NTIA/ITS's Programmatic Approach to Advanced Communications

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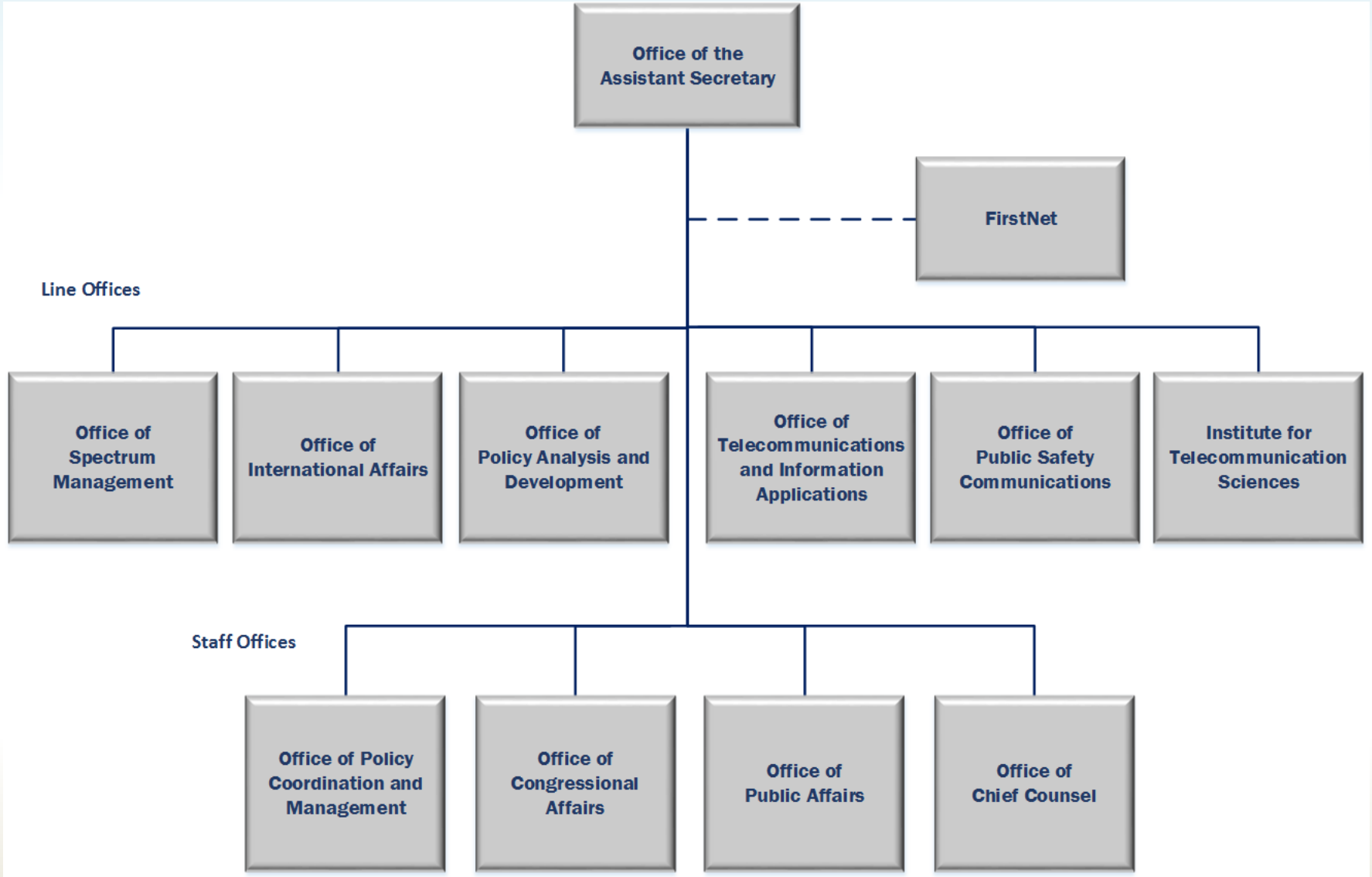
Institute for Telecommunication Sciences

- NTIA's research and engineering laboratory; evolved from NBS Central Radio Propagation Laboratory.*
- Supports telecommunication policy formation and research needs of U.S. government.
- Principal Federal resource for solving the telecommunications concerns of other Federal agencies, state and local Governments, private corporations and associations, and international organizations.

