Wireless Infrastructure Association

Jonathan Adelstein
President and CEO, Wireless Infrastructure Association
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Thank you Rick, and The Media Institute, for inviting me. Back when I last spoke as an FCC Commissioner, you fed us lunch at the Four Seasons. Now, I'm just glad you brought me back at all -- even if there's no food involved.

At WIA, infrastructure is our middle name. Our name's been used a lot lately, but not in vain. So clearly, I have big concerns about how the infrastructure bill takes shape.

The pandemic underscored the importance of connectivity. All of us in the telecommunications industry know we have a special responsibility. Our networks sustained the entire economy during the pandemic. We helped businesses to stay afloat, children to continue learning, and health care providers to reach people in need.

That's why crafting a funding plan needs careful planning – not just easy answers. Today, I'm going to talk about how wireless will play a key role in expanding broadband to rural America. This is personal for me because I grew up in South Dakota. It's long been my personal goal – at the FCC, then RUS, and now in the private sector – to pursue the goal that is enshrined in the very first sentence of the Communications Act of 1934: "to make [communications]...available to all the people of the United States."

And I'll explain how a fiber-only approach – though well-intentioned – would crash on the messy rocks of reality in rural America where I grew up. The bipartisan agreement – if reports we are hearing are correct – will avert those problems. The bipartisan agreement deserves our support since it's moving toward a flexible standard that allows wireless to compete for funding.

Congress Should Support Multiple Technologies

We find ourselves today in a surprising battle on Capitol Hill to get wireless even included in the biggest broadband investment ever considered. We've grown accustomed to policymakers recognizing 5G as the next great technology for the future. It's predicted to create 4.5 million jobs and $1.5 trillion in economic growth.[1] It seemed obvious to us at the outset that an undertaking of this magnitude needs to harness all available technologies, including wireless, building upon the best of each to provide broadband to all Americans. So, I must admit our industry was taken a bit by surprise when so many policymakers aimed for what they called a "future proof" strategy, mandating 100Mbps speeds up and down, which was code for "fiber-

[1] Enrique Duarte Melo ET AL., *5G Promises Massive Job and GDP Growth in the US*, BCG (Feb. 2, 2021), https://www.bcg.com/publications/2021/5g-economic-impact-united-states?awsPersonalize=true&awsPersonalizeView=standaloneArticle.

only." But this idea hadn't been properly vetted considering the complexities of the telecom networks.

WIA members own much of the fiber in the U.S. We understand each technology comes with tradeoffs. Fiber provides outstanding bandwidth and is essential to any national broadband buildout effort. There's no debate about the need to drive fiber deeper into the network. Fiber is integral in 5G networks. Some argued that since expanding fiber would provide ancillary benefits to wireless, there was no need to make wireless part of the plan. But this argument obscures the real question: whether fiber needs to reach directly to every remote home, or if fiber should sometimes terminate at a wireless antenna to serve many homes and businesses more effectively.

Congress and the White House are now poised to make the greatest federal investment yet: $65 billion. An investment of this magnitude is a dangerous time to experiment with putting all your eggs in a single fiber basket.

The plan should focus on how people actually use broadband. Most broadband networks are designed to provide more bandwidth for download traffic because that's what people need. The gap between downstream and upstream traffic has consistently grown over the last ten years to a ratio of fourteen to one.[2] Current trends show download demand will continue to outpace upload.[3] Popular applications that utilize relatively high upload bandwidth, such as video conferencing, don't require anything near symmetrical speeds.[4]

It is certainly true that consumers value upload speeds. The problem is that fiber-only advocates proposed making symmetrical upload the single and primary gating criterion for funding. A provider would not even be eligible for funding unless it could provide a service of such little utility. By cementing in law a technologically discriminatory standard -- as a *gating* eligibility factor – Congress could *hamstring* its ability to advance other priorities.

