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Spectrum Update Part II: 4.9 GHz, 5.9 GHz, 10 GHz, 37 GHz, and More

Access to spectrum is vital to our industry's growth. There are a number of rulemaking proceedings at the FCC that will determine what spectrum you will be able to use in the future. This is Part II of the Spectrum Update panel and it will give you important updates about those spectrum proceedings.

Moderator & Speakers

Josh Luthman - Imagine Networks, President –
josh@ohbroadband.com

Louis Peraertz - WISPA, VP of Policy - lperaertz@wispa.org

Richard Bernhardt - WISPA, VP of Spectrum & Industry -
rbernhardt@wispa.org

Steve Coran - Lerman Senter PLLC, Attorney -
scoran@lermansenter.com

Fred Goldstein - WISPA Technical Consultant – fred@interisle.net

Before We Get Started...

- Please mute your devices.
- Disclaimer:
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Spectrum Bands And Topics We Will Cover

- 4.9 GHz
- 5.9 GHz
- 10 GHz
- Secondary Market Opportunities
- 37 GHz and 42 GHz
- NTIA's National Spectrum Strategy
- NextNav Petition For Rulemaking Concerning 902-928 MHz

4.9 GHz Band

- 4940-4990 MHz band currently allocated for public safety, but underutilized
- FCC has been looking at expanding use of the band for more than 15 years
- January 2023 – FCC adopted 7th Report and Order and 9th Further Notice of Proposed Rulemaking

4.9 GHz Band

- 7th Report and Order (January 2023)
 - Unlicensed, non-Public Safety users will operate on a secondary, pre-emptible basis
 - All use, including licensed, manually coordinated by a single nationwide Band Manager
 - All existing links and base stations must go into ULS
 - Band Manager to be selected (method discussed in FNPRM)
 - No restrictions on technology
 - Unchanged power limits, *except* licensed PtP cap raised to 85 dBm EIRP (for 17+ km links), same as Part 101
 - Freeze on new licenses remains until Band Manager is in place

4.9 GHz Band

- 9th Further Notice of Proposed Rulemaking
 - Leasing or dynamic spectrum access?
 - Who will be the band manager(s)?
 - What should interference criteria be?
 - FCC leaning towards Part 90 (land mobile) or FS model (extremely protective), at least to limit unlicensed users or lessees
 - FNPRM shows zero awareness that the predominant use of the band is based on Wi-Fi, which tolerates channel sharing

4.9 GHz Band

- WISPA Positions
 - Dynamic spectrum access model to enable non-public safety use on a secondary basis, supervised by band manager
 - NOT a leasing model, but an access model
 - Public safety would have right to preempt non-public safety use for emergency operations
 - Band manager should have authority to make unused spectrum available
 - Band manager selection committee should include non-public safety

4.9 GHz Band

- Current activity in docket focused on band manager
 - FirstNet and some public safety interests supporting centralized control and integration into FirstNet
 - Other public safety interests favor local control
 - 4.9 GHz Coalition recommends designating four FCC-certified public safety members of Frequency Advisory Committee to serve as national band manager
- Expect order before election

5.9 GHz Order And FNPRM

- In November 2020, FCC adopted an Order that grants U-NII-4 devices immediate access to indoor use of 45-megahertz of unlicensed spectrum in 5.850-5.895 GHz band. Need to apply for Special Temporary Authority or waiver for outdoor use.
- Adopts power levels and rules to ensure indoor use protects Federal Radiolocation Services & Intelligent Transportation Services (ITS)

5.9 GHz Order And FNPRM

- Between 2021 and 2022, 5.9 GHz FNPRM proceeding was delayed in part by litigation in the U.S. Court of Appeals for the D.C. Circuit
- The Intelligent Transportation Society of America, and others, argued that the FCC Order failed to (1) adequately explain that 30 megahertz of spectrum was sufficient for intelligent transportation systems in the future; and (2) consider the possibility that unlicensed devices in the lower 45 megahertz would interfere with communications in the upper 30 megahertz
- In August 2022, the D.C. Circuit affirmed the 2020 Order and FNPRM

5.9 GHz Order And FNPRM

- Until FCC issues a second order allowing outdoor unlicensed use of 5.9 GHz and, in order to use this spectrum for outdoor operations, WISPs must apply for a Special Temporary Authority or a waiver
- The FNPRM seeks comment on technical proposals related to unlicensed outdoor use
- FNPRM asks technical questions related to operation of ITS using Cellular to Vehicle Everything (C-V2X) technology
- WISPA has asked about timing of an order resolving FNPRM. Staff could not provide a specific time frame

