



Subcommittee 3
Electromagnetic Compatibility Improvements

Electromagnetic Compatibility Improvements Subcommittee Tasking by NTIA

- Background: As the spectral environment continues to become more congested and spectrum sharing becomes more common, the potential for adjacent channel interference scenarios remains a limiting factor in expanding access to spectrum. In particular, government radar bands increasingly are being identified for sharing with commercial or other government systems.
- Question: To increase the efficient use of the spectrum resource:
 - How can radar and other systems better co-exist in co-channel and non-co-channel relationships?
 - How should statistical risk-based analysis techniques in spectrum modeling analyses be used to characterize operational impact to federal systems?
 - What improvements in propagation modeling would increase the accuracy?
 - What role should NTIA play in ensuring the independent and timely analysis of these potential interference scenarios?
 - Other improvements suggested by CSMAC.

ECI Subcommittee Members

Co-Chairs: Donna Bethea-Murphy and Tom Dombrowsky

NTIA Liaison: Antonio Richardson

FCC Liaison: Jessica Quinley

Subcommittee Members

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Status of Efforts

- Subcommittee has met monthly (4 meetings thus far).
- A series of clarifications were asked of NTIA to solidify the questions and the task for the subcommittee.
 - Based on this, the subcommittee will focus on how to improve compatibility analyses between airborne radar and commercial wireless systems in the 5-16 GHz frequency range.
 - Subcommittee is not conducting any analysis, but instead will provide recommendations on potential methodologies and types of inputs required for an appropriate statistical analysis.
- A draft outline of a report has been created with volunteers to support each section.
- ITS provided an overview of efforts on propagation modeling in November (summary of those findings in next slides).
- NTIA provided background on Incumbent Informing Capability to subcommittee in December.
- Subcommittee plans to outreach to federal agencies.

NTIA Question: **What improvements in propagation modeling would increase the accuracy?**

Clarifications: Focus on compatibility of commercial wireless systems with federal aeronautical radar systems operating in the 5–16 GHz range to facilitate sharing

- 11/1/2022 – Virtual meeting with ITS experts on propagation (B. Kozma, P. McKenna, M. Cotton, D. Boulware) to discuss limitations of existing propagation models
- Takeaways
 - Existing models require expert users who understand the associated constraints and limitations to get a valid answer.
 - Recognize that everything in radio science as it applies to real-world problems is non-deterministic; probabilistic uncertainties must be accounted for.
 - Models that focus on narrowly-defined cases are likely to have lesser uncertainties than general models.
 - Data-driven modeling in complex environments (*e.g.*, LiDAR data to predict propagation through cluttered environments) is one area of needed study.
 - Sensitivity and interpretation of input datasets (*e.g.*, LiDAR, terrain, measurements) is another area of needed study.

NTIA Question: **What improvements in propagation modeling would increase the accuracy?**

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- ITS meeting Takeaways (continued)

- An expert system or handbook is needed to recommend an appropriate model and dataset to a given situation.
- Open-source measurement databanks with standardized collection methods would help validate models.
- Propagation model use cases and requirements should be chosen from possible deployments being considered for public policy action(s).
- Repeatable and documented experimental design/analysis is critical for the improvement and validation of predictive models.
- Forward-looking action should be taken to provide adequate time and funding for necessary and sufficient science and engineering results to underpin spectrum policy.
- A systematic approach involving stakeholders should be taken to standardize and evolve propagation models in the highest-priority frequency band. Once established, the approach should be extended to next-priority bands.

Questions?