

Introduction to Spectrum Policy for Technologists

Winn Forum Webinar Series

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Driving the future of radio communications and systems worldwide

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Outline & Overview

1. **Introductions**
2. **The Spectrum Regulatory Establishment (Peter)**
3. **The Spectrum Policy Process (Ari)**
4. **The Wireless Regulatory Framework (Peter & Ari)**
5. **Q&A (Lee, Peter, Ari)**

- High-level introduction to spectrum regulation and public policy issues.
- Overview of domestic (U.S.) and international regulatory institutions involved in regulating access to the radiofrequency spectrum.
- Key concepts that will be explored/explained:
 - spectrum allocations, licensing regimes and assignments, wireless service rules, authorization of unlicensed devices and protections from harmful interference.

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About The Winn Forum Regulatory Committee

- Works with the regulatory/public policy community to establish global regulatory framework promoting adoption of reconfigurable wireless technologies in advanced wireless systems.
- Facilitated by Regulatory Advisory Committee
- Supports Forum's overall strategy by:

Advocacy:

- Developing/maintain regulatory agenda that addresses members' needs;
- Proactively promote regulatory agenda in relevant bodies worldwide;
- Inform members of regulatory proceedings & filing deadlines; and
- Form ad-hoc project groups to develop Forum responses as required .

Opportunity Development: identify regulatory barriers/misconceptions impacting members' ability to pursue business opportunities/objectives; inputs/feedback to/from User Requirements Committee

Commercialization: identify regulatory constraints impacting feasibility of technical options pursued under Forum's commercialization efforts; inputs/feedback to/from Technical Committees

Education: programs to educate members and community on regulatory landscape; Technical Conference and Workshops

Chair, Peter Tenhula

Vice Chair, Paul Kolodzy



About Hogan Lovells

- **Full service law firm with over 2400 attorneys in 43 offices around the world**
- **Large, multi-jurisdiction communications regulatory and technology practice, focusing on matters governed by US, EU, and other legal regimes**
- **Regularly provides strategic and legal advice on a wide range of spectrum policy issues before the FCC, NTIA, U.S. Executive Branch, U.S. Congress, EU, ITU, and other national and international regulatory authorities**

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Regulatory Establishment (U.S.)



Executive Branch
(President)



Legislative Branch
(Congress)



NTIA

Federal Users

- National Defense
- Law Enforcement,
- Homeland Security & Emergency Services
- Transportation
- Resource Mgmt & Control

