



# An Overview of the Institute for Telecommunication Sciences (ITS)

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# ITS Mission

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- Work with US Government agencies and private industry to
  - Explore, understand and improve the use of telecommunications technologies and principles
  - Investigate and invent new technologies
  - Overcome telecommunications challenges





# ITS Contributions to NTIA Strategic Objectives

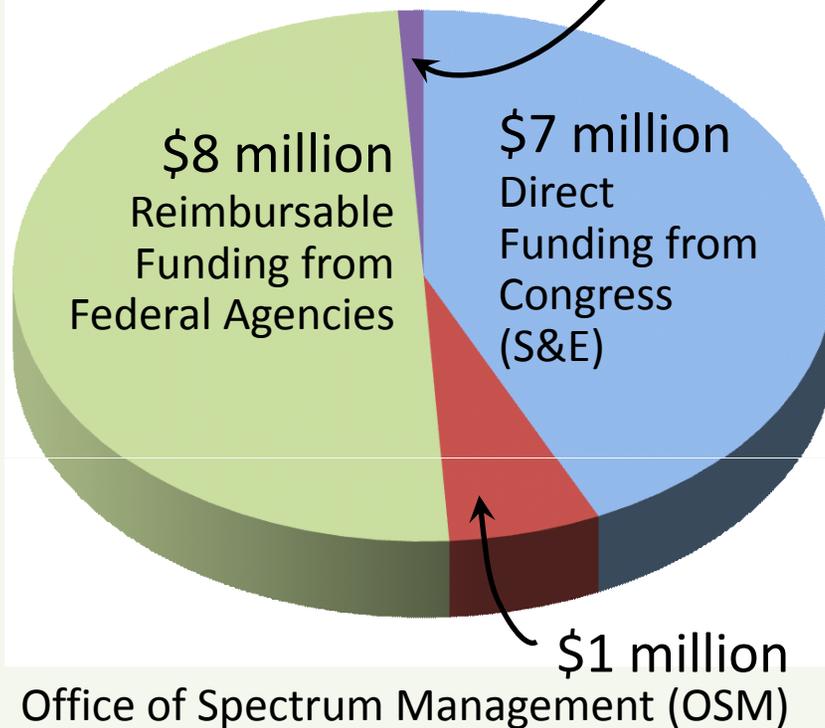
ITS Contribution	DOC Strategic Objectives
<ul style="list-style-type: none"> <li>• Spectrum and propagation measurements</li> </ul>	<ul style="list-style-type: none"> <li>• Promote U.S. telecom and information infrastructure development</li> </ul>
<ul style="list-style-type: none"> <li>• Standards development</li> </ul>	<ul style="list-style-type: none"> <li>• Improve foreign trade opportunities for U.S. telecom firms</li> </ul>
<ul style="list-style-type: none"> <li>• Joint research with industry</li> <li>• Testing and assessment of new technologies</li> <li>• Audio, video and multimedia quality research</li> </ul>	<ul style="list-style-type: none"> <li>• Enhance domestic competitiveness</li> </ul>
<ul style="list-style-type: none"> <li>• Spectrum sharing research</li> </ul>	<ul style="list-style-type: none"> <li>• Facilitate more efficient and effective use of radio spectrum</li> </ul>



# ITS Funding

Total: \$16.1 million

Cooperative Research and Development Agreements (CRADA) — \$100K



- 50% Direct Funding
- 50% Reimbursable



# Major Research Programs

- Spectrum Sharing Research
- Spectrum Measurement Research
- Radio Propagation Research
- ITU-T and ITU-R studies
- Public Safety Communications Research
- Audio, Video and Multimedia Quality Research

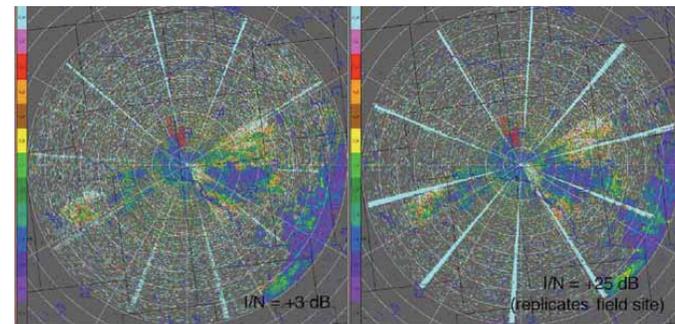




# Spectrum Measurement Research

- Spectrum Measurements
  - Occupancy
  - Individual Transmitters
  - Noise
- Field measurement efforts to resolve and prevent interference
  - Radars
  - Communication Systems
  - Radio-Jamming Systems in Prisons

- Spectrum-Sharing R&D
  - Dynamic Frequency Sharing (DFS) Research in Radar Bands
  - Dynamic Spectrum Access (DSA) Testbed for LMR bands
  - Interference Protection Criteria (IPC) for Spectrum-Sharing



