

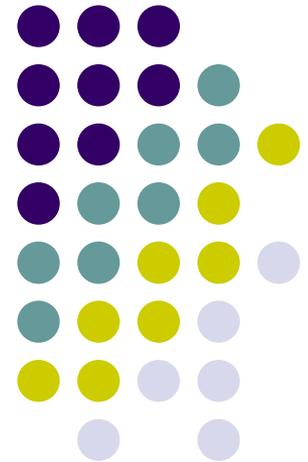


The Future of Telecom Regulations in the United States

Second International Workshop on Mutual recognition
Agreements for Conformity Assessment of EMC and
Telecommunications Regulations

May 5, 2009

Julius P. Knapp
Chief, Office of Engineering and Technology
Federal Communications Commission



Note: The views expressed in this paper are those of the author and may not necessarily represent those of the Federal Communications Commission

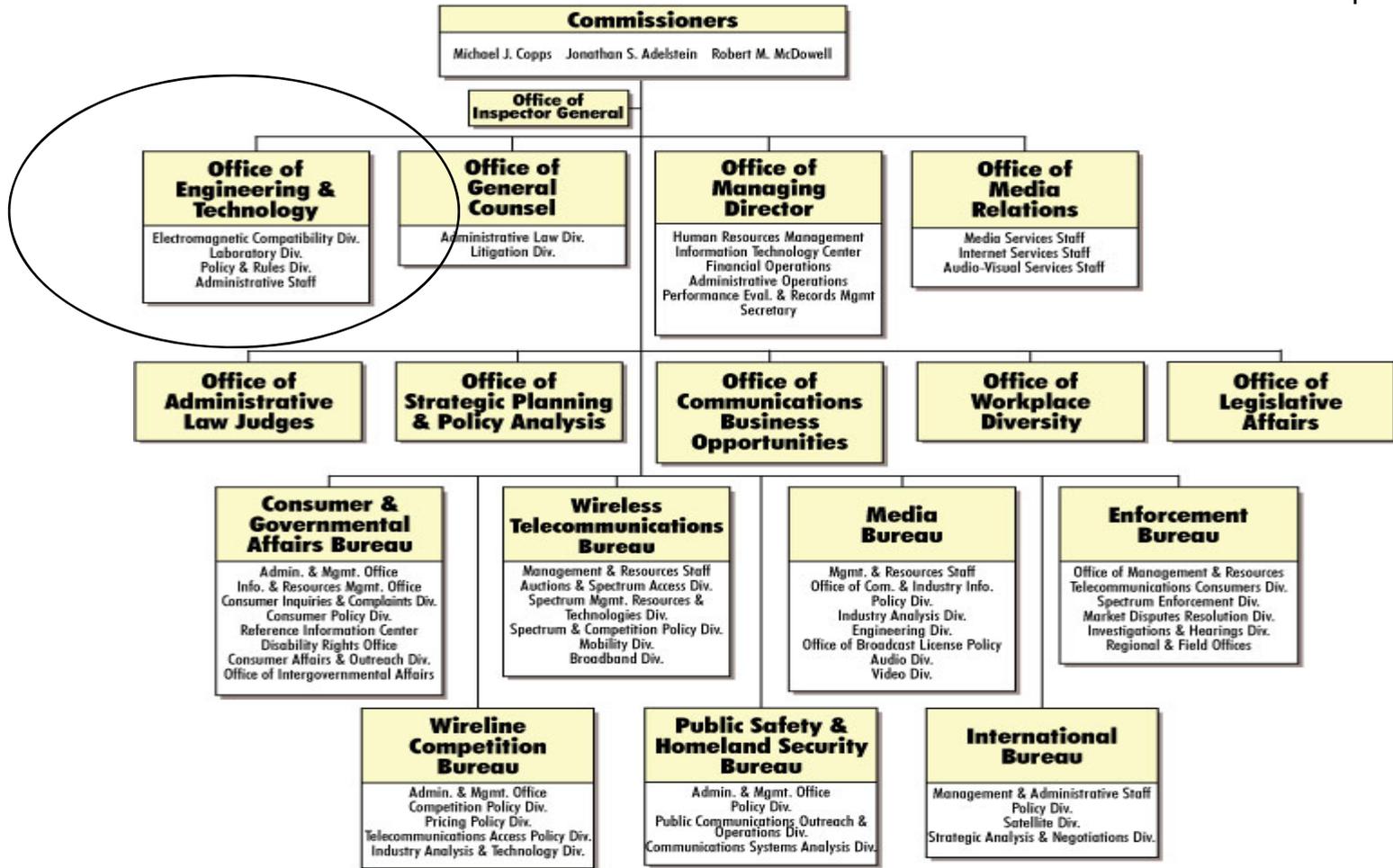
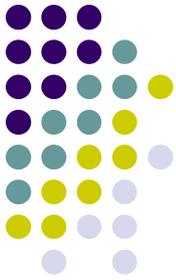
Overview of the FCC



- Created By Communications Act of 1934
- Independent Regulatory Agency
- Oversight by Congress
- Charged with Regulating Interstate and International Communications by Radio, Television, Wire, Satellite and Cable
- Directed by Five Commissioners
- Staff of 1800 (approx.)