FCC

Non-Federal Users

- Commercial
- Private
- Business
- State & Local Government
- Media

← COORDINATION →

← ADVISORY LIAISON →



INTERDEPARTMENT RADIO ADVISORY COMMITTEE
Chaired by NTIA

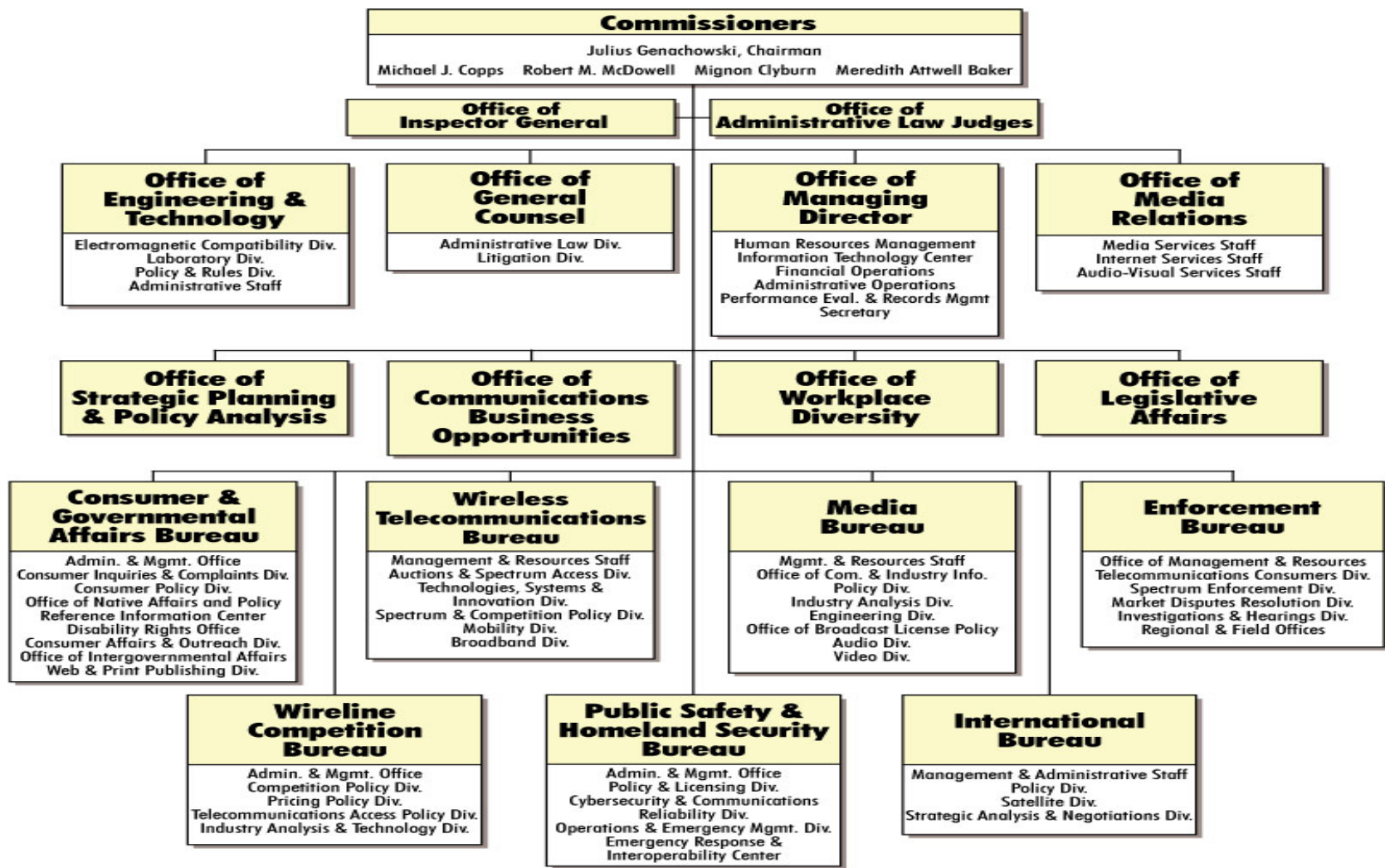
19 Federal Agencies (3 from DoD) and the FCC



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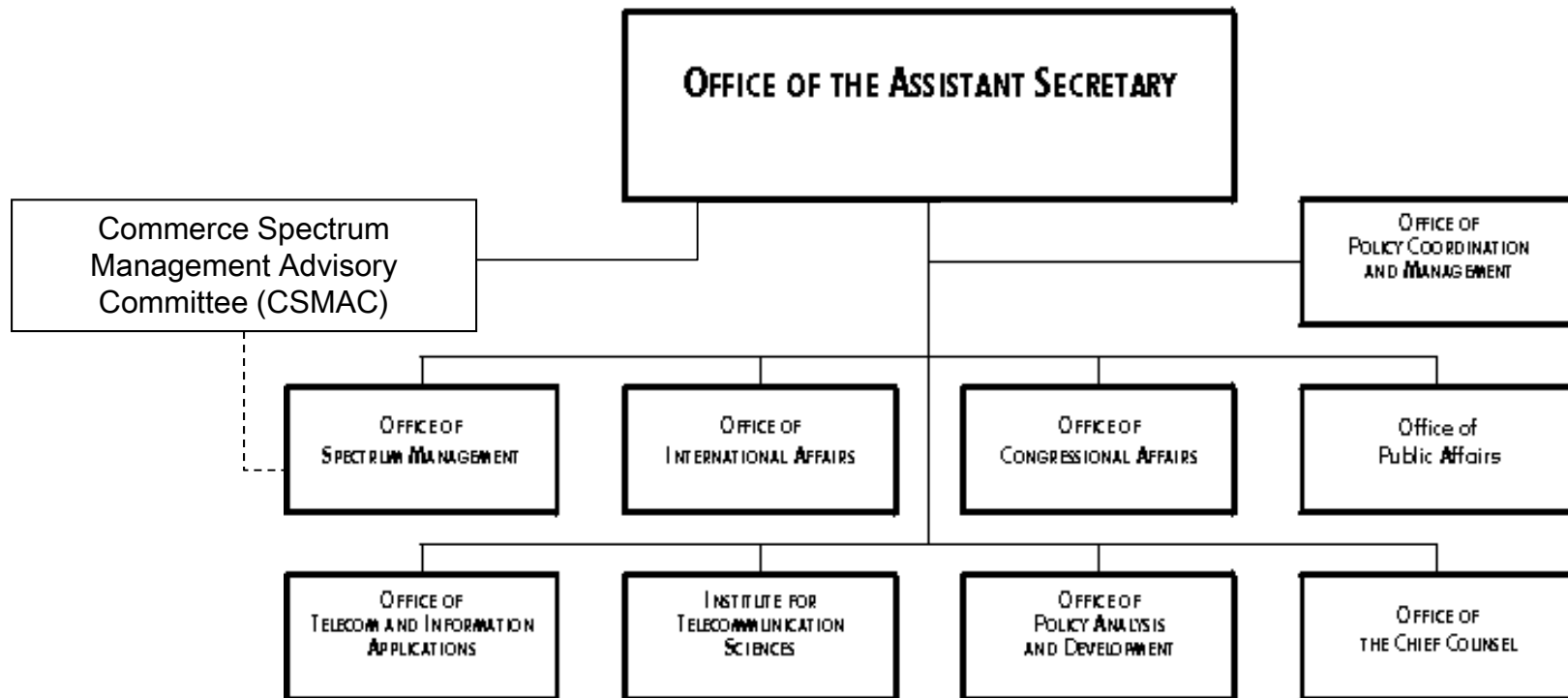


