WRITTEN STATEMENT

of

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UNITED STATES CELLULAR CORPORATION

before the

UNITED STATES SENATE COMMITTEE
ON
COMMERCE, SCIENCE AND TRANSPORTATION

"EXPANDING BROADBAND INFRASTRUCTURE IN THE GRANITE STATE"

OCTOBER 13, 2017

Mr. Chairman, Senator Hassan, and members of the Committee, my name is Grant B. Spellmeyer, and I am the Vice President, Federal Affairs and Public Policy at United States Cellular Corporation. Thank you for the opportunity to discuss ideas for expanding broadband in New Hampshire's rural areas.

I. Introduction.

U.S. Cellular provides mobile wireless telephone and broadband services in nearly 200 markets across 23 states located in regional clusters across the country, including one here in New England, comprising New Hampshire, Maine, and Vermont. We serve overwhelmingly rural areas in many states represented on this committee, such as Missouri, Nebraska, Kansas, Washington, West Virginia, Oklahoma, Wisconsin, and Illinois.

Much of our business involves finding ways to build cell towers in small towns and on rural roads, areas where population density, income levels, and commercial development are often well below those in our nation's urban areas. Consequently, we are constantly thinking about ways to address the economics of providing vital services to areas that present financial challenges to build, maintain, and upgrade.

Earlier this year, our Chairman, Ted Carlson, testified before the Senate and House of Representatives, noting that much of our nation's business success in the 20th Century was built upon our backbone infrastructure – our rail network, our interstate highway system, our electrical grid, and our fixed line telephone system – all of which blossomed with the active engagement of the public and private sectors. This hearing is an important step toward making all of the United States more competitive in the 21st Century. While we are today focused on

New Hampshire, all of rural America is racing to build super-fast broadband networks that can compete with our urban/suburban areas, as well as many other countries openly seeking to lead this information revolution.

Sparsely populated rural areas are a perfect illustration of the rule that capital flows to areas with the best conditions for investment. Nearly forty years after cell towers began sprouting up across America, some rural citizens still can't get high-quality mobile wireless coverage to make and hold a telephone call or data session, or connect to wired speeds that are comparable to urban areas in price and quality. In many areas, service exists at all only because of the various universal service support mechanisms that have improved the investment case for carriers willing to take on the challenge. According to Cisco's Visual Networking Index, there will be 12 billion mobile connected devices worldwide in 2021.[1] This challenges policymakers to foster high-quality mobile networks to ensure that these devices are all productive tools, wherever citizens need to use them.

Consumers' and businesses' reliance upon high-quality, ubiquitous mobile broadband deepens every day. For example:

- Public Safety. The ability to use 911/E-911/Text-to-911 and eventually NG911, depends 100% on high quality coverage, to fully enable location-based services.[2] When disaster strikes, first responders depend on mobile wireless and broadband networks, which are the first to return to service.

- Health Care. Mobile devices and applications capable of diagnosing, monitoring and treating various conditions are exploding into the marketplace and

[1] *See,* https://www.cisco.com/c/en/us/solutions/service-provider/visual-networking-index-vni/vni-infographic.html.

[2] The FCC estimates that 70% of 911 calls are placed from wireless phones, and that percentage is growing. *See,* https://www.fcc.gov/consumers/guides/911-wireless-services.

revolutionizing health care.[3] These advances improve patient outcomes, and increase efficient delivery of services, saving millions of dollars. It is now possible for a diabetic patient to continuously monitor, store, and transmit glucose levels to health care providers through a mobile device.[4] Mobile video conferencing is increasingly important to emergency medical services and in delivering health care to remote areas where facilities are not easily accessible.[5] These applications are but a small fraction of the incredible health care tools enabled by mobile broadband.

- The Internet of Things. Soon, almost any object will be capable of connecting to the Internet. Gartner expects nearly 21 billion IoT devices to be deployed by 2020.[6] According to General Electric, the Industrial Internet, defined as the combination of Big Data and the Internet of Things, may be responsible for $15 trillion (not a typo) of worldwide GDP by 2030.[7]

- Education – the Homework Gap. Students are increasingly using mobile devices to access learning materials, do homework, create presentations, and communicate with teachers. Students with connectivity throughout the community are more likely to meet educational goals, especially in an age where learning through the Internet is essential.