Effects of increasing levels of interference on a safety-of-life weather radar



# Radio Propagation Research

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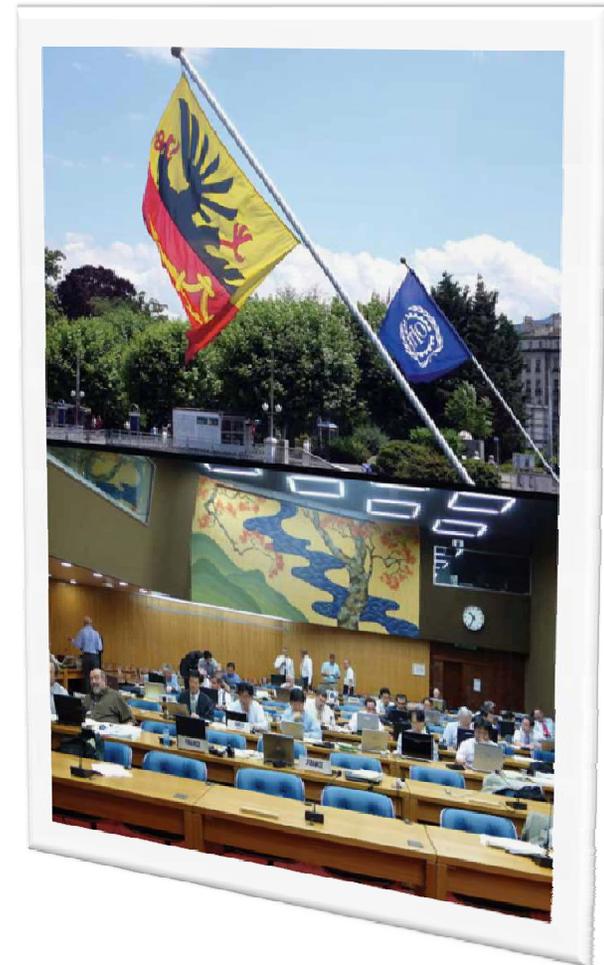
- Development and Maintenance of Propagation Models
- On-Line Propagation Models and Data via TA Services
- Geographic Information System (GIS) Applications
- Recent Development of Short-Range (<1 km) Propagation Model
- Ultra-Low Antenna Height Modeling and Measurements
- Development of a Ground-Conductivity Measurement System





# ITU-T and ITU-R Studies

- Leadership of ITU and U.S. Telecommunications Standards Committees and Contributions
  - U.S. Standards Proposals
  - ITU Recommendations and Associated Industry Standards
  - Technical Support for U.S. Administration in ITU-R Study Group 3 and Working Parties 3J, 3K, 3L, 3M, 5B, 5D, 6C, and ITU-T Study Group 9
  - ITU-R U.S. Chair of Study Group 3
  - ITU-T U.S. Chair of Study Group 9
  - ITU-T International Chair of Study Group 9





# Public Safety

- Joint effort between ITS and NIST Office of Law Enforcement Standards (NIST/OLES)
- One of the longest-running Other Agency-funded efforts ( $\approx 14$  yrs)
- Supports DOJ and DHS interoperable public safety communications efforts
- Areas of research
  - Land Mobile Radio Standards
  - Broadband Standards
  - Interoperability device testing
  - Emerging standards and technologies

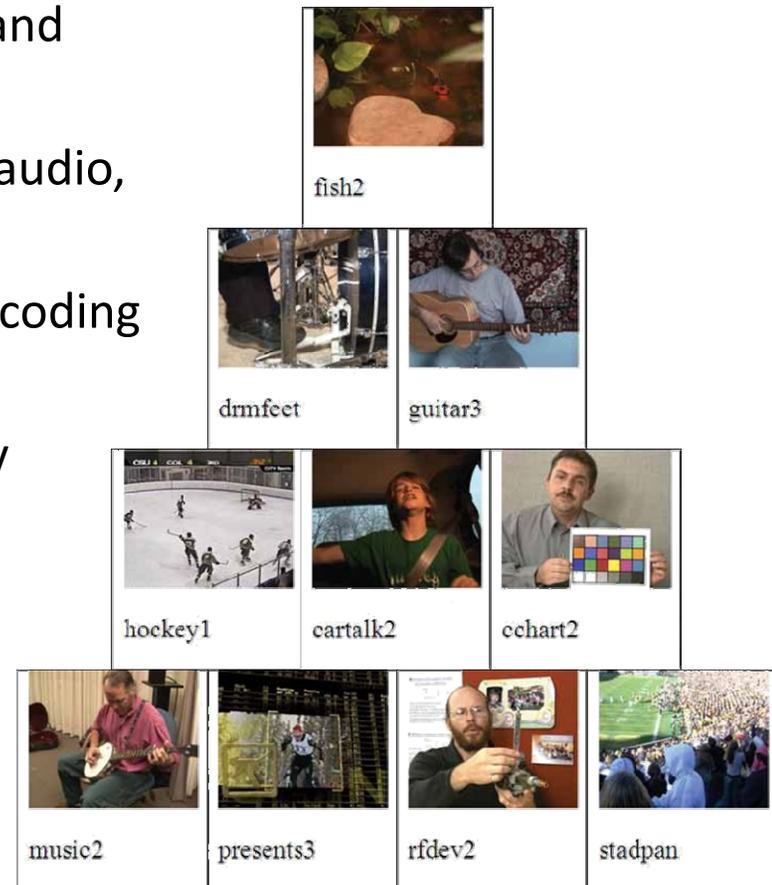


[www.pscr.gov](http://www.pscr.gov)



# Audio, Video and Multimedia Quality Research

- Measurements of speech, audio, video, and multimedia quality
- Assessments of algorithms for encoding audio, video, and multimedia
- Development of better algorithms for encoding audio, video, and multimedia
- Improve competitiveness of U.S. Industry
- Technical inputs to U.S. policies on advanced media technologies
- Contributions supporting the U.S. Administration's goals in ITU-T, VQEG and other national and international forums



Video Source Material Used In Video and Multimedia Research



# RSMS Van





# Table Mountain “Quiet Zone”

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# Questions?

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Visit the ITS website and download publications  
at [www.its.bldrdoc.gov](http://www.its.bldrdoc.gov)

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