Open RAN
POLICY COALITION

February 4, 2022

Submitted via Regulations.gov

The Honorable Alan B. Davidson
Assistant Secretary of Commerce for Communications and Information
National Telecommunications and Information Administration
U.S. Department of Commerce
1401 Constitution Avenue NW
Washington, DC 20230

>   Re: **Comments of the Open RAN Policy Coalition on *Infrastructure Investment
>   and Jobs Act Implementation*, Docket No. 220105-0002, RIN 0660-ZA33**

Dear Administrator Davidson,

The Open RAN Policy Coalition ("ORPC" or "Coalition")[1] appreciates the opportunity to provide initial input to the National Telecommunications and Information Administration ("NTIA") regarding its Request for Comment on the *Infrastructure Investment and Jobs Act Implementation*.[2] NTIA stands at the forefront of a once-in-a-generation nationwide investment aimed at connecting all Americans to reliable, affordable high-speed broadband. The Coalition shares this goal, and its members look forward to collaborating with NTIA to achieve it.

Expanding access to broadband and fostering innovation lie at the heart of the ORPC's core mission. The Coalition was formed to support policies and initiatives that will advance the adoption of open and interoperable solutions in the wireless radio access network ("RAN") to promote innovation, spur competition, and expand the supply chain for advanced wireless communications technologies. Coalition members represent a cross-section of the wireless communications industry, ranging from network operators to network solutions providers, systems integrators, cloud providers, edge device manufacturers, and others. Our members believe that by standardizing network interfaces, the communications sector can invite more competition and optionality into the broadband marketplace, leverage these options to expand access to broadband, and provide a foundation for rapid innovation going forward.

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[1] *See* https://www.openranpolicy.org/. As of this filing, the Coalition includes 57 members, including: Airspan, Altiostar, Amdocs, American Tower, Analog Devices Inc., Arm, AT&T, AWS, Bharti Airtel, Broadcom, Ciena, Cisco, Cohere Technologies, DeepSig, Dell Technologies, Dense Air, Deutsche Telekom, DISH Network, Fujitsu, Google, Hewlett Packard Enterprise, IBM, Inseego, Intel, Juniper Networks, Ligado Networks, Marvell, Mavenir, Meta, Microsoft, NEC Corporation, NewEdge Signal Solutions, Nokia, NTT, Nvidia, Oracle, Pivotal Commware, Qualcomm, Quanta Cloud Technology, Radisys, Rakuten Mobile, Red Hat, Reliance Jio, Robin, Samsung Electronics America, STL Tech, Telefónica, Texas Instruments, U.S. Cellular, US Ignite, Verizon, VMware, Vodafone, World Wide Technology, XCOM-Labs, and Xilinx.

[2] NTIA, *Infrastructure Investment and Jobs Act Implementation*, Request for Comment, Docket No. 220105–0002, RIN 0660–ZA33 (Jan. 10, 2022) ("RFC").

With this aim in mind, the Coalition urges NTIA to consider the following points as it begins to shape these broadband funding programs:

- First, IIJA investments should fund deployments of wired and wireless broadband networks.

- Second, open and virtual RAN can provide efficiencies that expand broadband access.

- Third, open and virtual RAN will enable publicly funded broadband networks to sustain and scale over time.

- Fourth, NTIA should pursue a limited "Build America, Buy America" waiver for "broadband equipment" to provide market certainty.

Below we provide additional discussion of all four points.

IIJA Investments Should Fund Deployments of Wired and Wireless Broadband Networks. To achieve connectivity for all Americans, NTIA must leverage every tool at its disposal to find efficient, reliable, and sustainable solutions that will maximize the impact of these investments. In addition to funding basic fiber infrastructure, states, territories, and tribes should explore wireless options to build robust networks that best suit the individual needs of a particular use case. In many cases, wireless networks with the requisite speed will be the best solution to extend broadband service to the hardest to reach communities.[3] Wireless networks can also provide efficiencies by serving multiple functions. For example, the same cell tower can support both mobile and home broadband.

Open and Virtualized RAN Can Provide Efficiencies That Expand Broadband Access. The communications sector is working to advance two complementary evolutions in the RAN – open RAN and virtualized RAN – which together are enabling massive efficiencies and more rapid network innovation.

- *Open RAN* refers to a disaggregated approach to deploying mobile networks by using open and interoperable protocols and interfaces between the different parts of the RAN, which allows for increased flexibility over traditional RAN systems – in other words, splitting the baseband functionality from the radio functionality with an open and interoperable interface between the two parts. This "functional split" allows for

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[3] *See* Accenture Report, *5G Fixed Wireless Broadband: Helping close the digital divide in rural America* (Nov. 2021), https://api.ctia.org/wp-content/uploads/2021/11/CTIA-Rural-HHs-mini-POV-V2-20211115.pdf ("[Fixed Wireless Broadband] networks in the U.S. can be expected to deliver at least 100 Mbps download speeds to individual subscribers (potentially up to 1000 Mbps, depending on specific markets and each customer's location)").

modularity among RAN components so that network owners and operators can incorporate components of the radio base station from a variety of vendors, with the potential to change and evolve pieces of the network more nimbly over time.

- *Virtualized RAN ("vRAN")* refers to solutions that disaggregate software from the hardware components of the RAN so that baseband units can be deployed on a consistent cloud platform. This "cloudification" enables network owners and operators to automate deployment at scale and optimize the location of workloads. By moving "compute" power and functions from the cell tower to distributed hubs, operators can lower the cost of geographically distant or rural deployments, enhance network management, leverage automation to improve spectral efficiency, increase the availability of services and applications, and more.

