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Mr. Travis Hall
Telecommunications Policy Specialist
National Telecommunications and Information Administration
U.S. Department of Commerce
1401 Constitution Ave NW
Washington, DC 20230

June 25, 2020

Re: Aviat Networks, Inc. Comment in Response to NTIA request for public comment on Implementation Plan for National Strategy to Secure 5G; RIN #0660-XC047

Dear Mr. Hall,

Aviat Networks, Inc. (Aviat Networks) appreciates the opportunity to submit our response to NTIA's request for comment, on behalf of the Executive Branch, on developing an Implementation for the National Strategy to Secure 5G (hereafter the "5G Strategy Plan").

Aviat Networks is the U.S.'s leading microwave radio manufacturer. We are headquartered in Austin, Texas where our products for U.S. customers are also manufactured. Aviat Networks is a global supplier of point to point wireless solutions for fixed and mobile broadband networks and mission critical applications. Thanks to our seventy plus years of industry experience, Aviat Networks knows wireless transport better than anyone else. Our services and product portfolio support mission critical network infrastructure to thousands of customers including many in the U.S. Government, including FAA, U.S. Air Force, FBI, and Homeland Security, to name a few.

We support the USG's increased focus on enabling the deployment of the next generation of cellular network technology; indeed, 5G will be transformative for our society, offering opportunities to U.S. companies and consumers not previously available. We further appreciate the comprehensive nature of the National Strategy to Secure 5G – all four lines of effort can facilitate U.S. leadership in this space.

Summary Recommendations

The U.S. government should take steps to enable an environment that supports U.S. innovation, encourages investment in the foundational and new technologies that will facilitate 5G networks. These steps should include prioritizing U.S. based manufacturing by U.S. companies, using targeted government/public funding to complement private sector U.S. investment to accelerate the rollout of 5G infrastructure, investing in U.S. workforce training and development of new U.S. based technology.

The U.S. government should focus 5G security to include focusing on threats to the 5G ecosystem associated with supply chain. As a U.S. manufacturer of microwave technology, we understand the challenges of international supply chain. We are taking steps to minimize our component

parts from outside the U.S. and with the U.S. government's support we could minimize that further. We recognize the threat of technology backed and controlled by the foreign governments and the risk this poses to U.S. citizens as well as free citizens around the world. We are ready to provide an alternative in the U.S. as well as globally to other free nations and customers.

Line of Effort 1: Facilitate Domestic 5G Rollout

- 1) *How can the United States (U.S.) Government best facilitate the domestic rollout of 5G technologies and the development of a robust domestic 5G commercial ecosystem (e.g., equipment manufacturers, chip manufacturers, software developers, cloud providers, system integrators, network providers)?*

The basis for sound 5G policy rests on ensuring an environment that supports innovation and encourages investment in the foundational and new technologies that will facilitate the next generation of networks, while also driving deployment by freeing up spectrum and taking steps to make 5G deployment easier. We recommend that the USG:

- **Prioritize U.S. based manufacturing of equipment and software for 5G.** Aviat Networks supports increasing both the hardware and software used in the U.S. 5G deployment coming from U.S. based companies which not only provides needed economic advantages to U.S. companies but also ensures compliance with U.S. laws in the manufacturing process.
 - **Use targeted government/public funding to complement private sector investment and accelerate the rollout of 5G infrastructure.** Where public funding is available and utilizable, it should facilitate solutions by U.S. based companies that want to partner with the U.S. government to develop new chipsets and other hardware and software developments for 5G and beyond. Through public funding mechanisms—whether through investment tax credits or federal and state grant programs, Aviat Networks would like to partner with other U.S. manufacturers to provide leading-edge semiconductor innovations which are key components of the transition to 5G networks.
 - **Invest in workforce training.** In addition to the tower technicians and telecom crews servicing 5G infrastructure, 5G will also require more datacenter technicians, cloud systems administrators, cybersecurity experts and other workers with the skills to advance virtualization. Governments should prioritize funding training and retraining for workers to meet 5G-related workforce needs. Aviat Networks is prepared to do this training and retraining in conjunction with other U.S. partners to ensure that it meets the required skillset and policymakers should consider providing incentives to industry to support this training.
 - **Further streamline siting requirements.** Governments at all levels should consider siting reforms, including streamlining licensing requirements to speed up the deployment of 5G infrastructure. The FCC should continue to remove barriers to 5G siting, considering not only how to facilitate new small cell technology but also how to upgrade existing cell sites.
- 2) *How can the U.S. Government best foster and promote the research, development, testing, and evaluation of new technologies and architectures?*

