Testimony of John Mezzalingua
House Energy & Commerce Committee
Subcommittee on Communications & Technology

Leading the Wireless Future: Securing American Network Technology

April 21st, 2021

Introduction

Chairman Doyle, Ranking Member Latta, Chairman Pallone, Ranking Member McMorris Rodgers, and other distinguished members of the subcommittee, thank you for holding this hearing on this particularly important topic.

My name is John Mezzalingua, and I am the CEO of JMA Wireless. I am honored to be here today.

JMA is grateful for everything the Congress and the Administration have done and are continuing to do to promote the adoption of 5G and the transition to an OpenRAN (O-RAN) ecosystem.

With O-RAN, the stars have aligned with the technology and the market to unleash a new communications revolution. As I explain below, this revolution will be a product of the innovation stimulated by networks transitioning to O-RAN.

We believe our industry and country are at an inflection point. As the world transitions to 5G and O-RAN, we have an opportunity to bring U.S. leadership back to a communications industry that we originally created and led. Wireless network solutions designed and manufactured by American companies here in the U.S. will help secure our supply chain, promote high-speed broadband access for all Americans, and transform how businesses operate—all while creating countless American jobs.

We are still in the early stages of this transformation, and we believe the government has a positive role to play in making it a reality. The promotion of home-grown technology and a competitive marketplace can contribute substantially to this communications revolution and restore leadership to the U.S. Americans have so much to gain from policies that support this nascent and highly strategic domestic industry.

Company Overview

JMA Wireless is an American wireless technology company based in Syracuse, New York. While we currently manufacture antennas and other hardware deployed on virtually every cell tower in the country, our relatively new software-based network solutions have a revolutionary impact in the transition to 5G for carriers, businesses, and government customers,

including municipalities and the DoD, among others. This O-RAN-compliant technology is disrupting the marketplace and can play a major role in the restoration of U.S. wireless leadership.

We currently support approximately 1,000 jobs, primarily in the U.S., in R&D, manufacturing, and sales. We currently operate facilities in Syracuse, Dallas, Austin, Chicago, Boulder, and Richmond, VA. We also have R&D, manufacturing, and sales staff in Europe.

JMA is a growing enterprise. Notably, we are building a 5G campus in downtown Syracuse that will open this fall and support 200 new jobs. In this state-of-the-art facility, JMA will design and manufacture some of its most important technology, including O-RAN compliant 5G Radio Access Network (RAN) products, 5G millimeter wave products, and private wireless technology. The campus will also house a network operations center. Our fully-automated "smart" 5G factory will be powered by JMA 5G O-RAN technology, featuring real-world 5G use cases on display, promoting future competitiveness and the promise of U.S. manufacturing.

JMA is a member of the Open RAN Policy Coalition. We are very supportive of the organization's policy initiatives and are privileged to be sitting here alongside Ms. Rinaldo and some of the other distinguished members of the group.

Importance of O-RAN

O-RAN will unleash innovation because it allows more companies to compete for the same business. Currently, carriers are limited to two, possibly three, companies to supply the significant pieces of any given network. Through industry consolidation, there are now five companies worldwide who can supply all the integrated pieces, two of which are Chinese.

This system has led to the problem of customer "lock-in." Once an equipment manufacturer starts supplying equipment for a nationwide network, barriers to entry rise and the cost of adding or switching equipment providers becomes too great. In addition, closed networks have historically been needed to optimize functionality and performance. Thus, for many years, there has been very little competition in the telecommunications equipment industry. This lack of competition limits the incentive for innovation.

O-RAN turns this paradigm on its head. The core concept of O-RAN is that a network operator should be able to mix and match various components from a variety of different vendors, without compromising performance. The O-RAN standard requires these various pieces to be compatible with each other, enabling the use of multiple manufacturers' equipment within a single network. So, instead of three equipment suppliers, there will be a multitude. With many companies specializing in their area of expertise and competing in the marketplace, costs will be lower and innovation will be greater.

One of the technology advancements making O-RAN a possibility is the transition from hardware-based networks to software-based ones. This concept is oftentimes referred to as "virtualization." This simply means that many of the functions of a network, such as switching and load management, that are typically handled by large pieces of expensive custom hardware can now be performed by software. Thus, rather than having to replace rooms full of equipment every time you need to upgrade a network, virtualization allows you to make the same improvements by simply updating the software in the Virtual Radio Access Network (vRAN).

For example, in multi-operator, indoor conditions, deploying JMA's vRAN product reduces space and power requirements by as much as 90% versus traditional indoor architectures.

Virtualization offers enormous benefits. The most obvious is the cost savings gained through the elimination of endless hardware cycles, but virtualized networks also take up much less space and use less power. Moreover, vRAN allows a network operator to incrementally upgrade its network rather than having to wait for a massive overhaul, which will improve speeds and network security, and adds new functionality more quickly.

In a software environment with common architecture and non-proprietary interfaces, the barriers to entry are much lower than for traditional custom-built telecommunications equipment manufacturing. Thus, the combination of the adoption of O-RAN based architecture with the transition to virtualization is the path that accelerates the U.S. back to telecommunications leadership.

