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January 27, 2023

Ms. Josephine Arnold  
Senior Attorney-Advisor  
National Telecommunications and Information Administration  
U.S. Department of Commerce  
1401 Constitution Avenue NW  
Washington, DC 20230

**Re: Public Wireless Supply Chain Innovation Fund Implementation  
Docket No. 221202-0260**

Dear Ms. Arnold -

Federated Wireless, Inc. (Federated Wireless) hereby provides comments on the National Telecommunications and Information Administration (NTIA) Notice and Request for Comment (RFC) on the implementation of the Public Wireless Supply Chain Innovation Fund (Innovation Fund), as directed by the CHIPS and Science Act of 2022.<sup>1</sup>

Federated Wireless appreciates the opportunity to share our views on this matter, which is of critical importance to the growth and diversification of a competitive global telecommunications ecosystem and to the advancement of policies, technologies, and architectures that will enable new, innovative U.S. companies to break into the market.<sup>2</sup> We hope our expertise in the development and deployment of groundbreaking wireless broadband solutions, as described in greater detail below, will prove useful to NTIA as it seeks to promote software, hardware and microprocessing technology that “will enhance competitiveness in 5G and successor wireless technology supply chains.”<sup>3</sup>

## **I. Background on Federated Wireless and dynamic shared spectrum solutions**

Founded in 2012 and headquartered in Arlington, Virginia, Federated Wireless is an innovator in the field of new spectrum management tools, such as spectrum sensing, cloud computing, and dynamic spectrum database technologies. Federated Wireless has a world-class team of technologists, researchers, engineers, as well as software system architects, software security experts, and software developers with broad experience in 5G technology and standards,

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<sup>1</sup> U.S. Department of Commerce, National Telecommunications and Information Administration, Docket No. 221202-0260, RIN 0693-XC053, *Public Wireless Supply Chain Innovation Fund Implementation* (RFC).

<sup>2</sup> RFC.

<sup>3</sup> Id.

cloud and distributed computing, artificial intelligence and machine learning, software development and test automation, network function virtualization, database development and management, networking, signal processing, and security. Our team also includes radio frequency engineers with experience in all aspects of the 5G wireless ecosystem including network design, deployment, and operations.

Federated Wireless has long led the industry in development of shared spectrum capabilities. Our founders did much of the original research for solving the problem of spectrum scarcity by designing a framework for sharing federal spectrum with commercial users, working closely with the Department of Defense (DoD), the Federal Communications Commission (FCC), and NTIA to establish the Citizens Broadband Radio Service (CBRS) in the 3.5 GHz band. Applying machine learning and artificial intelligence, our engineers designed a system that could securely manage the band for continued mission critical military use while simultaneously sharing that spectrum for widespread commercial use. We were one of the first wave of FCC-certified Spectrum Access System (SAS) administrators for CBRS, taking a lead role in the formation of the CBRS Alliance (now known as the OnGo Alliance) and deploying the industry's first nationwide Environmental Sensing Capability (ESC) network. We leveraged our CBRS experience and expertise to develop an Automated Frequency Coordination (AFC) system to enable sharing of the 6 GHz band, which was recently conditionally approved by the FCC.

Today, the Federated Wireless partner ecosystem includes more than 40 device manufacturers and edge providers, while our customer base includes over 400 companies and government entities spanning the telecommunications, energy, hospitality, education, retail, office space, municipal and residential verticals, with use cases ranging from network densification and mobile offload to private wireless and Industrial IoT. Through this partnership, Federated Wireless has driven the growth of what is arguably the world's largest wireless ecosystem by focusing on key facets, including:

- **Standardization** with focus on protocol simplicity;
- **Technology development** based on microservice-architecture with secure application programming interfaces (APIs);
- **Interoperability** support via an open, vendor-neutral integration model;
- **Onboarding** of vendor partners made seamless via automation wherever possible;
- **Partner ecosystem development** targeting all industry stakeholders in the supply chain including chipset vendors, radio vendors, device vendors and operators;
- **Security** of interfaces and as-a-service solutions leveraging widely used industry standards.