It is important that the USG consider counterbalancing the immense financing and subsidization available to global competitors in the telecom industry. Funding for research and development is a hugely important factor in maintaining a consistent edge in network technology. Aviat Network's seventy plus years in the microwave radio space uniquely positions us partner with USG to lead the world with superior product development through our expertise.

To foster innovation in 5G technologies, Aviat Networks would like to explore public-private partnerships with the U.S. Government for cooperative agreements, and grant agreements to support ongoing research and development. Public-private partnerships are an important tool for the Government to facilitate not only the technical investment in 5G, but also the legal and policy framework to support and

govern the technology long-term. Historically, public-private partnerships have helped bring to fruition large-scale projects by combining private sector technology and innovation with public sector oversight and buy-in; both critical requirements for advancing a cohesive national 5G strategy.

Cooperative agreements and federal grants are two other mechanisms Aviat Networks would like to partner with USG to channel federal funding toward 5G research, development, and testing in as a streamlined manner. Legislatively, Congress should consider incentivizing 5G investments by expanding federal agencies' existing grant authorities and funds, while still ensuring federal government oversight of critical projects to maintain compliance with applicable legal requirements and providing a preference to U.S. based manufacturing vendors.

To this end, the U.S. government should also seek to support foundational semiconductor research, development, and manufacturing in the U.S. as part of its overall strategy to grow a strong 5G ecosystem. Continued advancements in semiconductor technology will be critical in driving advancements in 5G technology and should not be overlooked as the USG seeks to develop the National Strategy to Secure 5G Implementation Plan. Aviat Networks looks forward to working with USG on these advancements and is currently exploring partnerships with other U.S. based companies.

3) *What steps can the U.S. Government take to further motivate the domestic-based 5G commercial ecosystem to increase 5G research, development, and testing?*

Many federal agencies have existing legal and procurement authorities to support private sector research and development work for agencies' procurement and adoption of mission-critical technologies like 5G. By investing R&D funds through contracts or other instruments (e.g. Other Transaction Authority agreements), the Government can incentivize Aviat Networks further investment in 5G by providing seed funding for prototype projects, and help reduce barriers that agencies have to confront in purchasing private sector developed cutting edge solutions.

Successful R&D prototypes generally move on to the testing phase and the Government's security accreditation process. When the Government shares responsibility for ensuring compliance with security protocols and standards, we can move more quickly toward wide-spread Government adoption through subsequent procurements, which would further incentive Aviat Networks to participate in Government-sponsored R&D for emerging technologies like 5G.

4) *What areas of research and development should the U.S. Government prioritize to achieve and maintain U.S. leadership in 5G? How can the U.S. Government create an environment that encourages private sector investment in 5G technologies and beyond? If possible, identify specific goals that the U.S. Government should pursue as part of its research, development, and testing strategy.*

A crucial component for the success of 5G is wireless backhaul and microwave. The U.S. does not have a unified backhaul strategy which is greatly needed for the 5G Strategy Plan to be successful. Currently half of all cellular backhaul globally is done wirelessly rather than fiber optics. Wireless will be a key technology going forward as 5G is deployed at street level where fiber availability and deployment is too difficult or costly. As mentioned above, Aviat would welcome the opportunity to partner with the USG on this strategy and deployment.

As we reference in several areas throughout our comments, we support the continued prioritization by the U.S. Government of R&D in areas foundational to next generation wireless technologies, including increased funding for the highly technical USG labs such as those at the DoD, DoE, NIST, etc. into key foundational and applied research areas to bring USG R&D spending closer to par with the 5G investments made by foreign competitors, as well as other important telecommunications R&D efforts, such as in the area of broadband funding. In particular, we recommend that the USG elevate R&D related to virtualized architectures and software-defined networking, two areas where the United States

can leverage existing technological prowess of Aviat Networks in other contexts to increase competitiveness in 5G.