The impetus of the fiber-only strategy was apparently based on a 2017 FCC paper that was little noticed in the final moments of the Obama Administration. While it envisioned only fiber, ironically, the major benefits it cited to justify federal investment relied on wireless. These include "transportation (e.g., autonomous vehicles including trucks, cars, drones), energy, healthcare, and manufacturing" as well as public safety and smart cities.[5]

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[2] *See* John Ulm & Tom Cloonan, *The Broadband Network Evolution Continues*, COMMSCOPE 9 (2019), https://www.nctatechnicalpapers.com/Paper/2019/2019-the-broadband-network-evolution-continues; *see also The Asymmetric Nature of Internet Traffic*, NCTA (Mar. 22, 2021), https://www.ncta.com/whats-new/the-asymmetric-nature-of-internet-traffic (stating that the downstream to upstream traffic ration was sixteen to one at the end of 2020.

[3] *The Broadband Network Evolution Continues*, COMMSCOPE at fig. 3, 4 (demonstrating a 37.8% average growth rate over five years for downstream while upstream has a 18.8% growth rate for the same time).

[4] Jay Zhu ET AL., *Testing Bandwidth Usage of Popular Video Conferencing Applications*, CABLE LABS (Nov. 5, 2020), https://www.cablelabs.com/testing-bandwidth-usage-of-popular-video-conferencing-applications (studying various video conferencing applications utilization of upstream and downstream bandwidth).

[5] Paul de Sa, *Improving the Nation's Digital Infrastructure*, FED. COMMC'NS COMM'N, https://transition.fcc.gov/Daily_Releases/Daily_Business/2017/db0119/DOC-343135A1.pdf (last updated Jan 19, 2017).

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Wireless Broadband Brings Many Advantages to Meet Congressional and Administration Priorities

Those advocating a fiber-only strategy disregarded the longstanding consensus in U.S. telecommunications policy: that Washington shouldn't pick a specific technology in law. We'd always held that given rapid American innovation and the development of technology, the government shouldn't pick winners and losers. We succeeded by allowing all technologies to compete and let consumers reward the winners. Perhaps too many took technological neutrality for granted because it's been so successful. Most recently, wireless networks rose to the challenge of the pandemic and performed magnificently. U.S. networks were the envy of the world. Traffic dramatically increased overnight, yet mobile data speeds kept pace. Not so in other countries.[6]

What hasn't been discussed enough are overwhelming benefits of wireless that reliance on a single technology would shortchange. I was finally able to make that case before the U.S. Senate Commerce Committee at a hearing late last month. I highlighted the need for an all-of-the-above policy that harnessed fixed and mobile wireless, along with fiber. It resonated with Senators that wireless networks addressed many Biden Administration and Congressional priorities.

Among my main points: wireless can get service more quickly their constituents. Rural Americans need mobility. Public safety relies on wireless. 5G is a fundamental technology to address climate change. And wireless is often more resilient and gets restored faster when disasters strike. These are all urgent needs wireless can help Congress address.

At the hearing, I discussed my experience overseeing RUS for the Obama-Biden Administration. I found it's more complicated in practice than it appears. I'm very familiar with financing fiber projects as over 2/3 of our awards were fiber to the home, while the rest involved wireless.[7] Fiber makes sense in many contexts, but not always.

Before I arrived at RUS, funding was going out the door more slowly than the White House wanted. Once confirmed, I was called into then-Vice President Biden's office. Vice President Biden gave some clear guidance. He said, "Give yourselves more freaking flexibility." I'll never forget those words – a direct quote, not a PG-rated version – because they became our motto. When making policy cuts with staff, I often called for more "freaking flexibility."

Vice President Biden's advice proved as wise as it was piquant. We made major changes that were critical to the success of the program.[8] A big lesson is that RUS had almost more funding than it had qualified projects. While we received $29 billion in total applications, we only awarded $3.5 billion. Sounds competitive, right? Well, it wasn't. Most of the applications were thrown out for failing to meet our financial and technical feasibility screens. Almost every one

[6] Francesco Rizzato, Sam Fenwick, & Ian Fogg, *Mobile Experience During the COVID-19 Pandemic: 4G Download Speed*, OPENSIGNAL (Apr. 8, 2020), https://www.opensignal.com/2020/04/08/mobile-experience-during-the-covid-19-pandemic-4g-download-speed.

