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Department of Commerce
before the
Committee on Commerce, Science and Transportation
United States Senate

Hearing on
Spectrum Management: Improving the Management of Government and Commercial Spectrum Domestically and Internationally

June 11, 2002

Thank you, Mr. Chairman. I would like to thank you and the members of the Committee for inviting me here to testify on the important topic of spectrum management. I am Nancy J. Victory, Assistant Secretary for Communications and Information, U.S. Department of Commerce.

Spectrum is an invisible, but indispensable building block for America's future. It is a natural resource that can fuel economic growth. It is key to our nation's digital defense and our citizenry's safety. It is a wireless link that can enable anyone, anywhere to access the marvels of the worldwide web.

Spectrum management is under stress and strain from concurrent challenges. There is the challenge of constantly evolving technological capabilities. There is the challenge of threats to security and safety. There is the challenge of static processes and legacy regulations in a dynamic field. And finally, there is the challenge of the finite nature of the radio spectrum.

As reflected by the interest of this Committee and its members, spectrum management is one area where we have "to get it right" and "keep getting it right." Too much of our country's future

is riding on it to do anything less.

The Spectrum Summit

In early April, I convened a high-level 2-day Spectrum Summit meeting at the Department of Commerce. The purpose of the Summit was to explore new and innovative ideas to develop and implement spectrum policy and management approaches. The focus was upon ways to encourage spectrum efficiency; provide spectrum for new technologies; and improve the effectiveness of the domestic and international spectrum management processes.

Recognizing that improving the national spectrum management process is a multifaceted undertaking that neither government nor the private sector can do alone, I invited a variety of experts in spectrum management from government, industry, and academia to share their thoughts in this area. I was also particularly pleased with the extensive participation of the Federal Communications Commission in our two-day Summit. Chairman Michael Powell and Commissioners Kathleen Abernathy and Kevin Martin helped moderate panels with me.

The first day of the Summit consisted of panel discussions by government and private sector spectrum users, economists and academic analysts who follow spectrum issues, and technologists and futurists. The second day of the Summit entailed three simultaneous breakout sessions focusing on spectrum management, spectrum efficiency, and international issues.

The results of the Spectrum Summit were very revealing. Among the major problems identified were:

- Gaps in governmental coordination - NTIA, FCC & State;
- Length and complexity of the allocation process;
- Inefficient uses of spectrum and the absence of efficiency stimulating incentives;
- Challenges in making "room" or "homes" for new services and technologies; and
- Lack of clarity about spectrum rights and the federal spectrum management process.

A common criticism was that the process is usually too reactive – waiting until the technology is ready to be deployed before beginning the allocation process, rather than anticipating future spectrum

needs. There was also significant discussion on the hurdles the current system erects that limit the ability to promote sharing and encourage relocations to accommodate new needs or capabilities. Panelists indicated that the allocation process too often pits advocates of new technology against incumbents, instead of focusing on win-win outcomes that preserve existing rights while facilitating new uses.

The Future of Spectrum Management

From the Spectrum Summit, I believe several basic goals emerged. First, the U.S. Government agencies involved in spectrum management – NTIA, the FCC, and the State Department – must work collaboratively as "One Spectrum Team" to serve our Nation's collective interest. Secondly, we should develop policies that encourage spectrum efficiency. Third, we must establish forward-looking policies that enable technological advances and eliminate legacy regulations that stand in the way of innovation. And fourth, we should ensure that we have policies that ensure the deployment of robust wireless networks that are prepared for the worst of crises and able to deliver the very best of services to the American people. Let me describe what I mean by each of these in a bit more detail.

1. "One Spectrum Team"

The Summit was the first effort to bring NTIA, the FCC and the State Department together in a collective look at common challenges. As head of NTIA, I have responsibility for managing the federal government spectrum. As head of the FCC, Chairman Powell has responsibility for managing non-federal spectrum. As the lead State Department official for international telecommunications policies, David Gross, the U.S. Coordinator and Deputy Assistant Secretary, has responsibility for representing U.S. spectrum interests abroad. Our roles are different, but ultimately interdependent.