We also recommend that the USG prioritize and increase R&D spending for 5G use cases, including those related to the Internet of Things and Artificial Intelligence, as well as advanced semiconductors that will underpin such technologies. Investments in 5G infrastructure and next generation applications are absolutely imperative in fueling a cycle of investment and innovation. As more consumers and businesses harness 5G, application developers are incentivized to create innovative new offerings. From there, these new applications and use cases drive demand for 5G enabled devices and connections, thereby encouraging further investment in 5G infrastructure. Examples of R&D and pilot projects that could harness 5G built on open and interoperable infrastructure include innovations in energy monitoring on the power grid, smart network monitoring in commercial facilities that require a high degree of government regulation and security. Aviat Networks is established in these areas and could further assist the USG in these pilot projects. The USG should also provide funding for cloud testbeds developed in partnership with U.S. operators to create opportunities for stakeholders to create, test, and deploy new use cases for 5G. It is also helpful for the USG to consider allocating funding for 6G advanced research.

Line of Effort 2: Assess Risks to and Identify Core Security Principles of 5G Infrastructure

1) *What factors should the U.S. Government consider in the development of core security principles for 5G infrastructure?*

Aviat Networks is currently evaluating the threat landscape in our supply chain, including the supply chain ecosystem, to identify which risks can be mitigated and which ones cannot. We can provide recommendations for policymakers to consider in developing measures to address challenges related to 5G security from a supply chain perspective through our years of experience manufacturing here in the U.S. and other parts of the world.

We have policies which promote the procurement of equipment from trusted suppliers that adhere to international standards, consider geopolitical implications of manufacturing locations, and encourage diverse supply chains to help reduce risk so that we can better partner with our customers and the USG.

- **Policymakers should continue to focus on threats to the 5G ecosystem associated with specific supply chain actors and equipment and foreign governments subsidies or providing their products.** We encourage governments and industry partners to continue to focus on supply chain risk management as one of the most important 5G risk factors. In furtherance of this, Aviat Networks is also exploring ways to manage the full range of security risks to mobile network infrastructures, applications, and services, including devices and data. As the U.S. Department of Homeland Security recommended in its Overview of Risks Introduced by 5G Adoption in the United States, “the U.S. Government and industry partners can develop security capabilities that protect not only the 5G infrastructure, but also the applications and services that utilize it. The U.S. Government can do this by incorporating a prevention-focused approach that focuses on visibility and security across the mobile network.”¹
- **Government and industry must share responsibilities and collaborate.** Government and industry share the goals of mitigating cybersecurity threats to mobile and 5G network infrastructure, preventing cyberattacks, and reducing the impact of related cybercrime. As in all areas of cybersecurity, achieving these goals is a collective effort. Aviat Networks would like to explore a public-private partnership with USG to ensure that we arrive at the desired policy outcome of more secure 5G networks.

¹ https://www.cisa.gov/sites/default/files/publications/19_0731_cisa_5th-generation-mobile-networks-overview_0.pdf

- 2) *What factors should the U.S. Government consider when evaluating the trustworthiness or potential security gaps in U.S. 5G infrastructure, including the 5G infrastructure supply chain? What are the gaps?*

As an overarching matter, Aviat Networks would like to emphasize our support for viewing issues of 5G equipment or infrastructure security through the lens of “trustworthiness,” which includes scrutiny of country-of-origin and development funds provided by government entities hostile to the U.S.’s open, democratic communications network. It is appropriate to consider the country of origin of a supplier especially where government funding and support encourages censorship and monitoring of its citizens and business communications.

Additionally, we support the Prague Proposals² and we recommend that the USG continue to leverage them as a starting point in understanding relevant risk assessment criteria. Utilizing the Prague Proposals as a foundation for policymaking can further promote procurement of equipment from trustworthy suppliers such as Aviat Networks.

Another important point to make is that security is not static, as such Aviat Networks is committed to 5G infrastructure risk management that will be a continuous process of assessing changing threats and adapting new technologies.