FCC Organizational Chart

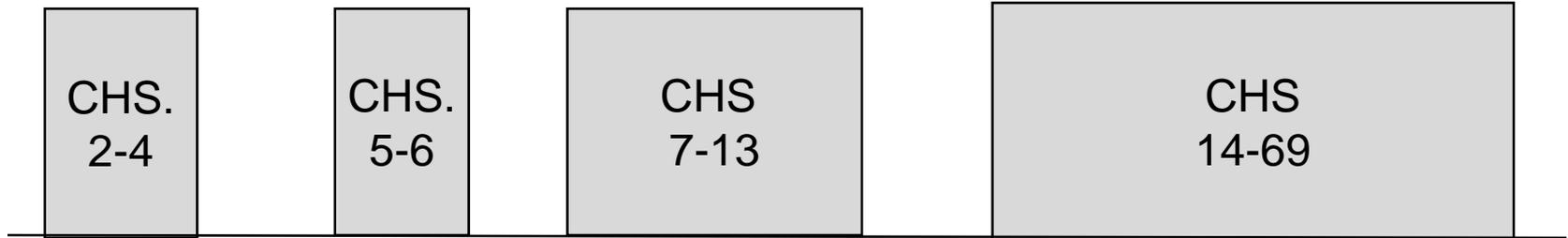
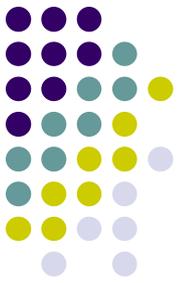


Federal Jurisdiction



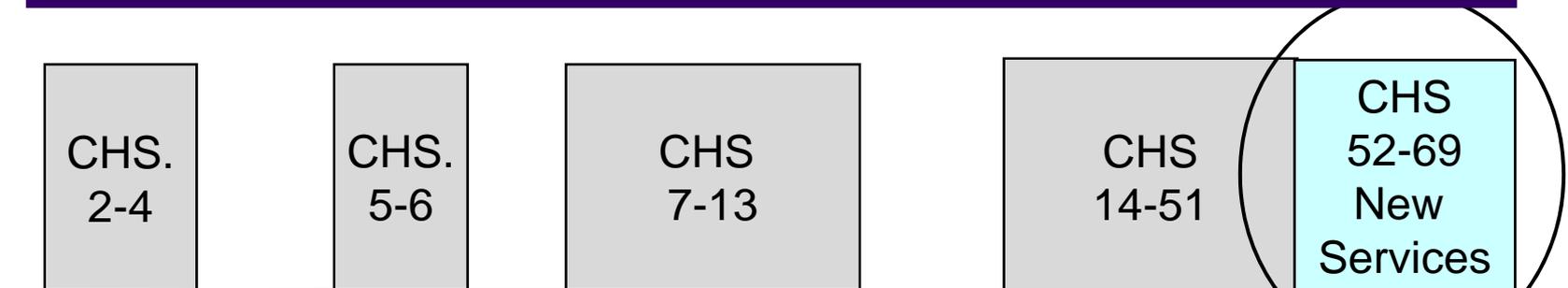
- Executive Branch has Jurisdiction for Parts of the Spectrum Used by the Federal Gov't.
- Department of Commerce:
National Telecommunications &
Information Administration (NTIA)
- NTIA Advised by Interdepartment Radio
Advisory Committee (IRAC)
- Federal Agencies Participate in IRAC:
DoD, DoT, NASA, State Dept., etc.

Digital Television Transition



Analog TV

Because digital TV is a more efficient technology, the same number of stations can offer digital service in less spectrum than for analog service



Digital TV

Overseeing the DTV Transition



Delayed from 2/17/09 to 6/12/09

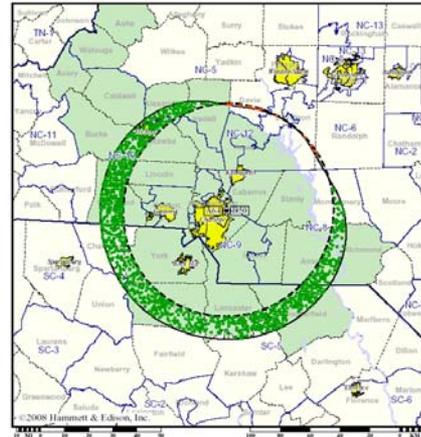
More than 1/3 of approx. 1800 stations already have transitioned

Developed TV receiver tuner rules and addressed waivers

Tested > 135 DTV converter boxes in support of NTIA coupon program

Signal mapping tool and signal maps

Extensive outreach: cooperative effort; web site; call centers; walk-in centers; consumer guides; “DTV Made Easy”