[7] DISTRIBUTION OF BROADBAND STIMULUS GRANTS AND LOANS, CONG. RESEARCH SERV. at 6 (Jan. 4, 2011).

[8] MARK A. ABRAMSON AND PAUL R. LAWRENCE, PATHS TO MAKING A DIFFERENCE, LEADING IN GOVERNMENT ch. 4 (revised ed. 2012).

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that made it through both won funding. In other words, only about one in eight projects penciled out as even feasible.

The lesson of the Recovery Act is that Congress can't assume funding with narrow strictures will achieve its vision. An Administrator knows the agency doesn't choose who applies -- or which private or municipal actors are willing to step up. They can only consider what comes through their door. And should only fund those operators that are not only willing, but able to demonstrate a plan that is both financially and technically feasible.

Clearly, finding feasible projects is difficult. The more rural and less densely populated, the more difficult it becomes. The way telecommunications networks are structured, typically only providers with infrastructure in the geographic area can expand to the most hard-to reach areas. The essential limiting factor is often whether – even if Congress pays for 100% of the capital expenses – the ongoing revenues from subscribers cover the operating expenses. Again, the less densely populated the service area -- those Congress most seeks to reach -- the more difficult this long-term business case becomes. Real "future proofing" requires funding only companies that will remain in business to provide service into the future. If operating costs aren't covered by the revenue stream, the networks will fall into disrepair -- or worse, become inoperable.

Congressional Efforts to Reach Bipartisan Agreement on Infrastructure Bill

This Senate Commerce Committee hearing turned out to be very timely. It was the last hearing held days before the bipartisan agreement on a broad infrastructure deal was reached in the Senate. It was the right time -- and the Senate was the right place. Immediately after the hearing, Senate staff picked up pens to turn the framework into legislative text.

It should serve as a reminder to all how bipartisanship can restore sensibility in our field, which is long known for bipartisanship. The bipartisan group is reportedly considering restating that technology neutrality remains the cornerstone of U.S. telecommunications policy. I'm hopeful they will. And to make that promise real, I'm encouraged by reports they agreed that symmetrical speeds are not required to compete for funding. They appear to be moving toward a position that 100 megabits down and 20 megabits up should be the floor. Wireless can reach that, so I'm very encouraged.

If reports are accurate that the agreement will include funding for wireless, it's a threshold decision, because $65 billion is an unprecedented sum. $40 billion is reportedly proposed to go directly to states. By comparison, the 2009 Recovery Act included a total of $7.2 billion of new spending on broadband deployment. We will soon be swimming in deep and uncharted waters.

The bipartisan Senate group is charting a course that will get broadband deployed quicker and bring mobility along with high speeds to rural America. A course that will win the race to 5G. A course that will create millions of jobs and over a trillion dollars in economic development. Congress and the Administration are now positioned to enact a program that would achieve its goals more easily than if it depended on a single technology. By providing implementing agencies with needed flexibility, the bipartisan agreement is more likely to garner qualified applications for more unserved areas.

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Benefits of Tech Flexibility to Speed Deployment to Unserved Americans

Having worked in the Senate for 15 years, I've seen up close how elected officials want to deliver results for their constituents. They want to get people connected as quickly possible. Wireless networks get up and running much faster. Rural Americans need broadband now. The bipartisan deal won't make consumers wait for a decade or more by limiting the range of eligible providers. Future proof shouldn't mean deployed far in the future. Connectivity delayed is connectivity denied.