- 3) *What constitutes a useful and verifiable security control regime? What role should security requirements play, and what mechanisms can be used to ensure these security requirements are adopted?*

We generally advocate for voluntary, flexible frameworks when it comes to security requirements, especially because security is not static and any regime needs to be adaptable. It is our view that a useful and verifiable security control regime should be flexible, and able to adapt to different risks as they emerge. We suggest that any mechanism considered should provide preference to U.S. manufacturers who opening comply with such security controls.

- 4) *Are there stakeholder-driven approaches that the U.S. Government should consider to promote adoption of policies, requirements, guidelines, and procurement strategies necessary to establish secure, effective, and reliable 5G infrastructure?*

It is worth highlighting the importance of continuing to support industry-led standards development organizations, which are developing many of the technical specifications, including those related to security, that will support 5G networks. See our response in 4.2 for additional recommendations as to how to support private sector participation.

- 5) *Is there a need for incentives to address security gaps in 5G infrastructure? If so, what types of incentives should the U.S. Government consider in addressing these gaps? Are there incentive models that have proven successful that could be applied to 5G infrastructure security?*

The U.S. government should explore incentives such as procurement requirements for U.S. based manufacturing, via Qualified Bidder/Manufacturer Lists, for vendors who follow best practices and are based in the U.S. One enormous gap in the FirstNet rollout was the exclusion of a requirement for U.S. based manufacturing. AT&T is now using microwave radios manufactured outside of the U.S. to build out the First Responders Network further jeopardizing the security of that hugely important infrastructure.

² <https://www.vlada.cz/en/media-centrum/aktualne/prague-5g-security-conference-announced-series-of-recommendations-the-prague-proposals-173422/>

Line of Effort 3: Address Risks to U.S. Economic and National Security during Development and Deployment of 5G Infrastructure Worldwide

Economic and national security are very closely linked. As a member of the Information Technology Industry Council (ITI), Aviat Networks fully supports ITI's National Security Principles³, which highlights that it has never been more important for the U.S. government and industry to work together to harness U.S. technological leadership to strengthen national security.

1) What opportunities does the deployment of 5G networks worldwide create for U.S. companies?

The deployment of 5G globally presents enormous opportunity for U.S. companies, particularly as 5G technology is expected to enable \$13.2 trillion in economic output by 2035.⁴ 5G use cases are expected to generate tremendous economic growth – the increased speed, capacity, and functionality of 5G networks will help to enable the next generation of data-enabled innovations such as the internet of things (IoT) and artificial intelligence (AI).

As countries around the world deploy 5G, U.S. companies can seize upon these new networks to implement use cases that were previously unachievable. Aviat Networks is uniquely positioned to support U.S. based 5G initiatives as well as global initiatives through our separate manufacturing facility in Thailand.

2) How can the U.S. Government best address the economic and national security risks presented by the use of 5G worldwide?

As a foundational matter, strong national security requires maintaining technological leadership in a variety of areas. Our recommendations in response to Line of Effort 1 address some ways in which the United States Government can help to support U.S. technological leadership but Aviat Networks stands ready to develop and manufacture 5G microwave and millimeter wave radios as well as management and control software with encryption and security standards set in partnership with USG. Aviat is also ready to deliver state of the art in-line interference detection mechanisms which would significantly remove interference, and where possible eliminate it, which would add a layer of protection to incumbent and new radio systems, thus preventing risk to public safety – especially in bands previously exclusive to military, national security and safety services.

The USG should also ensure that U.S. based companies and manufacturers are giving priority in any funding or legislation passed so that we ensure U.S. technology is used in any subsequent implementation which ensures mitigation of both economic and security risks.

3) How should the U.S. Government best promote 5G vendor diversity and foster market competition?

We appreciate the interest that the USG has taken in examining the role that open radio access networks can play in promoting vendor diversity and fostering market competition. We believe the USG, should support open and interoperable solutions for 5G networks, which will allow for interoperability, supplier diversity, competitiveness, and innovation on a massive scale but should also focus on U.S. manufactured products in order to address the economic and security concerns as mentioned above.