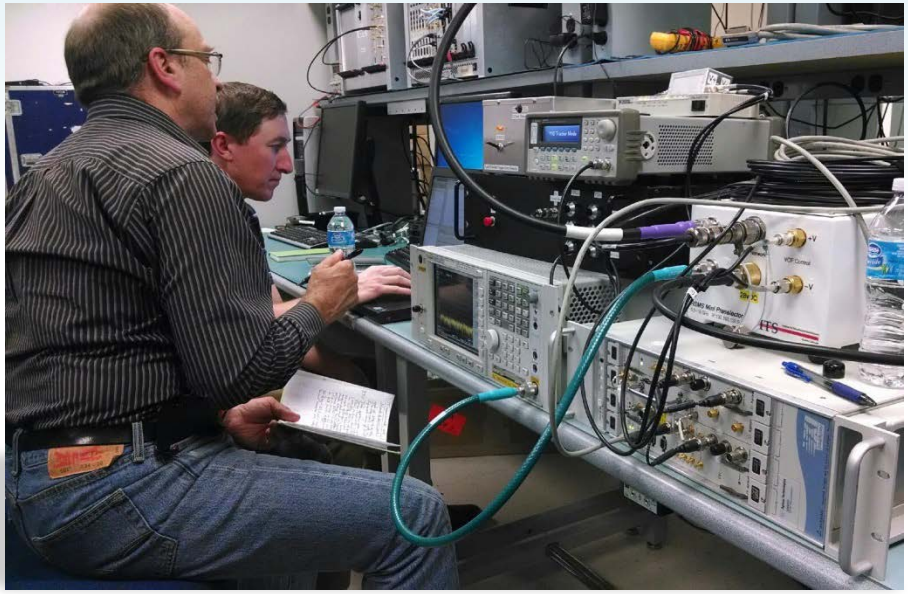
* C. Gordon Little, "What on Earth Happened to the Central Radio Propagation Laboratory (CRPL)," *IEEE Antennas and Propagation Magazine*, Vol. 33, No. 4, August 1991.

