

March 21, 2024

Ms. Mallory Hinks  
National Science Foundation  
2415 Eisenhower Avenue  
Alexandria, VA 22314  
USA

**Re: Request for Information on the National Spectrum Research and Development Plan**

Dear Ms. Hinks -

The Dynamic Spectrum Alliance (DSA)<sup>1</sup> respectfully submits these comments<sup>2</sup> in response to the Request for Information (RFI) issued by the National Science Foundation (NSF) on the National Spectrum Strategy Research and Development Plan (NSS R&D Plan). We appreciate the opportunity to offer our perspectives on key innovation areas for spectrum research, particularly as related to Dynamic Spectrum Sharing (DSS) - an area in which our members have significant knowledge and experience particularly in designing, developing, implementing, and operating dynamic spectrum management solutions (DSMS).

**Responses to RFI Questions**

**1. Recommendations on strategies for conducting spectrum research in a manner that minimizes unnecessary duplication, ensures that all essential spectrum research areas are sufficiently explored, and achieves measurable advancements in state-of-the-art spectrum science and engineering.**

In order to ensure that spectrum research minimizes duplication, while also achieving measurable results, the DSA encourages NSF to recognize in the NSS R&D Plan the existence of proven innovative licensing frameworks and DSMS tools and technologies, including the solutions that have made spectrum sharing a success in the Citizens Broadband Radio Service (CBRS) and 6 GHz bands. Given the historical success of the variety of spectrum sharing

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<sup>1</sup> The DSA is a global, cross-industry, not for profit organization advocating for laws, regulations, and economic best practices that will lead to more efficient utilization of spectrum, fostering innovation and affordable connectivity for all. Our membership spans multinationals, small-and medium-sized enterprises, as well as academic, research and other organizations from around the world all working to create innovative solutions that will benefit consumers and businesses alike by making spectrum abundant through dynamic spectrum sharing. A full list of DSA members is available on the DSA's website at [dynamicspectrumalliance.org/members](http://dynamicspectrumalliance.org/members).

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techniques in different bands designed to protect different incumbents, the DSA is of the view that there is no one size fits all solution to spectrum sharing. On the contrary, better results are achieved when sharing mechanisms are tailored to the characteristics and deployment conditions of the federal and commercial incumbents of each band.

The DSA recommends that the NSS R&D Plan focus on iterating on, enhancing, and optimizing dynamic spectrum access and management by using, as a starting point, existing DSMS tools and solutions, including the CBRS Spectrum Access Systems (SAS), the 6 GHz Automated Frequency Coordination (AFC), and the TV White Spaces databases – all of which have proven to protect incumbent systems from harmful interference while significantly increasing spectrum availability for a wide range of new broadband services. These existing DSMS solutions can be enhanced through additional research and development – for instance, by updating the propagation models used, automating sharing mechanisms, such as incumbent notification systems, and use of active Radio Access Network (RAN) technology together with machine learning to better assess RF environments. By focusing initially on enhancements of existing, proven solutions, the NSS R&D Plan can avoid duplication and achieve measurable advancement more expeditiously.

## **2. Recommended priority areas for spectrum research and development, as well as productive directions for advancing the state-of-the-art in those areas.**

The DSA strongly supports the research areas listed as priorities in the RFI. Spectrum efficiency, dynamic spectrum access and management, automated interference mitigation, and co-existence modeling are all areas in which the DSA and our members have keen interest and extensive experience. Further research and development in these critical areas will have meaningful impact on the achievement of the objectives articulated in the National Spectrum Strategy. We also fully support efforts to study the economic-, market-, social-, and human-centric aspects of increasing spectrum access. Testbeds are an effective way to assess these aspects in addition to the more traditional hardware and software components of spectrum management techniques.

## **3. Recommendations on grand challenge problems for spectrum R&D. Grand challenges are selected research problems that if attacked will help motivate and coalesce R&D efforts.**

No comment.

## **4. Recommendations on spectrum R&D accelerators.**

No comment

**5. Recommendations on near-term Federal activities to make progress towards anything identified in responses 1–4.**

As mentioned above, the DSA recommends that the Federal agencies focus near-term efforts on updating propagation models, developing automated sharing capabilities, such as incumbent notification systems, and establishing real-world, data-driven protection criteria for incumbent Federal systems.

**6. Recommendations on a process to refine and enhance the R&D plan on an ongoing basis.**

No comment.

**7. Terminology and definitions relevant for spectrum R&D. One term of interest is “Dynamic Spectrum Sharing” which is a focus of the National Spectrum Strategy but was not defined.**

The DSA defines Dynamic Spectrum Sharing as the use of both innovative licensing frameworks, such as those that enable opportunistic access, and automated dynamic spectrum management tools to coordinate spectrum assignments, increase spectrum efficiency, and expand spectrum access for a wide range of new users while also protecting incumbent operations.

The DSA and our members are available to discuss these comments and provide any additional information and insights on dynamic spectrum management and its role in the implementation of the NSS R&D Plan.

Respectfully submitted,  
Martha SUAREZ  
President  
Dynamic Spectrum Alliance