With this experience, Federated Wireless offers its perspectives on how NTIA can best develop and implement the Innovation Fund so that its investment in open and interoperable standards-based Radio Access Network (RAN) capabilities will “drive U.S. wireless innovation, foster competition, and strengthen supply chain resilience,” while also helping to “unlock opportunities for U.S. companies, particularly small and medium enterprises.”<sup>4</sup>

## II. Federated Wireless Responses to RFC Questions

**Question 1** *What are the chief challenges to the adoption and deployment of open and interoperable, standards-based RAN, such as Open RAN? Are those challenges different for public vs. private networks?*

*a. What are the challenges for brownfield deployments, in which existing networks are upgraded to incorporate open, interoperable, and standards-based equipment?*

### **Federated Wireless response:**

As NTIA observed in the RFC, traditional wireless telecommunications networks rely on a single supplier’s proprietary equipment, which has resulted in proprietary end-to-end solutions, “vendor lock-in,” and limited competition.<sup>5</sup> In order to break this cycle and promote competition, the virtualization of RAN functions and formation of multi-vendor interoperability will be important initial steps.

However, successful Open RAN development will also depend on three additional critical components, namely: 1) increased access to spectrum by a wide and diverse group of users beyond traditional public mobile network operators (MNOs); 2) the development of open interfaces to manage network control, configurability, and optimization, which will, in turn, drive the development of applications that will make more efficient use of network and spectrum resources; and 3) a focus on solving practical commercial use case challenges and rapidly transitioning solutions from testbed to market. We will address each of these critical Open RAN development hurdles and how the Innovation Fund can be leveraged to overcome them.

### **1) Increased Spectrum Access**

Access to spectrum is a gating item for the provision of wireless broadband communications services. Historically, the FCC has made spectrum available for wireless broadband services, such as 5G and its predecessor technologies, by auctioning exclusive licenses for different sized, albeit generally large, geographic areas. While today the FCC’s

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<sup>4</sup> Id.

<sup>5</sup> Id.

service and technical rules are flexible and permit a variety of mobile and fixed use cases by operators with different business models, one obvious result of the FCC’s auctions over the past thirty years is that a limited number of large MNOs have acquired rights to utilize spectrum for what is known as 3GPP technologies. This limited number of spectrum license holders, which rely on a single supplier’s proprietary end-to-end solutions, has led to suppressed competition in the market for technology and equipment.

In recognition of the limitations of traditional auctions, the FCC developed the rules for the CBRS band that would provide multiple access options to spectrum conducive to 3GPP technology deployments. The CBRS licensing framework has resulted in a record number of users having access to “carrier-grade” spectrum. The CBRS PAL auction resulted in 228 entities acquiring licenses, while the CBRS GAA tier has seen some 900 different users emerge in less than three years of commercial operation. The existence of multiple spectrum access options under the CBRS licensing framework, especially the license-by-rule GAA tier and use-or-share PAL rules, has led to increased competition by a diverse set of operators and stimulated investment in innovative business models. It has also spurred the development of a larger equipment supplier ecosystem where over 40 vendors, many of whom are domestically based, are providing solutions for both PAL licensees and GAA users.

This massive expansion of non-traditional 3GPP network operators is reaching every aspect of the U.S. economy. From agriculture to automotive, manufacturing to media, energy, retail, commercial real estate, in addition to schools, libraries, and civil society groups, private wireless networks are springing up as the result of the combination of easily available spectrum, lower cost equipment, and tailor-made solutions from multiple vendors.

Given the relationship between increased spectrum access and a larger technology and equipment ecosystem, Federated Wireless encourages NTIA to support projects through the Innovation Fund that enable licensing frameworks that will facilitate the broadest range of services and maximize competition by a diverse set of operators. Projects that involve dynamic spectrum management systems, for example, should qualify for Innovation Fund support.