Rural consumers should not have to wait in the back of a long line for many years to finally get the broadband Congress promised. A recent study found it would take 10 years and an additional $70 billion to pass 90% of U.S. households with fiber – before even reaching the last 10% which are of greatest concern for rural access.[9] To even connect that 90% with a drop to their homes would require another $15 billion.[10]

Wireless broadband links can be installed and ready for operation in a matter of days in a variety of scenarios.[11] In other cases, WIA members report that, on average, it can take about six months for a wireless collocation and about eighteen months for a new tower to be built. Given rural consumers urgent need for broadband, the focus should be on utilizing all technologies to connect all communities as quickly as possible.

Like many of you, I've finally begun travelling again. Fully vaxed and ready to rock, I've joined two conferences in the last two weeks and spoken with dozens of leading contractors who build these networks, both fiber and wireless. They're excited about the new funding. But to a person, they told me they are already very busy and having trouble keeping up with the business already coming in the door.

Complicating that, they're confronting three major bottlenecks in short supply right now -- heavy equipment and telecom gear reliant on chips -- materials like fiber, which is back ordered for up to a year already -- and skilled labor prepared to do the work in the field.

Right now is bad timing on all three, which means this could take longer than policymaker hope -- and more delays than rural America can afford. I've never heard more concern from contractors about the lack of available workers. If Congress adds massive additional demand when supplies are already short, contractors are telling me they just don't know how they will get it done.

With business booming as it is, and skilled workers in short supply, Congress needs to invest in broadband workforce development – especially apprenticeships – along with investing in the infrastructure itself if they want to see it deployed any time soon.

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[9] *FTTH Study 2019*, CARTESIAN at 2 (June 4, 2019), https://optics.fiberbroadband.org/Full-Article/new-study-explores-cost-of-fiber-deployment-in-rural-areas.
[10] *Id*. at 4.
[11] Dori Erann, *Fiber VS Wireless- The Greatest Debate of the Decade*, CERAGON (Mar. 18, 2021), https://www.ceragon.com/blog/fiber-vs-wireless-the-greatest-debate-of-the-decade.

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Congress is taking steps to address these issues, but it will take time to get the pipeline ready. The Senate's recent passage of the U.S. Innovation and Competition Act is a great step to speed the availability of chips.

We are seeing labor shortages in nearly every industry and telecommunications is no exception. 5G is a new technology that requires new skills. Accenture reports that the full impact from broadband 5G construction spending alone could be approximately 120,000 jobs created each year during the first seven years of deployment. Adding in the massive fiber buildout ahead, we need to ramp up telecommunications training and apprenticeship to ensure a large enough and properly skilled workforce to meet the demands of the infrastructure bill.

WIA has long worked with Congress and the Department of Labor to create a skilled broadband workforce. Congress can create a diverse pipeline of skilled workers ready for these jobs by taking bold action to invest in registered apprenticeships and evidence-based job training.

Today, registered apprenticeship in the broadband industry is new and needs resources to scale to the level needed to support the level of funding contemplated by Congress and the Biden Administration. To solve this "good problem" from creating high-wage jobs, and to ensure the success of a broadband infrastructure investment, a corresponding initiative is needed to develop and diversify the broadband workforce through additional support for registered apprenticeships and the educational and training system. An immediate expansion of education and skills training will create a pipeline for broadband infrastructure jobs in a growing industry of the future.

Multiple Technologies Needed to Address Broadband Resiliency, Mobility, Public Safety, and Climate Change

Resiliency of telecommunications networks is a priority for Congress. All telecommunications technologies, including wireless broadband, have their own vulnerabilities. Long stretches of aerially deployed fiber, or any overhead wireline service, is exposed to many natural forces, and can take long periods to restore. And fiber is dependent on electrical service at the home, which is often disrupted for long stretches.

Wireless networks greatest vulnerability is fiber backhaul – the very technology some wanted to use exclusively. The difference is in wireless, we can restore one transmission site with backhaul options, such as microwave, much faster. And we only need to restore power or provide a generator to one transmission site that may serve thousands of homes without power. Real "future proofing" means funding networks that are resilient when they needed most in emergencies.

