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REBUILDING INFRASTRUCTURE IN AMERICA: INVESTING IN NEXT GENERATION BROADBAND

HEARING

BEFORE THE

SUBCOMMITTEE ON COMMUNICATIONS, TECHNOLOGY, INNOVATION, AND THE INTERNET

OF THE

COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION
UNITED STATES SENATE

ONE HUNDRED FIFTEENTH CONGRESS

SECOND SESSION

MARCH 13, 2018

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ONE HUNDRED FIFTEENTH CONGRESS

SECOND SESSION

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REBUILDING INFRASTRUCTURE IN AMERICA: INVESTING IN NEXT GENERATION BROADBAND

TUESDAY, MARCH 13, 2018

U.S. SENATE,
SUBCOMMITTEE ON COMMUNICATIONS, TECHNOLOGY,
INNOVATION, AND THE INTERNET,
COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION ,
Washington, DC.

The Subcommittee met, pursuant to notice, at 10 a.m. in room SR–253, Russell Senate Office Building, Hon. Roger Wicker, Chairman of the Subcommittee, presiding.

Present: Senators Wicker [presiding], Nelson, Schatz, Blunt, Udall, Fischer, Hassan, Moran, Tester, Klobuchar, Capito, Peters, Blumenthal, Sullivan, Gardner, and Baldwin.

OPENING STATEMENT OF HON. ROGER F. WICKER, U.S. SENATOR FROM MISSISSIPPI.

Senator WICKER. Good morning. This hearing of Subcommittee will come to order.

Today the Subcommittee will kick off a series of hearings in the Commerce Committee on Rebuilding America's Infrastructure. We start here in the communications subcommittee with a focus on how to advance broadband deployment in infrastructure legislation this Congress. I'm glad to convene this hearing with my colleague, Ranking Member Schatz.

Broadband connectivity is the digital engine driving investment, innovation and productivity in virtually every economic sector in the United States. Over the past decade there have been unprecedented advancements in healthcare, agriculture, transportation and many other industries because of increasingly ubiquitous broadband connections. These connections are helping industries reduce cost, increase efficiencies and rapidly identify and act on opportunities for growth.

Continuing the success of these developments and maintaining the Nation's global leadership in technological innovation are goals that depend on widespread access to a reliable high speed broadband connection. Although we have made significant progress on wireline, wireless and satellite broadband deployments, more needs to be done. There is still a disparity in broadband deployment across the country, particularly in rural America.

In its 2018 broadband deployment report the FCC concluded that "far too many Americans remain unable to access high speed

broadband Internet access and we have much work to do." A direct quote from the Federal Communications Commission.

To that end, I'm greatly encouraged by the President's support for programs directed toward increasing broadband infrastructure deployment in rural areas. Today I hope to discuss with our witnesses how Congress can most effectively and efficiently deploy broadband infrastructure to unserved communities. Using lessons learned earlier from broadband projects, President Trump's infrastructure proposal is an opportunity to get broadband to communities that truly need it.

This process should start with collecting standardized and accurate data about where the reliable fixed and mobile broadband already exists and where it does not, both in Mississippi and around the country. This is critical to delivering broadband to rural communities that lack service, whether that be through infrastructure legislation or existing Federal programs like Phase II of the mobility fund.

Inaccurate information of where broadband exists would only exacerbate the digital divide and leave millions of rural Americans further behind. We don't have accurate data yet, and I hope we can discuss that today in the hearing. As we seek to close the broadband gap in rural America, we should also plan for the next generation of broadband such as 5G.

The availability of 5G communication networks promises to transform the way we experience the Internet because of the projected capacity speed and reliability to make next generation broadband a reality and position the United States so it can win the global race to 5G. We should modernize outdated rules that delay and add unnecessary cost to broadband infrastructure deployment.

A bipartisan piece of legislation that I introduced called the Streamlining Permitting to Enable Efficient Deployment of Broadband Infrastructure or SPEED Act does just that. Inaction on our part would take the next generation of jobs, innovation and investment out of the United States and put us at an economic disadvantage with respect to our global competitors.

Clearly as the FCC concluded in its report that I have just quoted, there is much work to be done. We are almost one-fifth of the way through the 21st century. We ought to be able to accelerate the deployment of next generation broadband, get all Americans connected now and close the digital divide once and for all.

I'm told that Senator Schatz has no opening statement, and I think that's because he has concluded that I so completely covered the subject in my opening statement. So we will get right to our witnesses, and they include the Honorable Gary Resnick, Mayor of the City of Wilton Manors, Florida.

Oh, I see, so the other part of that statement was that Senator Nelson wishes to make an opening statement. After I introduce our panel, we will certainly allow that. Although I'm crushed now that the conclusion wasn't that I had said all that could possibly be said.

Mayor Resnick will be joined by Mr. Steve Berry, Chief Executive Officer, Competitive Carriers Association; Mr. Robert DeBroux, Director of Federal Affairs and Public Policy, TDS Telecom; Mr. Brad Gillen, Executive Vice President, CTIA, the Wireless Association;

and, Mr. Mike Romano, Senior Vice President for Policy, NTCA, the Rural Broadband Association.

The Chair now recognizes Senator Nelson, the Ranking Member of the Full Committee.

STATEMENT OF HON. BILL NELSON, U.S. SENATOR FROM FLORIDA

Senator NELSON. Mr. Chairman, I do appreciate it. As you know, Florida has many rural areas where we desperately need advanced broadband networks. We do have advanced networks in our state, but in rural areas such as Gilchrist, Dixie, Levy, and even some cities where citizens have little to no access to quality and affordable Internet service and in those areas students often lack the ability to complete their homework, small businesses cannot compete and social and political engagement is hampered.

We have to close this digital divide and leave no area of this country behind. That's why we have wanted to include significant direct investments in broadband deployment in any Federal infrastructure legislation.

Because the administration's proposal is simply inadequate on broadband expansion, it is incumbent on this Committee to work together in a bipartisan way to provide these critical investments. Everyone, from those of us in the Senate, to our mayors, local officials, we want Americans to benefit from the availability of robust broadband.

Building these networks has always raised a number of very sensitive issues from historic preservation and environmental concerns to state and local land use policies to tribal sovereignty and national security. And the highly anticipated 5G wireless technology brings with it networks that will require installation of much denser wireless infrastructure made up of many more small cell facilities. So we ought to have reasoned discussion about these regulatory issues.

That reasoned discussion cannot begin and end with a wiping away of key laws and regulations meant to protect our fellow citizens and important Federal, state, local and tribal interests. Steps that the FCC seems keen to take. And that discussion must include fair and fulsome input from all affected parties, including states and localities. And that's why I'm pleased that Mayor Resnick is here. He is here for a repeat performance. And he's going to provide the Committee with the important local government perspective.

And I hope that all stakeholders, including those represented before us today, can work together to help find ways to effectively balance these competing concerns about siting, construction of broadband facilities and consumers' increasing demand for fast and reliable broadband services.

Mr. Chairman, I thank you.

Senator WICKER. And thank you, Senator Nelson.

Mayor Resnick, we will begin with you. I understand you represent a City of about 11,000 just off I–95; is that correct?

Mr. RESNICK. That is correct. We are Broward County, Florida; east Broward County.

Senator NELSON. Mr. Chairman, they are not far from the very, very terrible, tragic shooting in Parkland.

Mr. RESNICK. That is correct, Senator. Thank you. Two of my colleagues that I work very closely with have children that attend that school. And fortunately they were fine, but they will probably be dealing with the trauma for the rest of their lives. So we do appreciate your sentiments with respect to that.

