The FCC Vision For Spectrum Sharing

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

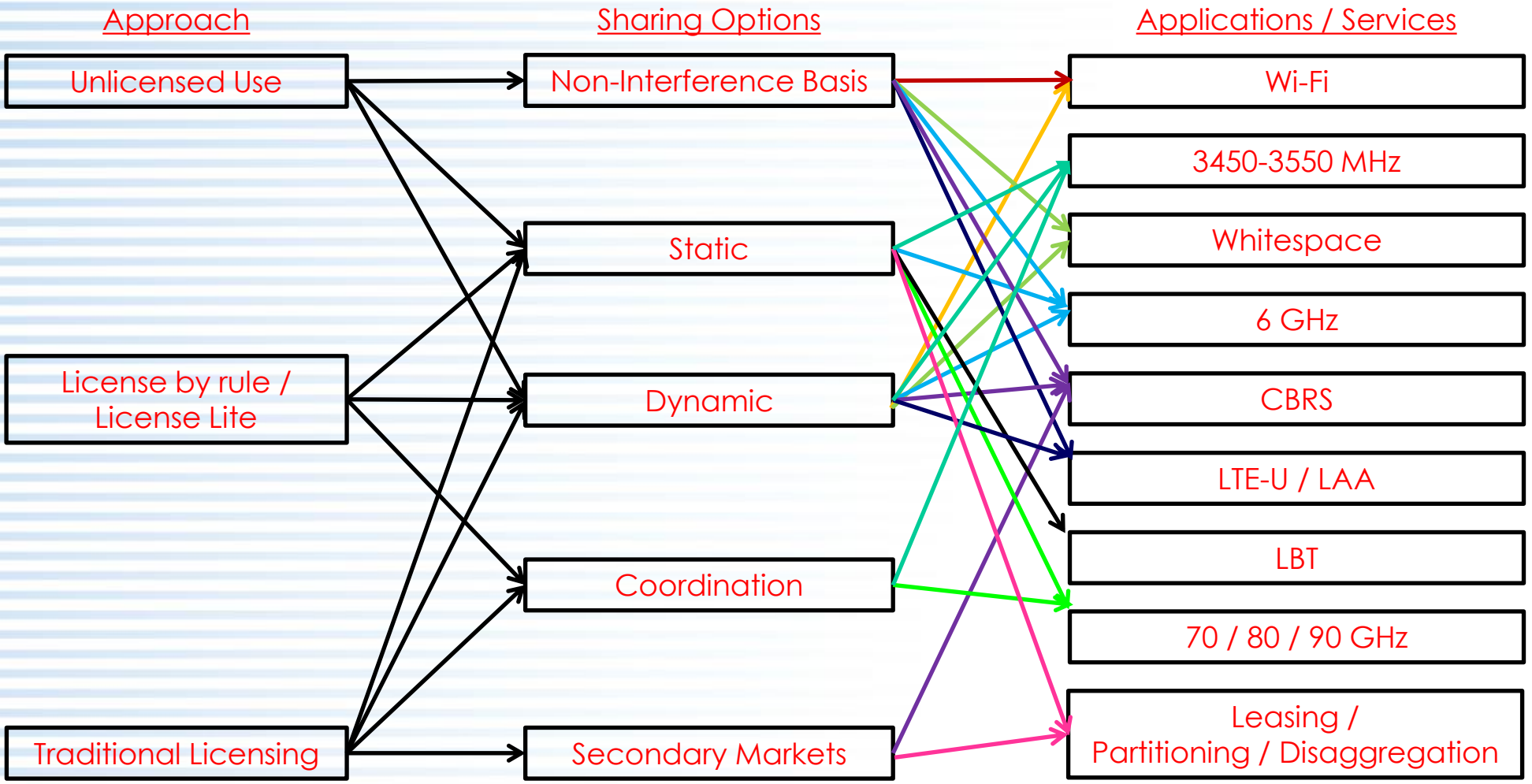
View on Spectrum Sharing

"We're going to have to get creative about the policies we put in place …"

"I think that kind of [CBRS sharing model] creativity is terrific. It's something that I think we're going to need to study going forward, because as we scour the airwaves for more opportunities for commercial services, we're going to need to be mindful of the fact that there are just many more actors who are going to want access to spectrum. And more ways to be creative and efficient are going to be important."

