7th Annual DoD Spectrum Management Conference

World Innovation Leadership: The Intersection of National Security and Economic Security

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Annapolis, Maryland
October 28, 2004

The National Telecommunications and Information Administration (NTIA)

- NTIA, under the leadership of Commerce Secretary Don Evans, serves as the President's principal adviser on telecommunications and information policy matters and presents coordinated Executive Branch views to the OMB, FCC, and Congress.
- NTIA, under statutory authority, manages the use of the spectrum by Federal agencies and coordinates shared spectrum uses with the FCC.
- NTIA's goal is to enhance the public interest by promoting quality service, competition, consumer welfare, and economic and social opportunities for all Americans.

Economic and National Security: The Past

- Radar
- Analog computers
- Digital computers
- Internet
- Space program technologies
- CDMA
- Weather radars
- Earth sensing
- Satellite communications

Economic and National Security: The Present

- 3rd Generation Wireless – 45 MHz reallocated from government to private use
- 5 GHz – 255 MHz of additional spectrum made available for unlicensed wireless LANs (Wi-Fi) shared with government systems
- Ultra-wideband – enabled implementation of new communications services that will operate co-frequency with existing government and commercial services over wide range of spectrum
- 70-80-90 GHz to be shared between government and private users (potential for commercial extremely high-data rate applications)
- Broadband over power lines – additional broadband alternative, e.g., more competition
- Improving efficiency of mobile systems

Emerging Technologies Will Facilitate More Sharing Between Spectrum Users

- Cognitive radios - utilizing software to enable the radio devices to “listen” before transmitting (e.g. JTRS, XG)
- Highly directional antennas (fractal antennas)
- Use of coding technologies, including coding combined with advanced modulation (e.g. CDMA)
- Greater utilization of multiple domains - time, geography, etc.
- Orthogonal Frequency Division Multiplex (OFDM) such as that used by satellite radio systems

The Goal: Increasing bits transmitted per Hz per km² at lowest unit cost

3G: Partnership to Coordinate Relocation of Government Spectrum to Provide Frequencies for Advanced Wireless Services

- 45 MHz of government spectrum reallocated for 3rd generation wireless (1710-1755 MHz)
  - Cherry Point, North Carolina
  - Yuma, Arizona
- Comparable spectrum for government users was identified by using Spectrum XXI
  - Fixed microwave operations relocate to various bands (e.g. 7-8 GHz)
- Multiple bands will be used for relocating the government users
  - FCC 7th Report and Order (2025-2110 MHz co-primary status)
- Cost of relocation to be provided by industry
  - Commercial Spectrum Enhancement Act (Spectrum Trust Fund legislation) pending before Congress

Funding Relocation of Government Systems to Accommodate 3G: Current Approach

- *Existing approach to funding relocation*: Current law requires the winners of spectrum auctions to negotiate directly with the federal agencies to determine relocation costs to be paid by private sector auction winners in addition to amounts paid in auction.

- This creates additional costs for private users which will not be known prior to auction and uncertainty for federal users.

Funding Relocation of Government Systems to Accommodate 3G - New Approach

- Administration has proposed legislation to provide a spectrum relocation trust fund out of proceeds of spectrum auction for commercial users
  - Process:
    - **(1)** Prior to auction federal agencies will calculate cost of relocation;
    - **(2)** Auction proceeds equal to 110 per cent of cost estimates will be deposited into a spectrum trust fund
  - Relocation fund would speed the relocation of federal government spectrum users
  - Proposed law would provide more certainty for government and private users

5 GHz: Promoting Broadband While Protecting Government Users

- Increasing use of wireless local area networks (Wi-Fi) necessitated additional bands for operation to support broadband users
- Extensive cooperation between NTIA, government users (DOD), FCC and private sector developed technical sharing rules to enable co-frequency operation between unlicensed Wi-Fi and government systems
- Ongoing dialogue continues to ensure that, as Wi-Fi expands into upper part of 5 GHz band, technical means of protecting government operations are adequate

The President's Spectrum Policy Initiative

The Spectrum Challenge

A Presidential Policy Board examining spectrum management summed up the urgent issues in stating:

"The development of so valuable a resource as the radio spectrum is a matter of paramount importance. Despite technical and operational improvements the demand for frequencies has steadily crowded the supply within the usable spectrum. The use of this resource should have the most careful planning and administration within the United States and in cooperation with other countries. Unfortunately, guidance and administration have often been inadequate."