Senator WICKER. Well, and please do express our concern and good wishes to all of the people who were involved.

Mr. RESNICK. Thank you.

Senator WICKER. And to the citizens of your city.

Mr. RESNICK. Thank you.

Senator WICKER. So proceed with your testimony. Thank you for coming.

STATEMENT OF HON. GARY RESNICK, MAYOR, CITY OF WILTON MANORS, FLORIDA

Mr. RESNICK. Good morning. Thank you so much, Chairman. First Chairman Wicker, Ranking Member Schatz, Senator Nelson, thank you so much for your service for Floridians. We really do appreciate your wonderful service for our country.

I am Gary Resnick, Mayor of the great City of Wilton Manors, Florida. I have the honor of serving on the Board of the National League of Cities and chairing its Information, Technology and Communications Committee.

I want to thank you for the opportunity to share some perspective from city leaders across the country and for calling attention to the importance of broadband infrastructure deployment. I would also like to recognize my fellow city officials who are here today. In fact, many of my friends from Florida traveled here for NLC's Congressional Cities Conference to emphasize the pressing need for infrastructure investment.

I can assure that you no one cares more about competitive broadband access than local governments. We recognize that everyone needs affordable, fast internet. Cities, however, are not the reason that millions of Americans lack the necessary infrastructure in their communities.

Today I would like to outline the challenges cities face in ensuring that all Americans have access to affordable broadband.

I would also like to offer policy solutions to tackle these challenges. First, cities continue to face preemption by states and the Federal Government. Many states do not allow cities to build municipal networks or even to negotiate directly with broadband providers to ensure that all neighborhoods are served. Congress must preserve local authority and allows us to do what we do best, solve problems for our residents.

Second, too many neighborhoods, particularly less dense and lower income areas, have a lack of fiber investment and rural communities are being left totally behind by new leaps in technology. It is simply not sufficiently profitable for private broadband providers to build in many cities and towns leaving residents with inadequate options or none at all.

For too many households, a broadband subscription is simply not affordable. The public libraries in my city are packed after school

with children looking for a place to get online to do their homework. To address these gaps, Congress should strengthen existing programs to expand broadband access and to tackle Federal barriers to infrastructure deployment.

I would like to thank this committee for its work on the MOBILE NOW Act and the Dig Once legislation which eliminates some Federal barriers to deployment.

Finally, preemption of local authority over small cell deployment is bad public policy. Our residents and businesses are being asked to subsidize the private sector's deployment of small cell infrastructure, supposedly for 5G. This technology does not even exist. More importantly, it will not solve our problems of rural access and digital inclusiveness.

Small cell technology is called small, not because it is physically small, but because the signal covers a small area. This makes small cells a good technology for improving signal in profitable downtown areas, but terrible for covering communities with few potential customers.

The Federal Government should work with both local governments and the industry. An example that does not work is the FCC's Broadband Deployment Advisory Committee. It continues to be structurally dominated by industry. The BDAC recently completed a draft model State code that lacked input from a single local official.

Finally, the Federal Government must require responsible industry practices. In the recent hurricane season experienced by my community, and hundreds of others around the country, we lost power and communications because so many of our utilities are installed above ground. Restoring communications was a challenge as cable, phone and wireless providers were slow to assist with recovery efforts.

Companies enjoying access to the incredible valuable public rights-of-way should be good citizens, particularly in times of emergency.

On behalf of the City of Wilton Manors and National League of Cities, I want to thank the Committee for inviting me to participate in this hearing and cities are committed to ensuring that Americans benefit from advances in next generation broadband.

Thank you and I look forward to your questions.

[The prepared statement of Mr. Resnick follows:]

PREPARED STATEMENT OF HON. GARY RESNICK, MAYOR, WILTON MANORS, FLORIDA

Good morning, Chairman Wicker, Ranking Member Schatz, and members of the Subcommittee. I am Gary Resnick, Mayor of Wilton Manors, Florida. I'm here to speak on behalf of the National League of Cities, the Nation's oldest and largest organization representing local elected officials in America's cities and towns of all sizes in your states and across the country.

I currently serve as Chair of NLC's Information Technology and Communications Committee and a member of NLC's Board of Directors. In addition, I served on the Federal Communications Commission's (FCC) Intergovernmental Advisory Committee for eight years, including as Chair from 2014 through 2016. More locally, I have served on the Board of Directors of the Florida League of Cities for 15 years and have chaired various committees for the Florida League addressing communications policies. My background as an attorney with the Florida firm of GrayRobinson, representing businesses and local governments for over 20 years in connection with communication issues, and my role as Mayor, has afforded me a unique opportunity

to work effectively with public and private entities, and local citizens, focused on improving communications services.

I want to thank Senators Thune and Nelson for inviting me here to share some perspective from city leaders across the country. I'd also like to thank the Subcommittee for calling attention to the importance of broadband deployment. I particularly want to thank the members of this subcommittee for their work to advance the dig once language currently included in the FCC reauthorization bill. Commonsense bipartisan policies like dig once will help us move toward responsible broadband infrastructure deployment.

I also want to recognize my fellow local elected officials here today. We are in Washington for NLC's Congressional City Conference, and no doubt you will be hearing from my colleagues in the coming days about how sorely broadband and other infrastructure investment is needed in our communities. Affordable broadband for all Americans is vital for 21st century education, health care, economy, recreation, and public safety.

Cities Want and Need Broadband, But Obstacles Remain

City officials continue to work with our private, state, and Federal partners to close the digital divide and provide the remaining disconnected 10 percent of Americans, including 39 percent of Americans living in rural areas, with access to the FCC's current benchmarked 25 Mbps/3 Mbps service, and more robust service, at affordable rates, that will be demanded by our younger generation.

Cities, perhaps more than any other level of government, understand the absolute necessity of reliable, affordable broadband for our residents and businesses. Local officials are keenly aware of the broadband gaps in their communities, driven by a lack of infrastructure investment by the private sector and broadband options that are far too costly for many residents and businesses. We are also aware of the public need for broadband, as human resources, utilities, city clerks, parks and recreation, and as we just saw only twenty miles from Wilton Manors in Parkland, Florida, police and EMS first responders absolutely need technology to do their jobs.

Despite the diligent efforts by communities across the country, these gaps in service persist and are increasing. If our goal is to ensure that all Americans have access to reliable, affordable broadband services, states and the Federal Government are not adopting appropriate actions consistent with that policy. I appreciate the opportunity to share with you reasons why most Americans do not have appropriate access to affordable broadband, from our local government vantage point, and offer some solutions.

- *Preemption of Local Investment*—In many states and in many FCC orders, local governments are preempted from negotiating with broadband providers or regulating broadband service. In Florida, for example, my City is prohibited from entering into an agreement with a broadband provider for use of our rights-of-way. Cities and counties in Florida also have no authority to regulate broadband service. The same holds true for state agencies, including the Florida Public Service Commission, and even the FCC. Without the ability to enter agreements or to regulate broadband providers, the only reason for a broadband provider to provide service is profit. Not all potential consumers are going to provide sufficient incentive for private investment in broadband infrastructure. It is up to government to address this gap where the market fails.

