



ISART™ 2026

BOULDER, CO | AUGUST 11-13, 2026

Opening Remarks: Conference Overview

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Telecommunication Sciences (ITS)

Manhattan's Population Growth: A Blueprint



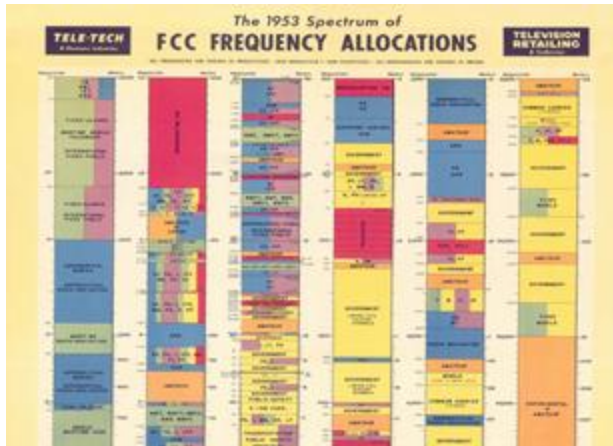
As population, commerce, and businesses grew, Manhattan expanded. The island filled.

The city started to build up. As technology advanced, so did the height of the buildings.

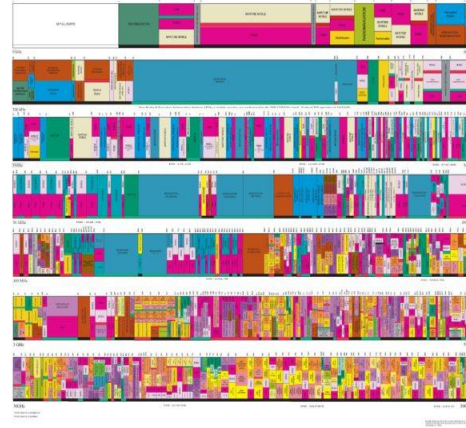
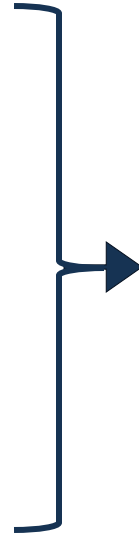
Today, One World Trade Center stands at 1,776'.

*Pictures from www.history1010.nyc

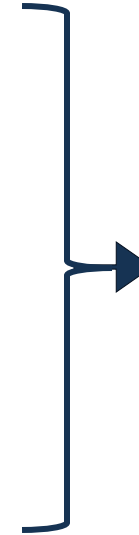
Maximizing the Future of Spectrum



1953



2016



2030+

ISART Discussion Areas



- Understanding Our World: Data Foundations



- Real-World Applications and Use Cases



- Hardware Solutions

Understanding Our World: Data Foundations



Federal &
Non-Federal
Systems



Allocations &
Assignments



Efficiency &
Interference



Technical
Parameters

How do we define spectrum use?

Technical Parameters:

1. Which ones are required for AI/ML?
2. How do we collect the right data?

Data Scarcity & Inconsistency:

1. How do we make data available?
2. Who defines available?
3. How is consistency agreed to?
4. What datasets are missing?

Requirements for Real-World Applications



Mission-driven

- Align with operational requirements
- No single metric works across agencies



Context-specific assessments

- Mission needs
- Operational tempo
- Required immediate availability even if observed occupancy is low



Modernization focus

- New technologies (e.g., compression, advanced modulation, coexistence techniques, AI/ML)
- Improved receiver performance.



Federal-commercial coexistence

- Band studies to expand commercial access while safeguarding federal missions



Data-driven transparency

- Better data, transparency, and tools such as Spectrum.gov to improve efficiency and trust.

How Do We Use a Playground?



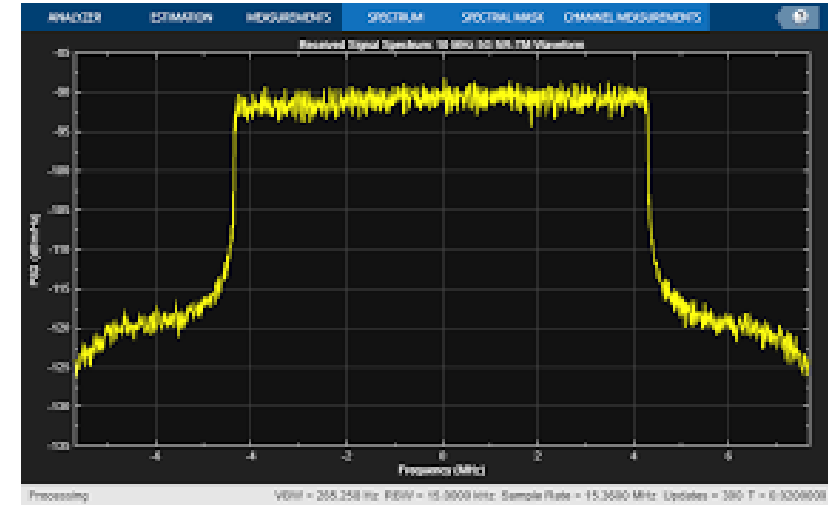
Considerations for Hardware Solutions

Transmitters

- Highly regulated
- Tunable
 - Frequency
 - 3dB point
 - Waveform
 - Maneuverability
 - "Data" Focused

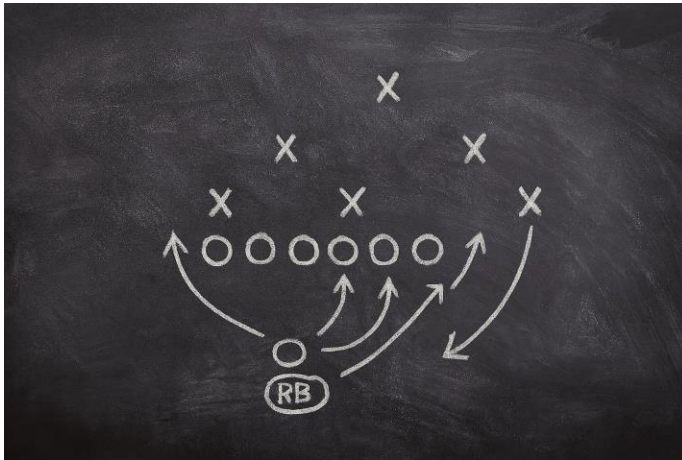
Receivers

- Tunable filters (potentially using AI)
- Not currently regulated
- What happens after "reception"? Can they move?



Considerations for Hardware Solutions, Cont.

- Play like a running back
 - Read the spectrum
 - React to the spectrum
 - Find the hole
 - Teammates adjust to you
 - React to the defense (interferers)



Questions to Resolve

- How do Transmitters and Receivers sync?
 - In same spectrum environment?
 - In different spectrum environments (i.e., Over-the-Horizon)?
- Can AI help maneuver?
- How does the receiver know where to go?
- What happens during the next burst?

Conference Highlights

- 1) Data scarcity and inconsistency
- 2) Autonomous operation and **interference** risk
- 3) Integration of hardware, propagation, and intelligent systems for scalable real-world autonomy