- Agriculture. Connected tractors, irrigation systems, livestock management, commodity tracking, and many more applications depend upon mobile wireless connectivity. By definition, these services require networks that are not measured by "road miles covered" but by actual services reaching their acreage.

- Low-income households. For households that cannot afford to purchase a desktop computer, a router, a WiFi access point, and subscribe to both mobile

[3] An updated list of hundreds of approved mobile medical applications can be found at: https://www.fda.gov/MedicalDevices/DigitalHealth/MobileMedicalApplications/ucm368784.htm.

[4] http://www.dexcom.com/g5-mobile-cgm. Someday soon, patients may wear a contact lens that constantly measures glucose level through tears, transmitting the data to attending physicians. *See*, https://verily.com/projects/sensors/smart-lens-program/.

[5] The FCC's Connect2HealthFCC initiative is a powerful example of how broadband data can be used to improve health care. *See,* https://www.fcc.gov/about-fcc/fcc-initiatives/connect2healthfcc; https://www.fcc.gov/reports-research/maps/connect2health/#ll=39.909736,-95.039063&z=4&t=insights&inb=in_bb_access&inh=in_diabetes_rate&dmf=none&inc=none&slb=90,100&slh=10,22; and https://www.fcc.gov/document/commissioner-clyburn-continuation-connect2health-task-force.

[6] *See*, https://www.gartner.com/doc/3558917/forecast-internet-things--endpoints.

[7] *See*, http://www.ge.com/digital/sites/default/files/industrial-internet-insights-report.pdf.

and fixed networks, a single mobile device is capable of meeting voice communications and Internet needs.

None of the benefits described above will be available to rural Americans unless high-quality mobile broadband coverage is available everywhere people live, work, and travel. In areas where emergency calls cannot connect, or where medical devices cannot transmit data, lives will be lost. In areas where tablets and laptops don't work, educational opportunities will be foreclosed. The enormous power of the Internet of Things cannot be fully realized without ubiquitous mobile broadband.

Below, I discuss several matters that bear on the federal and state government's efforts to improve broadband infrastructure and services in rural New Hampshire and other places where traditional market forces have not been sufficient to deliver high-quality broadband.

II. The AIRWAVES Act Can Accelerate Broadband Deployment.

U.S. Cellular was happy to see Senators Hassan and Gardner introduce S.1682, the "Advancing Innovation and Reinvigorating Widespread Access to Viable Electromagnetic Spectrum Act." U.S. Cellular has long been a proponent of an "all of the above" strategy for broadband deployment, with fiber, mobile wireless, fixed wireless, licensed spectrum, unlicensed spectrum, and satellite all having an important role in knitting together broadband networks that meet the needs of every American.

The AIRWAVES Act requires the FCC to release a steady stream of mid-band and high-band spectrum, and to move quickly to complete the Spectrum Frontiers proceeding, which will free up several blocks of high-band spectrum key to small cell deployments. By giving the FCC

specific deadlines for completing auctions, it allows the FCC to put spectrum to use promptly, removing external pressure on the Commission to schedule auctions to maximize revenue while providing potential bidders with increased certainty to plan for future auctions. This is the right policy choice because the economic and long term societal benefits of putting spectrum to use far exceed whatever short-term auction revenues might yield.