## **2) Common RAN Intelligent Controller (RIC) with Service Management and Orchestration (SMO) Platform**

Another challenge to the development of a successful Open RAN capability is the need for a common, open RAN Intelligent Controller (RIC) with Service Management and Orchestration (SMO) capability. Having a commercial-ready, common RIC/SMO platform will facilitate a wide community of developers to build applications to make more efficient use of 5G networks and spectrum on a massive scale and tailored to the use cases needs of various enterprises. Without such a platform, technology and solution development will remain hampered by the limitations associated with the closed, vendor-locked and preferred network configurations of large MNOs and their preferred suppliers.

A RIC/SMO platform that works across multi-vendor reference architectures will enable third party applications to be developed and onboarded quickly and securely, while also being managed and de-conflicted. Such applications will incorporate automation, machine learning, as well as network optimization and configuration to meet the needs of diverse enterprises and government entities. Having access to an integrated, multi-vendor network management capability will support a wide range of different use cases and multi-vendor components and combinations, which is an important aspect of Open RAN.

At this time, there is no single entity or group that has the incentive or resources to create a standardized RIC/SMO platform. Therefore, Federated Wireless recommends that NTIA use the Innovation Fund to support projects that will ensure the development of a common RIC/SMO platform and increase the pace of technology development by a larger group of solution providers.

### **3) Focus on Solving Practical Commercial Use Case Challenges**

A third obstacle to widespread adoption of Open RAN is a customary concentration of attention and resources on large traditional mobile network requirements, rather than on solving challenges facing a larger, more diverse set of users and use cases. As described above, Federated Wireless maintains that Open RAN adoption will be accelerated when a broader and more diverse community of users have access to spectrum for their broadband connectivity needs.

Additionally, broader adoption will be accelerated when solutions for those diverse users' specific needs can be rapidly developed and implemented in a commercial context. This includes creation of operations-ready reference architectures that are designed as end-to-end solutions and address the security concerns of a multi-vendor RAN environment. These reference architectures should be further complemented by deployment and configuration automation templates that make Open RAN deployments at scale as easy as what DevOPs enables for cloud applications today. A vendor neutral approach is critical to avoid siloed solutions that work only with a single vendor's Open RAN stack.

By recognizing that nearly all industries and sectors can benefit from 5G technology advancements and that private wireless networks (not just large MNO networks) will play an increasingly important role in delivering that capability, NTIA can direct Innovation Fund resources towards projects that will solve practical business challenges and speed the transition from testbed to market.

## **Question 2 *What ongoing public and private sector initiatives may be relevant to the Innovation Fund?***

### ***a. What gaps exist from an R&D, commercialization, and standards perspective?***

***b. How might NTIA best ensure funding is used in a way that complements existing public and private sector initiatives?***

**Federated Wireless response:**

There are several examples of ongoing public sector initiatives that are relevant to the Innovation Fund and its goals.

- At DoD, the 5G-to-Next G Initiative (5GI) and Innovate Beyond 5G (IB5G) Program are both seeking to advance 5G and Open RAN capabilities. Through 5GI, DoD has invested in 5G experimentation at ten different locations with the goal of improved workforce efficiency in warehouse operations via inventory management by autonomous vehicles, machine learning for inventory tracking, and augmented/virtual reality applications. At the Marine Corps Logistics Base Albany, Georgia, the 5GI network is based on next generation Open RAN standards and is designed to comply with DoD specifications for zero-trust architecture for native security as well as secure connectivity with other networks. Federated Wireless recommends that NTIA consider whether any of these locations offer an opportunity for dual-use commercial and military Open RAN upgrades and testing.
- The National Science Foundation has several regional testbeds in its Platforms for Advanced Wireless Research (PAWR) program, which are designed to enable experimental exploration of new wireless devices, communication techniques, networks, systems, and services. Federated Wireless recommends that NTIA consider expanding these testbeds to include Open RAN.
- NTIA itself has funded a 5G Challenge to accelerate the development and widespread deployment of open and interoperable 5G networks with plug-and-play operation in cooperation with DoD and CableLabs.

In addition to the aforementioned programs, which could be expanded, Federated Wireless recommends that NTIA considered using the Innovation Fund to support a low-rate initial production (LRIP) of Open RAN software and hardware. By deploying 5G on U.S. military bases and U.S. civilian government campus and buildings around the world, the Innovation Fund can seed the market for new Open RAN solutions, making it easier to convert these projects from science projects to commercial reality.