Together, these innovations in network architecture and management enable efficiencies that can empower providers to extend the impact of their network investments. For example, Open RAN architectures often leverage software-based networks and virtualization to allow for more functionality and increased use cases. A software-based network moves network functions to the software that exists on general purpose servers found in every cloud data center as opposed to traditional environments wherein network operators have deployed purpose-built physical equipment to support network functions. This type of programmable and interoperable RAN infrastructure lowers costs and simplifies the roll-out of new features and functions at distributed RAN locations at the network's edge, reducing the need for physical equipment replacement.

As another example, the O-RAN Alliance standards also define the RAN Intelligent Controller ("RIC"), which helps commercial operators balance the RAN load and enable new features such as dynamic spectrum sharing among multiple radio access towers to alleviate network congestion and manage network resources more efficiently. The RIC also enables operators to leverage analytics from their network traffic and develop data-driven approaches including advanced ML/AI tools to improve resource management capabilities. These innovations enable Open RAN to drive down costs and expand network coverage in rural and cost-sensitive communities in two ways: (1) increased modularity and virtualization invites more competition into the market and can reduce costs for purchasing and operating RAN equipment; and (2) moving computing functionality away from the cell tower to concentrate DU/CU functionality and network management in the cloud at distributed hubs can lower the cost of that hardware at the edge, allowing network owners to buy and deploy more to expand network coverage.[4]

Open and Virtual RAN Will Enable Publicly Funded Broadband Networks to Sustain and Scale Over Time. As we move toward a world powered by 5G and future generation technology, standards-based modular networks that leverage software upgradability

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[4] *See* ORPC Comments on FCC Open RAN NOI at 24, (Apr. 28, 2021), https://www.openranpolicy.org/wp-content/uploads/2021/04/ORPC-FCC-NOI-Comment-Final-4-28-21-c3.pdf.

will be more adaptable than their predecessors and will foster more diverse and innovative ecosystems going forward. Open RAN can facilitate competition, innovation, and vendor diversity in three essential ways: (1) increased modularity in the network architecture enables more participation across a varied set of vendors, (2) this modularity prevents vendor "lock-in" by enabling carriers to upgrade their networks more rapidly as innovative features become available for components over time, and (3) the ability to upgrade more quickly – especially when paired with the speed and agility of virtualization – can engender a virtuous cycle for innovation and adoption wherein architecture can be tailored more nimbly to function and network management can more effectively navigate evolving architectures.[5]

Furthermore, open and interoperable RAN can complement parallel advances in 5G and network management to enhance network security and meet risk management needs going forward.[6] 5G networks will have improved security and subscriber privacy compared to previous generation networks, and as compute functionality shifts to distributed hubs, operators are implementing new and embedded security functionalities to ensure a highly secure mobile network. Open RAN can build upon these 5G-enabled security enhancements by allowing the operator to fully control the security of the network, ultimately improving its overall operational security. Open and virtual network architectures can also provide greater visibility across the network, allowing operators to respond to security events more rapidly and effectively. Open RAN also allows operators to build upon the capabilities enabled by 5G to shift the security capabilities closer to the edge of the network and stop attacks closer to the source. Open RAN can speed the complete automation of network management, which enables zero-touch management and eliminates security risks inherent in human access to network functions.

As noted, moving software and computing functions away from the cell tower to aggregate functionality at distributed locations facilitates network management at scale. This scale can help expand networks to reach more customers in remote rural areas or to densify parts of the network in high demand to provide better customer experience in heavily populated urban environments. A network's ability to operate effectively at scale will only become more important with ever-increasing connectivity demands and more functions relying on network infrastructure.

NTIA Should Pursue a Limited "Build America, Buy America" Waiver for "Broadband Equipment" to Provide Market Certainty. Expeditious deployment of broadband as envisioned in the IIJA could be severely and significantly impacted if the "Build America, Buy America" requirements in the law are applied to the broadband deployment programs to be administered by NTIA. While "broadband equipment" is largely developed and designed in the U.S., it is not manufactured in America by and large. The law requires 55% domestic content based on the bill of materials of the broadband products used in deployment. The scope of "domestic content" does not take into account the cost of research and development

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[5] *See id.* at 19-21.
[6] ORPC, *Open RAN Security in 5G*, (Apr. 29, 2021), https://www.openranpolicy.org/resources/.

done in the United States, nor does it include the value of intellectual property or software originating in the U.S. Because of these variables, it will not be possible for NTIA, eligible entities, and subgrantees to procure the broadband equipment they need to build the networks envisioned in the IIJA on the timelines that the law requires while meeting the 55% domestic content threshold.

Accordingly, the Open RAN Policy Coalition strongly recommends that NTIA apply for a limited waiver for "broadband equipment," per se, and that the "Made in America" Office in the Office of Management and Budget approve such a waiver as soon as possible to provide market certainty. There is precedent to do so from a very similar prior circumstance: NTIA issued a limited waiver to allow deployment of nondomestic "broadband equipment" in connection with the American Recovery and Reinvestment Act of 2009 (ARRA) funding.

Conclusion

Ultimately, communities across America will be served by investments in open and virtual network architectures that have the capacity to meet contemporary connectivity needs and the ability to evolve as those needs grow. NTIA should ensure that the IIJA programs enable states, territories, and tribes to benefit from these technologies as they work with providers to understand what solutions will most effectively serve their populations. ORPC and its members look forward to ongoing work with NTIA to achieve this outcome.

/s/ *Diane Rinaldo*

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