National Telecommunications and Information Administration Structure

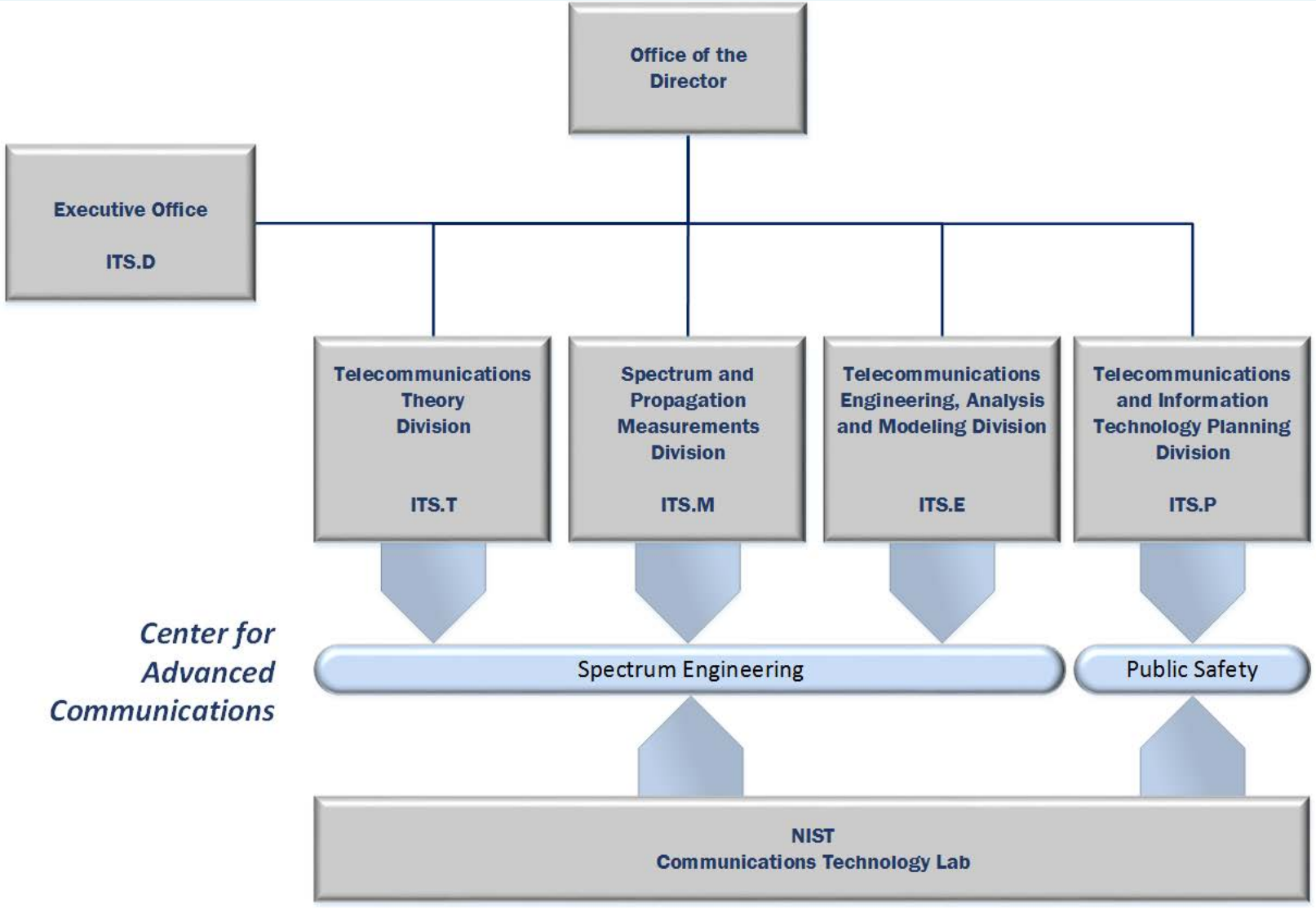


Major Research Programs

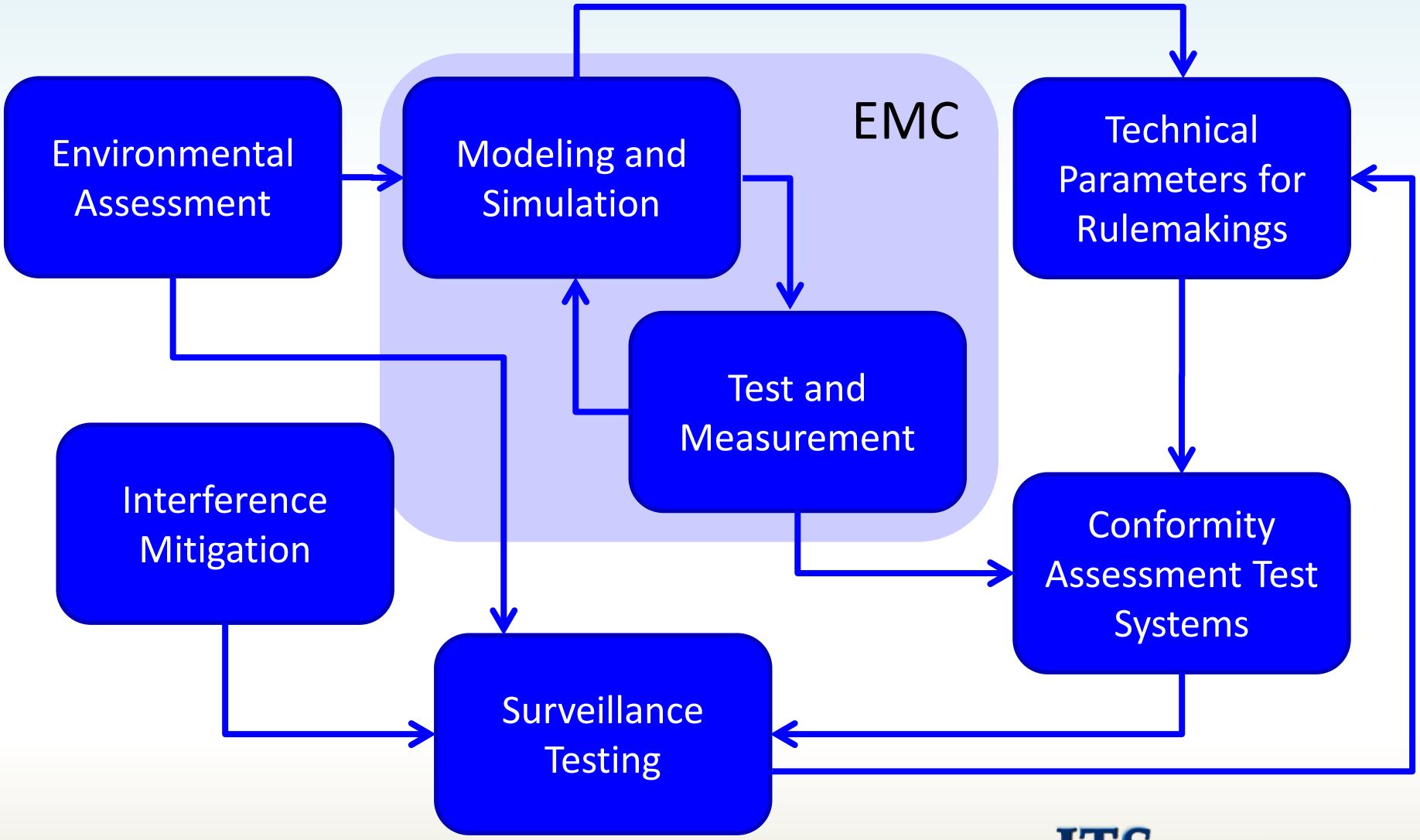
- Radio propagation modeling
- Spectrum measurements
- ITU-T and ITU-R studies
- Audio, video and multimedia quality
- Public Safety Communications
- Spectrum sharing