10.0-10.5 GHz Band – A Petition For Rulemaking

- PtP currently falls into two categories
 - Licensed Fixed Service (Part 101: 6, 11, 18, 23, 80 GHz)
 - Coordinated (using prior coordination notice, except on 80 GHz), heavily protected against interference
 - FDD paired channelization (ideal for telephone, not data)
 - Limited availability in some areas
 - Generally expensive, both to meet standards (large antennas) and coordination cost
 - Unlicensed (Part 15)
 - Unprotected from harmful interference
 - Shared with Wi-Fi (except 24 GHz) so noise often impairs backhaul
 - Inexpensive

10.0-10.5 GHz Band – Coalition Joins WISPA

- FCC has allocated thousands of megahertz of spectrum for last-mile use over the past decade, but its allocation of point-to-point spectrum has not kept pace
- In October 2022, the Coordinated Spectrum Coalition (WISPA, Cambium, New America, Public Knowledge) filed petition for rulemaking to make 500 MHz of spectrum available for point-to-point
 - Subject to coordination by an AFC System (database driven)
 - Useful for backhaul, middle mile, and other specialized PTP purposes
 - Licensed
 - Secondary to Federal and Amateur Incumbents
 - Spectrum currently underutilized
 - Unmet demand for mid-band PTP

10.0-10.5 GHz Band – What's Next?

- This band is not in NTIA's National Spectrum Strategy
- If we can get NTIA to work with FCC to move forward on petition
 - FCC assigns Petition an official docket number.
 - FCC seeks public input on the Petition.
 - Incumbents and associated agencies find merit and agree to consider allowing the use.
 - Grow the coalition with more qualified entities.
 - Spur interest and gain the FCC's approval, creation of a report and order and published rules.

Secondary Market Opportunities

- Traditional Methods

- *De Facto* Spectrum Transfer Lease – more control with lessee (Form 608)
- Spectrum Manager Lease – more control with licensee (Form 608)
- Sublease – Lessee subleases all or a portion of its spectrum to another party
- Partitioning – assignment of all licensed spectrum in defined geographic area within entire licensed area (Form 603)
- Disaggregation – assignment of some defined portion of licensed spectrum throughout entire licensed area (Form 603)

ALL LEASES, SUBLEASES, PARTITIONING AND DISAGGREGATION ARRANGEMENTS MUST BE APPROVED IN ADVANCE BY FCC*

*** Spectrum manager leases effective 21 days after notice to FCC**

Secondary Market Opportunities

- Restrictions
 - *De facto* spectrum transfer and spectrum manager leases need to include specific language to comply with FCC rules
 - FCC approvals of secondary market arrangements cannot exceed license term, but can be extended once license renewal application is on file with FCC
 - Traditional models do not apply to microwave licenses
 - Common carrier licenses are subject to foreign ownership restrictions

Secondary Market Opportunities

- Part 96 CBRS PALs
 - Traditional models are available for PALs and SAS should accommodate
 - Light-touch leasing
 - Lessee pre-certifies with FCC that it meets non-lease-specific eligibility and qualification criteria
 - PAL licensee notifies SAS of leasing arrangements with pre-certified lessee
 - SAS will confirm lessee is qualified
 - Upon SAS confirmation, leasing can begin
 - SAS provides daily reports to FCC

Secondary Market Opportunities

- Enhanced Competition Incentive Program (ECIP)
 - Program adopted in July 2022 to establish incentives for wireless licensees to make underutilized spectrum available to small carriers, Tribal Nations, and entities serving rural areas
 - Encourages licensees to partition, disaggregate, or lease spectrum to better match available spectrum resources with entities that seek to provide needed services to under-connected communities

February 15, 2024, FCC announced that it would begin accepting ECIP applications

Secondary Market Opportunities

- Tribal entities and common carriers
 - Licensees can assign or lease spectrum to unaffiliated tribal nations or small common carriers (those with 1,500 or fewer employees)
 - Applies anywhere
 - Licensee must assign or lease at least half of the applicable spectrum rights
 - Must cover at least 25% of the licensed area if that area is 30,000 square miles or less, or 10% of the licensed area if that area is more than 30,000 square miles
 - Does not include non-common carriers due to statutory language

Secondary Market Opportunities

- Rural-focused transactions
 - Licensees can assign or lease spectrum to any unaffiliated entities, including WISPs
 - Applies only to rural areas
 - Licensee must assign or lease at least half of the applicable spectrum rights
 - Assignment or lease must be at least 300 contiguous square miles if the licensed area is 30,000 square miles or less
 - Minimum area is increased under a formula for licensed areas larger than 30,000 square miles