-- Acting Chairwoman Jessica Rosenworcel, February 2021

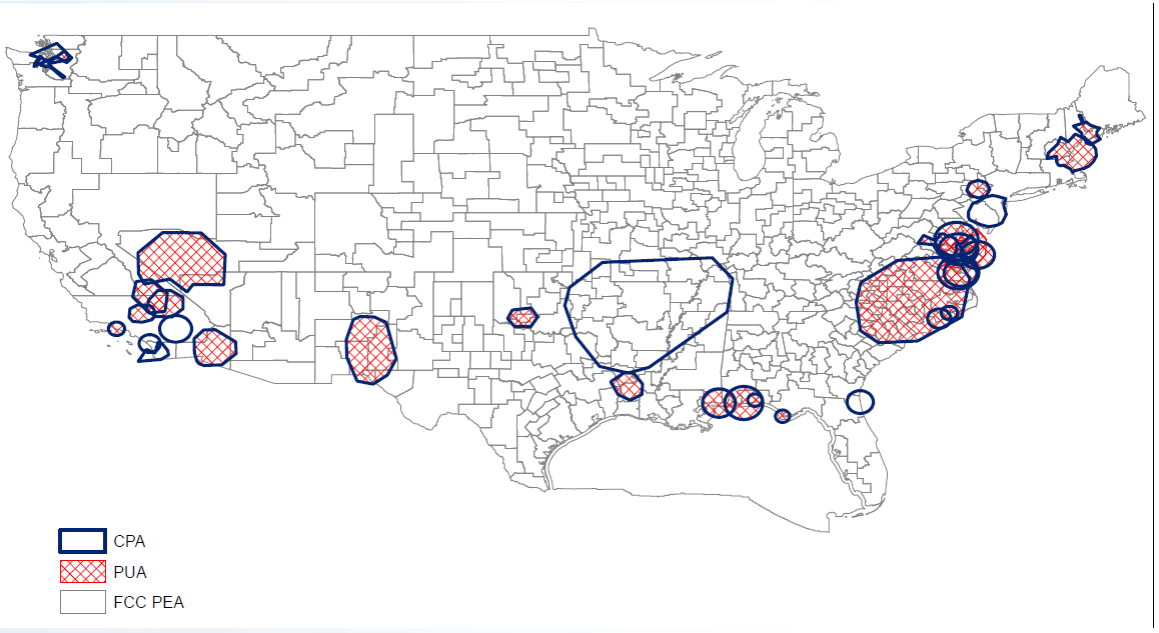
Approaches to Spectrum Sharing



3.45-3.55 GHz Band

GN Docket No. 19-348

- **Auction competed November 2021 - $21.9 Billion in winning bids**
- **Second Report and Order adopted March 17, 2021**
  - Federal / non-federal sharing framework within CONUS based on:
    - Cooperative Planning Areas (CPAs)
    - Periodic Use Areas (PUAs)
  - Non-federal operations are primary except in CPAs and PUAs
    - Generally available at full power and without any coordination requirements
  - Anticipated 5G deployments