Another relevant and potentially instructive Open RAN project is the U.K. Department for Digital, Culture, Media and Sport (DCMS) 5G Testbeds and Trials Programme, which is designed to support specific commercial use case and deployment scenarios, including agriculture, utilities, automotive, transport and logistics, and healthcare. These projects have

been successful at solving problems for specific use cases and could be instructive for use of the Innovation Fund resources.

**Question 3** *What kind of workforce constraints impact the development and deployment of open and interoperable, standards-based RAN, such as Open RAN? How (if at all) can the Innovation Fund help alleviate some of these workforce challenges?*

**Federated Wireless response:**

Federated Wireless recommends that NTIA support programs that offering training in multidisciplinary approaches needed for the advancement of Open RAN, including cloud computing, spectrum sharing, and radio engineering.

We also recommend the development of reference templates to make the commercial adoption of Open RAN faster and capable of being supported by a wider workforce. Today, Open RAN networks are not simple to design, deploy or manage. They resemble science projects, rather than commercial products. This is due in part to the fact that the Open RAN standards and ecosystem are still evolving. However, we believe a conscious and deliberate effort is needed to ensure simplicity in all aspects of Open RAN architecture, such as interface design, inter-operability requirements, as well as a common understanding around security, deployment and management requirements. While Open RAN vendors should have the incentive to add special proprietary value with optimization algorithms, the Innovation Fund can be directed to reduce complexity and facilitate greater workforce deployment and management of such networks.

Finally, we recommend that NTIA fund projects that do not require classified access to make it easier for more widespread private industry involvement and adopt funding mechanisms that facilitate participation by non-traditional vendors, such as Other Transaction Agreements (OTAs).

**Question 4** *What is the current climate for private investment in Open RAN, and how can the Innovation Fund help increase and accelerate the pace of investment by public and private entities?*

**Federated Wireless response:**

Currently, investment in Open RAN is limited to a small number of large, traditional MNOs and their equally small supplier ecosystem. Without a path to market for companies that are not currently supplying these MNOs, additional industry-led investment is highly unlikely. As explained above, ensuring inexpensive and streamlined access to flexible use spectrum for a wide range of 5G private wireless networks will be important, as will the funding of projects

focused on specific commercial use cases that can be easily converted from testbed to marketplace. These investments should result in self-sustaining projects. Much like what has occurred in CBRS, where the “Innovation Band” framework has resulted in the emergence of myriad new and innovative services and use cases, the Innovation Fund can seed projects that can broaden the ecosystem beyond the traditional MNOs and their handful of regular suppliers.

**Question 5** *How do global supply chains impact the open, interoperable, and standards-based RAN market, particularly in terms of procuring equipment for trials or deployments?*

**Federated Wireless response:**

As discussed above, Federated Wireless recommends that NTIA leverage the Innovation Fund to support projects that will tackle challenges related to specific commercial use cases. Greater certainty regarding market entry and focus on developing end-to-end solutions will bolster a self-sustaining U.S. supply chain.

**Question 6** *What open and interoperable, standards-based network elements, including RAN and core network elements, would most benefit from additional research and development (R&D) supported by the Innovation Fund?*

**Federated Wireless response:**

Federated Wireless recommends that NTIA focus Innovation Fund resources on projects related to applications and use cases, rather than spending more research dollars on hardware where sufficient progress has already been made. Further R&D in open and interoperable, standards-based RAN and core will in fact benefit from projects that both expose and highlight needs or deficiencies in the network element ecosystem.

As described above, increasing and easing spectrum access for more enterprises to launch commercially relevant capabilities and developing a common vendor-neutral RIC/SMO platform are two areas in crucial need of additional support.