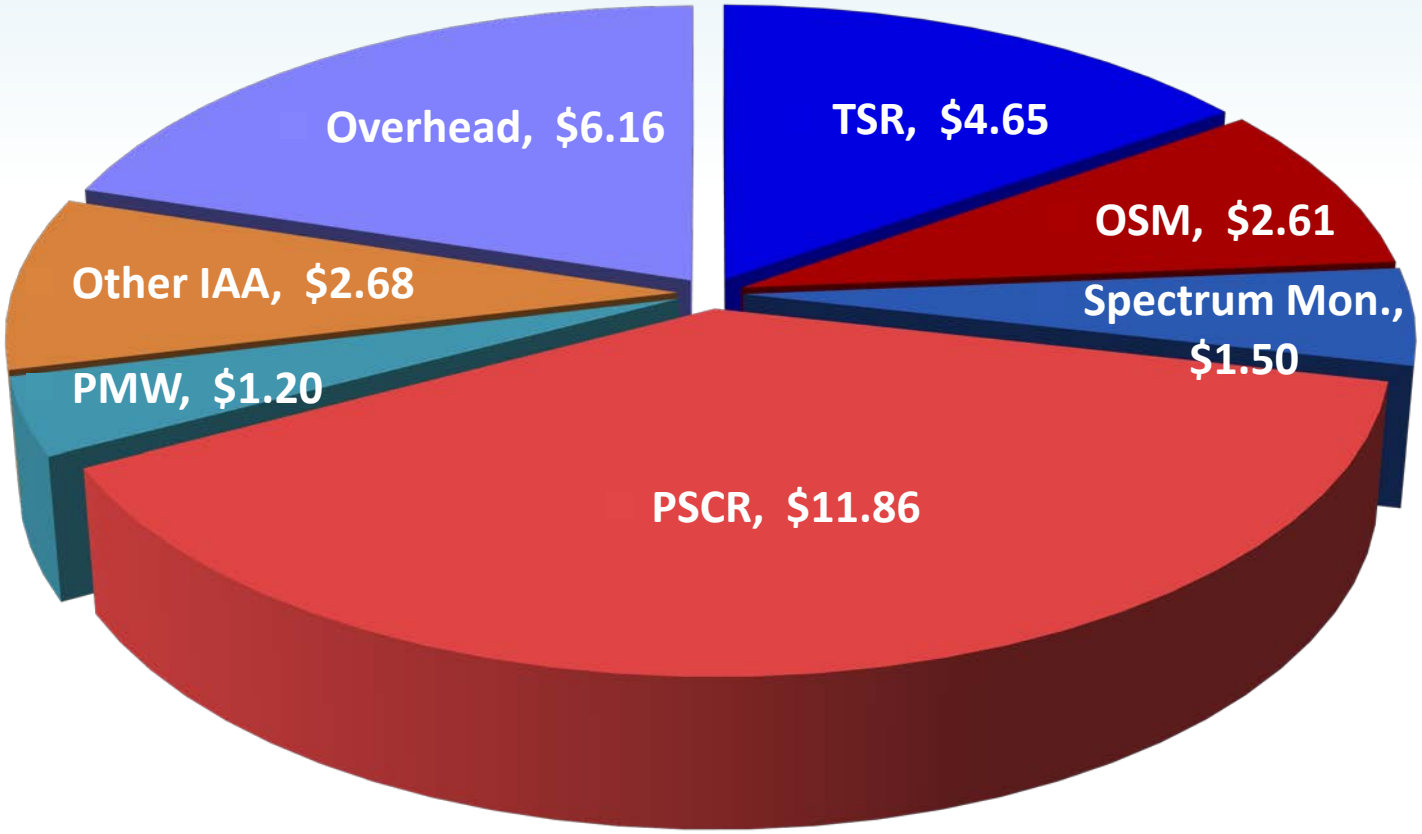
Institute for Telecommunication Sciences Structure