FCC Organization

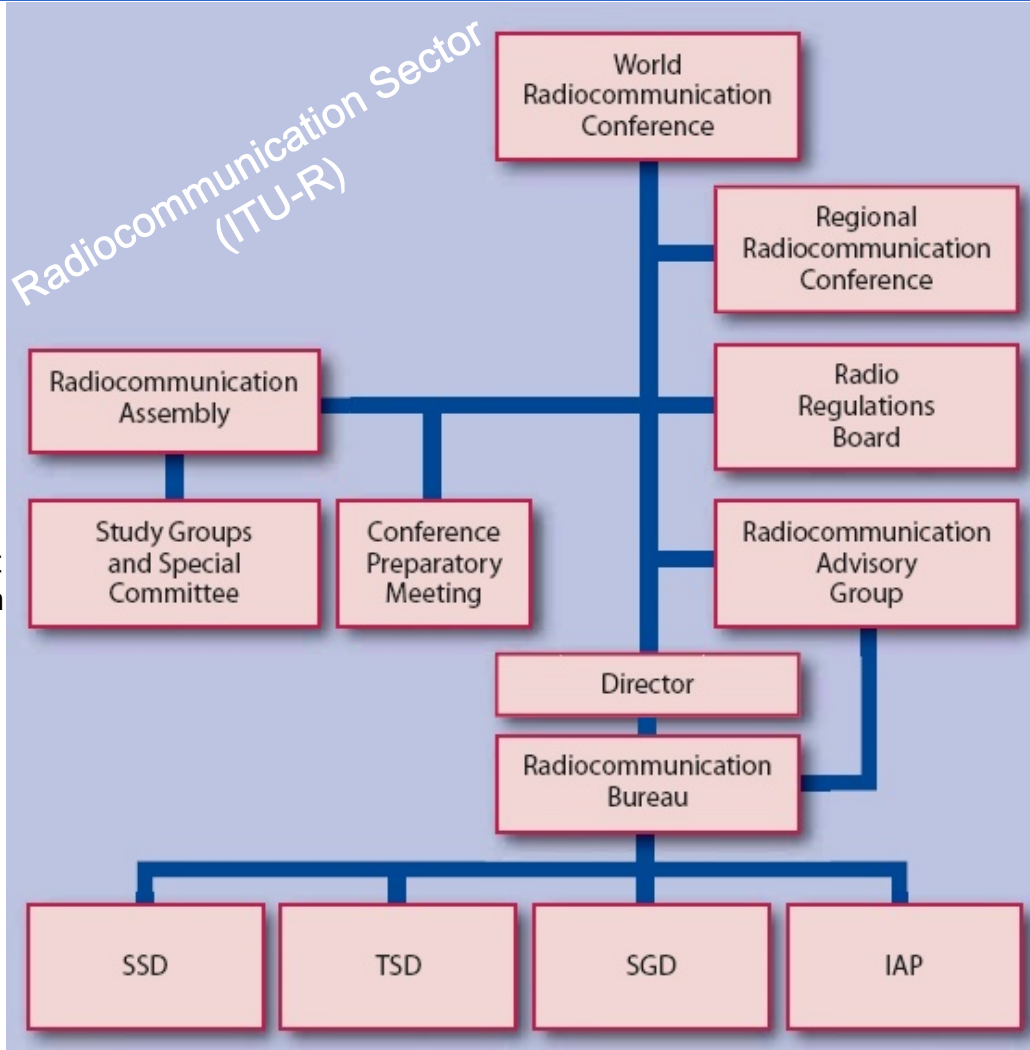


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NTIA Organization



ITU-R Organization



ITU-R Study Groups

1. Spectrum management
3. Radiowave propagation
4. Satellite services
5. Terrestrial services
6. Broadcasting service
7. Science services