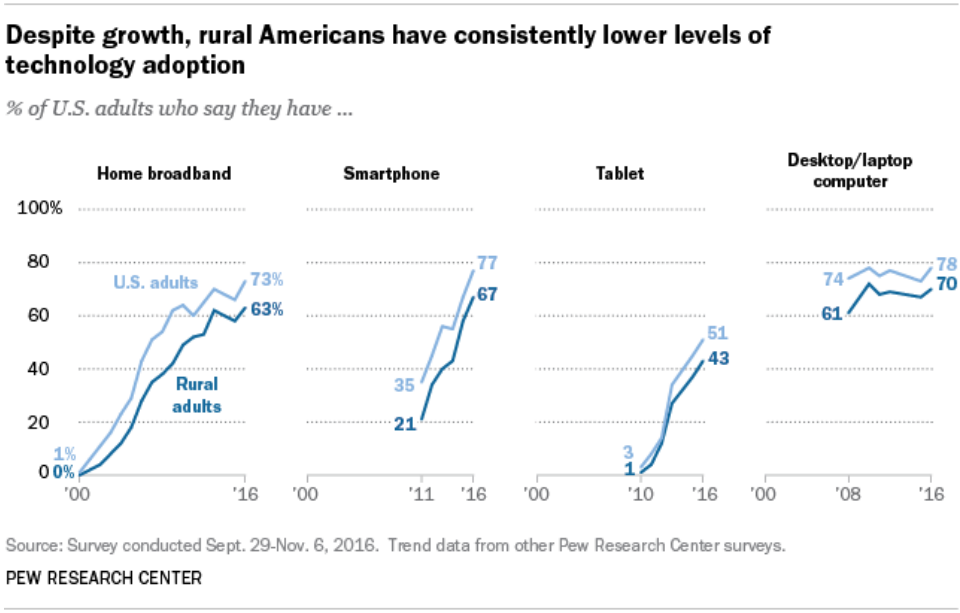
U.S. Cellular is also pleased to see that ten percent of AIRWAVES Act auction proceeds will be set aside for deployment of rural infrastructure. This reflects a Congressional policy priority – to develop a steady stream of auction proceeds that can target places most in need of infrastructure development. As discussed below, federal and state governments have not sufficiently funded universal service and other mechanisms to meet the demand for broadband networks in rural America. Congress has set aside proceeds in the past for spectrum clearing and other salutary purposes; this is a smart policy choice that will have lasting benefits. U.S. Cellular supports the AIRWAVES Act, and welcomes other opportunities to make additional spectrum available for use in rural America.

III. Congress, the FCC, and the States Must Attack the Digital Divide.

A. Expand Universal Service to Meet an Urgent Need.

Building infrastructure in America, whether it be roads, electricity, water, or broadband, is a really big job. The past forty years have seen dramatic growth in our nation's capabilities, with multiple fixed, mobile, and satellite technologies being deployed, and more on the near-term horizon. Yet, at a time when 5G and the Internet of Things are just around the corner, many rural Americans remain significantly behind, limiting opportunities for education,

economic development, health care, and much more. Recently, the Pew Internet Survey found that the persistent Digital Divide remains, with rural Americans lagging eight to ten points behind their urban counterparts in four different categories.[8] Americans living on Tribal lands are much farther behind.