Published Reports:
DTV Coverage Maps

Tested 135 DTV
Converter Boxes



Consumer guide on antennas and conducted Workshop on DTV converter boxes



Broadband

- 2008 Farm Bill: FCC Chairman to submit report describing comprehensive broadband strategy by May 22, 2009
- American Recovery and Reinvestment Act of 2009 (ARRA)
 - Congress appropriated \$7.2 B for broadband grants and loans administered by the NTIA and Dept. of Agriculture Rural Utilities Service
 - FCC to deliver national broadband plan to Congress by 2/17/2010
 - FCC has initiated a Notice of Inquiry

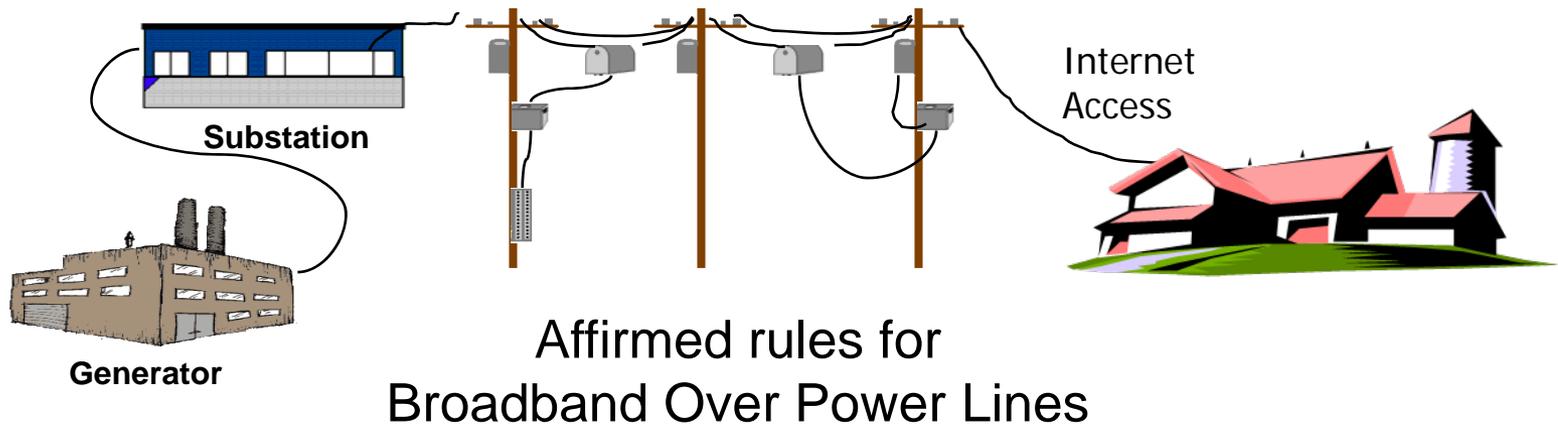
Some Recent Actions to Advance Broadband Deployments



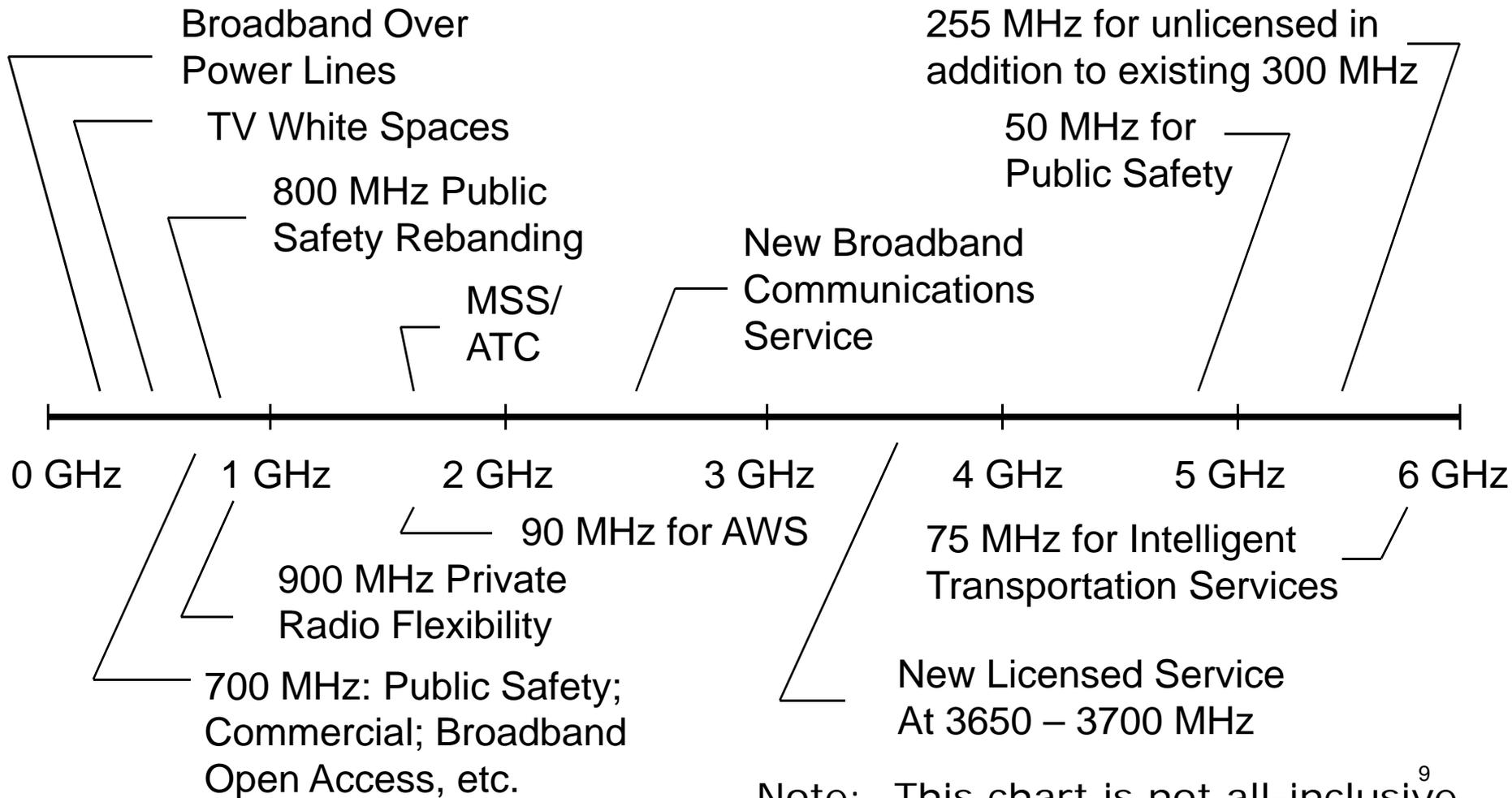
Determined that airport Wi-Fi devices are subject to the over-the-air reception device (OTARD) rules



