

**ISART 2022**  
**Opening Panel**

**A Research Perspective on  
Continuous Regulatory Improvement**

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This talk is the personal opinion of the speaker

# Past technical constraints shaped the current paradigm

- Radios and other RF devices in 1930s-1950s
  - Function fixed in hardware
  - No processing or storage
  - No data links
- Expensive
  - Regulatory changes requiring behavior changes
  - Real-world assessment of model accuracy or regulatory outcomes
- Modify regulations in a band once per decades



# The constraints have changed

- Radios and other RF devices in 2020s
  - Most functions flexible (firmware/software updates)
  - Processing and storage in all devices (varying constraints)
  - All devices connected to the Internet (some intermittently)
- Potentially affordable
  - Change behavior in response to regulatory changes
  - Report data on model accuracy and regulatory outcomes
- Opportunity: data-based continuous regulatory improvement



# Thoughts on key research questions

- Regulatory / Technical Mechanisms
  - How to specify the range of possible future changes in a band
  - How to choose the range
    - How to predict the potential costs and benefits of flexibility options
  - What technical features and operational methods grow the affordable range



# Thoughts on key research questions

- Assessment
  - Technical methods for gathering, processing, sharing
    - With privacy protection
  - How to make crowd-sourced data trustworthy
  - Who does the assessment
  - How to resolve contradictory data sets



# Thoughts on key research questions

- Policy / Economic
  - Optimal time between changes to a band
    - What factors affect the optimal time
  - How to reduce regulatory distortion
    - Every change creates opportunity for undue influence or political intervention
  - Interactions with
    - Spectrum user business models
    - Auction design and payoffs
  - Incentives for parties other than the regulator



# Summary

- Technical opportunity for data-based continuous regulatory improvement
- Many research questions to address, including:
  - Regulatory / Technical Mechanisms
  - Assessment
  - Policy / Economic
- ISART community is invited to help set & prioritize research topics