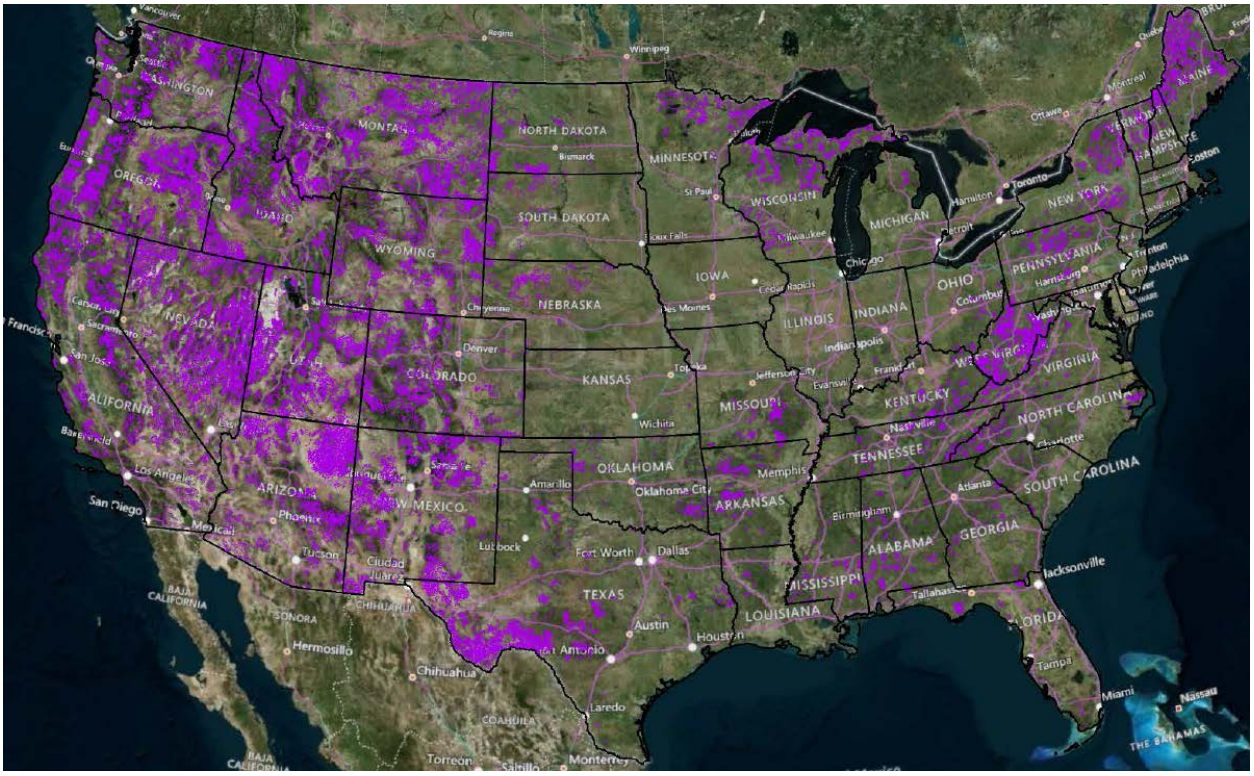


From U.S. Cellular's perspective, the cost of leaving rural Americans behind has not been sufficiently studied. There is an enormous productivity and economic cost to the nation from lost educational opportunities, poor health care outcomes, and business and population migration out of rural areas. Moreover, only recently do we get a sense that federal and state policymakers are fully embracing a sense of urgency must be brought to bear with respect to broadband.

And urgency is what is needed. While the FCC's universal service mechanism is the best tool for attacking the Digital Divide, as a tool I would describe it as a shovel, when what is

[8] *See,* http://www.pewresearch.org/fact-tank/2017/05/19/digital-gap-between-rural-and-nonrural-america-persists/.

needed is a dump truck. To illustrate, CostQuest Associates recently did a study to identify areas of the country that lack 4G LTE service. Their map, identifying areas lacking 4G, is below (purple areas lack 4G):

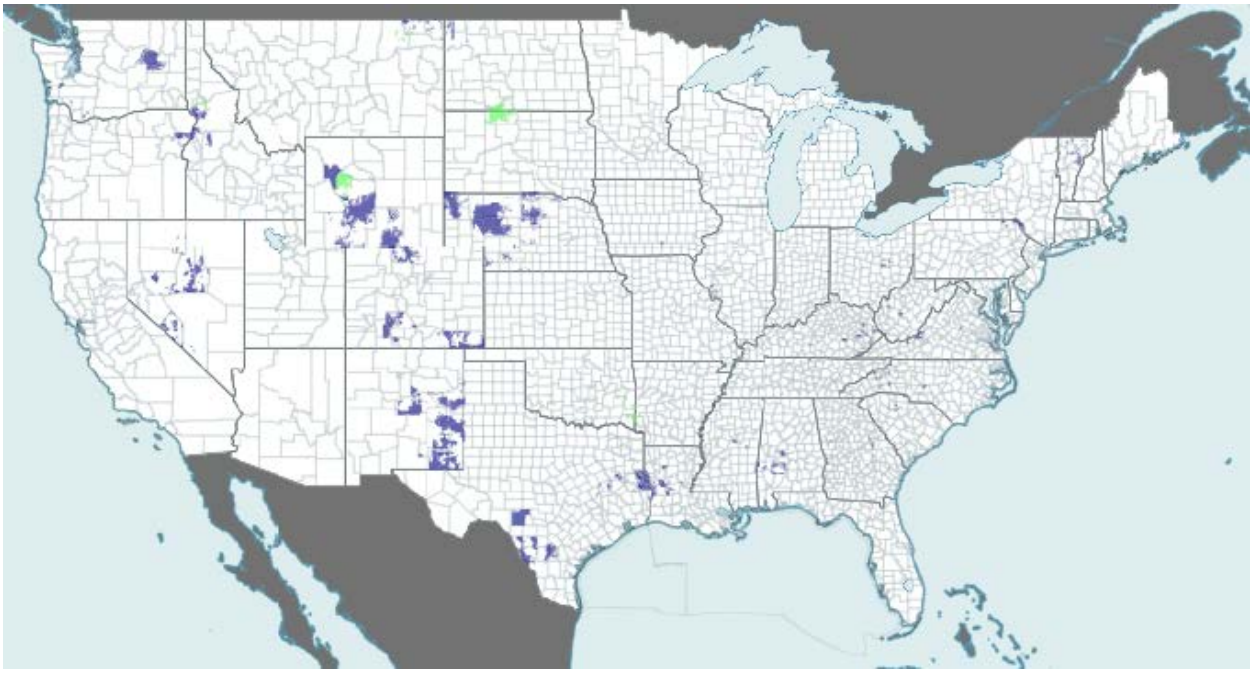


CostQuest's model predicted that it will cost $12.5 billion in capital expense to improve our nation's mobile network to 4G, with an annual maintenance capital expense of $1 billion and an annual operating expense of $1 billion.[9]