Continued to support broadband deployment by WISPs



Considerable Spectrum Is In Transition



Note: This chart is not all-inclusive⁹

700 MHz Band Plan For Commercial Services

WT Docket No. 06-150



A	B	C	D	E	A	B	C	C	A	D	Public Safety	B	C	A	D	Public Safety	B	
CH. 52	CH. 53	CH. 54	CH. 55	CH. 56	CH. 57	CH. 58	CH. 59	CH. 60	CH. 61	CH. 62	CH. 63	CH. 64	CH. 65	CH. 66	CH. 67	CH. 68	CH. 69	
698	704	710	716	722	728	734	740	746	752	758	764	770	776	782	788	794	800	806

Lower 700 MHz Band
(Channels 52-59)

Upper 700 MHz Band
(Channels 60-69)

<u>Block</u>	<u>Frequencies</u>	<u>Bandwidth</u>	<u>Pairing</u>	<u>Area Type</u>	<u>Licenses</u>
A	698-704, 728-734	12 MHz	2 x 6 MHz	EA	176
B	704-710, 734-740	12 MHz	2 x 6 MHz	CMA	734
C	710-716, 740-746	12 MHz	2 x 6 MHz	CMA	734*
D	716-722	6 MHz	unpaired	EAG	6*
E	722-728	6 MHz	unpaired	EA	176
C	746-757, 776-787	22 MHz	2 x 11 MHz	REAG	12
D	758-763, 788-793	10 MHz	2 x 5 MHz	Nationwide	1**
A	757-758, 787-788	2 MHz	2 x 1 MHz	MEA	52***
B	775-776, 805-806	2 MHz	2 x 1 MHz	MEA	52***

*Blocks have been auctioned.

**Block is associated with the 700 MHz Public/Private Partnership.

***Guard Bands blocks have been auctioned, but are being relocated.

700 MHz Band Plan for Public Safety Services



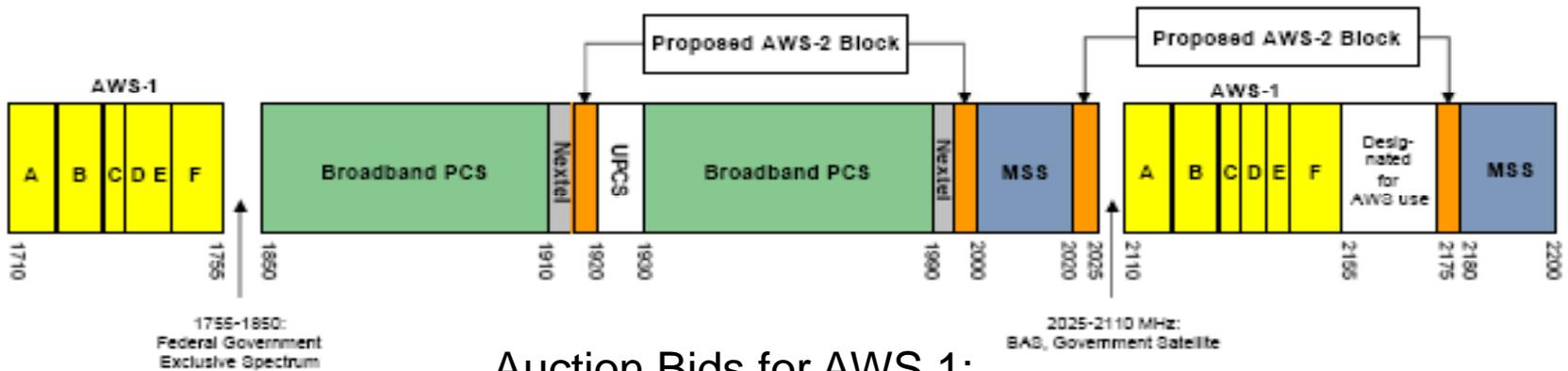
	763	769	775		793	799	805		
<i>Commercial Allocation</i>	<i>Public Safety Allocation</i>			<i>Commercial Allocation</i>	<i>Public Safety Allocation</i>				
	Broad-band	G B	Narrow-band		Broad-band	G B	Narrow-band		
	CH. 62	CH. 63	CH. 64	CH. 65	CH. 66	CH. 67	CH. 68	CH. 69	
	758	764	770	776	782	788	794	800	806