ITU-R Departments

- Space Services (SSD)
- Terrestrial Services (TSD)
- Study Group (SGD)
- Informatics, Administration and Publications (IAP)

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 - Examples of past and ongoing proceedings
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Process for Initiating FCC Spectrum Policy-Making

Private Sector-Initiated Options

- Petition for Rulemaking
- Request for Rule Waiver
- Congressional Legislation
- White Paper or Extensive Ex Parte Filing

FCC-Initiated Options

- Forum or En Banc Hearing
- Task Force Proceeding and Report
- Notice of Inquiry
- Notice of Proposed Rulemaking

Advantages/Disadvantages of Selected Private Sector–Initiated Options

	Petition for Rulemaking	Request for Rule Waiver	Congressional Legislation	White Paper/Ex Parte
Securing A Speedy Final Decision	-	+	- *	-
Framing Issues	+	+	-	+
Building Stakeholder Coalitions	+	-	+	+
Developing A Comprehensive Public Record	+	+ **	-	- ***

* Although the legislative process usually takes longer to complete than an FCC proceeding, it is sometimes advisable to seek legislative relief, especially where the FCC appears hesitant to rule in your favor.

** FCC has discretion whether to seek public comment on waiver applications. If no public comment is sought, a comprehensive public record will, of course, not be developed.

*** A more comprehensive public record can be developed if the FCC puts the White Paper/Ex Parte out for public comment before developing a response or NPRM proposal.

Comparison of Various Private Sector-Initiated Options

Petition for Rulemaking

- Lengthy process (often 2-4 years before completion where valuable spectrum rights are at stake and major parties disagree)

Request for Rule Waiver

- Often shorter than the rulemaking process (especially where facts giving rise to waiver request are unique and the request is unopposed)
- Waiver may be granted where: (1) the underlying purpose of rule would be frustrated by application of the rule in the instant case and grant would be in the public interest or (2) unique circumstances warrant grant.
- Expedited FCC treatment possible (FCC has discretion on whether to seek public comment)

Comparison of Various Private Sector-Initiated Options (cont.)

Congressional Legislation

- Generally, the lengthiest process. But sometimes legislation can be an effective means of securing relief, especially where a bill exists that is likely to be enacted and the FCC appears hesitant to issue a decision in your favor

White Paper / Extensive Ex Parte Filing

- Less formal than petition for rulemaking, but often helps in framing issues

Comparison of Various FCC-Initiated Options

Forum or En Banc Hearing

- Alternative method for highlighting FCC priorities and gathering information for future NOI or NPRM
- Best used when FCC wants to focus in a particular policy area and does not have pressing deadlines

Task Force Proceeding and Report

- Good way to gather good information and provide intellectual/policy framework for future FCC decisions (e.g., National Broadband Plan, Spectrum Task Force Report)
- Best used when FCC seeks input on a wide range of related issues and does not have pressing deadlines

Comparison of Various FCC-Initiated Options

Notice of Inquiry

- Used when FCC has not developed a specific proposal. Like a Task Force report, an NOI can be a good way to gather information to support a more substantive NPRM in the future

Notice of Proposed Rulemaking

- Generally used when FCC has determined to move forward in a specific policy direction
- Of the choices available to the FCC, the NPRM offers the fastest path toward a final decision

Spectrum Policy-Making Process

Applicable Legal Framework

FCC decisions must comply with the Administrative Procedures Act, 5 U.S.C. § 706(2)(A)

- Federal agency findings must be set aside if they are “arbitrary, capricious, an abuse of discretion or otherwise not in accordance with law”

FCC decisions must be consistent with the U.S. Constitution, the Communications Act, and other applicable laws

Reviewing courts defer to the FCC’s expertise on spectrum policy and technical interference matters under the Supreme Court’s Chevron decision, but FCC decision must be reasonable.