JMA is Already Making an Impact

While the world is just beginning to transition to O-RAN and virtualization, JMA began pursuing this path in 2015 and is already making an impact using these concepts. O-RAN enabled networks powered by vRANs and spectrum that has been recently made available by the U.S. government have unleashed a number of new opportunities for broadband connectivity. Below are three examples of projects JMA is currently operating. Each exemplifies different contributions O-RAN can make to critical American priorities including:

1) Bridging the digital divide;

2) Competing with low-cost foreign competitors through innovation; and

3) Creating highly secure "local 5G networks" for campuses and large facilities.

The projects below are particularly exciting because they are highly replicable, not only here in the U.S. but around the world.

Bridging the Digital Divide

In Tucson, Arizona, JMA is deploying a wireless network for the city of Tucson that will provide reliable and free high-speed broadband coverage to over 5,000 underserved households, including an estimated 10,000 school age children.

The Tucson area is currently considered one of the most deprived areas in the country for high-speed broadband coverage. Through a bold initiative, the City of Tucson is using CARES Act funding to create a local high-speed network that will literally transition Tucson to a world class connected city. The project uses recently released CBRS spectrum. Households showing need will receive a device that will convert the CBRS signal to a Wi-Fi signal giving the entire house access to high-speed broadband. Local businesses will also have access to the network. We have anecdotally heard that at least one substantially sized business has agreed to move its headquarters into the coverage area because it will now have access to reliable high-speed Internet.

And Tucson is just the beginning. JMA is also engaged in pursuit of similar opportunities with other cities, many of which are being at least partially funded through money appropriated in the CARES Act and the American Rescue Plan.

Competing Through Innovation

In Europe, JMA's American software-based solutions have been deployed in a number of locations, including city-centers and sports venues, swapping out or displacing incumbents, including China-based vendors. The shift from proprietary hardware to JMA's open software solution shows how being more innovative provides a tremendous opportunity to compete.

Local 5G Networks

JMA was selected by the Department of Defense's (DoD) creation of secure 5G networks on its bases. In October 2020, it announced awards for 5G experimentation and testing at five U.S. military sites, representing the largest full-scale 5G tests for military applications. JMA is the only U.S. RAN vendor selected to participate, thanks in part to our unique design of the 5G millimeter wave products – our software centric design replaces the need for custom chipsets, which allows us flexibility on product features, faster time to market, and free of dependency on third-party technology.

JMA, Amazon Web Services, Cisco, and Federated Wireless are the all-U.S. team providing an advanced private 5G wireless network at the Marine Corps Logistics Command warehouse in Albany, Georgia. This new "private" or "local 5G" wireless network will support a broad set of smart warehouse use cases, including warehouse robotics, barcode scanning, and virtual reality applications. Most importantly, the network will allow massive amounts of data to be wirelessly transferred throughout the base with the utmost security.

JMA's virtual RAN solution, XRAN, will give the base's network an unprecedented level of flexibility. Instead of expensive hardware replacements every three to five years to keep up with technological advancements, XRAN will allow the network to quickly and continually evolve through simple software updates—all while matching the performance of the best custom hardware.

These are just three real-life examples highlighting how a migration to O-RAN and vRAN will change how we communicate and transfer data.

Policy Considerations Moving Forward

As I mentioned above, our country is at a critical juncture. The adoption of 5G provides us with an opportunity to bring affordable and secure high-speed broadband to the entire country, especially those parts that are lacking adequate service today. Just as importantly, it creates an opportunity to reestablish the United States as a leader in wireless innovation and in the design and manufacturing of advanced telecommunications equipment. Much of this will be done by American companies like JMA and others through groundbreaking innovation.

While we are making progress today, we also believe the U.S. government will play an important role. We believe there are a few key policies the government can enact to enable this:

- Funding the USA Telecom Act – The USA Telecom Act is a bold piece of legislation, and we commend Chairman Pallone, Rep. Guthrie, Rep. Matsui, Sen. Warner, Sen. Rubio, and many others in Congress for introducing and pushing it forward. Enacting the underlying framework in the 2021 National Defense Authorization Act was a great first step, but fully funding the grants program in the Act is necessary. We encourage Congress to fund the program as soon as possible.

- The grants program will provide O-RAN companies like JMA a financial boost to develop and manufacture leading-edge products that will be used in 5G networks (and beyond) throughout the world. At the end of my testimony is a paper authored by JMA and other companies in the O-RAN Policy Coalition that provides examples of the types of projects that could be funded by the grants in the USA Telecom Act.

- Additional Funding for Broadband Expansion – As highlighted above, because of funding recently appropriated by Congress, JMA and other companies are already helping to expand high-speed broadband throughout the country, but there is much more to do. The adoption of O-RAN means that broadband expansion can happen much faster and more cost-efficiently today than at any other time in history. However, it still does require some public investment. We encourage Congress to continue finding ways to fund investment in these network expansions.