- The new rules also established a framework for a 700 MHz Public Safety/Private Partnership between the licensee for one of the commercial spectrum blocks and the licensee for the public safety broadband spectrum.
- Further developments:
 - Auction was unsuccessful
 - Further rule making initiated
 - En Banc Hearing held in NYC
 - FCC considering options

Spectrum Reallocations For Advanced Wireless Services

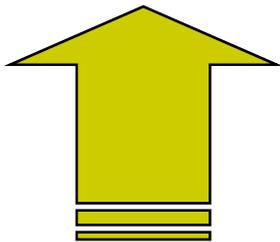


Advanced Wireless Services (AWS) Band Plan

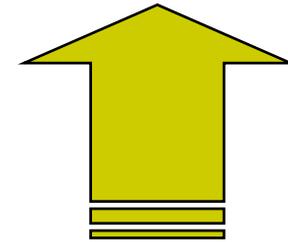


Auction Bids for AWS 1:
Approx. \$ 14 B

Recent Further Proposal
AWS 2 & 3



Reallocated 45 MHz
From Federal Operations
Under Trust Fund Legislation

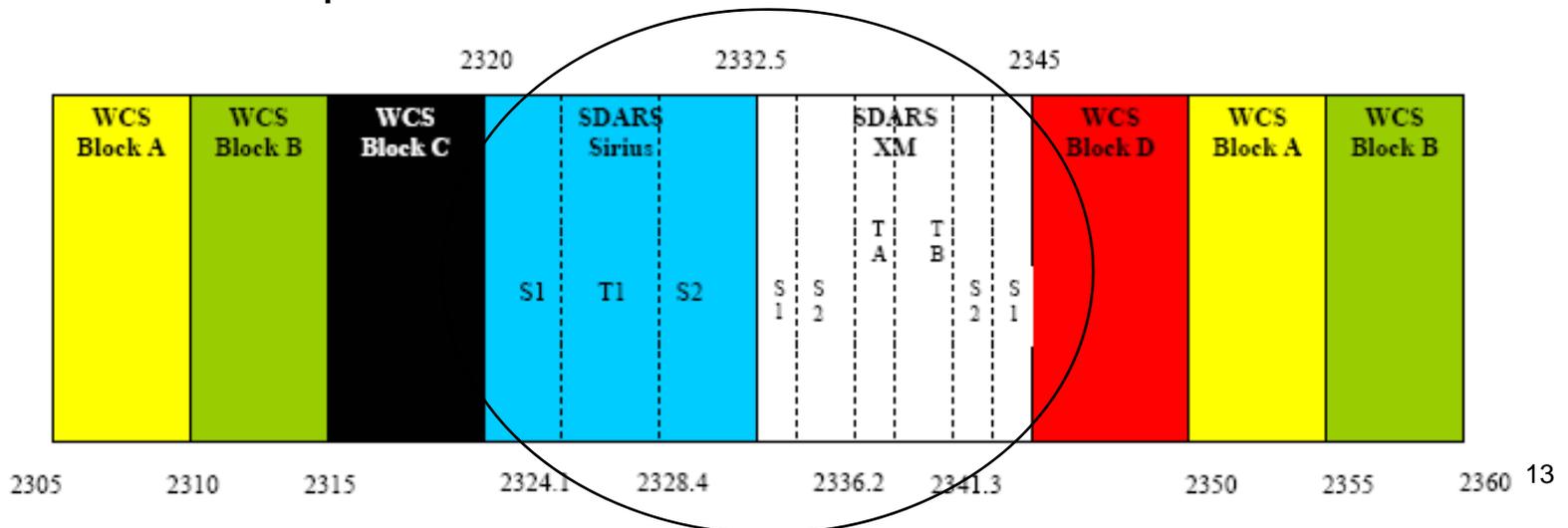


Reallocated 45 MHz
From Non-Federal Operations
Under Emerging Technologies Policy

DARS-WCS



- Proceeding pending to address potential interference between the Wireless Communications Service (WCS) and the Digital Audio Radio Service (SDARS)
- WCS seeks changes to technical rules to facilitate mobile broadband service
- SDARS seeks technical rules to facilitate deployment of terrestrial repeaters

