January 27, 2023

<u>Via Electronic Filing</u>
National Telecommunications and Information Administration
U.S. Department of Commerce
1401 Constitution Ave, NW
Washington, DC 20230

Re: Notice and Request for Comment, NTIA-2022-0003

The Alliance for Telecommunications Industry Solution (ATIS) is pleased to have the opportunity to respond to National Telecommunications and Information Administration's (NTIA) Request for Comment (RFC) on the implementation of the Public Wireless Supply Chain Innovation Fund, as directed by the *CHIPS and Science Act of 2022*.

I. Introduction

Through its establishment of the Innovation Fund and the $1.5 billion provided for this effort by the *CHIPS and Science Act*, Congress has provided the Department of Commerce and NTIA with the tools to drive the adoption of open, interoperable, and standards-based RAN that supports a more competitive and diverse telecommunications supply chain. Effective implementation of this program presents a number of challenges, however, including several that are significantly different from those presented in previous funding programs managed by NTIA.

NTIA's implementation of the Innovation Fund is taking place mid-stream in the Open RAN technology development cycle. As such, the Innovation Fund's impact ultimately will be measured over time on market adoption and deployment by mobile network operators, and entry of new hardware and software vendors including those filling new roles such as system integration, continuous integration testing, and certification. The yardstick to measure and monitor this impact will be in the form of standards development and global consensus-driven adoption of key Open RAN architectures for 5G and future generations of wireless technologies. Accordingly, it will be important for NTIA to promote early and active industry engagement in standards development processes.

In providing a 10-year timeline for the Innovation Fund, Congress correctly understood that achieving these goals will require an ongoing process that will need to adapt over its life to changing needs and priorities. The RFC further recognizes that there are numerous ongoing private and public sector initiatives relevant to the Innovation Fund's success and that it is essential that the Fund be administered in a way that complements those existing initiatives. [1]

As the leading developer of open and interoperable consensus-based standards used by the U.S. Information and Communications Technologies (ICT) industry, and through its relationships

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[1] National Telecommunications and Information Administration, Public Wireless Supply Chain Implementation, Request for Comment, *Federal Register*, 87, No. 238, p. 76184 (question 2).

with other key industry players, ATIS sits at the intersection of efforts to ensure a strong interoperable Open RAN ecosystem for 5G and beyond. In that vein, and to ensure that this historic $1.5 billion investment achieves Congress' goals, ATIS urges NTIA to work closely with ATIS and the U.S. industry resident in its membership, as well as with the other organizations in its ecosystem, throughout the implementation of the program. Such collaboration will best serve to deliver on the goals of U.S. leadership in the global telecommunications ecosystem, fostering vendor diversity, lowering costs for network operators and consumers, and strengthening our supply chain.

II. The Importance of Standards

As the RFC recognizes, open and interoperable standards will be essential to the success of Open RAN technology. [2] The early development of standards is vital to a vibrant but still emerging ecosystem, such as Open RAN. And standardization is a necessary precursor to entry by new and diverse vendors that will drive innovation and reduce costs.

Standards support the timely and cost-effective delivery of interoperable products and services to the marketplace – a marketplace that is now global – so that the market can meet the needs of users for new technologies and services. This is fundamental to the robustness of the U.S economy and its competitive stance in the global marketplace.

The industry standards, developed by ATIS, an accredited standards organization, are developed through a process characterized by openness, balance, due process, consensus, and the right to appeal. [3] ATIS' process ensures that decisions and deliverables approved are based on the best technical and operational input possible. ATIS members – who represent companies across the spectrum of the ICT industry – collaborate to develop much-needed industry-led, consensus-based standards and solutions to address challenges.

ATIS' standards process also ensures that proposed solutions have broad industry support and promote vendor diversity. Participation in ATIS' standards initiatives are open to all stakeholders and these initiatives benefit from the input received from a broad range of subject matter experts. ATIS members represent a diverse group of companies including providers, manufacturers, and hyperscalers that contribute to the work and approve deliverables. Moreover, ATIS standards are generally approved via consensus, which requires substantial agreement by the participants (i.e., more than a simple majority). [4]

Of particular import will be the critical step of translating specifications and technical work items to globally adopted standards. NTIA should collaborate closely with ATIS which is well-positioned in this ecosystem given its recent MoU with the O-RAN Alliance and well-versed in this process. Support for industry engagement in, and development of, open and interoperable

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[2] National Telecommunications and Information Administration, Public Wireless Supply Chain Implementation, Request for Comment, *Federal Register*, 87, No. 238, p. 76182.

[3] ATIS would draw a distinction between consortia specifications and standards. Consortia specification are usually voluntary specifications whose development is generally initiated by groups of companies agreeing to work together to address a single commercial/market need. Participation in such consortia is often restricted.

standards is a necessary prerequisite for achieving the legislative goals of a more competitive and secure wireless technology sector.