Spectrum Policy-Making Process

Division of Labor Among FCC Bureaus and Offices

Spectrum Allocations, Unlicensed Operation and Equipment Certification: Office of Engineering & Technology

Service and Technical Rules for Licensed Services:

- Commercial Satellites – International Bureau
- Broadcasting (Including Satellite Broadcasting) – Media Bureau
- Commercial Terrestrial Wireless – Wireless Telecommunications Bureau
- Public Safety – Public Safety and Homeland Security Bureau

Spectrum Policy-Making Process

Division of Labor Among FCC Bureaus and Offices (cont.)

**General Policy Guidance,
Including Economic
Analysis: Office of Strategic Planning and
Policy Analysis/Chief Economist/
Chief Technologist**

Legal Considerations: Office of General Counsel

Legislative Issues: Office of Legislative Affairs

FCC Spectrum Policy-Making Process

Key Players

FCC Chairman

- Appointed by President/Confirmed by Senate for five-year term
- From the President's political party
- Sets and manages FCC policy agenda
- Decides when items are put before the full FCC for vote

Remaining FCC Commissioners

- Appointed by President/Confirmed by Senate for five-year terms
- Two from the President's political party and two from the other party

FCC Spectrum Policy-Making Process

Key Players (cont.)

Operating Bureaus (International, Media, Public Safety and Wireless), and OET

- Issue decisions on delegated authority and prepare drafts of Commissioner-level decisions
- Senior staff of these Bureaus and Offices wield significant influence over policy

FCC Spectrum Policy-Making Process

Key Players (cont.)

OSP/Chief Economist/Chief Technologist and OGC

- Provide policy and legal advice on major decisions

Commissioners' Wireless, International and OET Legal Advisors

- Generally, the same set of advisors cover all of these portfolio areas
- Meet regularly to discuss items, vote items on circulation and prepare for Commission meeting votes
- Because Commissioners themselves are prohibited by the "Sunshine Act" from meeting together in groups of more than two outside an open FCC meeting, the legal advisors (who are not so restricted) wield significant influence over spectrum policy-making

Spectrum Policy Advocacy Dos and Don'ts

Do:

1. Use experienced engineering, legal/policy and communications team
2. Meet with FCC (Bureau and Commissioner) staff and interested outside parties (including trade press, Congressional interests and NTIA staff, where possible) prior to launching proposal
3. Try to build coalitions among the private sector and public interest groups
4. Try to submit comprehensive solution to the FCC - a solution that takes care of all or most stakeholder interests
5. Strive to show how your proposal is consistent with the FCC's major policy objectives

Spectrum Policy Advocacy Dos and Don'ts (cont'd.)

Don't:

1. Be overtly critical of existing FCC policy directions that make achievement of your goals more difficult
2. Try to maneuver around FCC staff with day-to-day responsibility for your issue
3. Settle for sloppy engineering, legal and policy analysis and advocacy
4. Try to pit certain FCC bureaus and offices against each other

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 - Key regulatory concepts
 - Some regulatory trends
 - Examples of past and ongoing proceedings
 - Current focus on the “shortage” of spectrum for wireless broadband services
5. Q&A (Lee, Peter, Ari)

Wireless Regulatory Framework (1)

Spectrum Access Methods

- Licensed
- Unlicensed
- Hybrid (“light” licensing)

Equipment/System Certification & Coordination

- FCC Part 2 and 15 Rules
- NTIA Coordination
 - Spectrum Supportability for Federal Systems

Operational Limitations

- Spectrum Allocations, Allotments/Band Plans
- Wireless Service Rules

Wireless Regulatory Framework (2)

Traditional Spectrum Access Methods

- Licenses/Assignments
 - Non-Gov't/Fed. Gov't = FCC/NTIA (U.S. only)
 - Exclusive Licenses
 - “Centralized” Trunking in Land Mobile Services
 - Cellular architectures and geographic-based licenses
 - Freely transferable assets (U.S. and U.K. only)
 - Leasing of spectrum usage rights (U.S. and U.K. only)
 - “Shared” Frequency Assignments/Licenses
 - Frequency coordination
 - Site-based
 - “Decentralized” trunking

Wireless Regulatory Framework (3)

Evolving Spectrum Access Methods

- Unlicensed Commons
 - Open entry to many types of very low power RF devices (garage door openers, WiFi, cordless phones)
 - “Junk” Bands “shared” with microwave ovens, radars and other ISM devices (e.g. 900 MHz, 2.4 GHz and 5 GHz bands)
 - Ultrawideband
 - Dynamic Frequency Selection (DFS) and Transmit Power Control (TPC) Sharing Requirements (e.g. 5.8 GHz U-NII band shared with Federal radars)
 - Geo-location Database and/or Sensing Based Sharing (e.g. TV “White Spaces”).