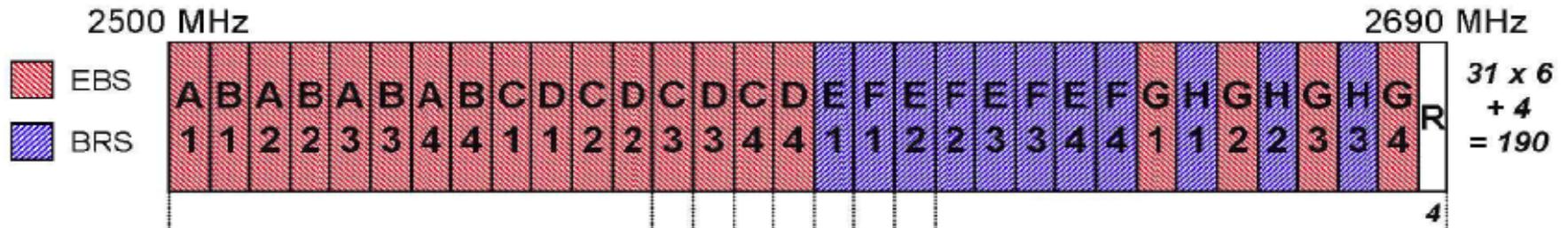




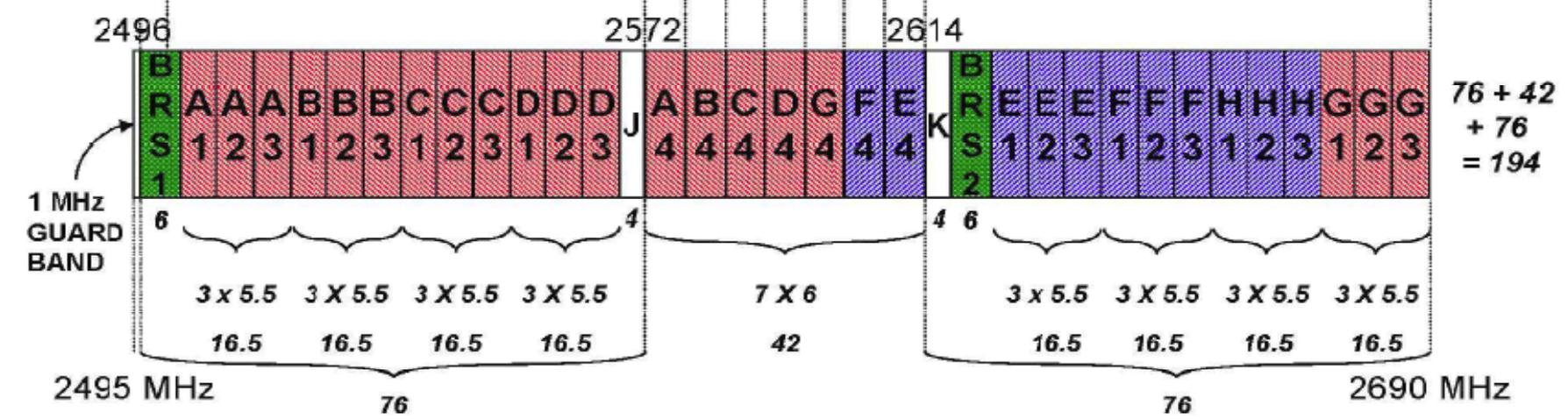
2.5 GHz Rebanding

Instructional Television Fixed Service and Multi-Point Distribution Service were reconfigured to create the new Educational Broadband Service and the Broadband Radio Service