³ https://www.iti.org/policy/ITI_NationalSecurity_Policy_June2020.pdf

⁴ <https://www.qualcomm.com/media/documents/files/ihs-5g-economic-impact-study-2019.pdf>

- 4) *What incentives and other policy options may best close or narrow any security gaps and ensure the economic viability of the United States domestic industrial base, including research and development in critical technologies and workforce development in 5G and beyond?*

Please refer to our responses to questions posed under Lines of Effort 1 and 2, which we believe sufficiently address the question asked here.

Line of Effort 4: Promote Responsible Global Development and Deployment of 5G

- 1) *How can the U.S. Government best lead the responsible international development and deployment of 5G technology and promote the availability of secure and reliable equipment and services in the market?*

We appreciate the efforts the USG has undertaken to promote responsible international development and deployment of 5G technology thus far. We have several specific recommendations to offer when considering how to continue with these efforts, including:

- **Create the Multilateral Telecommunications Security Fund as proposed in Sec. 501 of the Intelligence Authorization Act for FY 2021.** In addition to setting up other helpful funding mechanisms noted elsewhere in our response, the language set forth in the Act would create a Multilateral Telecommunications Security Fund. We are supportive of this fund, as it would provide additional direct support to the United States in its engagements with foreign partners.
- **Carve out a national security exception for telecommunications networks in Development Finance Corporation (DFC) funding.** While 5G is rightfully a top priority for the DFC, there are currently constraints on where it can operate. The European Energy Security and Diversification Act of 2019 (P.L. 116-94, Div. P, Title XX) eases DFC's less-developed country requirement for energy infrastructure projects in Europe and Eurasia. This authority for energy projects, which provides commercial opportunities in upper-middle-income countries that may have both strategic and development benefits, should be extended globally for deployment of secure and trusted telecommunications infrastructure.
- **Reconsider the content rules that currently govern Export Import Bank transactions as they are not necessarily applicable to the tech sector.** Indeed, current U.S. content requirements hinder the ability of Ex-Im to support the deployment of trusted network equipment overseas. Especially in the tech sector, IP and R&D may be U.S.-based, even if the *product* is manufactured elsewhere. This important aspect is not considered in the current iteration of U.S. content requirements that dictate whether Ex-Im can support an overseas deal, therefore making it significantly more difficult for Ex-Im to support deals related to 5G technology.
- **Continue advocacy through bilateral and multilateral dialogues, including the Digital Connectivity and Cybersecurity Partnership Program and Prague Conference.** We encourage the USG to continue consistent engagement on this issue through bilateral and multilateral dialogues, engaging with other countries wherever possible. That said, we encourage the USG to consider how to creatively advocate for secure equipment and services, especially in countries where cost is a significant driver in decision-making. Often, entities with the backing of their government can undercut U.S. companies on pricing. Different arguments may be more effective in different places. In any engagement with foreign countries, we encourage USG to work closely with industry representatives such as Aviat Networks, who can oftentimes present unique and persuasive perspectives on issue areas related to 5G deployment.
- **Continue and expand funding for 5G- and cybersecurity-related business development trade missions, reverse trade missions, and other events led by the U.S. Trade and Development Agency (USTDA), U.S. Agency for International Development (USAID), and U.S. Department of Commerce.** These agencies regularly organize opportunities for U.S.

companies to identify business opportunities and potential customers in foreign markets for U.S. technologies. The breadth of missions and events focused on 5G/mobile security/ cybersecurity has increased in recent years, largely due to growing demand. Although many in-person missions/events have been put on hold due to the Covid-19 situation, they should be resumed as soon as practicable, and they should be expanded in terms of regularity and countries. During the current crisis, these agencies should determine ways to hold these missions/events virtually.