Secondary Market Opportunities

- Incentive rules – “carrots and sticks”
 - All parties receive a five-year extension of license term
 - All parties receive a one-year extension of interim and final performance requirements
 - Must construct and operate, or provide signal coverage and offer service to 100% of the subject geographic area for at least three years
 - ECIP assignee and lessee subject to five-year holding period
 - Penalties include loss of license and exclusion from ECIP

Secondary Market Opportunities

- Further Notice of Proposed Rulemaking
 - Whether the Commission should expand the small carrier/Tribal Nation prong to allow non-common carriers to be eligible for ECIP
 - Whether to adopt alternative construction requirements for services with less flexible metrics and on a “use or offer to share” safe harbor metric, both of which are independent of ECIP

37 GHz And 42 GHz Bands

- In 2017, the FCC made this band available for coordinated co-primary sharing between Federal and non-Federal users and sought comment on the proper band plan and best regime to share the band with federal operations
- In 2018, FCC adopted an order reaffirming that commercial use of the band would be on a non-exclusive licensing basis, with six 100 megahertz channels.
- FNPR sought more comment on proposals of how commercial operators could share the spectrum with federal uses

37 GHz And 42 GHz Bands

- FCC's August 9, 2024 Public Notice sought comment on many issues
 - Potential uses of the band (fixed wireless, IoT,), proper coordination framework, adjacent band protection, licensing (nationwide non-exclusive license),
- FCC Public Notice proposed a model close to 70/80/90 GHz but with PtMP as well as PtP use
 - Coordination between and among federal and non-federal users
 - Nationwide non-exclusive license for commercial operators
 - Federal priority on lower 200 MHz
 - Protection criteria based on PtP (Part 101) norms
 - 100 MHz per user per channel per site

37 GHz And 42 GHz Bands

- In response to the August 9 Public Notice, WISPA, Charter Communications, Federated, Open Technology Institute, Starry and Qualcomm arrived at a consensus on various issues
 - Issues we did not agree on were not addressed
- CBRS validates automated sharing and coordination
 - Use a Dynamic Spectrum Management System (DSMS), which will also cover 42 GHz band
 - Request a preliminary grant, build out in a timely manner, receive grant
 - Allow more than 100 MHz at a time, but subject to rollback if congested
 - DSMS will help mediate coexistence, but we don't expect many problems given the shorter ranges and higher directionality on this band
 - Technology neutral

37 GHz And 42 GHz Band

WISPA recommends the following other technical rules for these bands

- Set appropriate power limits separately for base stations (fixed or mobile), fixed clients, mobile clients, and PtP systems
 - Base stations and some clients likely to use beam steering
- Do not strictly follow Part 30 UMFUS rules, which are MNO-oriented and do not address fixed clients
- 42.0-42.5 GHz band may be primarily fixed, not mobile, and have lower power limits
 - Both bands are near passive bands and OOBE is a major area of contention
- Common DSMS mediation of the two bands, ideal if one radio can serve both with flexible channel selection

Questions from the Audience

- Please step up to the microphone or grab one from the room.
- Thanks!

National Spectrum Strategy

On November 13, 2023, NTIA released its National Spectrum Strategy (Strategy).

The Strategy identifies certain specific strategic objectives that fall into four broad pillars:

Pillar One: A Spectrum Pipeline to Ensure U.S. Leadership in Advanced and Emerging Technologies

Pillar Two: Collaborative Long-Term Planning to Support the Nation's Evolving Spectrum Needs

National Spectrum Strategy

The Strategy identifies certain specific strategic objectives that fall into four broad pillars:

Pillar Three: Unprecedented Spectrum Innovation, Access, and Management through Technology Development

Pillar Four: Expanded Spectrum Expertise and Elevated National Awareness

National Spectrum Strategy

To meet those specific strategic objectives, the Strategy identifies five spectrum bands totaling 2,786 megahertz of spectrum for in-depth, near-term, study to determine suitability for potential repurposing to address the nation's ever-evolving wireless communication needs.

3.1-3.45 GHz

5.03-5.091 GHz

7.125-8.4 GHz,

18.1-18.6 GHz,

37.0-37.6 GHz bands.