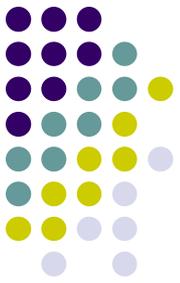
PRE-TRANSITION



POST-TRANSITION

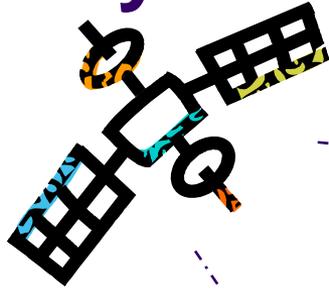


3650 MHz: A Hybrid Licensing Approach



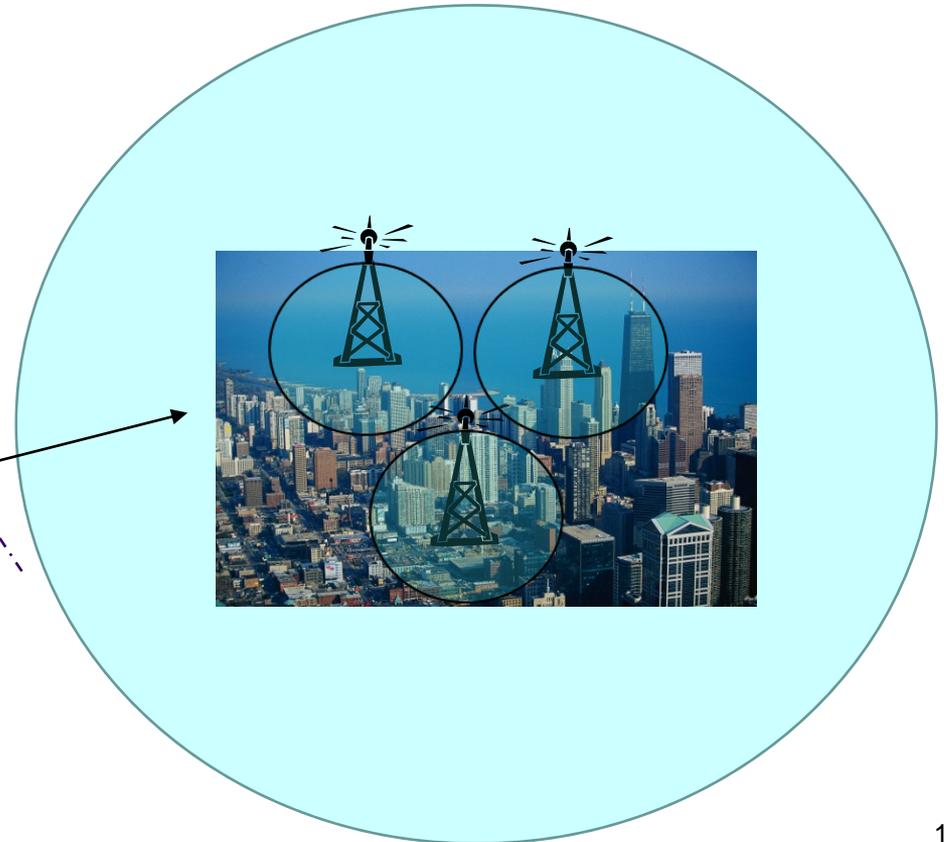
- FCC designated 3650 – 3700 MHz for nationwide, non-exclusive licensed operations:
 - Avoids licensing via auction
 - No first-in-time right of interference protection
- Licensees register fixed and base stations in public database
- Licensees must cooperate in selection and use of frequencies to avoid harmful interference with other nearby licensees
- Equipment must use a contention-based protocol (CBP):
 - Establishes rules by which each device is provided a reasonable opportunity to operate
 - Defines the events that must occur when two or more devices attempt to simultaneously access the same channel
- FCC has authorized equipment and issued more than 400 licenses
- Industry developing CBP standards: 802.11y & 802.16h

Mobile Satellite Service Ancillary Terrestrial Component



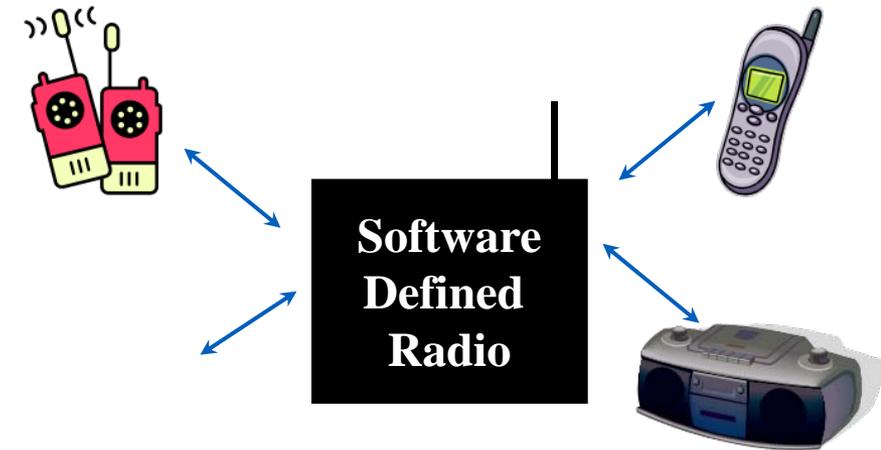
Satellite provides ubiquitous coverage, including rural areas

Terrestrial base Stations provide coverage in areas where satellite signals may be weak



Other Developments

- Software Defined Radio
- Ultra-wideband
- Millimeter Wave
- Smart antennas
- RF Exposure



An SDR radio could become any of these simply by changing software



UWB

Opening Spectrum



TV White Spaces

2- Year testing program
open to the public

Adopted rules to provide
Access to TVWS spectrum

Established Fellowship Program



Proposed spectrum and
granted waivers for
Medical devices

Facilitated relocation
of Broadcast auxiliary
service

OET has worked on nearly every spectrum
and technical proceeding:
700 MHz; AWS-1; AWS 2 & 3, BRS/EBS;
3650 MHz; MSS/ATC; DARS/WCS; etc.