  Many local governments have heard their residents' complaints and attempt to address the lack of affordable, reliable broadband either on their own with public municipal broadband networks, or by pursuing public-private partnerships. Mayors are good at getting things done. However, once again, we are preempted by industry-backed state laws that not only prohibit local governments from offering broadband, but some that require local governments that have already built taxpayer-funded networks to shut them down. NLC's Center for City Solutions and Applied Research found that in 2016, nearly half of states preempted cities from creating—or even exploring—municipal broadband networks.[1] Yet, as we have seen with the large number of successful ballot initiatives in cities in Colorado, the demand remains enormous, and needs continue to go unmet by the private sector. In Fort Collins, Colorado, the city's residents recently passed a referendum granting the city permission to build a municipal fiber network, despite industry spending nearly a million dollars campaigning against

[1] National League of Cities. "City Rights in an Era of Preemption," February 22, 2017. Online at *http://www.nlc.org/preemption.*

it.[2] Imagine how many broadband customers could have been served by those dollars, if they had not been spent fighting a local government attempt to fill a void where there was not even a private competitor.

- *Lack of Fiber Investment*—Even in urban and suburban areas, like my City, neighborhoods lack the necessary infrastructure for true in-home or business broadband. As leaps in technology move wealthy, highly profitable neighborhoods ahead, many areas are being left further and further behind. Despite offering fairly high density in eastern Broward County, Florida, and having two of the largest wireline broadband providers competing home by home, my City does not enjoy fiber to the home, except in a few private developments that are served by smaller, nimbler providers who negotiated contracts that they feel can provide appropriate compensation for their investment. If smaller companies can manage this, why not the large incumbents? This is the same across Florida and the Nation. When some potential competitors announce they will construct fiber, we see the incumbents hold press conferences to announce increased investment in fiber, but this is extremely rare, particularly as competitors pause fiber builds and cities face court challenges to prevent or delay access to utility poles. As we recently saw in the legal challenge to the City of Louisville's One Touch Make Ready ordinance, incumbents are willing to invest significant resources to maintain barriers to competition that could increase consumer choice.[3]
- *Our Forsaken Rural Communities*—While residents and businesses in more populated areas can generally obtain broadband service, though often at a high price, our Nation's policies and actions on broadband have not closed the digital divide in rural areas. Small and rural communities are often the last to receive improved technology, because of the high cost of construction and relatively low return on investment. There is no incentive or regulatory mandate for a private company to build broadband to serve customers in areas that will not generate sufficient profits. In some communities, it may never be profitable for a private company to offer broadband. That does not mean that we are absolved of our responsibility to ensure that those residents have access to a vital modern utility.

  While my home in Wilton Manors is in a relatively urban area, I also have experience with trying to obtain reliable broadband in rural Georgia for a family home. There is one landline communications provider serving the area, and it does not offer broadband. The maximum data service is 5 mbps download for about $60 per month. Many residents in the area rely solely on wireless data. For vacationers, this may be fine. However, for families with children or people running businesses, the lack of broadband hurts educational and economic opportunities and harms economic development in these areas.
- *Financial Issues*—Even in neighborhoods with broadband infrastructure, high rates can keep families from getting and maintaining a subscription. Increased housing, medical, and educational costs make it difficult for many households to budget for broadband, despite its importance. The public libraries in my area are packed after school with children looking for a place to do their homework, since they do not have broadband access at home. While teenagers live on their smart phones, despite what the FCC may think, there are limits to what you can do on such devices and wireless broadband is similarly not affordable for many families.

  While we are on the subject of money, the wireless broadband industry has been successful in getting taxpayers to subsidize the industry's access to public assets and rights-of-way. For example, in Florida, cities and counties cannot charge service providers for use of public rights-of-way. Taxpayers pay 100 percent of our costs to maintain the public rights-of-way. Also, we cannot charge permit fees to process applications to construct infrastructure in our rights-of-way. Taxpayers foot the bill for our staff time to review these applications. This is particularly a problem for smaller cities that do not have in-house staff and pay out of pocket for outside contractors to review permits. While Florida established a communications services tax for communications providers using public

[2] Nick Coltrain. "$900K spent on failed fight against Fort Collins broadband," December 8, 2017, The Coloradoan. Online at *https://www.coloradoan.com/story/news/2017/12/08/fort-collins-broadband-vote-spending/934967001/*.

[3] "Judge throws out AT&T suit against city's 'Google Fiber' proposal." Louisville Courier-Journal, August 16, 2017. Available *https://www.courier-journal.com/story/news/politics/metro-government/2017/08/16/judge-throws-out-at-t-suit-against-citys-google-fiber-proposal/573863001/*.

rights-of-way, a portion of which is distributed to cities and counties, the providers do not pay that. Rather, the tax is paid entirely by their subscribers as line items on bills. Ironically, there is no tax on Internet service or prepaid wireless service, so the fastest growing and most profitable services that benefit the most from use of public rights-of-way contribute nothing for rights-of-way maintenance.

Also, around the country, the industry has lobbied for State legislation—and is pushing soon to be released FCC regulations—giving them access to publicly owned light and traffic poles at virtually no cost. In Florida and many other states, the maximum rate Verizon or AT&T pays is $150/year/pole. The typical cost to our taxpayers to purchase and to install a new light pole is $15,000. The industry pays roughly 1 percent of the cost and once again, taxpayers subsidize this industry's use of public resources. Market rates for access to poles where local governments are not preempted from charging market rates are closer to $2,000/pole/year. Given the tremendous expenses cities and counties around the U.S. are incurring, with aging infrastructure, soaring health care costs for employees and first responders, and costly improvements for public safety, this is not the time to be asking local governments' residents to subsidize a for-profit communications industry that is hardly in need of a handout.

- *Preemption of Local Authority Over Small Cells Is Not a Silver Bullet*—While wireless providers have touted the potential of 5G, it is important to keep in mind the realities of prospective 5G networks, and the limitations of the technology. 5G deployment will not be a panacea for digital inequity in the United States, particularly in rural areas. 5G, which is still being standardized, necessitates the buildout of hundreds of thousands of small cell sites because the portion of the spectrum it uses cannot travel very far. Small cell technology is called small not because it is physically small, but because the signal covers a small area. This makes them great tools for densifying downtown networks and event venues, but terrible tools for covering sparsely populated, far-flung communities. At a conference last week, the big 4 wireless carriers announced their 5G market plans. No location in Florida, Mississippi, or South Dakota is on anyone's plans for 2018 or 2019. They are looking at the most profitable markets, like Dallas, Atlanta, Chicago and a few others. They will not extend 5G to rural areas, nor to areas where there will not be many customers because of the high rates. Even if we eliminate all local permitting processes, and every environmental and historic review, we cannot streamline our way out of the cost to deploy broadband in rural areas.

Policy Recommendations for the Subcommittee

As the Subcommittee works to promote the advancement of next-generation technology, I hope that you will also maintain focus on a core goal of ensuring that all Americans have reliable access to affordable, truly high-speed broadband. To further that goal, NLC has proposed a number of actions the Federal Government can take to increase broadband availability, affordability, and adoption.

- *Work in Partnership with Local Governments*—Congress and the FCC should more actively engage local governments in Federal decision-making processes. Since I last testified, the FCC's Broadband Deployment Advisory Committee (BDAC) has continued its work to create policy recommendations on broadband deployment without a sufficient balance of public and private interests. Local government representatives are outnumbered on that committee by industry by a ratio of ten to one, and the BDAC's work on a model state code was completed behind closed doors without input from a single local government committee member.