To promote an improved spectrum management process for the country, Chairman Powell, David Gross and I have established a "One Team" spectrum management approach. Specifically, to enhance NTIA and FCC cooperation, Chairman Powell and I have taken the first steps to improve our interagency communications and to take a more forward-looking approach to accommodate advances in technology. These improvements will enable our agencies to be more "proactive" and "predictive" in

spectrum management.

Deputy Assistant Secretary Gross, Chairman Powell and I have also been discussing how we can better coordinate to improve our international outreach as we prepare for international fora. This is increasingly important to U.S. interests as many aspects of spectrum management are addressed in such international bodies. In particular, our ability to reach consensus with other countries in the Americas prior to such meetings helps ensure that U.S. policy views have a greater likelihood of success, given the oftentimes unified positions of the European or Asian-Pacific nations. This is most significant in such fora as the World Radio Communication Conferences (WRC) held by the International Telecommunication Union (ITU) every three years. The ITU develops international radio regulations that have treaty status. We are also discussing ways in which we can begin the development of U.S. positions earlier in the process, including whether the appointment of the U.S. head of delegation for each WRC should be made sooner in the process to allow for the most effective representation of U.S. interests at these meetings.

Last, but not least, NTIA is examining ways to improve its own processes. We have recognized that the frequency authorization and coordination process through which government frequency assignments are made depend upon an inefficient paper-based system. In NTIA's Fiscal Year 2003 budget, we are requesting the funds to streamline this process into an electronic frequency selection, coordination and authorization system.

2. Spectrum Efficiency, Not Spectrum Waste

Effective spectrum management must include policies that create incentives for spectrum efficiency. NTIA has long advocated the use of more spectrum efficient technologies. For example, NTIA has developed and the Federal agencies are now implementing a transition to narrowband technology to relieve the congestion in the land mobile radio bands used by the Government. Under NTIA regulation, Federal agencies will convert to narrowband technology in certain land mobile frequencies by 2005 and in all others by 2008. This should effectively double the number of frequencies

available to Federal agencies. Narrowbanding, where technically possible, holds great promise for increasing the number of channels available to all users of the spectrum.

NTIA and the Federal public safety agencies have also advocated the adoption of technical standards for receivers to minimize interference and increase overall spectrum efficiency. State and local public safety entities are also recognizing the importance of establishing receiver standards to minimize interference. The adoption of receiver standards allows transmitters and receivers to operate closer to each other in the spectrum, thereby increasing the overall efficiency of the use of the band. NTIA has worked with several private sector organizations to establish receiver standards, including standards for Global Positioning Satellite (GPS) System receivers and VHF maritime mobile radios.

Federal agencies have also found that trunked systems can improve spectrum efficiency. In particular, trunked systems can be used for limited areas with a high concentration of use and for campus environments. Examples of sites particularly appropriate for trunked systems are Federal prisons, hospitals, laboratories, and training facilities.

Innovative new technologies, including those using adaptive frequency, power, and antenna capabilities, for example, also hold great promise in improving spectrum efficiency. Frequency adaptive technology will permit radios to adaptively select their operating frequencies based on sensing the operating environment and dynamically selecting unused channels. This permits an enhanced opportunity to share channels, a more efficient use of the spectrum. NTIA will be looking for additional opportunities for promoting and maximizing spectrum efficiency.

3. Forward-Looking Policies Enabling New Uses and Efficiencies

Current spectrum management practices often require users to seek permission from either the FCC or NTIA before changing the services offered over their licensed frequencies. This process can impose time-consuming approval processes that engender lengthy delays. The unintended consequence can be to discourage, rather than enable, new spectrum uses.

As a policy matter, agencies with spectrum management responsibility – NTIA and the FCC –

must continually reexamine their policies and rules to eliminate those that have become obstacles to innovation and to more efficient uses of the spectrum. To the greatest extent possible, we should be forward-looking in our policies and practices to remove procedural roadblocks to important federal and public advances.