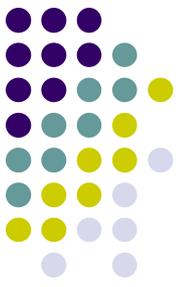


Trends: Evolution of Mobile Wireless Technology



- The major “incumbent” mobile technologies – GSM, CDMA, etc. - - have established evolutionary paths towards faster data speeds and an expanded array of services
- All appear headed long term to use of OFDM
- The improvements make use of an array of technology advances in compression, modulation, smart antennas, etc.
- Fixed/Mobile services are converging
- Collectively promise continuing improvement in spectrum efficiency aiming towards data speeds in excess of 100 Mbs

Trends: Open Technology Platforms & Combined Devices

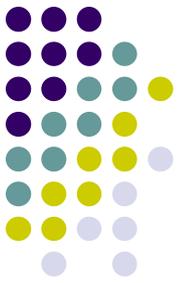


- Developed 700 MHz C-block open technology platform rules with WTB
- Promoted expansion of open access concept
- Devices are integrating licensed and unlicensed technologies

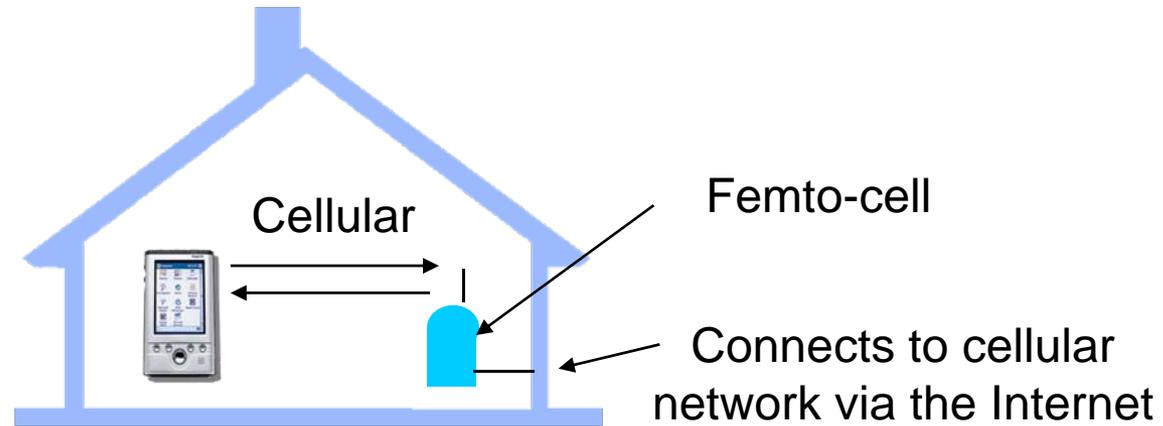


**Commission adopted rules facilitating underlying technologies:
Modular radios and software defined radios**

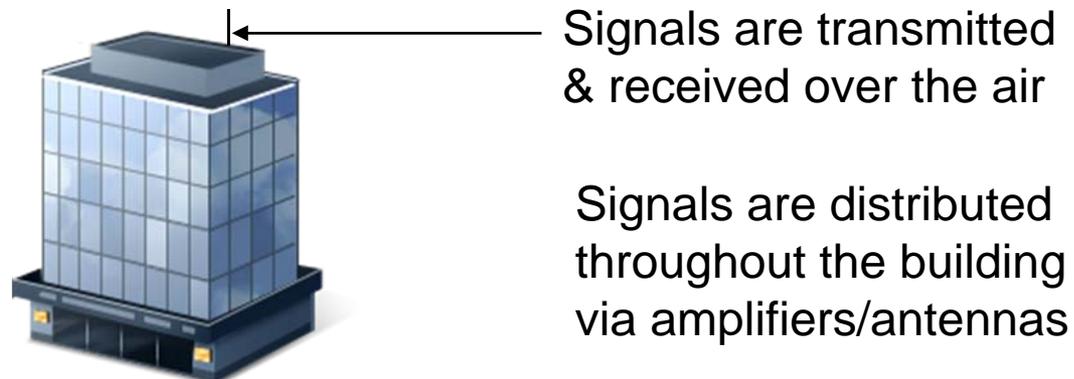
Trends: Other Developments



- Femto-Cells



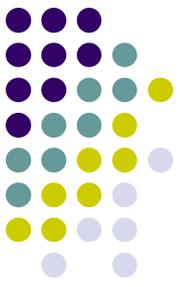
- Distributed Antenna Systems



Trends: Equipment Authorization & Conformity Assessment



- Equipment authorization program has been an overall resounding success
- More than 95 % of all certifications performed by Telecommunications Certification Bodies
- Exclusion list is relatively small: UWB, 5 GHz; equipment raising RF exposure issues
- Mutual Recognition Agreements have helped facilitate market access
- FCC will continue to support TCBs and MRAs



Future & Ongoing Work

- Strengthen consistency & integrity of program
- Improve education and info dissemination
- Continue to address technology challenges:
 - Software defined & cognitive radios
 - Complex equipment & test methods
 - Measurements of extremely low signal levels & signals at higher frequencies
 - RF exposure
- Possible review of authorization program



Conclusion

Thank you!

julius.knapp@fcc.gov