- Focus on U.S. Manufacturing – JMA is very proud of its American roots and looks forward to continuing its growth as an American innovator and manufacturer. At the same time, we are competing in this country and around the world with foreign competitors who have been the beneficiaries of a variety of industrial policies from their home governments that have given them an advantage over homegrown U.S. companies. Thus, we believe our government should continue to enact policies that promote American companies while staying true to our international obligations of fair play. Such policies could include ensuring that projects funded by American taxpayers are awarded to domestic manufacturers.

- Additional Spectrum – While 5G and O-RAN hold tremendous promise, they can only become a reality if there is enough spectrum available to enable our networks to thrive. Spectrum policy is incredibly complicated. We encourage the Administration and Congress to coordinate their efforts to ensure the maximum spectrum possible is made available.

Conclusion

Thank you for your time. I welcome your questions and a robust conversation, today, and going forward.

Open RAN for America

Helping the U.S. lead in 5G and beyond

Some Select Examples of Use Cases for Future Open RAN NTIA Grants

Today, American companies supply few of the infrastructure components for U.S. (and worldwide) 4G and 5G mobile networks. With the jump to 5G coinciding with a wireless network technology migration to Open Radio Access Networks ("Open RAN"), there is an opportunity for both the United States and countries across the globe to expand their wireless supply chains to include products and systems from innovative American companies – propelling the U.S. economy and advancing U.S. leadership for 5G and beyond.

In order to accomplish these objectives, the currently-nascent U.S. domestic Open RAN industry needs a financial resources shot in the arm. That is why Congress authorized an NTIA-administered "Public Wireless Supply Chain Innovation Fund" in its FY2021 NDAA, but Congress now needs to appropriate funding for that authorization to best unleash American innovation on the global 5G telecom supply chain market.

Below are *just a few* examples of how some of the American companies innovating in this industry (such as the ones named in the header above) could utilize grants from the NTIA and potentially create thousands of new U.S.-based jobs… *once* the Public Wireless Supply Chain Innovation Fund has money appropriated to it, that is.

Supercharge U.S. Telecommunication Manufacturing

American vendors are challenged to compete with subsidized Chinese vendors and other foreign competitors already dominating the market and at scale. Open RAN unbundles and expands the supply chain to allow multiple vendors to coexist and compete, allowing mobile network operators to be less reliant on any single, foreign-owned vendor for their entire network architectures. Supporting Open RAN deployment also allows the U.S. government to improve its national security posture by reshoring critical network components from China to the U.S.

Potential projects include:

- Building a U.S.-based manufacturing facility to produce open and interoperable network components (e.g. RF components, filters, Remote Radio Units, and antenna design) to supply the worldwide Open RAN ecosystem and help lower mobile network operator costs. Estimated funding could be ~$100 million.

- Upgrading existing semiconductor fabrication facilities in the U.S., thereby reshoring key manufacturing capabilities (e.g., through the formal transfer of two critical integrated circuits currently fabricated at TSMC in Taiwan and OnSemi in Belgium) Estimated funding could be ~$20-25 million.
- Creating U.S.-based 5G technology/innovation labs with the goal of advancing technology development and use-case validation to improve competitiveness of the global Open RAN ecosystem. Estimated funding could be ~$70 million.
- Creating a lab to certify interoperability of Open RAN compliance, and other end-to-end network elements from multiple vendors, with the goal of accelerating integration with multiple vendors to authenticate use-cases and interfaces for different markets. In doing so, domestic supply chain diversity is achieved and Open RAN equipment is primed as a key U.S. export to international markets. Estimated funding could be ~$15-20 million.

Advance U.S. Leadership in the Development of Open and Interoperable Interfaces

Open and interoperable specifications will reduce network costs and allow more U.S. companies to compete globally. However, more is needed to be done to close the feature gap and ensure continuity to future generations of wireless standards. Interface standards development is essential to the success of the Open RAN multi-vendor vision, and is a multimillion dollar initiative for the Open RAN ecosystem. Standards development will ensure both dynamic innovation and robust competition, with American players firmly in the mix.

Potential projects include:

- Hiring U.S.-based standards and software engineers to develop and promote new open and interoperable interfaces based on the constantly evolving standards from 4G to 5G and beyond. These engineers would accelerate closing existing vendor-locked feature gaps within established mobile wireless infrastructure suppliers. Estimated funding could be ~$85 million.

Improve American Mobile Network Security

Open and interoperable interfaces provide the foundation and architecture for improving security. An open, intelligent Radio Access Network (RAN) enables operators to deploy greater security capabilities closer to the network edge, allowing the operators to more quickly respond to cybersecurity threats.

Potential projects include:

- Funding for U.S-based "Centers of Excellence" dedicated to developing security assurance standards and practices to help ensure that the U.S. stays at the forefront of cybersecurity and related disciplines. Estimated funding could be ~$75 million.
- Funding that allows for the expansion of U.S.-based 5G and 6G (and beyond) R&D would not only enable U.S. development of next-generation specifications and products (hardware, firmware, software) but would empower U.S. vendors to keep pace with feature-development currently dominated by foreign suppliers. Such support could range from funding for enhanced or new R&D facilities in the U.S. to investments in testing equipment and staff. Estimated funding could range from ~$35 million for limited feature sets to ~$175 million for more comprehensive solutions.