National Spectrum Strategy

NTIA's strategy also noted the important progress that the FCC has been making in other bands to provide more spectrum for commercial wireless service needs. Those bands are

12.2-12.7 GHz

12.7-13.25 GHz

42.0-42.5 GHz

57-71 GHz

National Spectrum Strategy

NTIA sought comment from the commercial wireless industry and other stakeholders on its strategy.

WISPA's Comments made the following points

The FCC should quickly resolve the issues pending in the 5.9 GHz proceeding

The FCC should open 500 megahertz of licensed spectrum in the 10 GHz band for point-to-point secondary use on a shared basis with federal and amateur users

National Spectrum Strategy

WISPA's Comments made the following points

NTIA should solicit public comment on initial draft plans for spectrum transition in bands identified for near term reallocation or enhanced use

NTIA should hold multiple listening sessions with industry stakeholders

NTIA should initiate a comprehensive spectrum occupancy audit covering both federal and non-federal users

National Spectrum Strategy

WISPA's Comments made the following points

The FCC should establish methods to encourage flexible leasing, sale or disaggregation methodologies for licensed spectrum with light touch regulation for unserved and underserved geographic areas

The FCC should allow opportunistic use of unused spectrum with appropriate protections

NTIA said next step of strategy is to develop an Implementation Plan

National Spectrum Strategy

In March 2024, NTIA revealed its Implementation Plan for the National Spectrum Strategy

For each strategic objective, the Plan identifies specific outcomes, with responsible Federal agencies, contributing stakeholders, and a timeline for both the beginning and the expected completion of the effort.

Link to Implementation Plan

<https://www.ntia.gov/sites/default/files/publications/national-spectrum-strategy-implementation-plan.pdf>

National Spectrum Strategy

August 23, 2024, In-Person Meeting

- NTIA is considering “sharing” options for 3.10-3.45 GHz Band.
- NTIA is also considering “sharing” options for the 7/8 GHz Band.
- Multistakeholder meetings will be held for each of the above separately facilitated by the National Spectrum Consortium (NSC).
- In-person meetings will be held with WISPA representing the FWA industry to the government and other stakeholders.
- Begins this month.

NTIA/NSC National Spectrum Review v. DoD Spectrum Review (3.10-3.45 GHz – the PATH-SS and PATH-SS (2) Reports

- 3.1 GHz Band: Heavily occupied on the lower portion of the Band by DoD uses (not very movable). Upper portion of the Band may be shared with Dynamic Spectrum Sharing System(s) or other.
- Previously, Considered using CBRS style management of Shared Portion of the Band.
- DoD-CIO/NSC issued report called PATH-SS praising CBRS and seeking sharing, but was referred back from the Secretary of Commerce for further study. Now PATH-SS (2).
- NTIA considerations will look at National Spectrum Strategy implications.

NextNav Proposal On 902-928 MHz

- NextNav, successor to Prodigy LMS, has licenses to provide multilateration services on 902-928 MHz
 - Very little buildout since auction over 20 years ago
 - Main purpose: Alternative to GPS with better vertical accuracy
 - Existing rule has unusual clause where most unlicensed has safe harbor against any claim of interference to licensee
- NextNav claims band is under-utilized
 - Well, nobody pays for their services...
 - Relatively light use by WISPs, mainly because it's so noisy already
 - Utility meters/SCADA, LoRaWAN, Thread, wireless mics, billions of RFID chips, and various other unlicensed uses
 - Also licensed Amateur use, mainly on top and bottom 1 MHz sections

NextNav Wants Its Licenses Opened For 5G

- In its petition for rulemaking, NextNav wants to build out a nationwide 5G network with its PNT (positioning, navigation, timing) service sharing a small portion of the downlink
 - 5G would be leased to national carriers as a way to pay for nationwide PNT
 - 902-907 MHz for uplink, 918-928 MHz for downlink
 - These licenses went at auction for a pittance compared to mobile licenses
- They want the safe harbor removed and for unlicensed and Amateur users to be required to protect them from interference
 - This may make half the 902 MHz band unusable in areas NextNav builds out, even if our equipment can work through the interference

Will Widespread Opposition To NextNav Win?

- Thousands of comments filed against NextNav's petition; virtually no one else supports them
 - But this does not by itself guarantee its rejection
- This is the only unlicensed band that penetrates clutter well
 - WISPs need it where nothing else gets through
 - No current manufacture of WISP gear but plenty is around
- 902-928 MHz is an "innovation band" too
 - Many new unlicensed devices being introduced
 - Important to IoT
 - Some consumer devices
- Petition can be dismissed, ignored, or could lead to NPRM

Questions?

- Please use one of the room microphones.
- Thanks!

THANK YOU

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