Spectrum sharing analyses



ITS Program Funding (millions)



Technical work:

- 25% Direct
- 75% Reimbursable

Contemporary modeling example

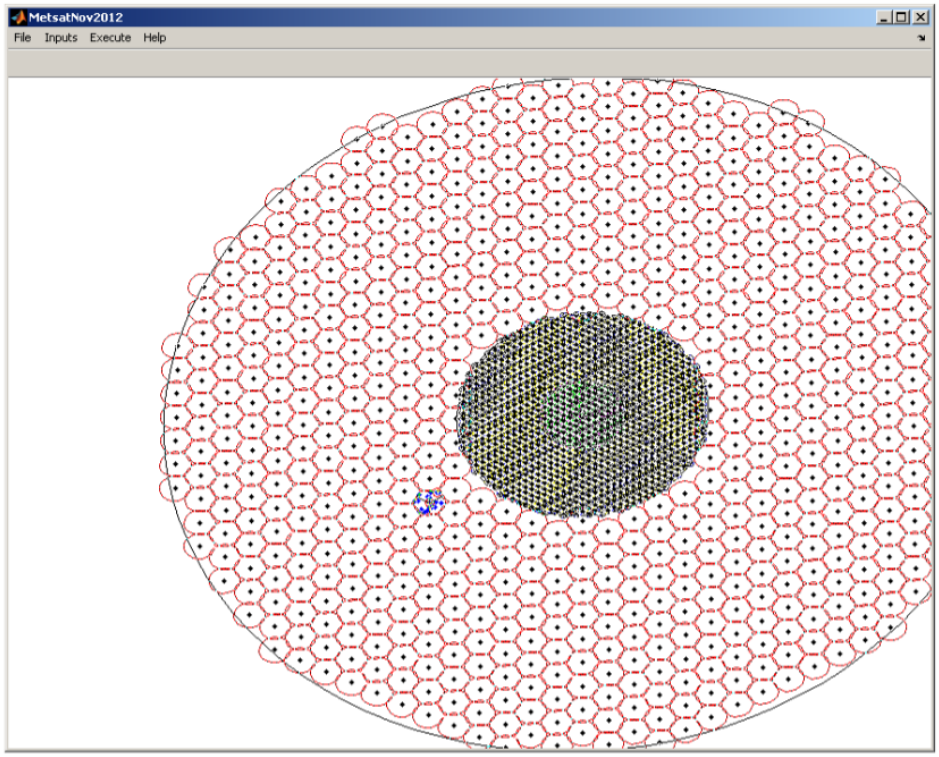
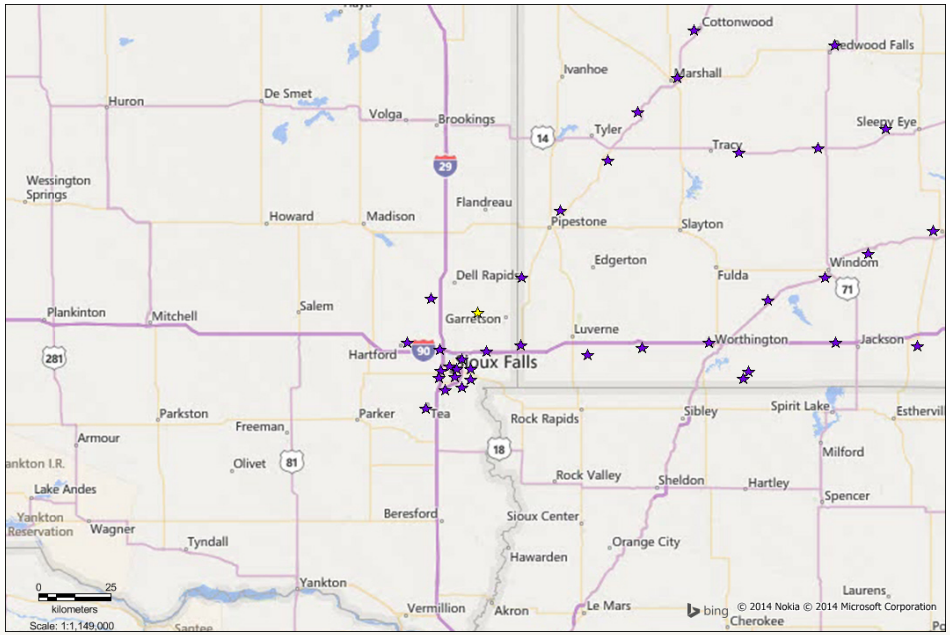


