CSMAC
Spectrum Efficiency Subcommittee

November 17, 2017

Subcommittee Members

- Co-Chairs:
  - Bryan Tramont
  - Jennifer Warren
- NTIA Liaison:
  - Giulia McHenry
  - Ed Drocella

- Members:
  - Audrey Allison
  - Laurie Buckhout
  - Michael Calabrese
  - Mark Crosby
  - Tom Dombrowsky
  - Carolyn Kahn
  - Paul Kolodzy
  - Mark McHenry
  - Janice Obuchowski
  - Charla Rath
  - Rick Reaser
  - Steve Sharkey

Improving Spectrum Efficiency: 2 Questions

1. What additional regulatory, procedural, legislative, or policy actions could be implemented to improve spectrum efficiency without harming effectiveness, including enhanced funding options for the federal agencies? Carolyn Kahn - Lead
2. What practices (technical and otherwise) has industry adopted to optimize its efficiency across disparate networks that might provide useful lessons for NTIA and federal agencies? Bryan Tramont - Lead

Task Group 1 Schedule

Regulatory, Procedural, Legislative, or Policy Actions

- Subcommittee kickoff: 4/27/17
- Task meetings:
  - Outreach discussion: 5/22/17
  - Outreach plan: 6/7/17
  - Brainstorming and preliminary recommendations: 8/8/17
  - Status, discussion and next steps: 9/14/17 and 10/23/17
- Year-end report: 11/17/17

- Outreach
  - Survey questions development: 6/20/17
    - 6 questions developed for OMB
    - 14 questions developed for federal agencies
  - Conducted targeted outreach (management/regulatory focus) to-date; use inputs to inform questions and dialogue with federal agencies
    - NTIA – ITS metrics effort: 7/17/17*
    - OMB interview: 7/19/17
  - CSMAC member input
  - Conducted additional outreach
    - Federal agencies (implementation focus): DoD, FAA, NASA, NOAA, DHS (10/31/17)
    - Follow-on: NTIA ITS (11/1/17), OMB (OFPP)

*"Spectrum Efficiency Study Description," Institute for Telecommunication Sciences for Office of Spectrum Management," NTIA, July 2017.

Task Group 1 Observations

- Measurement of spectrum efficiency differs by usage
  - Spectrum efficiency is a multifaceted issue, and these complexities must be recognized and reflected into policy reform to be effective
- Technology advancements have and will continue to improve spectrum usage
  - Environmental sensor networks, decision aids, automation, software-defined radios, advanced signal processing, policy-based spectrum access control features
  - Radars for particular missions, for example, have increased BW requirements to avoid intentional jamming and improve mission effectiveness
- The legacy spectrum management regime inherently constrains today's use of spectrum
  - This is a macro- (federal and non-federal) level problem that must be addressed collaboratively and constructively
  - All dimensions of the problem space should be leveraged, including the frequency band, geographic location, directionality, and time

Task Group 1 Considerations Include:

- Macro-level (federal and non-federal) options
  - One-government concept
  - Partnership with industry
- A roadmap – including technologies, standards, metrics, tools/software, implementation, schedule, and cost elements – to drive toward greater spectrum efficiency, relative to individual mission needs
- Sufficient resources/staffing to properly address policy changes (i.e., if there's a requirement, agencies need resources and staff)
- Further expansion of the Spectrum Relocation Fund (SRF), such as to cover O&M costs for improved, more spectrally-efficient solutions
- Mechanisms for federal government to share spectrum, without giving up assignments (e.g., a secondary markets model)

Based on initial interviews and discussions, the Subcommittee is considering these draft recommendations for further analysis and deliberations after completing the additional federal agency interviews.

Task Group 2 Schedule

Industry Practices Supporting Government Network Optimization

- Kickoff on 4/27/17
- Survey questions development 5/16/17
  - 14 questions total were developed and shared with all of CSMAC
- Question finalization 5/22/17
  - Solicitation of industry respondents
- Response review 7/12/17
- Final Report 11/17

Responses Received

- Surveys were sent to all CSMAC members
- Total of 6 responses were received
- Responses came from:
  - Manufacturers
  - Service providers
  - Broadcasters

Recommendations

- A number of industry practices to improve efficiency across disparate networks may hold helpful lessons for NTIA, including:
  - Make extensive use of Commercial Off-the-Shelf (COTS) equipment where feasible.
  - Sunset old technology, phasing out less efficient options.
  - Use consensus-based industry standards whenever possible. Opportunities for multi-purpose networks should be encouraged over single-purpose networks.
  - Determine whether entities with compatible missions, utilizing similar technologies could be considered for sharing and consolidation.

- Investigate if there are ways to make federal procurement processes more responsive to market-based incentives to invest in new technologies.

- Closely monitor the progress at 3.5 GHz including geolocation requirements, and see how it develops to see what coordination technologies may be of future benefit.

Recommendations for Future Work

- Continuation of this Subcommittee's Q1 efforts to gain additional details from the agencies
  - To ensure a well-rounded discussion of all elements prior to issuing formal recommendations to NTIA
  - The Subcommittee has pending interview requests with DoD (expecting written input), FAA, NOAA, and NASA; additional outreach could include others
- Consider focusing another CSMAC Working Group on economic mechanisms that could be employed to increase spectrum efficiency via sharing options, such as a federal mechanism to monetize assets on a non-permanent basis (e.g., a secondary markets model)
- As a follow-on effort, NTIA should consider focusing another CSMAC Working Group on federal procurement processes and how it can help agencies develop communications capabilities that are responsive to agency needs and still be competitive with the pace of technology advances in the private sector.
- Select a subset of the industry practices for further study.