The Spectrum Challenge (cont'd)

- The statement on the previous slide sums up today's situation pretty well… except it was written in 1951 by President TRUMAN'S policy board.
- A Johnson Administration report in late 1968 observed the "remarkable" growth in spectrum use and resulting problems and inefficiencies caused by an inflexible block allocation system among other things. It called for greater use of economic factors, and, echoing a Commerce Department advisory board report called "The Silent Crisis," cautiously raised the idea of a market system and possibly license fees related to the amount of spectrum used.
- The General Accounting Office has visited spectrum issues more than once, including a report in 1974 that discussed the views of economists that advocated the use of market forces for spectrum management.
- In 1991, NTIA released its own comprehensive review of spectrum management, which among other things called for greater use of market forces.

President's Spectrum Policy Initiative

"The existing legal and policy framework for spectrum management has not kept pace with the dramatic changes in technology and spectrum use."

- President George W. Bush, Presidential Memorandum, May 29, 2003

- Committed the Administration to develop a comprehensive U.S. spectrum policy for the 21st century
- The Secretary of Commerce was charged to lead this initiative

Overall Goals of the Spectrum Reform Initiative

- Foster economic growth
- Ensure national and homeland security
- Maintain U.S. global leadership in communications technology development and services
- Satisfy other vital U.S. needs such as public safety, scientific research, federal transportation infrastructure and law enforcement

Responding to the President's Directive

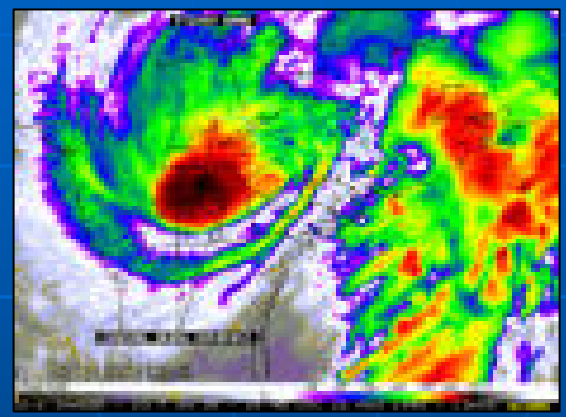
During 2003 -2004, Secretary Evans:

- Convened a Federal Government Spectrum Task Force to develop recommendations for improving the federal agencies' use of the spectrum
- Conducted public meetings and obtained comments from a wide range of stakeholders on how to improve U.S. spectrum management (including management of spectrum use by federal, state, local, and private sector entities)
- Prepared two reports with recommendations which were released on June 24, 2004
- [Further details available at http://spectrumreform.ntia.doc.gov]

The Vision for Spectrum Policy Reform

Support critical government functions:

- Ensure that the spectrum needs of national defense, homeland security and public safety are met



Innovation:

- Support the timely deployment of new products and services
- Promote market driven competition to the extent feasible
- Create an environment fostering technological innovation and efficient use of spectrum
- Ensure U.S. global lead in spectrum-based technologies

Spectrum Reform Initiative's Key Objectives

A. Facilitate a modernized & improved spectrum management system

B. Facilitate policy changes to create incentives for more efficient & beneficial use of spectrum & to increase predictability & certainty for incumbent spectrum users

C. Develop policy tools to streamline deployment of new & expanded services & technologies while preserving national & homeland security & public safety, & encouraging research

D. Develop means to address the critical spectrum needs of national & homeland security, public safety, federal transportation infrastructure, & science

Facilitate A Modernized & Improved Spectrum Management System

Develop Consistent Methods for Assessing New Technologies to standardize methods to evaluate spectrum efficiency & effectiveness.

Develop Best Practices Handbook of analytical engineering spectrum tools & procedures for coordinating new services and managing interference.

Apply Information Technology to replace paper based processes & procedures.

Adopt Career Development Program to assist private sector & federal spectrum management organizations.

Establish the DOC Spectrum Management Advisory Committee to advise the Asst Sec. on needed reforms to domestic spectrum policies & management to enable new technologies and services.

Review & Improve International Spectrum Management policy and framework and improve U.S. processes for World Radio Conferences.

Facilitate Policy Changes To Create Incentives For More Efficient & Beneficial Use Of Spectrum & To increase Predictability & Certainty For Incumbent Spectrum Users

Apply Capital Planning Process & investment control procedures to better identify associated spectrum requirements & costs of major investments.