One promising spectrum management reform is the FCC's proceeding on creating secondary markets for spectrum use. The proposed secondary markets rules would permit parties to "lease" their spectrum to others – encouraging the development of secondary markets in order to put spectrum to its most efficient use. This concept is not entirely new. As the FCC's rulemaking notes, *de facto* leasing already takes place in some circumstances, such as for Instructional Television Fixed Services, where parties are allowed to sell excess capacity. Leasing is also permitted with satellite time and through the relatively new band manager licensing regime. The secondary markets concept would broaden these limited leasing venues and extend the benefits of leasing arrangements across more of the spectrum. If fully developed, it could even lead to dynamic trading of spectrum rights among parties in real time, on an "as needed" basis.

I also supported the FCC's repeal of the spectrum cap on commercial mobile radio services. The FCC adopted an order last December to repeal the cap as of January 1, 2003 and to raise the cap to 55 MHz in all markets in the interim. This will permit carriers to assemble spectrum where appropriate to meet capacity needs and to deploy broader bandwidth services. The spectrum limits were simply too rigid to allow for changing needs and capabilities.

New frequency flexible and low power technologies offer tremendous opportunities for innovative, new services. We need to ensure that wireless systems, such as those under the 802.11 standard, can flourish on an unlicensed basis. Frequency flexible systems will challenge our current block allocation structure and we must ensure that they can be accommodated without needless government micromanagement.

One of our top priorities at NTIA is to work with the FCC to examine policies to alleviate the

current congestion below 3 gigahertz (GHz). Over 93 percent of all FCC licenses and Federal Government frequency assignments are in the 0 to 3 GHz range. Among other things, spectrum managers should be examining ways to encourage migration to higher frequency bands as the technology permits. Such policies should include clear incentives for relocation to higher bands, where possible.

In 1998, Congress enacted such a tool to permit Federal agencies to be reimbursed by the private sector for the costs associated with relocating from certain frequencies bands below 3 GHz, as well as any future reallocation of spectrum from the Federal government to private sector uses. Working with the FCC and the Federal agencies, NTIA has finalized these rules and they will be published in the Federal Register shortly. The President's Budget for Fiscal Year 2003 contained a legislative proposal to streamline this reimbursement process by creating a fund from spectrum auction proceeds to reimburse the affected Federal agencies. The Department of Commerce expects to transmit this proposal to Congress this summer.

4. Preparing for the Worst and Delivering the Best

The events of September 11, 2001, demonstrated how critically important communications capabilities are for our nation's first-responders – the public safety and emergency response men and women who protect and serve our country and our communities. Now, more than ever, we must ensure that our wireless facilities are robust and constructed to withstand physical and cyber-attacks. It has been made exceedingly clear that spectrum-based communications can be an indispensable link and lifeline in time of crisis.

NTIA has had a long and active role in providing spectrum for our nation's law enforcement and emergency response activities. Special attention was focused on public safety and multi-agency communications interoperability following the bombing of the Federal office building in Oklahoma City when state, local and federal police agencies had difficulty communicating with each other. In 1996, NTIA and the FCC co-sponsored the Public Safety Wireless Advisory Committee (PSWAC) report,

which provided recommendations on public safety issues through the year 2010. As a result of the report, NTIA established the Public Safety Program to address the long-range spectrum requirements of federal public safety agencies, develop a strategy to provide sufficient spectrum for growth of the current services, and to provide for advanced technology and interoperability.

Interoperability is shorthand for ensuring that different organizations with different radio systems operating on different frequencies are able to communicate immediately and effectively with each other. This is a complex problem that requires procedures and spectrum management tools to convert a potential Tower of Babel into a common communications language and an agreed upon process for linking different branches of government and different agencies together in a chaotic environment. NTIA is attempting to assist in tackling this problem in several ways.

First, within NTIA, we have one of the world's leading telecommunications research laboratories located in Boulder, Colorado – the Institute for Telecommunication Sciences (or ITS). ITS is NTIA's chief research and engineering arm, but it also serves as a principal federal resource for solving the telecommunications concerns of other federal agencies, state and local governments, and private associations and organizations. Among other things, ITS has been particularly involved in identifying solutions to the public safety interoperability issue, including developing standards for public safety digital land mobile radio systems

Moreover, at this very moment, NTIA and the Public Safety Wireless Network Program (PSWN), jointly managed by the Departments of Justice and Treasury, are co-hosting the Public Safety Interoperability Technology Summit here in Washington. The Summit focuses on current and emerging solutions for achieving interoperability to better inform public safety officials on their technology choices. NTIA will also be looking for additional ways to assist the public safety community to reach a fully interoperable future.