III. Relevant Private Sector Initiatives

In Question 2 of the RFC, NTIA seeks input regarding ongoing public and private sector initiatives that may be relevant to the Innovation Fund.[5] As NTIA is quite aware and as explained below, there are already several key on-going initiatives that will drive development and adoption of next generation wireless functionality, including the incorporation of Open RAN technology. These initiatives present both an opportunity and a challenge to the execution of NTIA's mission. The opportunity is that there is already significant foundational work to inform and guide implementation decisions. The challenge is in coordinating the various key players in a manner that most efficaciously utilizes the initiatives already underway.

Arguably, the two most fundamental drivers for Open RAN's success will be seamless interoperability and security. To paraphrase one of the presenters at NTIA's listening session, industry will only invest in new technology if it will 'make money, save money, or reduce operating risks.' Widely-accepted specification and standards for interoperability will be essential to driving down costs and facilitating additional competition for Open RAN technology.   At the same time, however, Open RAN network designs introduce a significantly greater vulnerability surface that will require even greater emphasis on network and supply chain security. It will be critical for NTIA to ensure that public and private initiatives addressing these issues are coordinated throughout the Innovation Fund's lifecycle.

ATIS. ATIS is the leading developer of open and interoperable consensus-based standards used by the U.S. ICT industry. ATIS' role is critical to foster global innovation and the standardization of technologies for use by the U.S. industry and the government. As explained below, ATIS also serves as the nexus between stakeholders, such as wireless carriers, manufacturers, the Third Generation Partnership Project (3GPP), and the O-RAN Alliance.

O-RAN Alliance. The O-RAN Alliance's mission is to re-shape the RAN industry towards more intelligent, open, virtualized and fully interoperable mobile networks. O-RAN Alliance specifications are intended to enable a more competitive, vibrant RAN supplier ecosystem. ATIS and the O-RAN Alliance are collaborating on advancing the state-of-the-art of open radio access network, including Open RAN security and stakeholder requirements for Open RAN, and the potential publication of O-RAN Alliance specifications by ATIS as Open RAN standards to advance the adoption of Open RAN in North America. ATIS recently signed a Memoranda of Understanding with the O-RAN Alliance that addresses: (1) open radio access network issues, including Open RAN security; (2) stakeholder requirements for Open RAN; and (3) publication of O-RAN Alliance specifications by ATIS as ATIS standards.

ATIS notes that additional industry work will be required to evolve and standardize Open RAN to meet 6G performance metrics. Standardization of these specifications will facilitate broader

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[5] National Telecommunications and Information Administration, Public Wireless Supply Chain Implementation, Request for Comment, *Federal Register*, 87, No. 238, p. 76184 (question 3).

knowledge and use of Open RAN. Transforming specifications into voluntary, consensus-based standards fosters innovation, facilitates interoperability, and advances technology and infrastructure development and deployment. In particular, interoperability standards are essential to the viability of new, diverse vendors looking to break into the industry with innovative solutions. Standardization also accelerates adoption by allowing broad input and review of specifications.

ATIS' 5G Work. ATIS' 5G wireless networks and services work is particularly relevant to the NTIA's goal of promoting compatibility of new 5G equipment with future open standards-based, interoperable equipment and promoting and deploying technology that will enhance competitiveness in 5G and successor wireless technology supply chains that use open and interoperable interface radio access networks.[6] 5G services and solutions will be deeply integrated into the next generation of networks and services, and ATIS developed many of the standards that are setting the 5G network into action.

- In 2019, ATIS launched its 5G Supply Chain Working Group at the request of the Department of Defense (DoD) in consultation with other government agencies. This group extended the development of 5G best practices and guidelines for the purpose of creating supply chain standards that can be operationalized in the public and private sectors. To address end-to-end ICT supply chain visibility, coordination of existing supply chain management best practices, industry alignment with federal guidelines, improved threat monitoring tools, and a method to influence national/international standards development, the 5G Supply Chain Working Group: (a)established a common assurance framework for trusted 5G networks; (2) developed standards for 5G systems; and (3) evaluated audit/certification options for ICT solution providers, infrastructure and endpoint device original equipment manufacturers.[7]

- ATIS' 5G Secure Profile Working Group (SPWG) launched in October 2022 to bring industry and government leaders together to develop a standardized set of above-baseline security measures and configurations. Government agencies and enterprises alike are eager to adopt transformative 5G technologies. To advance these efforts, the SPWG will define and prioritize identified security gaps and produce secure profiles for use by both public and private sector stakeholders. These 5G "secure profiles" may be applied as standardized, above-baseline security measures by the 5G mobile industry. Each profile will be tailored to a specific high-assurance use case or security requirement(s) and may potentially make "optional" 3GPP security features "mandatory" for those use cases.