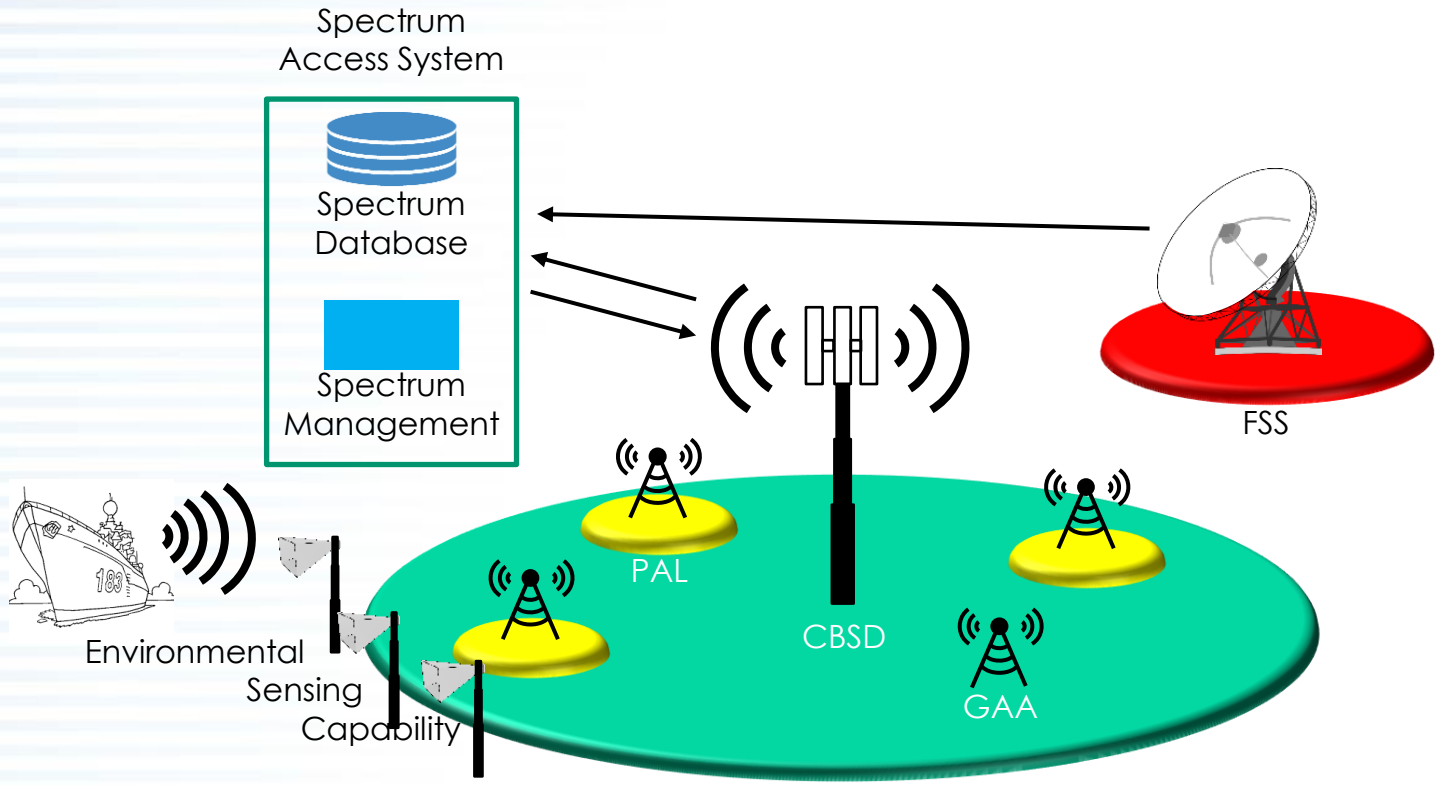


3.55-3.7 GHz Band (CBRS Band)

GN Docket No. 12-354 (3.5 GHz), 15-319 (SAS/ESC), Docket 17-258 (October 2018 R&O)

- **Sharing 150 MHz in 3550-3700 MHz for flexible use between mobile broadband, incumbent DoD Radar, and Commercial FSS.**

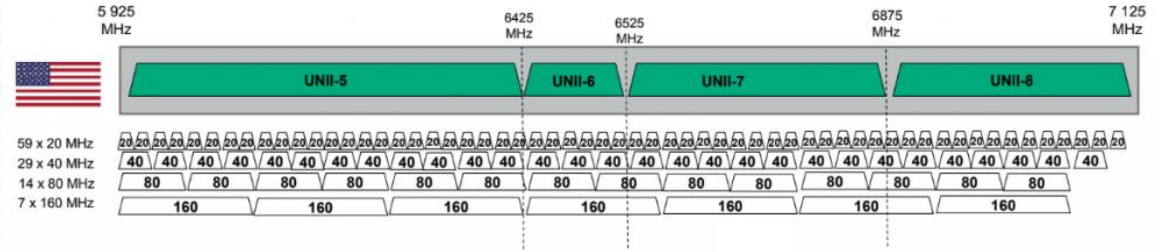
- Successful fully dynamic sharing since January 2020
- Protected Area Licensees and General Access Licensees operating throughout U.S.
- Over 100 CBSDs from over 45 different manufacturers have been approved
- New innovative spectrum use models emerging (e.g., private LTE, IoT, etc.)