**Question 7** *Are the 5G and open and interoperable RAN standards environments sufficiently mature to produce stable, interoperable, cost-effective, and market-ready RAN products? If not:*

*a. What barriers are faced in the standards environment for open and interoperable RAN?*

*b. What is required, from a standards perspective, to improve stability, interoperability, cost effectiveness, and market readiness?*



*c. What criteria should be used to define equipment as compliant with open standards for multivendor network equipment interoperability?*

**Federated Wireless response:**

We see progress being made in terms of Open RAN standards development and do not believe it to be a bottleneck to deployment and adoption of Open RAN capabilities. Instead, the challenge we see is the development of technology solutions that can be put into practical implementation and are based on a truly interoperable, multi-vendor ecosystem.

**Question 8** *What kinds of projects would help ensure 6G and future generation standards are built on a foundation of open and interoperable, standards-based RAN elements?*

**Federated Wireless response:**

Federated Wireless recommends that NTIA fund operational testbeds for commercial use cases to resolve practical challenges where easy-to-deploy reference solutions can be developed to propel the Open RAN adoption curve beyond what is available today with protocol-specific interface and interoperability testing and trials.

**Question 9** *How can projects funded through the Innovation Fund most effectively support promoting and deploying compatibility of new 5G equipment with future open, interoperable, and standards-based equipment?*

*a. Are interoperability testing and debugging events (e.g., “plugfests”) an effective mechanism to support this goal? Are there other models that work better?*

**Federated Wireless response:**

Rather than funding additional Open RAN “plugfests” that are largely focused on vendors checking protocol compliance, Federated Wireless encourages NTIA to focus on Open Testing and Integration Centres (OTICs) that can be operated over the life of Innovation Fund and will support new product and application development and testing. While academic and government run OTICs are important contributors, industry and use-case focused OTICs will be critical to ensure Open RAN solutions make it to market and become self-sustaining. Merely demonstrating interoperability will not lead to market adoption and incentivize deployment. Rather, practical operational testbeds and use cases will be necessary to accelerate impactful commercial solutions.

**Question 10** *How can projects funded through the program most effectively support the “integration of multi-vendor network environments”?*

**Federated Wireless response:**

As described above, Federated Wireless encourages NTIA to leverage Innovation Fund resources to develop operational testbeds that address specific commercial use case challenges, which will spur multi-vendor solutions.

**Question 11** *How do certification programs impact commercial adoption and deployment?*

- a. Is certification of open, interoperable, standards-based equipment necessary for a successful marketplace?*
- b. What bodies or fora would be appropriate to host such a certification process?*

**Federated Wireless response:**

Federated Wireless acknowledges that certification programs are an important part of adoption of new technologies and capabilities. However, mere certification does not necessarily lead to widespread commercial adoption.

Rather than focusing on certification requirements, Federated Wireless recommend that NTIA allow industry to develop its own certification programs that will meet customer needs and requirements. Industry is sufficiently incentivized to self-organize its own standards bodies, industry alliances, and certification programs. The CBRS experience with the WINnForum and the CBRS Alliance (now OnGo Alliance) is a case in point.

Federated Wireless recognizes that government customers may need their own certification programs for which Innovation Fund resources could be targeted.

**Question 12** *What existing gaps or barriers are presented in the current RAN and open and interoperable, standards-based RAN certification regimes?*

- a. Are there alternative processes to certification that may prove more agile, economical, or effective than certification?*
- b. What role, if any, should NTIA take in addressing gaps and barriers in open and interoperable, standards-based RAN certification regimes?*

**Federated Wireless response:**

As mentioned in response to Question 11 above, we recommend that NTIA allow industry to manage commercial certification requirements and instead focus on certification requirements for government entities.

**Question 13** *What are the foreseeable use cases for open and interoperable, standards-based networks, such as Open RAN, including for public and private 5G networks? What kinds of use cases, if any, should be prioritized?*

**Federated Wireless response:**

The private wireless use cases for Open RAN capabilities are nearly limitless. As described above, nearly every sector of the U.S. economy (manufacturing, automotive, agriculture, energy, retail, commercial real estate, communications, media, supply chain industries, schools, libraries, healthcare, etc.) can and will benefit from the advancements of 5G and successor technologies. These private wireless networks requirements are separate and distinct from those of the traditional public networks.