2) *How can the U.S. Government best encourage and support U.S. private sector participation in standards development for 5G technologies?*

Standards are an incredibly important driver and enabler of 5G technology. We appreciate that the USG recognizes this and is considering how to encourage and support U.S. private sector participation in standards development, consistent with long standing U.S. government policy and the law. Below are specific recommendations that the USG can undertake to best incentivize and support U.S. industry participation:

- **Support industry-led bodies with transparent, well-understood rules-based processes in place.** Companies that seek to compete in 5G technologies must participate in international standards development processes. The U.S. government should continue to support participation in industry-led bodies with transparent, rules-based processes in place. The U.S. government should also encourage other nations to rely on and reference international standards in relevant policies and regulations.
- **Make the United States a more attractive meeting location for standards development organizations to host meetings.** Attending standards meetings typically requires a significant amount of travel and time commitment, making the U.S. a more appealing meeting locale for those based in the U.S. The U.S. government can encourage this by facilitating visa applications for foreign standards experts to routinely attend meetings in the United States. The inability to get U.S. visas on time has often proved an impediment to hosting meetings in the United States.
- **Reexamine NISTIR 8074: Interagency Report on Strategic U.S. Government Engagement in International Standardization to Achieve U.S. Objectives to Cybersecurity⁵ and see whether and how the recommendations included in that report are applicable to 5G.** NIST published a comprehensive report in 2015, which set out proposed USG strategic objectives for pursuing and developing international standards related to cybersecurity and provides a series of recommendations for doing so. We believe that the strategic objectives set out in this document are similarly applicable to 5G standards. It would be helpful for the USG to reference this document and consider which recommendations may be applicable to help achieve these strategic objectives in the context of 5G.
- Further, while we understand the desire to send diplomats and other US government staff to track standards activities, technical subject matter expertise is critical to fulsome engagement into standards meetings, which are highly technical meritocracies. At the same time, there often is a gap between policy generalists and technical experts, so creating regular opportunities for the Aviat Networks to engage with USG staffers is important to developing a strategic approach to these issues.

3) *What tools or approaches could be used to mitigate risk from other countries' 5G infrastructure? How should the U.S. Government measure success in this activity?*

We understand and acknowledge that the USG is appropriately focused on national security risks related to the global 5G networking buildout, and Aviat Networks with manufacturing in Austin, Texas at our corporate headquarters as well as in Thailand, is uniquely suited to assist not only the U.S. in mitigating risk but also in other countries. Partnering with a global company with U.S. headquarters and

⁵ <https://nvlpubs.nist.gov/nistpubs/ir/2015/NIST.IR.8074v1.pdf>

manufacturing would assist other governments outside the U.S. to see the value of also partnering with Aviat Networks.

- 4) *Are there market or other incentives the U.S. Government should promote or foster to encourage international cooperation around secure and trusted 5G infrastructure deployment?*

The United States should endeavor to increase its competitiveness as a global investment destination. In addition to providing incentives through investment tax credits and grant programs related to the 5G technology ecosystem to U.S. based companies and manufacturers, the United States should continue efforts to strengthen trade and investment relationships with allies, partners, and economies around the world. Such efforts would be well-received and will complement efforts to strengthen international cooperation around secure and trusted 5G deployment.

- 5) *Both the Department of Commerce and the Federal Communications Commission (FCC) have rulemakings underway to address the security of the telecommunications infrastructure supply chain. Are there other models that identify and manage risks that might be valuable to consider?*

We reiterate once again that any approach taken to secure the supply chain should require U.S. based manufacturing requirements.

- 6) What other actions should the U.S. Government take to fulfill the policy goals outlined in the Act and the Strategy?

We cannot overemphasize the importance of a coordinated, whole-of-government approach to supporting the deployment of 5G in the United States and globally. In the United States, too often there are a host of agencies working on different initiatives, sometimes duplicating efforts. We appreciated the USG's efforts to appoint a "5G Czar" in charge of coordinating all ongoing efforts related to 5G. However, with his recent transition to a new role, we would encourage the Administration to consider appointing a new office (or person) to lead 5G-related efforts who Aviat Networks would be glad to work with and provide further details.

Once again, Aviat Networks appreciates the opportunity to submit comments and offer our support in the enormous opportunity to lead in secure 5G deployment both at home and abroad. We hope that our comments will be helpful in guiding the White House as it seeks to develop an Implementation Plan for the National Strategy to Secure 5G in partnership with U.S. manufacturing businesses.