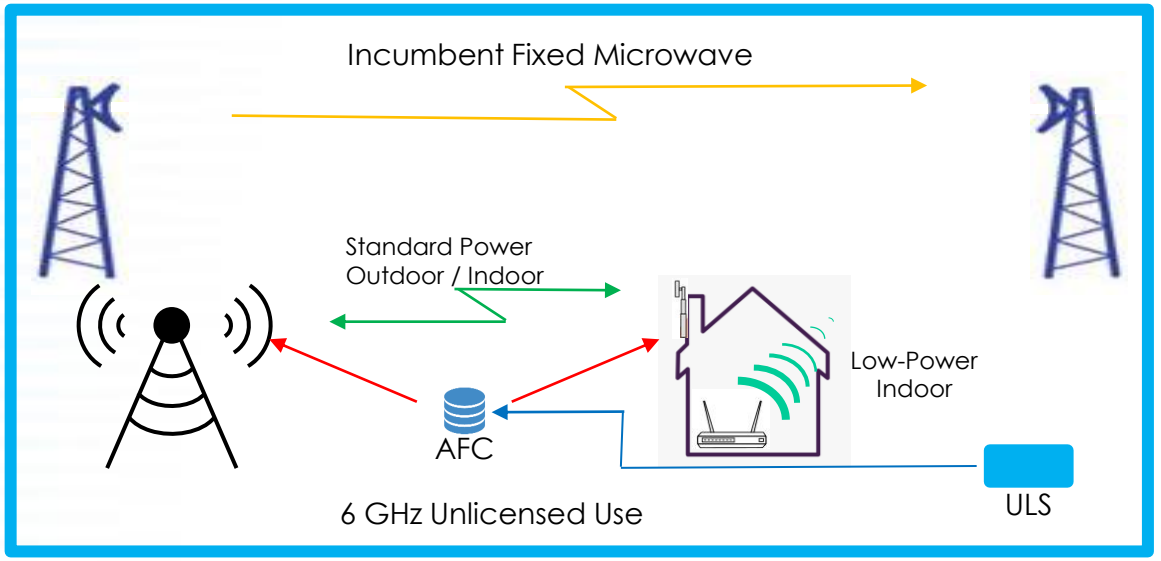


6 GHz

Unlicensed Sharing with Fixed Microwave Links

- Report & Order adopted April 2020
- 1200 megahertz for unlicensed use in four sub-bands
  - Up to 7 160-megahertz wide channels
  - Standard access points in U-NII-5, 7 only
    - No usage on cars, trains, boats, aircraft
  - Low-power indoor access points across full band
    - Operation permitted on aircraft
  - Contention-based protocol required
- Further Notice of Proposed Rulemaking
  - Very low power use across full band
    - Virtual / augmented reality use cases
  - Additional power for low-power indoor
  - Mobile standard power
  - Higher power/antenna directivity for standard power





6 GHz Band
Automated Frequency Coordination Systems
Public Notice ET Docket 21-352

- **AFC Public Notice (PN) adopted on September 27, 2021.**
- **AFC proposals due November 30, 2021**
  - 4 proposals submitted to date
  - Comments on these proposals must be submitted by December 21, 2021.
- **Process:**
  - OET will review all proposals submitted by November 30, 2021, concurrently and with equal priority. Proposals submitted after this date will be considered by OET, but they may not be considered concurrently with proposals submitted by November 30, 2021.
  - For proposal received after November 30, 2021, OET will issue a public notice announcing receipt of the proposal and establishing a period for the public to review and comment on the proposal.
  - OET will conditionally approve as many proposals as are found to satisfy all AFC system requirements.
  - AFCs will be subject to public testing