Figure 3. Example of Base Station Deployment Coverage Areas

WG1 approach
MetSat Rx at center of cluster
Urban: 1.6 km cell radius, n = 1088
Suburban: 7 km cell radius, n = 670

WG5 approach
Actual “randomized” carrier deployment
MetSat Rx ~ 20 km from city center
Urban: n = 15
Suburban: n = 11



A new spectrum framework

- Presidential memoranda on spectrum—Jun 2010, Jun 2013
- NTIA fast track reports—Oct 2010
- NTIA 10-year plan and timetable—Oct 2010
- CSMAC Working Groups in support of AWS-3 auction—Jul 2012
- International Symposium on Advanced Radio Technologies (ISART) conferences on spectrum sharing—Jul 2010/11/12, May 2015
- Wireless Spectrum R&D (WSRD) group—Oct 2010
- National Advanced Spectrum and Communications Test Network (NASCTN) Table-Top Exercise—Jun 2013

Programmatic approach

- Appropriated funds used to build capabilities and address research gaps
  - Radio Spectrum Measurement System
  - Clutter measurements
  - Aggregate models
  - System simulations
- Other agency projects and CRADAs enhance technical capabilities
  - 1755-1780 MHz CSMAC studies
  - DOT/Dedicated Short Range Communications (DSRC) study
  - Propagation modeling website (PMW)
  - US Coast Guard radar compatibility study
- NTIA short term studies
  - 3.5 GHz Joint Working Group
  - Radar compatibility with WiFi and LTE
  - Propagation modeling
  - Spectrum Sharing Innovation Test-bed

Key FY15 Spectrum Activities

Measurements research

- 1755-1780 and 3550-3650 MHz clutter measurements—statistical analysis, system verification, and test design
- Millimeter wave measurements

1695-1710 MHz band

- Spectrum Engineering Tool (SET), i.e. EMC analysis and coordination

1755-1780 MHz band

- Propagation modeling, interference protection criteria, and clutter measurements for Spectrum Sharing Test & Demonstration project

3.5 GHz band

- Spectrum monitoring, propagation modeling, and clutter measurements

5 GHz band

- U-NII DFS compatibility—analysis and conformity assessment
- DOT/Dedicated Short Range Communications (DSRC) study

ISART 2015—modeling, simulation, test and measurement

Abbreviations

CSMAC—Commerce Spectrum Management Advisory Committee
EMC—Electromagnetic Compatibility
IAA—Interagency Agreement
ITU—International Telecommunications Union
OSM—(NTIA) Office of Spectrum Management
PMW—Propagation Modeling Website
PSCR—Public Safety Communications Research
TSR—Telecommunication Sciences Research
WG—Working Group