  One local official, Mayor Sam Liccardo of the City of San Jose, was driven to resign from the committee by its overwhelmingly biased process and predetermined outcomes.[4] As Mayor Liccardo had noted in the few public meetings of the BDAC, the committee's recommendations have done nothing to address the challenges of broadband access and affordability in low-income and rural communities, despite the Commission's stated goal of closing the digital divide. When the Mayor of America's 5th largest city is not being allowed to provide meaningful input on important national policy that will affect his and all communities in the country, something is wrong with this process. We do not believe the BDAC represents a good-faith effort by the FCC to engage in meaningful dialog or create consensus around the best ways to expand broadband ac-

[4] Mayor Sam Liccardo, Letter to Ajit Pai, January 25, 2018, Available online at *http://www.sanjoseca.gov/DocumentCenter/View/74464.*

cess. If state, tribal, and local officials are willing to volunteer their time and travel to these meetings at the expense of their communities, the FCC must take advantage of their contributions.

- *Preserve Local Authority*—I urge this Committee to avoid further preemption in legislation focused on broadband. While I understand the drive to deploy 5G infrastructure efficiently and cost-effectively, we must not subsidize one sector of the broadband industry at taxpayers' expense. Imposing new restrictions on cities such as unreasonable shot clocks, restrictions on rent for public property to "actual and direct costs," and deemed granted remedies will only ultimately harm cities' ability to manage responsibly the public rights-of-way for all users. Cities continue to face mounting pressure to provide an increasing number of critical services, yet states—and now federal—governments are restricting our ability to raise additional revenue to carry out necessary activities.

  The Federal Government should understand that even if it adopts the industry's recommendations and preempts local governments further, cities and counties will not sacrifice residents' and businesses' health, safety and welfare by allowing infrastructure where it does not belong. Years of litigation is certainly not a good broadband policy. We best understand our communities' needs and concerns. It is foolish to try to develop national regulations for deploying broadband infrastructure without local governments having a seat at the table.

- *Strengthen Existing Federal Programs to Expand Broadband Access*—As this Committee and others work to invest in broadband infrastructure, I encourage you to focus your efforts on strengthening existing Federal programs that work. Programs should be improved and updated, rather than eliminated or replaced with new systems. Every Federal grant or loan comes with a certain amount of application and compliance work for eligible cities, and leveraging existing programs streamlines the process by allowing communities to use the programs they already know how to manage. For example, the Community Development Block Grant and Choice Neighborhood Grant programs are extremely flexible tools for communities that can be used for broadband planning and deployment alongside affordable housing and neighborhood improvement projects. These programs should be protected and fully funded.

  Congress should also support existing broadband grant and loan programs that directly distribute Federal dollars to local governments and community institutions that work on broadband planning and deployment. The now-concluded Broadband Technology Opportunities Program, the U.S. Department of Agriculture's Rural Utilities Service, and the various components of the Universal Service Fund programs are important tools for closing the digital divide in unserved and underserved communities. Congress should work to ensure that these programs are sustainably funded and have the flexibility to reach as many people as possible, while also ensuring that money is spent responsibly and where it is most needed.

- *Tackle Federal Barriers to Infrastructure Deployment*—I thank the Subcommittee members for their efforts in directly addressing Federal barriers to broadband infrastructure deployment. In particular, passage of the bipartisan MOBILE NOW Act and the dig once provision within the recently-passed FCC reauthorization legislation will support deployment of broadband infrastructure. By freeing up Federal spectrum, streamlining access to Federal lands, building a database of available infrastructure, and implementing common-sense dig once policies for Federal construction, the Committee is helping to eliminate obvious barriers to deployment in Federal systems.

  NLC also encourages Congress to strengthen the Federal Government's role in data gathering and management to ensure that private and public investments are made where they are most needed. Congress must not only call for an update to the National Broadband Map, but ensure that agencies are adequately resourced to gather that data and that the data provided to the public is accurate. Congress should also encourage the FCC to take action on our 2016 recommendation from the Intergovernmental Advisory Committee to create and maintain a comprehensive database of facilities available for wireless infrastructure collocation, particularly macro cell towers. Collocation reduces the costs and physical imposition of wireless infrastructure in our communities, and should be encouraged as we deploy many more small cell structures. The IAC recommended that it would be a good practice for local governments and the FCC to maintain such information to collocate wireless communications facilities more easily.

- *Allow Local Governments to Use Every Tool in the Toolbox*—We need every tool in the toolbox to ensure our residents can have access to affordable, modern broadband and do not wind up subsidizing the provider and infrastructure industries without obtaining significant benefits in return. That means allowing local governments to implement innovative policies like touch-once, which minimizes the time and disruption necessary to add new broadband providers to existing utility poles.

  Cities also need the freedom to develop municipal broadband networks, if appropriate, without outright or effective preemption that limits competition. Smaller and rural communities that have successfully developed partially or wholly publicly owned networks have found this option to be a critical lifeline in a market where private providers cannot realize a high return on investment. As broadband has become a necessary component for cities to retain talent and attract business, denying them this option ensures that they will continue to experience "brain drain" and fewer economic opportunities. Furthermore, if the Administration and Congress wish to encourage local investment in infrastructure, removing state barriers to direct local investment in that infrastructure is an important first step.
- *Require Responsible Industry Practices*

  Utility Responsibilities

  Utilities such as electric and gas do not enjoy the kinds of taxpayer subsidies demanded by the wireless industry. While electric utilities enjoy access to public rights-of-way, that access comes with costs and obligations. These include permitting fees, payment for access to public property, and obligations to provide certain levels of service to everyone—even in unprofitable neighborhoods. Those utilities are also obligated to partner closely with local governments during emergencies, and to repair any damage in a timely fashion.

  The City of Lincoln and other Nebraska local governments supported reducing the city's fee per pole from its present market rate fee of around $2,000 per pole per year to $95, if wireless providers would agree to build out the State with 5G infrastructure starting in rural areas. According to cities in Nebraska, the industry refused, preferring to pay higher pole access rates than providing service in areas that were not profitable. The same response was received in Leon County, Florida, where Tallahassee is located. When asked at a public hearing if the industry would bring 5G to inner city areas where families lack reliable broadband access, the industry, in a surprisingly candid moment, said no, and the County Commission was advised that Florida law preempted the County from requiring such buildout.

  Emergency Preparation and Recovery

  We also learned a lot this year from the horrible storms that struck Texas, Florida, Puerto Rico and the Virgin Islands. Regulated electric utilities worked with local governments to better prepare for and to recover from the disasters. In Florida, after Irma, we had daily contact with electric utility representatives who were embedded in our emergency operations centers. When cities were working to remove downed trees and debris to re-install utility poles and lines, we worked 24/7 with electric utility contractors. However, since there are no regulations, we did not hear from cable and phone companies, and getting them to move their lines in streets or to restore services in some communities was a challenge. Congress should analyze what occurred in Houston and consider whether undergrounding utilities should be a national priority. It appeared that utilities and communications functioned in Houston despite the tremendous flooding because they are underground. In Florida, most communities have aerial utilities, and lost power and communications during Hurricane Irma.

  Also, unlike electric utilities, such companies continue to charge when they do not deliver service after a hurricane unless the customer requests a credit, which residents found absolutely appalling. Wireless providers were nowhere to be found. With no power for towers, many communities reached out for Cells on Wheels powered by generators, but the industry was absent from recovery efforts. Perhaps FEMA should mandate such items for recovery efforts.

  Rights-of-way Repair

  Virtually all local governments have also had their rights-of-way and other utilities within the rights-of-way damaged by the communications industry, from the smallest cable installers to the largest incumbent providers. This is just the side effect of performing construction in the rights-of-way. However, without the proper authority to require repair and restoration, our communities suffer from unchecked water, sewer and gas leaks, and interference with access to transpor-

tation and businesses. Local governments throughout the country require security funds, insurance, and bonds to ensure that rights-of-way and utilities are properly repaired after damage. Nonetheless, it is difficult to get these companies to do the right thing. When a contractor for Crown Castle, working on a Saturday without a permit, damaged newly installed brick pavers on Miracle Mile in Coral Gables, the city had to sue and refuse to issue new permits to get the company to pay for repairs.