Wireless networks offer mobility rural Americans value as they traverse longer distances. Rural residents should not be tethered to the short leash of ethernet or a Wi-Fi signal when they need a high-speed connection. Many applications, such as precision agriculture, require wireless broadband blanketing farmland to be useful. If wireless were excluded from an infrastructure plan, Congress could inadvertently grow a rural mobility digital divide in which many unserved

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residents would be limited to accessing the Internet through a wired connection. By giving wireless broadband a fair chance to compete, including for the in-home market, the bipartisan agreement gives consumers the opportunity to benefit from mobility, including fixed wireless that supports 5G.

Public safety and first responders rely on mobile networks as they go in harm's way to protect the public. Fiber to the premise will not help as they race to put out fires, deliver health care in ambulances that can become a mobile emergency room with 5G, or protect the public from crimes in progress. Public safety has always and will always rely on mobile networks. The bipartisan agreement now addresses this priority goal.

And because 5G plays a particularly strong role in addressing climate change, the bipartisan agreement will contribute to saving the planet. Wireless networks address every policy goal of President Biden's American Jobs Plan, including environmental goals. The World Economic Forum documents that 5G connectivity is a primary digital technology that can "help reduce global carbon emissions by up to 15% – or one-third of the 50% reduction required by 2030."[12] Efficiencies in energy, smart grids, transportation and connected cars, agriculture, water and land use, building efficiency, and advanced manufacturing are enabled through wireless.

There is great concern about affordability, for good reason. Wireless capacity continues to rival wireline service. Many rural residents, especially those with low incomes, are prioritizing their mobile connections over fixed.[13] In rural America, nearly one in five residents are "smartphone only users,"[14] that rely solely on their wireless devices for broadband. One in four Americans who make less than thirty thousand dollars a year have made the switch to smartphone only; the same is true for those that have a high school degree or less.[15] If fiber to the home is the only choice, millions of rural Americans would need to spend their hard-earned dollars for a wireline connection that they already decided they don't want or can't afford.

Technological flexibility can also provide consumers with the most megabits for the taxpayer dollar. Fiber is critical, yet it is one of many tools for closing the digital divide. The last mile – often more than a mile in rural America – is most costly to provide with fiber, when simply connecting fiber to a tower for wireless can cover many premises in less time and for less money. The average capital outlay per subscriber for fiber is almost ten times what is needed for a fixed wireless connection.[16]

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[12] Börje Ekholm & Johan Rockström, *Digital technology can cut global emissions by 15%. Here's how*, WORLD ECON. FORUM (Jan. 15, 2019), https://www.weforum.org/agenda/2019/01/why-digitalization-is-the-key-to-exponential-climate-action/.

[13] Monica Anderson, *Mobile Technology and Home Broadband 2019*, PEW RESEARCH CTR. (June 13, 2019), https://www.pewresearch.org/internet/2019/06/13/mobile-technology-and-home-broadband-2019/ (stating 45% of non-broadband users said they do not have a connection at home because their smartphone meets all of their online needs).

[14] Andrew Perrin, *Mobile Technology and Home Broadband 2021*, PEW RESEARCH CTR. (June 3, 2021), https://www.pewresearch.org/internet/2021/06/03/mobile-technology-and-home-broadband-2021/ (providing a demographic breakdown of smartphone only users).

[15] *Id.*

[16] *See, The 2021 Fixed-Wireless and Hybrid ISP Industry Report*, THE CARMEL GROUP at 19 (2021), http://www.carmelgroup.com/wp-content/uploads/2021/04/The-Carmel-Group-2021-Fixed-Wireless-Report-4-23-

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Congress doesn't have to choose one of these priorities at the expense of all others. We can protect the planet from climate change and give unserved consumers the broadband service they need.

What we're hearing about the bipartisan agreement represents a breakthrough in thinking by providing technological flexibility. I'm thrilled by reports the wireless infrastructure industry is included. We're ready to expand broadband in every corner of America.

2021.pdf (Fig. 8 providing comparative capital outlay of various broadband technologies showing $4,500 per subscriber for fiber compared to $475 per subscriber for fixed wireless).

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