- ATIS is also ensuring 5G is positioned to deliver the long-promised convergence of all services onto a common framework, with corresponding enhancements to efficiency, security, and service velocity. ATIS' 5G Reimagined: A North American Perspective

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[6] *Id.* at p. 76183.

[7] The 5G Supply Chain Working Group has published a standard on 5G Network Assured Supply Chain. This standard addresses the 5G supply chain (5G/SC) as a critical function in the design, build, deployment, and operation of 5G assured networks. It focuses on the requirements and controls necessary to operationalize a set of agreeable levels of assurance associated with the lifecycle functions of high assurance 5G/SCs.

report employed use cases to address augmented and virtual reality and identified corresponding requirements in the new network. The analysis also provides an initial assessment of an approach to provide Optimized User Experience (OUx) in the forthcoming network. A detailed assessment of OUx requirements has also been completed.

ATIS Next G Alliance (NGA). While Open RAN technologies will be designed for 5G compatibility, the timeline for Open RAN maturity suggests its greatest implications will be on 6G. Indeed, with 6G specifications expected to be in development beginning in 2026, project management of the Innovation Fund will need to be closely coordinated with 6G pre-standards and standards organizations to drive Open RAN as a native characteristic of 6G.

The ATIS NGA is advancing North American wireless technology leadership over the next decade through private-sector-led efforts. The NGA has a strong emphasis on technology commercialization but encompasses the full lifecycle of research and development, manufacturing, standardization and market readiness. In 2022, the Next G Alliance published its National 6G Roadmap. Taking a holistic view of the 6G marketplace and the broader environment, the Roadmap explains the North American vision for 6G and beyond. Geared toward the eventual commercialization of 6G, it addressed the full lifecycle of research, standardization, development, and manufacturing and will be a major contribution toward shaping the networks of the future. The Next G Alliance provides a strategic platform for North American leadership in 6G that is compatible with the market-driven North American economy and allows North America to robustly engage with strategic initiatives in other regions.

3GPP. 3GPP is a global collaborative initiative that has developed the 4G Long-Term Evolution ("LTE") and 5G New Radio ("NR") wireless specifications and continues to work on emerging wireless technologies. As a founder and North American Organizational Partner, ICT companies may join 3GPP via ATIS and, as a 3GPP member, may contribute to the development of 3GPP specifications. ATIS also publishes 3GPP specifications as ATIS standards for use in North America and globally. ATIS' 3GPP relationship also permits it to identify any gaps or to address market-specific regulatory requirements (WEA, etc.)

IV. Importance of Public-Private Collaboration

ATIS believes that the NTIA Innovation fund can be a key catalyst that will strategically spur innovation and broader adoption of Open RAN technologies, as well as cement the leadership position of U.S. industry in 5G and future technologies. The Innovation Fund provides a singular opportunity to establish a foundation for the next generation of wireless communications technology that is consistent with the economic and security interests of North America. Executing on the goals set forth by Congress will require identifying key challenges from research to development to deployment and effectively targeting funding to addressing those challenges.

Importantly, Open RAN technology remains in the early stages of its life cycle and priorities will evolve over the 10-year life of the Innovation Fund. This presents challenges to the

implementation of the Innovation Fund that have not been present – at least not to the same degree – in connection with other funding programs that have been administered by NTIA. To effectively respond to these unique technical and administrative hurdles, an enduring and systematic process by which government, industry, and academia can work in partnership to execute the Innovation Fund's mission will be critical to success of the program.

To navigate these challenges, NTIA will need to incorporate into the life-cycle management for this 10-year long program several key considerations:

- Private sector outreach and engagement will be critical to assuring participation by both traditional and non-traditional industry players and drive operationalization. Important stakeholders include wireless carriers, equipment manufacturers, hyperscalers, and academia.
- Knowledge of standards and the standards ecosystem is necessary to accelerate industry adoption and avoid duplicative work efforts. Standards are vitally important to driving acceptance and adoption of Open RAN and delivering a vibrant marketplace. ATIS is central to this significant role in developing standards for 5G and beyond.
- Open RAN security is essential. Security must be addressed as part of NTIA's efforts to accelerate commercial deployments of Open RAN technologies and its incorporation in 5G wireless networks.
- To ensure that Open RAN architecture is developed as a native 6G technology, additional work will be required to evolve and standardize Open RAN to meet 6G performance metrics and a pathway must be developed to extend Open RAN to 5G network evolution and native 6G (and beyond) standards.

In conclusion, in its implementation of the Innovation Fund, NTIA should consider closer collaboration with the U.S. standards ecosystem vis-à-vis ATIS and empower U.S. industry to contribute and translate specifications and technical work items to globally adopted standards. ATIS urges NTIA to use the Fund to accelerate industry engagement in, and development of, open and interoperable standards.

If you have any questions about this matter, please do not hesitate to contact the undersigned.

Regards,
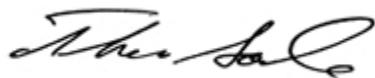
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