Implement a Technical Planning Process in the federal agencies to evaluate needs for use of the spectrum before seeking NTIA spectrum certification.

Use of Efficient Technologies to evaluate all spectrum use by the federal government over a five-year period to benchmark spectrum efficiency & effectiveness.

Develop & Use Economic Incentives that promote more efficient & effective use of the spectrum. Encourage Congress to enact legislation to increase incentive authority and examine spectrum rights as incentives.

Develop Policy Tools to Streamline Deployment of New & Expanded Services & Technologies While Preserving National & Homeland Security & Public Safety, & Encouraging Research

Develop a National Strategic Spectrum Plan for radiocommunication systems, new spectrum needs, & to meet those needs.

Facilitate Interoperability & Continuity of Government Communications – Implement plans to allow federal, state, and local governments to meet continuing terrorist threats, emergencies & day-to-day operations.

Increase Sharing For Private Sector & Federal Use – Identify bands & new for sharing, & barriers to allocation sharing & government use of commercial services. Establish a pilot program for sharing two, 10 MHz spectrum segments one allocated for government use & the other for non-government use.

Characterize New Technology & Expanded Services & Determine Their Impact – Determine impact of new technologies & expanded services on incumbents, & identify improvements to reduce time to assess new uses of the spectrum.

Develop Means to Address the Critical Spectrum Needs of National & Homeland Security, Public Safety, Federal Transportation Infrastructure, & Science

Establish a Policy & Plans Steering Group (PPSG) to provide advice on policies, strategic plans, planned or revised positions on spectrum issues nationally & internationally, & help resolve major contentious spectrum policy issues.

Policy Coordinating Committee (PCC) – Use the existing PCC process to review spectrum-based radiocommunication issues. Revise FCC/NTIA MOU to provide an additional minimum 15 business days for PCC review.

Homeland Security, Defense, Emergency Preparedness, & Public Safety – Modify provisions of 47 C.F.R. § 0.181 to include coordination of public safety activities within the purview of the FCC Commissioner responsible for homeland security, defense, emergency preparedness issues.

Encourage Long-Range Spectrum Planning – Encourage State, regional, and local government agencies to establish long-range spectrum planning processes considering federal long-range plans.

Identify and Address Unsatisfied Spectrum Requirements for Public Safety – Identify unsatisfied spectrum requirements, develop a federal/non-federal public safety demonstration program, and address public safety spectrum shortage, interference, new technology and security issues.

Overarching Goal: Promoting Economic Growth

- Thanks to the President's policies, America's economy is strong:
  - U.S. economy grew at a real GDP rate of 3.3% in the second quarter of 2004 (revised upwardly from 2.8%); over the last four quarters, GDP has risen at a robust 4.8% rate – nearly its strongest growth in 20 years.
  - The economy has shown 13 straight months of job growth and added nearly 2 million new jobs – more than Canada, France, Germany, Great Britain and Japan combined.
  - Homeownership rate is a record high of 69.2% in the first quarter of 2004.
  - Productivity grew from 2000 to the present at the fastest rate of growth in more than 50 years.
- "…the United States, with one-twentieth of the world's population, accounts for one-third of the world's output and, last year, more than three-fifths of its growth." *– "Understanding the Role of the United States in the Global Economy ", Glassman and Hassett, American Enterprise Institute, August 1, 2003*
- "The world's economy in the last 10 years has opened up, and you've had a seminal event, of half the world's population joining the world's free economic system almost overnight, in the 1990s. India, China, Russia and the Eastern Bloc joined the world's free economic system: 3 billion people."

  – Craig Barrett, CEO, Intel Corp., The San Francisco Chronicle, April 28, 2004
- "Instead of American companies outsourcing services like call centers to foreign countries like India, the companies could turn to Appalachia."

  – Michael Powell, FCC Chairman at the ARC Conference, June 30, 2004

Conclusion

- Spectrum dependent services are essential to the United States' national security and economic security.
- Spectrum is a critical engine for economic growth and job creation.
- DoD has been a pivotal contributor to our world leading spectrum policy.
- This Administration is committed to spectrum policies that create a domestic and international environment for economic growth by removing barriers to the implementation of U.S. technologies and services.
- NTIA's spectrum reform program will result in policies that satisfy the United States' requirements for domestic and worldwide spectrum use.