12 GHz Band

WT Docket No. 20-443

- **12 GHz band is 500 megahertz of mid-band spectrum between 12.2-12.7**
- **Currently licensed to two DBS operators but NGSO and MVDDS services can operate on a non-harmful interference basis**
- **NPRM adopted January 15, 2021, seeks comment on:**
  - Whether it is possible to add mobile service throughout the 12 GHz band without causing harmful interference to incumbent licensees
  - Whether there are technical parameters that would allow additional terrestrial shared used of the band, methods for assigning flexible use rights in the band, and potential sharing mechanisms for the band if coexistence among the incumbent services and new flexible use service is technically feasible
  - Whether the public interest benefits of maintaining the current allocations and framework for the band outweigh the potential benefits of accommodating new services in the band

Allocation of Spectrum for Non-Federal Space Launch Operations

ET Docket No. 13-115

- **Report and Order and Further Notice of Proposed Rulemaking adopted April 2021**
  - Added a secondary non-Federal Space Operation allocation to the 2200-2290 MHz band through use of an Allocation Table footnote (limited to pre-launch testing and space launch operations in four 5MHz sub-bands)
- **Summary of FNPRM**
  - Seeks comment on:
    - Adopting primary non-Federal allocations in the 420-430 MHz, 2025-2110 MHz, and 5650-5925 MHz bands for use during commercial space launches
    - Adding a non-Federal Mobile allocation to the 2200-2290 MHz band and upgrading the non-Federal Space Operation allocation from secondary to primary
    - Propose service rules for commercial space launch operations in all these frequency bands.
  - Seek additional comment on proposals in a 2013 NPRM to provide Federal agencies access to commercial satellites in the C-band, Ku-band, and Ka-band
  - Comments extended to August 11, 2021, and reply extended to September 10, 2021.

60 GHz Short-Range Radars NPRM

ET Docket No. 21-264

- **NPRM adopted July 13, 2021**
- **NPRM is modeled after previously granted waivers for Google's gesture control device and to parties' applications for hot car sensors.**
- **Proposed changes:**
  - Expanding the permissible uses for short-range radars in the 57 to 64 GHz band while promoting coexistence with other unlicensed users and not interfering with licensed and authorized users in the band.
  - Allowing unlicensed field disturbance sensors like radar devices to operate in mobile environments at a higher power level than authorized today.
  - Seeks comments on the use of sensing technology such as Listen-Before-Talk to allow transmission at the same power level as other unlicensed devices in this band.
  - Comments were due by September 20, 2021, and reply comments were due on or before October 18, 2021.
  - Received 25 comments mostly in favor of the proposed changes.

Unlicensed Devices Sharing Spectrum

- **Railroad Safety**
  - **Metrom (DA 20-1186)** AURA UWB system to prevent collisions between trains, over-speed derailments, unauthorized train movement in work zones, and to minimize human error
    - Unlicensed sharing in the 3.248-4.990 GHz band
  - **Piper (DA 20-1349)** UWB Enhanced Transit Location System (ETLS) to provide train position information, prevent train-to-train collisions and identify unauthorized train movements in work zones.
    - Unlicensed sharing in the 4.243-4.743 GHz band
- **Medical Devices**
  - **Zoll Medical /Kyma Medical Tech** – UWB uCor medical device to monitor congestive heart failure using the 530-2105 MHz band
  - **Sensible Medical Innovations, LTD** – UWB ReDS System to measure lung fluid in congestive heart failure patients using the 1005-1709 MHz band
  - **MIT (DA 20-445)** – UWB WiTrack system passively monitors mobility, breathing, and other physiological signals in patients without body-worn sensors using the 6-8.5 GHz band

On The Horizon

- 3.1-3.45 GHz Band
  - Infrastructure Bill
    - $50 million from the Spectrum Relocation Fund for research, planning and other activities necessary for making the band available, including reallocating spectrum for shared federal and non-federal licensed users and conducting an auction.
    - 21 Month timeline for identifying and determining which frequencies in the band could be used on a shared basis between federal and non-federal commercial users under flexible-use service rules

- Experimental Innovation Zones will provide insight on new sharing opportunities

- NSF Spectrum Innovation Initiative to promote dynamic and agile spectrum utilization, while ensuring innovation and security for all users
  - $25 Million awarded to consortium led by Notre Dame University to for Spectrum Innovation Center

Questions ?

Thank you!