In its Mobility Fund Phase I program, the FCC allocated $300 million to improve broadband in rural America, about two-thirds of which was actually disbursed. The FCC's

[9] CostQuest Associates, *Cost Study for Unserved 4G Areas* (2017) at: https://ecfsapi.fcc.gov/file/10218108506527/2017%200216%20CQ%20Cost%20Study%20for%20Unserved%20Areas%20FINAL.pdf.

auction methodology awarded support to the lower-cost areas first and the higher-cost areas last. As a result, auction funds were exhausted before mountainous terrain such in New Hampshire were reached, that is, there were no winning bids awarded in New Hampshire in Mobility Fund Phase I. The resulting coverage can be seen on the map below.[10] The blue represents winning bids in rural areas and the green represents winning bids on Tribal lands.



For Mobility Fund Phase II, the FCC proposes to invest up to $4.53 billion, spread over a ten-year period. If CostQuest's estimate is accurate, it is not close to covering a $12 billion construction cost, plus $20 billion more in operating expenses. We should reach agreement on what it will cost to reach ubiquitous 4G, and how much of that should be borne by our universal service support mechanism, divide that amount by five years, and get it done.

[10] *See,* http://apps.fcc.gov/auction901/map/auction_result_ext.html.

We have a sense of urgency because if the FCC stays on the same trajectory, in ten years rural Americans will likely suffer a wider Digital Divide in a 5G (or 6G) world than they do today in the 4G world, especially as 5G is expected to build upon 4G networks. CostQuest has estimated several 5G deployment scenarios for the US, with total capital investment ranging from $61 billion to achieve ubiquitous coverage to $250 billion to deploy a network capable of autonomous vehicle support and future demand.[11] In rural areas, private and public investment will be required to achieve a service level reasonably comparable to that which will come to urban areas. If you're watching what Google, Tesla, and all major auto manufacturers are doing with autonomous vehicles, it is not too early to be considering these issues. In fact, this Committee advanced major autonomous vehicle legislation just last week.

The good news is, we don't need a new law to make progress. Congress gave the FCC an unequivocal goal, to use its federal universal service mechanism to ensure that rural Americans have access to advanced telecommunications and information services that are reasonably comparable to those available in urban areas, both in quality and price.[12] Congress ordered the FCC to deploy universal service funds sufficient to do the job, and it never capped what the FCC could invest.

And yet, at a time when rural areas need to catch up, the FCC's Mobility Fund II plan is not big enough -- it is not visionary. Mobile broadband networks in rural America are not prepared to deliver the volume of traffic that is coming. Any area lacking the necessary

[11] *See,* Cost Quest Associates, *The 5G Mobile Ubiquity Price Tag Costs for Full U.S. Deployment Of 5G – With and Without Support for Autonomous Driving* (2017), at: https://www.costquest.com/uploads/pdf/5g-mobile-ubiquity-costs-summary.pdf.

[12] *See,* 47 U.S.C. § 254(b)(3).

capabilities will not be a candidate for business growth, nor will it be a place with world class health care or educational opportunities.

B. Include Direct Investments in Broadband in any Infrastructure Bill.

The current administration has discussed an infrastructure bill, with as much as $1 trillion in investments in all manner of roads, bridges, airports, electrical grids, and broadband. We urge the Commerce Committee to take the lead and bring forth direct spending measures that improve our nation's fixed and mobile broadband infrastructure. New investments in mobile broadband infrastructure each year will have multiplier effects, creating jobs and stimulating economic growth.[13] One wireless industry job supports over six additional jobs in the economy, almost one and one half times higher than U.S. manufacturing sector jobs support.[14] Each dollar of investment in wireless results in $2.32 of economic activity.[15] We hear directly from our employees and customers that managers and educated professionals no longer consider rural areas that lack high-quality mobile broadband services attractive enough to relocate to, or to stay in.

In U.S. Cellular's experience, an infrastructure bill that focuses only on streamlining tower siting regulations and lowering overall barriers to entry, while salutary, is not nearly enough. In our experience, with the exception of lands controlled by government agencies

[13] *See*, http://www2.deloitte.com/content/dam/Deloitte/us/Documents/technology-media-telecommunications/us-tmt-impactof-4g-060612.pdf.