Wireless Regulatory Framework (4)

Evolving Spectrum Access Methods (cont'd)

- Hybrid Approaches
 - License by rule (e.g., radio controlled toys, CB radio, Family Radio Service, medical telemetry)
 - Site registration and automated link coordination (e.g., 70-90 GHz)
 - Contention-based protocols and site registration (e.g., 3650-3700 MHz)
 - “Private commons” in licensed bands

Wireless Regulatory Framework (5)

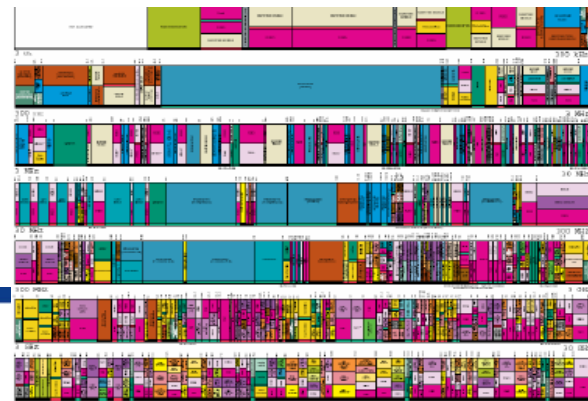
Equipment and system certification

- FCC Equipment Certification
 - Assures compliance with service rules, interference avoidance
 - Independent lab testing required
 - Big focus is on electromagnetic field health effects
 - “Software Defined Radios” security assurances
- NTIA Spectrum Supportability and EMC
 - Government systems (DD Form 1494)
- Europe: Self certification approach

Wireless Regulatory Framework (6)

Operational Limitations (1)

- Spectrum Band Allocations
 - International: ITU-R, World Radio Conferences
 - Domestic: U.S. Federal Gov't & Non. Gov't
 - Broad service categories (e.g., mobile, fixed, broadcasting, etc.)
- Priority access mechanisms
 - Primary, Co-Primary (coordinated use)
 - Secondary
 - Non-interference basis
 - Allocation table footnotes elaborate on access “rights”



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Wireless Regulatory Framework (7)

Operational Limitations (2)

- Wireless Service Rules
 - Narrower service categories (e.g., paging, cellular, PCS, SMR)
 - Classification of stations (e.g., fixed, mobile, portable, space)
 - Channelization plans/allotments, sub-bands, band plans
 - Eligibility limits (public safety, commercial . . .)
 - Technical rules (power, height, out-of-band limits . . .)
 - Performance/build-out requirements
 - Network access & behavior regulations (E-911, interconnection, open access, disability access . . .)
 - Other social, competition and industrial policies

Some Regulatory Trends

Emergence of Market-Oriented Regulation of Wireless Communications

- **Personal Communications Services (PCS) and other new commercial mobile wireless services (“3G” & “4G”)**
 - Flexible service rules
 - No gov’t standards for technology
 - Large spectrum blocks
 - Auctions
 - Disaggregation and partitioning of licenses
 - Secondary market leasing
 - Spectrum “sharing” and licensed overlays with/without incumbent relocation

Spectrum Supply: Uncertain Values

Spectrum auction prices/value (below in \$/MHz-Pop) have fluctuated significantly over the past several years:

1994-95 PCS Auction: \$0.52

1995-96 PCS C Block: \$1.35

1996-97 PCS D-E-F Block: \$0.33

2000 Re-Auction of PCS C Block: \$4.00 (eventually canceled due to litigation)

2005 Re-Re-Auction of PCS C Block: \$0.90

2006 AWS Auction: \$0.54

2008 700 MHz Auction: \$1.36 (paired blocks) and \$0.74 (unpaired block)

Now: Focus on Broadband Spectrum “Shortage”

FCC’s March 2010 National Broadband Plan

- Identifies need for additional 500 MHz of spectrum for wireless broadband in next 10 years
- Spectrum pipeline running dry

Q: where does “new” spectrum come from?

A: other services (TV, satellite, Federal government)

President Obama’s June 2010 Memorandum

- 500 MHz Goal and NTIA’s Role
- Technical Innovation to Improve Efficiency
- NTIA 10-Year Plan (Oct. 2010)

Congressional Spectrum Bills

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Some References

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