Conclusion

On behalf of NLC and the City of Wilton Manors, I want to thank the Committee for inviting me to participate in this hearing today. I offer the ongoing assistance of local governments as you examine ways to increase broadband deployment responsibly across our Nation. I urge you to view local governments as strong partners in ensuring that broadband services are available to all Americans.

Thank you, and I look forward to any questions you might have.

Senator WICKER. Thank you, Mr. Mayor.

Mr. Berry.

STATEMENT OF STEVEN K. BERRY, PRESIDENT AND CHIEF EXECUTIVE OFFICER, COMPETITIVE CARRIERS ASSOCIATION

Mr. BERRY. Chairman Wicker, Ranking Member Schatz and members of the Subcommittee, thank you for inviting me to testify on ways to preserve and expand mobile broadband in rural America. I'm here on behalf of CCA representing nearly a hundred wireless carriers, as well as the companies that make up the wireless ecosystem to say thank you, thank you to you and your colleagues for making broadband services in rural America a priority.

Like this Committee, every CCA member has an interest in closing the digital divide for their communities, families and businesses. On this day 34 years ago the very first handheld cell phone was sold for just under $4,000. Yes, wireless has come a long way since the brick, and we depend on mobile broadband coverage for every aspect of life, from jobs to public health and safety.

Tech companies recently announced plans to deploy 4G mobile broadband on the Moon. Yet, too many in rural America are unserved or underserved.

In 2016 Americans consumed 1.8 billion gigabytes of data per month using wireless connections. This is more than 7,000 times the total of all information stored in the Library of Congress each month.

Wireless usage will grow another fivefold over the next 5 years. To keep up with this demand and ensure that rural areas are not left behind, Congress should act on three key issues. One, provide sufficient and predictable funding for high cost areas. Two, base decisions on reliable data. And, three, streamline policies to site equipment and access new spectrum.

Rural America must have mobile broadband as a centerpiece. The 2009 stimulus package failed to fund mobility. We must include specific funding to support, preserve and expand deployment where private capital alone is not enough to make the business case for broadband service.

As Congress appropriates funds for infrastructure, significant amounts should be made available for mobile broadband deployment. Funding sources for broadband should ensure this committee, with its vast experience, maintains jurisdiction and oversight over how the funding will be efficiently and effectively spent.

Additional broadband funding is a must, but it does not replace the long-term need for ongoing universal service funds.

The FCC's implementation of the USF must meet Congressional mandates for reasonably comparable services in urban and rural areas and provide sufficient and predictable support. I thank Senators Hassan and Capito for addressing this issue in their legislation. The FCC should define what is reasonably comparable service and design USF, as Wayne Gretzky once said, to skate where the puck is going, not where the puck has been.

Second, we cannot afford to distribute funding based on a ready, fire, aim approach. You cannot manage what you cannot measure. Current data on mobile broadband coverage does not reflect the reality on the ground. You, as you travel your states, you know the job is not done.

I agree with concerns raised by members of this Committee last week that a recent FCC eligibility map misrepresents the existence of wireless service. It is so flawed that a challenge process may not be sufficient to correct it. In this regard I thank the Senate for passing the Rural Wireless Access Act, acknowledging the critical need for accurate, reliable data. Whether appropriated resources or ongoing support for the Mobility Fund II, funding distributions must be made on informed decisions.

Third, deployment and spectrum. Today's carriers face a maze of regulatory red tape to build and upgrade both towers and smaller cells with fees and delays at each step, and I thank the Committee for its steadfast focus and strongly support legislation introduced to streamline the siting process including the Mobile Now, the SPEED Act, Dig Once and the Rural Deployment Act. We also encourage the FCC to act swiftly to vote to update procedures for modern deployments. Remember, small cells are not just for big cities.

Just last week I was with FCC Commissioner Carr in the Shenandoah Valley examining how smaller cells and deployments are actually bringing new, latest services to rural America.

All carriers need access to high-, mid-, and low-band spectrum, the invisible infrastructure, if you will. The FCC should move quickly to auction spectrum currently available for mobile services, including high band spectrum. For low band access we must repack the 600 megahertz spectrum within the approved 39 month timeline, and if additional funds are needed, then they should be made available immediately.

And, finally, access to broadband is the opportunity equalizer in the modern mobile economy. Policies established by Congress and implemented by the FCC will determine whether rural Americans are part of the new economy or will they be left behind in the pursuant of a 5G IoT world.

Thank you and I welcome your questions.

[The prepared statement of Mr. Berry follows:]

PREPARED STATEMENT OF STEVEN K. BERRY, PRESIDENT AND CHIEF EXECUTIVE OFFICER, COMPETITIVE CARRIERS ASSOCIATION

Chairman Wicker, Ranking Member Schatz, and members of the Subcommittee, thank you for the opportunity to testify about closing the digital divide and the policies necessary to provide ubiquitous mobile broadband throughout the United States.

I am testifying on behalf of Competitive Carriers Association ("CCA"), the Nation's leading association of competitive wireless providers. CCA is made up of nearly 100 carrier members ranging from small, rural providers serving fewer than 5,000 customers to regional and national providers serving millions of customers, as well as vendors and suppliers that provide products and services throughout the mobile communications ecosystem.

I commend the Subcommittee for its continued focus on closing the digital divide. Building infrastructure for the next generation of services and technologies includes preserving, upgrading, and expanding existing mobile broadband services. CCA is pleased that mobile broadband deployment in rural America is a top priority for Congress, the Federal Communications Commission ("FCC"), and the Administration.

Consumer demand for mobile broadband services is undeniable. In 2016, American consumers used 1.8 exabytes of data on their smartphones, tablets, and other devices connected to wireless networks each month. That amounts to 1.8 billion gigabytes, or by way of comparison, more than 7,000 times the total of all information stored in the Library of Congress. This insatiable use demand for data will grow exponentially, with projections of another five times growth over the next five years.

Ever-growing mobile data use reflects the limitless potential for innovations touching every industry and aspect of life in today's mobile economy. For example, mobile networks and next generation services are transforming healthcare through remote monitoring and new health treatments, including in rural areas where patients must otherwise drive hundreds of miles to receive care. Precision agriculture technologies allow farmers to become agricultural engineers, reducing economic resources and increasing productivity on our Nation's farmlands and ranchlands. Mobile broadband supports distance learning and creates educational opportunities for students unimaginable only a few years ago. All of these applications are powered by mobile broadband today. As we move towards 5G technologies, applications once considered science fiction will become reality, with networks supporting drones, autonomous vehicles, and artificial intelligence continuing to change our lives.

However, reliance on mobile broadband networks only magnifies the problems associated with being on the wrong side of the digital divide. Indeed, the President's Interagency Task Force on Agriculture and Rural Prosperity recently presented a report focused on e-connectivity for rural America, finding that access to broadband "is not simply an amenity—it has become essential." The Administration has already taken steps to support expanding broadband, including the Presidential Executive Order on Streamlining and Expediting Requests to Locate Broadband Facilities in Rural America, finding that "Americans need access to reliable, affordable broadband Internet service to succeed in today's information-driven, global economy." But more needs to be done.