[14] *See,* Coleman Bazelon and Giulia McHenry, *Mobile Broadband Spectrum, A Vital Resource for the U.S. Economy* (May 11, 2015) at pp. 19-20: http://www.brattle.com/system/publications/pdfs/000/005/168/original/Mobile_Broadband_Spectrum_-_A_Valuable_Resource_for_the_American_Economy_Bazelon_McHenry_051115.pdf?1431372403.

[15] *Id.*

such as the U.S. Forest Service or Bureau of Indian Affairs, rural communities want service so much that getting permits is usually a non-issue. These communities need an infrastructure bill that targets investment in towers, telecommunications equipment, electronics, fiber, backup facilities, and related material. Nothing short of a "Marshall Plan" for broadband in rural America is required.

If we want to maximize our nation's capability and to complete globally, all sorts of investment in "public works" projects are required. Let's make sure broadband leads that list. It is a fundamental investment in our future.

C. Fix the Broken Contribution Mechanism.

A big problem hindering the FCC from effectively attacking the Digital Divide is the broken universal service contribution mechanism, which takes a bigger bite out of a smaller pie every year. The levy is now almost 20% of a consumer's "interstate telecommunications revenue," which revenue could fall to zero in the near future.

This issue is a creature of a statute written 21 years ago, when our communications services were separated into two buckets. In an all-IP world where we are headed, we need a statute that upholds all of Commissioner Rosenworcel's four pillars of telecommunications policy -- public safety, universal access, competitive markets, and consumer protection.[16] We need to recognize that an effective universal service mechanism is critical to achieving the other three for rural Americans.

If we as a society value universal access to broadband, then it makes sense to assess all connections. Indeed, this is the core concept of universal service, that everyone contributes to

[16] *See, e.g.,* https://apps.fcc.gov/edocs_public/attachmatch/DOC-318723A1.pdf.

the network, which is far more valuable to our society when everyone has high-quality service. That said, contributions in an all-IP world is politically difficult for the FCC to implement. For well over a decade, the Federal-State Joint Board on Universal Service has been wrestling with how best to reform the contribution mechanism and we hope to see a recommendation soon.

Over the past several years, both the House and Senate have begun drafting various reforms to the 1996 Telecom Act. If a bill moves, fixing contributions must be a part of it, to convey to the FCC clearly our nation's priorities for funding rural infrastructure.

D. Tax Adjustments, Siting on Federal Lands, and "Dig Once" Can Increase Universal Service Investments.

Congress can make all universal service fund support go farther by passing legislation to exclude universal service support from taxable income, similar to funds provided under the American Recovery and Reinvestment Act. By excluding support from taxation, we will be able to use 100% of the support received for investments in rural areas, and not just the net amount after taxes. If enacted before the Mobility Fund II auction, this change would stretch available federal support further, as bidders will be able to target their bids based on the cost of providing service, without including a multiplier for tax payments.

In addition, "dig once" policies for any federal infrastructure investment that supports installation of underground conduit and fiber when building or renovating roads, railways, pipelines, utility infrastructure, and energy distribution channels. I understand that dig once can reduce the cost of fiber installation by as much as 90%.

Over three decades after the inauguration of cellular telephone service, the ability to obtain rights of way on Federal lands continues to be a significant burden for carriers. Legislation that standardizes requirements for obtaining rights of way, such as that contained in

S.19, the MOBILE NOW Act, co-sponsored by Senators Thune and Nelson, can help to reduce costs and delays involved in operating on Federal lands and is an important first step. We would be happy to see that language incorporated into any infrastructure bill or promptly passed by the House of Representatives where it sits today.

In closing, we believe that infrastructure investments multiply opportunities. For example, when we build a rural tower that is served by fiber, the surrounding community benefits from being able to use our mobile wireless network. Other mobile carriers, including public safety networks, can co-locate on our tower, increasing competition and improving public safety. In addition, the newly deployed fiber can branch off to deliver fixed broadband to homes, businesses, hospitals, and schools. Every business in the coverage area instantly becomes more competitive, having tools they need. All of our citizens have a strong desire to access high-quality modern telecommunications and information services, and we ask policymakers to help us make these rural networks reasonably comparable to those in urban areas.

Thank you for the opportunity to testify here today.