Federated Wireless encourages NTIA permit applicants for Innovation Fund support to describe in their proposals what use cases they deem important and why, rather than attempting to prescribe a list of use cases at the outset.

**Question 14** *What kinds of trials, use cases, feasibility studies, or proofs of concept will help achieve the goals identified in 47 U.S.C. 906(a)(1)(C), including accelerating commercial deployments?*

*a. What kinds of testbeds, trials, and pilots, if any, should be prioritized?*

**Federated Wireless response:**

As described above in response to Question 2, Federated Wireless recommends that NTIA expand existing DoD investments in 5G testbeds to the surrounding communities for dual use commercial and military use cases. The National Spectrum Consortium could provide industry consensus on prototype, trial and testbed approaches.

In addition, as mentioned previously, Federated Wireless recommends that NTIA support the development of operational testbeds for commercial use cases to resolve practical challenges rather than focusing solely on interface testing or standards. Permitting applicants to identify and justify the use cases and challenges in their proposals will eliminate the risks of attempting to define a comprehensive list at this time.

**Question 15** *How might existing testbeds be utilized to accelerate adoption and deployment?*

**Federated Wireless response:**

As described above in response to Questions 2 and 14, Federated Wireless recommends that NTIA expand existing DoD investments in 5G testbeds to the surrounding communities for dual use commercial and military use cases. Testbeds should be designed with clear connections to commercial outcomes. The learnings from such testbeds can be made available across Innovation Fund initiatives with a focus on increasing Open RAN adoption.

**Question 16** *What sort of outcomes would be required from proof-of-concept pilots and trials to enable widespread adoption and deployment of open and interoperable, standards-based RAN, such as Open RAN?*

**Federated Wireless response:**

As described above, Federated Wireless recommends that Innovation Fund trials and testbeds be designed to assess commercial viability and solve challenges associated with practical implementation and business cases so that the transition from testbed to market is successful and self-sustaining.

**Question 17** *“Promoting and deploying security features enhancing the integrity and availability of equipment in multi-vendor networks,” is a key aim of the Innovation Fund (47 U.S.C 906(a)(1)(C)(vi)). How can the projects and initiatives funded through the program best address this goal and alleviate some of the ongoing concerns relating to the security of open and interoperable, standards-based RAN?*

*a. What role should security reporting play in the program’s criteria?*

*b. What role should security elements or requirements, such as industry standards, best practices, and frameworks, play in the program’s criteria?*

**Federated Wireless response:**

Federated Wireless encourages NTIA to create as big a tent as possible for Innovation Fund participation, including companies that have security expertise. The Information and Communications Technology (ICT) industry houses much of that expertise and should be included in funding initiatives.

**Question 18** *What steps are companies already taking to address security concerns?*

**Federated Wireless response:**

Federated Wireless does not have specific comments on this question pertaining to what Open RAN vendors are doing.

**Question 19** *What role can the Innovation Fund play in strengthening the security of open and interoperable, standards-based RAN?*

**Federated Wireless response:**

Federated Wireless encourages NTIA to fund programs to create Open RAN reference architectures and deployment templates that will leverage commercial use case focused testbed initiatives and take in account the end-to-end security challenges of multi-vendor solutions, including the security needed for the onboarding of Open RAN SMO/RIC applications.

**Question 20** *How is the “zero-trust model” currently applied to 5G network deployment, for both traditional and open and interoperable, standards-based RAN? What work remains in this space?*

**Federated Wireless response:**

As NTIA may be aware, Federated Wireless oversaw the successful demonstration of U.S. Marine Corps Logistics Base Albany, Georgia 5G Testbed. The 5G network demonstrated through the project was built on Open RAN standards and was designed to comply with DoD specifications for zero-trust architecture for native security and secure connectivity with other networks. As NTIA develops the Innovation Fund program, we encourage support for the integration of security solutions across 5G RAN and enterprise IT.