CCA is proud of our members' work to provide mobile broadband services in rural and remote areas. While they have invested millions of dollars into their communities, Congress, the Administration, and the FCC must work together to enact policies that connect the unconnected. Technology companies recently announced plans to deploy 4G LTE mobile broadband service on the moon—Americans living in rural America deserve no less. To close the digital divide and advance deployment in unserved and underserved communities, competitive carriers need sufficient and predictable sources of funding, streamlined deployment processes, and access to spectrum and equipment.

Legislative Proposals to Rebuild America's Infrastructure Must Include Funding for Mobile Broadband

Bipartisan infrastructure discussions from the campaign trail through the recent Administration proposal to Congress focus on the need for broadband deployment in rural America. As proposals move from ideas to concrete legislative language, it's clear broadband is the centerpiece driving economic growth and jobs in rural America. CCA agrees with this Committee and many other members of Congress that any infrastructure package should include dedicated funding for rural broadband.

The Bipartisan Budget Act, enacted last month, included $20 billion over the next two fiscal years for rural infrastructure. As Congress determines how to appropriate these funds, it should dedicate resources specifically for mobile broadband deployment. The Administration also has proposed allocating an additional $50 billion for rural infrastructure in its recent proposal. While the proposal provides funds as block grants to governors and even permits 100 percent of funding to be used for broadband projects—it does not *require* that any funds exclusively support broadband deployment. The goal of building infrastructure for the next generation cannot be met without specifically building broadband infrastructure.

Funding also should be available on a technologically-neutral basis. The American Recovery and Reinvestment Act of 2009 ("ARRA") included a scoring metric for certain applications for support through the Rural Utilities Service's ("RUS") Broadband Opportunities Program that placed the heavy thumb of the government on the scale to disadvantage wireless carriers. CCA encourages use of grants instead of loans due to the costly, unnecessary bureaucratic red tape that accompanies current RUS loans; however, if loans are provided, they should not be comingled with Universal Service Fund ("USF") resources.

Further, to ensure that funding is well spent, it is important that this Committee maintain jurisdiction over broadband funding programs. With oversight by this Committee, Congress should make support available through the Department of Commerce National Telecommunications and Information Administration ("NTIA") or through the FCC. If funding does flow through the FCC, any one-time investments should not jeopardize the critical and ongoing role of USF or place USF under the appropriations process. Commerce Committee oversight of rural broadband support is extremely important, leveraging Commerce Committee expertise and providing a safeguard against waste.

All Programs to Disburse Funding for Broadband in High Cost Areas Must Be Based on Reliable Data

You cannot manage what you cannot measure. Moving forward, it is critical to accurately measure the extent of unserved and underserved areas across the United States to implement practical, useful solutions to expand mobile broadband service to all consumers. As an example, the National Broadband Map was funded through ARRA. While important and well-intentioned, NTIA delivered the map after decisions for deployment funding awards had been made. We cannot afford to distribute funds in the future on a ready, fire, aim basis. Accurate data is an absolute for precisely targeting funds for future broadband buildout.

As another example, the FCC recently released mobile broadband data depicting areas initially deemed eligible for the Mobility Fund Phase II ("MF II") mechanism of the USF High Cost Fund. While we understand that the map released does not determine final eligible areas, the technological parameters selected by the FCC were not sufficient to produce a map that would reflect the experience you have as you travel throughout your states. CCA has long supported an efficient challenge process that is robust and targeted without overly burdening small providers. Unfortunately, the initial map released by the FCC falls short. CCA cautions against using this data as the basis for MF II or any other funding program, including forthcoming support for broadband infrastructure. We share concerns raised by Senators Wicker, Hassan, Moran, King, Gardner, Klobuchar, Roberts, Blunt, Peters, and Tillis last week that the map "misrepresents the existence of 4G LTE service in many areas" and accordingly a challenge process may not be robust enough to correct it.

At the same time, CCA appreciates actions by the FCC and other Federal agencies to correct the digital divide. In testimony last week, NTIA Administrator Redl noted the need to improve broadband mapping data, including that data must be more accurate, granular, and verified. The President's budget request included $50 million to update the National Broadband Map, and as Administrator Redl highlighted the NTIA can also leverage relationships with state and local governments to ensure accuracy. If other agencies lack the resources to establish parameters for data collection to accurately reflect your constituents' experience, NTIA should revisit the issue prior final to funding decisions.

CCA likewise commends the Senate for unanimously passing S. 1621, the Rural Wireless Access Act, and thanks Senators Wicker and Manchin for steadfastly championing this issue. We urge the House of Representatives to swiftly act to send this important legislation to the President for enactment so that the information used as a basis for USF decisions, or decisions for other similar programs including new infrastructure funding, are grounded in standardized, reliable data that reflects constituents' expectations.

The Universal Service Fund Must Meet Congress's Mandate

Regardless of any new support for mobile broadband through infrastructure efforts, ongoing support through USF remains critical. Congress created the USF high-cost program to provide Americans in rural areas with a "reasonably comparable" service as those in urban areas through support that is sufficient and predictable. In implementing this mandate, however, the FCC does not currently define "reasonably comparable" service. CCA supports S. 2418, the Rural Reasonable and Comparable Wireless Access Act of 2018 to establish this standard, and thanks Senators Hassan and Capito for introducing this important bill. If enacted, the FCC

must promulgate regulations to establish this standard, which provides an important step to clarify what services must be available to rural Americans.

Without a set standard, it is not clear that resources allocated by the FCC are sufficient. It is widely understood that the $4.53 billion budgeted for MF II will not ubiquitously expand mobile broadband networks. Reasonable and comparable standards can inform what parameters should be set for future data collections to revisit the goal of reliable mapping data.

With the focus on securing immediate funds for broadband infrastructure through appropriated resources, Congress also should consider directing the FCC to maintain current USF support for mobile broadband services and conduct the MF II auction after new infrastructure funds are disbursed. This practical action would allow the FCC to more accurately assess the ongoing needs to preserve and expand service after one-time infusions of support, and direct limited resources to areas in need.

Streamlined Infrastructure Siting Policies Increase Certainty and Reduce Costs to Deploy Mobile Broadband

While consumers have come to rely on wireless connectivity, the network itself depends on physical infrastructure, including towers, small cells, wires, and fiber, to connect. Competitive carriers must timely and efficiently deploy this infrastructure. Currently, however, providers must navigate a regulatory maze to gain approval to serve their communities, facing significant application review delays and burdensome, unforeseen fees while working through the federal, state, and local siting processes. To visualize the multitude of regulatory steps it takes to site mobile wireless infrastructure at the local, state, and Federal levels, with potential costs and delays at each step, please see the chart attached to this testimony.

Adding another barrier to infrastructure deployment, fees and administrative burdens attached to historic and environmental review processes have escalated sharply in recent years, and these costs and permitting delays will continue to rise as CCA members deploy to meet consumers' increasing data demands. Without Congressional and FCC intervention, deployment fees will become an increasingly exorbitant cost barrier to ubiquitous broadband deployment. For example, one CCA member operating in portions of Kansas, Colorado, and Nebraska paid over $107,000 to 36 Tribes for the deployment of just seven towers, in a seven-month period. This is an average of over $15,000 per tower, solely for Tribal review fees. One CCA associate member was assessed nearly $3 million in Tribal fees to deploy just under 3,000 nodes across the United States in a one-year period, from 2017–2018. It is not sustainable for carriers to continue expending these enormous funds, especially considering future networks will require denser deployment scenarios.