Current Challenges – Accommodation of New Wireless Technologies

While we wrestle with building a sound spectrum management framework for the future, the

demands of the present increase unabated. The search for new homes for new services – whether through new allocations, relocation of incumbents, or advanced sharing techniques – involve inherently nettlesome issues. Let me identify several of the key challenges that are facing all of us involved in spectrum decision-making.

1. Third Generation Wireless ("3G")

Over the past decade, there has been a tremendous growth worldwide in the use of cellular-based wireless telecommunications systems. The Department of Commerce and NTIA believe that this global growth will continue and that it is incumbent upon U.S. policymakers to find the spectrum to accommodate the demand for these new services.

NTIA is currently working with the FCC, the Department of Defense (DOD) and other Federal agencies to accommodate the demand for spectrum for third generation or 3G wireless services. The 3G systems advanced by industry propose to provide mobile and satellite-based broadband capabilities. While current cellular and PCS wireless systems are expected to evolve to 3G technology over time, there is a strong desire from the wireless industry for additional spectrum now to establish 3G networks.

In recognition of this growth and the trend toward global markets for wireless services, the ITU has considered the spectrum requirements for evolving 3G systems, which is internationally termed International Mobile Telecommunications-2000, or IMT-2000. The ITU forecast that 160 MHz of additional spectrum would be required for 3G systems over and above that spectrum already used for 1- and 2G systems. At WRC-2000, the ITU identified several frequency bands that could be used for IMT-2000 systems, leaving individual administrations the right to implement any of the bands in any time frame, for any service or technology, and using any portion of the identified bands that they deemed appropriate to satisfy national requirements.

Since 2000, NTIA, the FCC, and the Federal agencies have been working cooperatively to take certain actions to identify spectrum for 3G services. After extensive public outreach and work with

industry and affected agencies on technical analyses of the various band options, NTIA and the Federal agencies are now focusing specifically on the 1710-1770 MHz band, while the FCC is focusing on the 2110-2170 MHz band. A viability assessment on making both of these bands available for 3G is scheduled for release later this month.

2. Digital Defense of National Security

The events at home and abroad have underscored the importance of wireless communications capabilities to our national defense and critical infrastructure. The digital era of electronic links is a mission critical component of our military and security systems. Every branch of our armed services depend on radios and spectrum-dependent systems to conduct its missions. Information gained from these wireless systems is one of our nation's most effective weapons in today's war. DOD has predicted that its spectrum usage will grow by more than 90 percent by 2005. DOD must have access to these frequencies, not only when it deploys our troops abroad, but also to conduct critical training operations here in the United States. These requirements need to be recognized and addressed as we move forward in encouraging innovation and efficiencies in the public sector.

3. The 700 MHz Band

The Administration has also supported the FCC's postponement of the auction of the spectrum in the upper 700 MHz band to permit Congress and the FCC to develop the policies necessary to ensure certainty as to when and how this spectrum will become available for new wireless services. The Administration recognizes the important role that broadcasting continues to play in the lives of all Americans and the challenges associated with the digital conversion. At the same time, spectrum is needed for new wireless services that provide new communications opportunities to American families, businesses, and public safety providers. An equitable and efficient solution for relocating incumbents in these bands is possible and the Administration looks forward to working with the FCC and Congress to ensure such policies are developed in a timely fashion.

4. Rural Wireless Needs

Spectrum policies designed for the nation as a whole sometimes fail to recognize and address the special problems and challenges of the country's rural areas. Spectrum allocation and licensing policies need to be regularly reevaluated to assess whether they are fully and adequately meeting the needs of all Americans, including those in rural areas.

Conclusion

Mr. Chairman and members of the Committee, the radio spectrum is vital to our national security and to our economic security. I look forward to working with Congress in developing the best possible spectrum management policies for the future. Thank you again for inviting me to testify. I welcome any questions you may have for me.