**Question 21** *Transparency and accountability are critical to programs such as the Innovation Fund. What kind of metrics and data should NTIA collect from awardees to evaluate the impact of the projects being funded?*

**Federated Wireless response:**

As NTIA sets metrics for Innovation Fund projects, Federated Wireless recommends that it include requirements that grant proposals contain statements on the project’s relevance to commercial success and steps to transition from testbed to commercial operation. We also encourage NTIA to consider working with organizations that can develop a statement of

objectives and statement of work in a format agreed by a consortium or consensus of companies. Non-traditional innovators should not be burdened by traditional federal acquisition regulation accounting or compliance processes, which will otherwise limit participation, especially by small and medium sized enterprises.

In addition, Federated Wireless has concerns about the design of the program. We do not believe that a traditional grant style program with matching contributions from recipients will accelerate Open RAN innovation. In order to accelerate schedules and deliverables and leap ahead of global competition in Open RAN, industry needs access to funds in the near-term rather than 8-10 years from now. While a portion of the NTIA Innovation Fund should go to academic grants, the majority should go to small and medium enterprises given that market adoption rather than technical research is the primary impediment to Open RAN deployment.

**Question 22** *How can NTIA ensure that a diverse array of stakeholders can compete for funding through the program? Are there any types of stakeholders NTIA should ensure are represented?*

**Federated Wireless response:**

As described in our responses to prior questions, Federated Wireless strongly recommends that the NTIA Innovation Fund deliberately support proposals that involve small and medium size enterprises, rather than steering grants to traditionally large companies or academia. The typical grant structure does not enable wider industry participation and will stall progress toward achieving program goals.

We also recommend that Innovation Fund spending is not spread out (e.g., distributed uniformly) over a 10-year period. Funding is needed now. Moreover, funding should be directed towards fostering a self-sustaining ecosystem. In order to have meaningful impact on U.S. leadership in this space, we recommend front-loading funding and that projects that have practical outcomes and commercial readiness focus should be prioritized.

**Question 23** *How (if at all) should NTIA promote teaming and/or encourage industry consortiums to apply for grants?*

**Federated Wireless response:**

We recommend that NTIA maximize flexibility for teaming proposals, which will encourage as many different types of participants to self-organize into teams and consortiums.

**Question 24** *How can NTIA maximize matching contributions by entities seeking grants from the Innovation Fund without adversely discouraging participation? Matching requirements can include monetary contributions and/or third-party in-kind contributions (as defined in 2 CFR 200.1).*

**Federated Wireless response:**

As mentioned above, Federated Wireless recommends against requiring matching contributions. Such requirements limit participation by small and medium size enterprises.

**Question 25** *How can the fund ensure that programs promote U.S. competitiveness in the 5G market?*

- a. Should NTIA require that grantee projects take place in the U.S.?*
- b. How should NTIA address potential grantees based in the U.S. with significant overseas operations and potential grantees not based in the U.S. (i.e., parent companies headquartered overseas) with significant U.S.-based operations?*
- c. What requirements, if any, should NTIA take to ensure “American-made” network components are used? What criteria (if any) should be used to consider whether a component is “American-made”?*

**Federated Wireless response:**

Federated Wireless recommends that NTIA set requirements that grantee projects take place in the United States or at U.S. Government installations, such as DoD bases, abroad.

**Question 26** *How, if at all, should NTIA collaborate with like-minded governments to achieve Innovation Fund goals?*

**Federated Wireless response:**

We recommend that NTIA support U.S.-based technology and projects that can be exported globally and become self-sustaining through commercial adoption. There may be opportunities to partner with like-minded governments on Open RAN projects, such as the United Kingdom DCMS 5G Testbeds and Trials Programme, or to explore cross-border applications of U.S.-based technology, such as dynamic shared spectrum systems that could expand access to spectrum and encourage broader wireless network deployments by diverse users.



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### III. Conclusion

Federated Wireless appreciates the opportunity to provide these comments on the development and implementation of the Innovation Fund and stands ready to assist NTIA to spur the growth and diversification of a competitive global telecommunications ecosystem. Federated Wireless recommends that NTIA solicit and support projects that will increase access to spectrum by a wide and diverse group of users, invest in the development of open interfaces to manage network control, configurability, and optimization, and fund projects that are focused on solving real-world commercial and operational challenges.

Respectfully submitted,

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