

Federal Register Notice: 89 FR 12871, <https://www.federalregister.gov/documents/2024/02/20/2024-03400/request-for-information-on-the-national-spectrum-research-and-development-plan>, February 20, 2023.

Request for Information on the National Spectrum Research and Development Plan

WifiForward

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**Before the
NATIONAL SCIENCE FOUNDATION
Networking and Information Technology Research and Development
(NITRD)
National Coordination Office (NCO)
2415 Eisenhower Ave.
Alexandria VA 22314**

Request for Information

on the

National Spectrum Research and Development Plan

Comments of WifiForward

WifiForward is a broad coalition of entities that innovate, use and deliver services over Wi-Fi and other unlicensed spectrum technologies.¹ WifiForward filed comments with the National Telecommunications and Information Administration (NTIA) on the National Spectrum Strategy (NSS), and on the NSS Implementation Plan adopted this month.² We are pleased to provide brief comments to the Networking and Information Technology Research and Development (NITRD) National Coordination Office, as you shape federally-directed research and development in support of the NSS. Per the Federal Register Notice requirements,

¹ Additional information about WifiForward is available at www.wififorward.org

² See <https://www.ntia.gov/issues/national-spectrum-strategy/stakeholder-engagement/received-comments>.

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WifiForward is a strong proponent of policies that enable and support coexistence in spectrum utilization. The organization is focused on Wi-Fi technology, which was by design meant to politely contend for common spectrum resources. For the spectrum bands in which it operates today, Wi-Fi must yield to other radio systems that have superior claim to the band. The tools and techniques developed to enable this have allowed Wi-Fi to become a tremendous success story. Based on that success, the participants in WifiForward view coexistence as both a technology and business strategy to ensure that the United States can provide multiple systems and multiple users access to the spectrum they need to make the U.S. a spectrum leader. The use of coexistence-based approaches across a broad range of systems and users also supports the diversity and experimentation that drive innovation for the future. WifiForward believes the NITRD working group’s efforts can play an important role in supporting the future use of radio spectrum by building upon successful coexistence technologies and developing increasingly efficient ways to share scarce spectrum resources.

We offer four insights as you plan your research and development approach.

1. It is important that the work in the R&D Plan does not conflict with or duplicate efforts that are already underway through the NSS. In its Implementation Plan, NTIA has distinguished the shorter term work it is progressing on the 3 GHz, 5 GHz, 7/8 GHz and 37 GHz bands from the work it will do to stand up a longer-term spectrum planning process. The research and development work under the umbrella of the R&D Plan will be most valuable if used to inform and support NTIA’s long term planning where new challenges will arise.
2. Further technical investigation of existing sharing mechanisms available in the commercial marketplace is not necessary for them to be useful in meeting short-term needs. Coexistence mechanisms that are operating in the market have been evaluated and discussed repeatedly. For example, a comprehensive discussion of the existing

mechanisms at use now and available for many bands in the near term was recently authored by Michael Calabrese for the Dynamic Spectrum Alliance.³ Stakeholders with vested interests in the successful deployment of these coexistence techniques and tools are best positioned to work with Federal stakeholders on their use in the near term for bands of interest.

3. The R&D Plan should be focused on the next generation of coexistence techniques and tools. For example, one of the key aspects of coexistence that continues to be underdeveloped is a sophisticated understanding of signal propagation. Existing propagation models are outdated and lead to overly conservative results. An improved understanding of propagation would use more modern tools to better account for things like clutter from buildings and foliage, especially as they relate to signals from lower-site and indoor transmitters, rather than only the higher-site, outdoor transmitters that characterize traditional wide area networks. Another area of longer-term investigation could be the use of artificial intelligence in propagation modeling.

Advancements in this area would enable different systems to operate on the same frequencies – whether in the same geography or in directly adjacent geographies – and would be enormously beneficial as policymakers evaluate how to more efficiently allocate federal and commercial resources, and transition away from exclusive use radio silos. We recommend the NITRD working group coordinate its sponsored work in this area with other government organizations so as not to overlap efforts. Those are: NTIA’s ITS lab – which has propagation expertise – as well as NIST, whose Wireless Networks

³ Calabrese, Michael, “Solving the Spectrum Crunch: Dynamic Spectrum Management Systems,” October 2023 available at: <https://www.dynamicspectrumalliance.org/solving-the-spectrum-crunch.pdf>. IEEE DySPAN, as the National Science Foundation is well aware, has also been a forum for presentations of various aspects of sharing and coexistence mechanisms over the years, as well as generated standards in this area. See <https://standards.ieee.org/ieee/1900.5.1/5348/>. Similarly, the Dynamic Spectrum Alliance has also completed a research report on Automated Frequency Coordination solutions for 6 GHz unlicensed devices. DSA, “Automated Frequency Coordination: An Established Tool for Modern Spectrum Management,” March 2019 available at: https://dynamicspectrumalliance.org/wp-content/uploads/2019/03/DSA_DB-Report_Final_03122019.pdf.

Division also has done technical work in this area. The working group might also consult with the FCC Lab, which may have views on particular issues in the current application of propagation models that would be useful to tackle. Potential areas of investigation might include – building entry loss, short range propagation in urban and suburban environments, or use of artificial intelligence in propagation modelling.

4. The NITRD working group's effort also would be well served by understanding the work that will be assigned to NTIA's Commerce Spectrum Management Advisory Committee (CSMAC),⁴ which will launch a new two-year term this year. CSMAC is expected to provide advice to NTIA on standing up long term spectrum planning, and the CSMAC work may help the working group better target its science and technology-based research program to meet the future needs of policymakers.

Thank you for the opportunity to provide comments on the R&D Plan.

⁴ See <https://www.ntia.gov/category/csmac>.