



# **National Spectrum Management Association Broadband Division Perspectives**

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# Topics



- Spectrum Frontiers Proceeding
- General thoughts on various means of coordinating different spectrum uses
- General thoughts on spectrum sharing

# Spectrum Frontiers Proceeding



- Purpose of the proceeding is to look at bands above 24 gigahertz to see where mobile services can be authorized.
- Criteria for judging suitability of bands for mobile use:
  - Sufficient amount of contiguous spectrum
  - Opportunities for international harmonization
  - Compatible with existing incumbent assignments and uses, including point-to-point and satellite uses
  - Maximize flexibility where possible
- These criteria should be viewed as guidelines, not hard and fast rules (for example, 28 GHz)

# August 2016 R&O and FNPRM



## R&O

- Adopted UMFUS rules for 5G mobile broadband:
  - 27.5-28.35 GHz (28 GHz band)
  - 37-38.6 GHz (37 GHz band)
  - 38.6-40 GHz (39 GHz band)
- Allowed limited number of FSS earth stations in these bands.
- Announced 37-37.6 GHz would be shared Federal/non-Federal band with rules TBD.
- Rejected adding FSS allocation to 42-42.5 GHz (42 GHz band).
- Made 64-71 GHz available for unlicensed use using same rules as adjacent 57-64 GHz.

## FNPRM

- Sought comment on authorizing mobile service in the following bands
  - 24.25-24.45 GHz and 24.75-25.25 GHz (24 GHz band)
  - 31.8-33.4 GHz (32 GHz band)
  - 42-42.5 GHz (42 GHz band)
  - 47.2-50.2 GHz (47 GHz band)
  - 50.4-52.6 GHz (50 GHz band)
  - 71-76 GHz and 81-86 GHz (70/80 GHz bands)
- Also asked about bands above 95 GHz
- Other FNPRM Issues:
  - Federal Sharing Issues in 37 GHz band
  - 37.5-40 GHz Band Satellite Sharing

# Next Steps in Proceeding



- 13 petitions for reconsideration of the Report and Order
  - Cyber statement
  - Satellite sharing issues
  - Status of other LMDS bands
  - 37 GHz sharing framework
  - 64-71 GHz unlicensed band
  
- Resolve FNPRM Issues
  - Additional bands for mobile use
  - Frequencies above 95 GHz
  - Lower 37 GHz sharing framework
  - Satellite use of 37.5-40 GHz band
  - Buildout metrics for innovative uses
  - Use of 64-71 GHz on board aircraft

# Sharing and Coordination



- The demands we place on spectrum continue to increase.
- As demands increase, that requires the Commission to examine more closely whether advances in technology make sharing possible where it was not possible previously.
- The Commission has developed a variety of mechanisms to help coordinate between different uses and users:
  - “Traditional” Part 101 Frequency Coordination
  - The 70/80/90 GHz system
  - 3.5 GHz Spectrum Access System
  - Coordination Zones
- Geographic area licensing also provides flexibility to accommodate a variety of uses under the management of a licensee.

# Part 101 Frequency Coordination



- Advantages:
  - Well-established model
  - Accommodates reuse of spectrum by multiple licensees in a given area
  - Provides mechanisms for resolving interference disputes
  - Minimizes FCC involvement in interference disputes
- Challenges
  - Primarily designed for one type of service – point-to-point
  - Requires filing an application for each individual link
  - Problems arise when the process is not followed

# 70/80/90 GHz Registration



- Advantages:
  - Expedites authorization of service
  - Automates Federal coordination
  - Avoids need to file individual applications for each link
- Challenges
  - Primarily designed for one type of service – point-to-point
  - Interference disputes often require Commission resources to resolve

# 3.5 GHz Spectrum Access System



- Advantages:
  - Automates coordination among licensees
  - Automates Federal coordination/protection
  - Facilitates different tiers of licenses and shared use among tiers
  - Provides an expedited mechanism for enforcing changes to interference protection criteria and protection zones
- Challenges
  - Operationally still under development (unproven in practice)
  - Ongoing review of the rules relating to the 3.5 GHz band

# Coordination Zones



- Advantages:
  - Accommodates a variety of licensing schemes and use cases
  - Federal agencies are familiar with the process
  - Provides flexibility to allow individualized consideration of sharing between systems
- Challenges
  - Without automation, coordination zones can result in a manual, burdensome process
  - Hard to provide certainty to prospective licensees

# Geographic Area Licensing



- There is sharing in a geographic area licensing framework.
- Allows a variety of uses to share in a given area.
- Licensees can choose to lease spectrum to third parties or partition their licenses.
- There is also the opportunity for adjacent licensees to coordinate their operations at the border.

# Sharing and Coordination



- What will sharing and coordination look like in the future?
- IT DEPENDS. It's not clear there is a one-size fits all answer. Some considerations:
  - What are the types of uses involved?
  - Who are the users? (Federal, satellite, public safety)
  - To what extent are we dealing with unknown variables (e.g., technological advances, developing business cases)?
- As spectrum demands increase, the Commission will continue to closely examine new opportunities for spectrum sharing.
- When responding to sharing proposals, the Commission is very interested in arguments based on sound engineering and sound economics.