Spectrum Policy Reform – The Road Ahead
A Congressional Perspective

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Senator Olympia Snowe
Growing spectrum demand

Congress has concerns about making sure demands of all spectrum users can be met.

- **Commercial/Constituents**
  - Emergence of smartphones, netbooks, etc.
  - Exponential growth in wireless broadband!

- **Federal / Military**
  - Greater need for support surveillance, fire control, “Network-Centric Warfare”, imaging radar, National Airspace System enhancements, eGov 2.0, etc.

- **Public Safety**
  - Need for a nationwide interoperable network
Problems persist

GAO-02-906: “FCC and NTIA’s efforts are not guided by a national spectrum strategy. The absence of such a strategy may make it more difficult for FCC and NTIA to avoid contentious, protracted negotiations when providing for future spectrum requirements.”

GAO-03-277: “no one agency has been given ultimate decision-making authority over all spectrum in the United States or the authority to impose fundamental reform.”

GAO-04-666: “the current structure and management of spectrum use in the US does not encourage the development and use of some spectrum efficient technologies.” “NTIA and FCC do not have a sufficient understanding of the spectrum environment, including how and how much spectrum is used.”

GAO-06-526T: “there is evidence that some of the spectrum is currently underutilized” and there is mounting concern “about the availability of spectrum for future needs” for federal and non-federal use.
Presidents & spectrum

• President Bush’s Spectrum Policy Initiative (2004)
  • Improve stakeholder participation (CSMAC)
  • Reduce barriers to innovation in technologies and services
  • Modernize Federal Spectrum Management Processes
  • Promote efficient and effective spectrum use
  • Improve long-term planning and promote market-based incentives

• President Obama’s Presidential Memorandum (2010)
  1. Release 500 MHz of spectrum
  2. Provide tools to effectively reallocate spectrum
  3. Enable spectrum to be put to its highest value uses
  4. Public safety & deficit reduction
Improving spectrum policy

- **S.649, the Radio Spectrum Inventory Act**
  - More detailed information
  - Centralized portal
  - Greater Transparency to facilitate the public debate

- **S.3610, the Spectrum Measurement and Policy Reform Act**
  - Measurement studies and utilization metrics
  - Establishes Spectrum Sharing/reuse pilot programs
  - Greater collaboration and more strategic planning between FCC and NTIA
  - Incentive to promote efficiency (spectrum fees & auction revenue sharing)
Why a spectrum inventory?

“In order to free up additional spectrum, decision makers at the FCC, NTIA, and Congress must have a clear, detailed, up-to-date understanding of how spectrum is currently being used and by whom—such data is essential to sound policy decisions.”

--Senator Olympia Snowe
Current inventory - one dimensional
Current databases disparate

• FCC’s Multiple Databases
  – The Universal Licensing System (ULS) is the easy, online answer to your wireless licensing and research needs. ULS simplifies the application and licensing processes...
  – Broadcast Radio and Television Electronic Filing system (CDBS)
  – International Bureau Electronic Filing system (MyIBFS)

• NTIA’s Government Master File (GMF)

• NTIA’s Federal Spectrum Management System (FSMS) – TBD
  – Outlined in President Bush’s Spectrum Policy Initiative
FCC Spectrum Dashboard

Improved but more can be done.
S.649, Radio Spectrum Inventory Act

- **Data Sets (300 MHz to 3.5 GHz)**
  - Authorized licensees or government users
  - Total spectrum per user in band (% and sum)
  - Number of transmitters, end-user terminals, or receivers
  - Type of transmitters, end-user terminals, or receivers
  - Contour maps & geo-locations of base stations
  - Extent of use
  - Activities, capabilities, functions, or missions supported
  - Unlicensed authorization/activity

*House companion bill HR.3125: 225 MHz to 3.7 GHz (min) / 10 GHz (max)*
Inventory will greatly help

Deriving information from the data...

- Contour Maps
- Licenses
- Deployment
S.3610, Spectrum Measurement & Policy Reform Act

*Introduced by Senators Snowe & Kerry last week!*

- **Spectrum measurements**
  - Provide more up-to-date surveys of spectrum usage
  - Correlate with inventory date to determine accuracy

- **Metrics & utilization study**
  - Develop benchmarks to evaluate spectrum efficiency and utilization

- **Spectrum pilot programs**
  - Sharing, reuse, layering, and Just-In-Time Spectrum programs in noncritical areas

- **Relocation cost-benefit analysis**
  - Move incumbents thru emerging technologies to free up MHz
S.3610, *Spectrum Measurement & Policy Reform Act*

- **Greater collaboration between FCC & NTIA**
  - Adhering to Sec. 112 (47 U.S.C. 922)
  - Achieve long term goals and better management

- **More strategic planning**
  - Creation of Spectrum Advisory Committee
  - Completion of the National Strategic Spectrum Plan

- **Carrot & stick to drive efficiency**
  - Auction Incentives
  - Spectrum Fees

- **Spectrum Relocation & Efficiency Fund**
  - Greater flexibility for planning, research, upgrades
  - Allowance for long-term planning (8 to 20 yrs)
S.3610 Spectrum Measurement Provision

- **Spectrum measurements**
  - 100 MHz to 10 GHz
  - Several diverse locations over an appropriate period of time (translation: ~ 20 locations, 2 weeks each)

- **Survey results**
  - Ascertain usage patterns (spatial & temporal) for spectrum sharing and reuse pilot programs
  - Correlate with Spectrum Inventory to determine accuracy of records
  - Assist FCC and NTIA in developing long-term spectrum strategies
Sound spectrum policy reform

- Spectrum alone will **NOT** solve a *looming crisis*.
  - **Robust spectrum policy and management**
    - Underutilization ≠ band-clearing
    - Utilization has different definitions
    - Spectrum sharing & reuse critical (spatial & temporal)
  - **Technical innovation**
    - Femtocells & dual mode = offload options
    - Cognitive radio / dynamic access = efficiency and intelligence
    - MIMO = fiber optic speeds over air!

“In order to achieve harmony, you must play different notes.”
Sound spectrum policy reform will allow and encourage...

- Femtocells: offload wireless traffic onto broadband wireline networks
- Cognitive Radio: utilizing idle spectrum
- Spatial Multiplexing: more bandwidth
Future is difficult to forecast

"This 'telephone' has too many shortcomings to be seriously considered as a means of communication. The device is inherently of no value to us."

-- Western Union internal memo, 1876

"I think there is a world market for maybe five computers."

-- Thomas John Watson, Sr. of IBM, 1943

After extensive analysis, our forecasts for cell phone penetration in the U.S. by 2000 is expected to be only 900,000 subscribers.

-- McKinsey & Company report to AT&T, 1980

Actual figure: 109 million

"640K [memory] ought to be enough for anybody."

-- Bill Gates, 1981

"We're talking about 50 to 60 million [cell phones] over the next 20 or 30 years."

-- Peter Erb, President of Millicom, 1982
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| FIXED | Trunked and conventional systems in 125 kHz channels (paired with 906-901 MHz). |
| MOBILE | 944-955 MHz. Primarily, studio-to-transmitter links. 952-953 MHz paired with 920-929 MHz. 953-960 MHz. Primarily, fixed point-to-point communications. |

**Questions?**

THANK YOU