Fortunately, help is on the horizon. CCA applauds Congress's focus on the issue, and recent steps taken by the Administration and FCC to reduce regulatory burdens, increase certainty, and eliminate needless costs. The bipartisan legislation stemming from this Subcommittee alone demonstrates your commitment to closing the digital divide and connecting all Americans. S. 19, The Making Opportunities for Broadband Investment and Limiting Excessive and Needless Obstacles to Wireless Act or MOBILE NOW, led by Committee Chairman Thune and Ranking Member Nelson, makes common-sense reforms to Federal Government siting process, while freeing up valuable spectrum resources for commercial mobile use. S. 1988, the Streamlining Permitting to Enable Efficient Deployment of Broadband Infrastructure Act of 2017 or SPEED Act, spearheaded by Subcommittee Chairman Wicker and Senator Cortez Masto will make it easier to deploy small cells by exempting them from repetitive installation reviews. S. 2381, the Streamlining and Investing in Broadband Infrastructure Act introduced by Senators Klobuchar, Daines, Gardner, and Gillibrand would ensure broadband conduits be included in highway projects, a critical step in the rural buildout process. And S. 1363, The Rural Broadband Deployment Streamlining Act offered by Senators Heller and Manchin would establish best practices at the Department of Interior and Forestry Service by enforcing accountability in the broadband application process with uniform applications, streamlined processes, direct points of contact with the agencies, and a deemed granted provision.

Further, later this month the FCC plans to vote on a Second Report and Order ("Order") that will streamline infrastructure siting policies for mobile broadband. As proposed, this Order will exclude small wireless facilities from the environmental and historic review procedures that were designed for large macrocell deployments, update the Section 106 Tribal consultation process, and adopt a shot clock for the FCC's own processing of Environmental Assessments. Under current siting policies, the same regulations apply to tall towers and macro deployments as to small cells and distributed antenna systems. Building the networks of the future cannot be completed with yesterday's rules and regulations. Updating these policies for small

wireless facilities meets a key proposal from the Administration's "Legislative Outline for Rebuilding Infrastructure in America," which finds that small cells are materially different than their predecessors, regarding both size, and visual or actual impact on historic or environmental property. CCA urges Congress to support these efforts and stands ready to help ensure these policies are enacted.

To be clear, small cells are not only deployed in urban areas. In recent conversations with CCA members serving the most rural portions of our country, CCA has heard stories of using small cells to enhance coverage in county seats, schools and meeting centers, and even a popular boat ramp in a recreation area. Last week, I joined CCA member Shentel and FCC Commissioner Brendan Carr in rural Shenandoah Valley, Virginia, to discuss the importance of small cell deployment to Shentel's network and to the communities it serves. Shentel's customers use an average of 10 gigabytes of data per month and in some cases, wireless devices are their only connection to broadband. Shentel plans to build out 20 small cells on their network this year in an effort to meet growing consumer data demands. Eliminating costly Federal reviews could provide Shentel enough savings to deploy an additional 13 sites, strengthening and expanding their network service area.

Shentel is not alone. Just two weeks ago, twenty-three other CEOs and senior executives from non-nationwide CCA member companies joined together to urge the FCC to streamline infrastructure policies by providing regulatory certainty around siting processes, timelines, and fees to deploy and upgrade mobile broadband services. These companies serve rural populations represented by this Committee: from the upper Midwest, across Appalachia, throughout the Gulf Coast, over the Great Plains, into the desert Southwest and up to Alaska—each committed to bridging the digital divide in their communities. A copy of that letter is attached.

It is important to underscore that infrastructure reform need not pit wireless carriers against the municipalities and states they serve. Instead, streamlined processes will save resources for both carriers and government agencies by eliminating redundant and unnecessary reviews and spurring investment in local communities. Enhancing access to rights-of-way, reducing and eliminating fees, and streamlining siting processes will allow rural communities to connect exciting and innovative new technologies, including precision agriculture, telehealth, and the Internet of Things. Your constituents deserve nothing less, and CCA commends this Committee's unwavering leadership to address these issues.

Next Generation Services Depend on Increased Access to Spectrum

Beyond funding and streamlined deployment policies, the next generation of mobile broadband services depends on a myriad of spectrum resources. Spectrum is the invisible infrastructure connecting users to towers and base stations. It also is a finite resource, and only available for use through a license or lease by the FCC. As demand for mobile service explodes, all carriers must have access to low-, mid-, and high-band spectrum to deploy next-generation mobile broadband and, eventually, 5G networks. Competitive carriers, in particular, must deploy spectrum that is interoperable within bands to support an equipment ecosystem driven by the scaled economies of the largest carriers. It is equally important that spectrum is auctioned in sufficiently small geographic license sizes that balance local access to spectrum and the laws of physics with regard to power levels and interference. CCA urges Congress to consider the following policies to ensure that taxpayer-owned spectrum is properly managed.

Auction Deposits. Absent Congressional action to allow depositing auction upfront payments in the U.S. Treasury, FCC Chairman Pai has indicated that the FCC will be hamstrung from auctioning spectrum in the near-term. Auctions are particularly important for competitive carriers that may not have the size, resources, or access to purchase spectrum licenses on the secondary market. While other nations are moving forward with spectrum auctions, particularly to support 5G services, it is critical that the United States does not fall behind. Congress must authorize this change in the auction process and encourage the FCC to auction all bands suitable for mobile broadband use as soon as possible, and the FCC should move forward with a proceeding to begin the auction process.

600 MHz. The first-of-its-kind 600 MHz spectrum auction closed on March 30, 2017, with total bids nearing $20 billion and most of the winning bids coming from CCA members. CCA commends this Committee for the leadership in authorizing the auction and establishing a new model for spectrum reallocation now proven in the market. Now that the auction has closed, both the wireless and broadcast industries are in the midst of a Congressionally-based 39-month "repack" process to clear broadcasters out of the 600 MHz band as safely and efficiently as possible to allow winning bidders to put this spectrum to use to serve consumers and monetize their investment. The propagation characteristics of the 600 MHz band make this spec-

trum particularly important for serving rural America. For this reason, completing the transition within the timeline or sooner is critical for economic stimulation and job opportunities across rural areas, as well as setting important precedent for future auctions. Any delay would be detrimental to competition, the public interest, and the economy. CCA commends recent action by the House of Representatives, which passed legislation creating a reserve fund to keep the process on time in the event the allocated resources to repack broadcasters proves inadequate, and encourages the Senate to swiftly consider similar legislation. It is important for Congress to make funds readily available to ensure that delays do not prevent winning bidders from putting this spectrum into operation as quickly as possible.

mmW. As carriers seek to densify their networks, and as standards are developed for tomorrow's 5G technologies, unique spectrum bands that are newly allocated for mobile broadband use are in high demand. To ensure that competitive carriers are not left behind, policymakers must rapidly auction several high frequency millimeter-wave ("mmW") bands, including the 24 GHz, 28 GHz, 37 GHz, 39 GHz, and 47 GHz bands. CCA commends Senators Gardner and Hassan for introducing S. 1682, the Advancing Innovation and Reinvigorating Widespread Access to Viable Electromagnetic Spectrum Act or the AIRWAVES Act. This bipartisan legislation sets a timeline for future auctions to keep the FCC focused and provide certainty to carriers with regard to when spectrum will come up for auction. We support this legislation and urge inclusion of all bands ready for mobile broadband use to ensure sufficient spectrum is available for all carriers to have a meaningful opportunity to bid and win licenses. The nation's two largest carriers have a foothold in several of these bands through secondary market transactions, necessitating an auction as soon as practicable.

Demand for mobile broadband shows no signs of slowing down. Policymakers must remain focused on promoting the efficient use of spectrum and reallocating frequencies to ensure this finite resource is available for carriers of all sizes to access for mobile broadband use.

