

# WinnForum CBRS Specification Development – Lessons Learned

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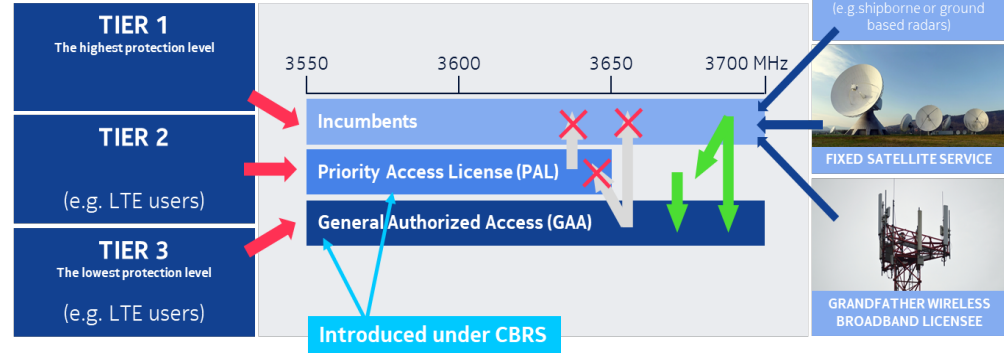
# Engage all stakeholders

- CBRS: 3-Tier Spectrum Sharing Scheme introduces some level of complexity
- Creation of Multi-stakeholder group(s) is key: all interested parties discussing in a single forum allows for a more efficient standardization process

## CBRS Model

Spectrum sharing is based on 3-tiers scheme which defines the interference protection criteria:

- The lower Tiers must accept interference from higher Tiers.
- ✗ The lower Tiers must not cause harmful interference to higher Tiers.



## It can get complex

- Identify key use cases to ensure all the needed requirements are addressed in baseline requirements.
- The higher the number of tiers and the diversity of use cases targeted for the band, the higher the complexity, e.g., for defining the coexistence framework, i.e., the framework to maximize spectral efficiency and minimize interference.

## Flexibility is needed

- Time is limited! The need to quickly enable commercial deployments may restrict the baseline supported capabilities.
- Consider flexibility in specifications development, especially for a new concept like CBRS. How to develop the ecosystem, enable trials as early as possible, etc?
- Any shared band with Federal incumbents will require a balance between flexibility of specifications which introduces more testing and certification requirements and future proofing

## Future proofing

- Mistakes can be costly: After networks are commercially operating and/or FCC testing and certification is completed for required network elements, it is complex to approve changes which can lead to inefficient operation.
- Introduce requirements and options for protocol extensibility.
- Consider features for transition between Releases (baseline mandated) and other optional releases.
- State diagram to allow for flexibility and optimizations in operation.
- Open-ended features without clear associated requirements may get misused.

## Agile and streamlined certification and testing

- Explore testing and certification models which allow for agile / continuous testing of Spectrum/Frequency controllers (e.g., CBRS SAS, 6GHz AFC) functionality.
- Government certification vs. third party certification body with the goal for quick and thorough testing.

## Final thoughts

- Keep it simple and flexible.
- Can the CBRS framework and SAS be streamlined and adapted for applicability in other bands and countries?
- Hear more from our international panel on September 24<sup>th</sup>.
  - Canada, Mexico, France, UK, Australia, Singapore

**NOKIA**