All Carriers Require Access to Equipment

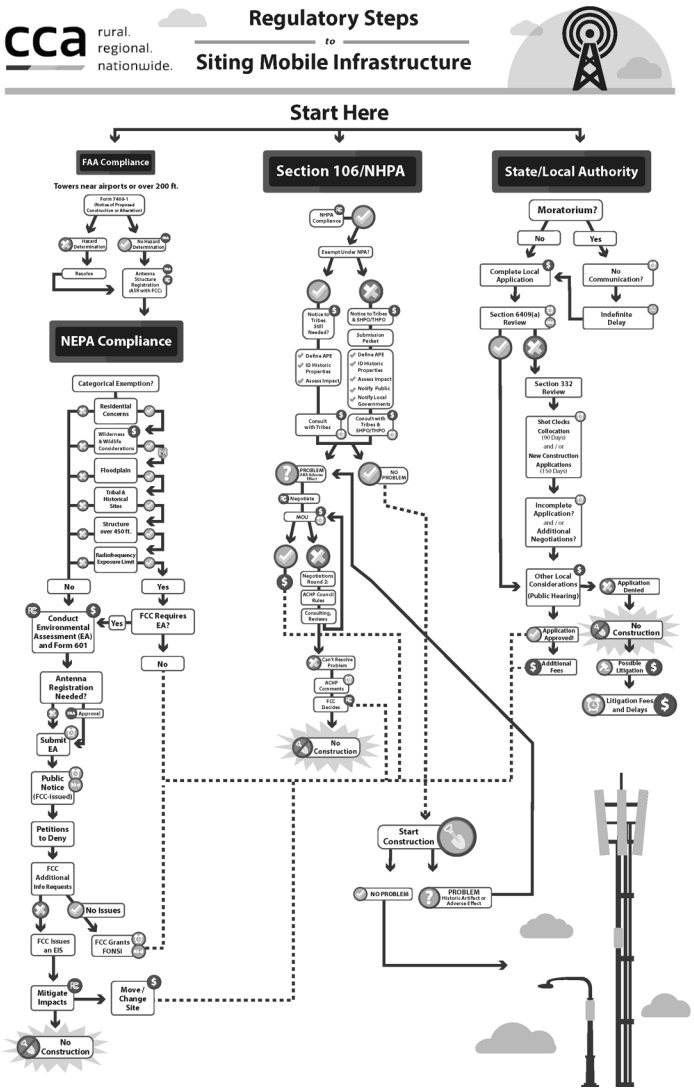
Finally, carriers cannot provide next generation mobile broadband service without access to next generation equipment and devices. Even as iconic devices may seem ubiquitous, many smaller carriers serving rural America continue to struggle to get access to the latest devices and are often 12 to 24 months delayed as compared to the largest providers. This harms competition, and results in technology denial for certain rural Americans. As the industry shifts to next generation technologies and 5G, competitive carriers need access to equipment that is available, affordable, and secure.

As equally frustrating for consumers as it is for competitive carriers, lack of access to devices and other equipment also can make it harder or nearly impossible to comply with regulatory mandates that are premised on the latest technology, including Next Generation 9–1–1 services and Wireless Emergency Alerts, two priorities for this Committee. Even where rural and regional carriers have access to devices or network equipment, they may face increased costs based on reduced economies and purchase order size. While competitive carriers have taken steps to help themselves through business relationships, including CCA's Device Hub, policymakers should ensure that rural areas are not left behind in the mobile world because of inaccessible equipment.

Today's hearing on investing in next generation broadband provides a timely examination of important issues as Congress considers next steps for infrastructure policies and the FCC seeks to solve the persistent digital divide. CCA looks forward to continued collaboration with Congress, the Administration, and the FCC to ensure that rural America is not left behind without the critical mobile broadband networks of today and the eventual tectonic shift to 5G services in the future.

Thank you for your attention to these issues and for holding this important hearing. I welcome any questions you may have.

ATTACHMENT


cca
rural.
regional.
nationwide.
Regulatory Steps
to
Siting Mobile Infrastructure
Start Here
FAA Compliance
Towers near airports or over 200 ft.
Form 7460-1 (Notice of Proposed Construction or Alteration)
Hazard Determination
No Hazard Determination
Resolve
Antenna Structure Registration (ASR with FCC)
NEPA Compliance
Categorical Exemption?
Residential Concerns
Wilderness & Wildlife Considerations
Floodplain
Tribal & Historical Sites
Structure over 450 ft.
Radiofrequency Exposure Limit
No
Yes
Conduct Environmental Assessment (EA) and Form 601
Yes
FCC Requires EA?
No
Antenna Registration Needed?
Approval
Submit EA
Public Notice (FCC-Issued)
Petitions to Deny
FCC Additional Info Requests
No Issues
FCC Issues an EIS
FCC Grants FONSI
Mitigate Impacts
Move / Change Site
No Construction
Section 106/NHPA
NHPA Compliance
Exempt Under NPA?
Notice to Tribes (60 Needed?)
Notice to Tribes & SHPO/THPO
Submission Packet
Define APE
ID Historic Properties
Assess Impact
Notify Public
Notify Local Governments
Consult with Tribes
Consult with Tribes & SHPO/THPO
PROBLEM (APE/Adverse Effect)
NO PROBLEM
Negotiate
MOU
Negotiations Round 2
ACHP Council Rules
Consulting, Review
Can't Resolve Problem
ACHP Comments
FCC Decides
No Construction
Start Construction
NO PROBLEM
PROBLEM Historic Effect or Adverse Effect
State/Local Authority
Moratorium?
No
Yes
Complete Local Application
No Communication?
Section 6409(a) Review
Indefinite Delay
Section 332 Review
Shot Clocks Collocation (90 Days) and / or New Construction Applications (150 Days)
Incomplete Application? and / or Additional Negotiations?
Other Local Considerations (Public Hearing)
Application Denied
Application Approved!
No Construction
Additional Fees
Possible Litigation
Litigation Fees and Delays

February 27, 2018

BY ELECTRONIC FILING

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: NOTICE OF EX PARTE
WT Docket No. 17-79: *Accelerating Wireless Broadband Deployment by Removing Barriers to Infrastructure Investment;*
WT Docket No. 15-180: *Revising the Historic Preservation Review Process for Wireless Facility Deployment;*
WC Docket No. 17-84: *Accelerating Wireline Broadband Deployment by Removing Barriers to Infrastructure Investment*

Dear Ms. Dortch:

We are CEOs and senior-ranking officers representing wireless carriers serving customers in cities, small towns, and rural areas throughout the United States. Streamlined infrastructure reform is critical to serving consumers in low density, hard-to-reach areas, and we support the Federal Communications

Commission's ("FCC" or "Commission") work to address barriers to mobile broadband deployment. To bridge the digital divide in rural America, we urge immediate action by the Commission to spur investment and increase certainty as we work to preserve and expand service in the most challenging locales in the United States.

Non-nationwide carriers serving rural and regional consumers are actively engaged in the communities they serve. We connect critical services such as telehealth to patients for monitoring and cutting-edge cures, and enable students to access the same educational resources as their peers in urban centers. On farmlands and ranchlands, our networks often cover more cattle than people, and mobile broadband helps farmers leverage modern farm equipment in today's thriving agriculture community to conserve resources and increase yields. And in times of emergency or disaster, we are the critical link to public safety networks and services.

With the move towards next-generation technologies, the time is ripe to adopt streamlined infrastructure policies that promote investment, expedite processes, and remove red tape. Specifically, streamlined regulations should reflect advancement in technology, and regulations for tall towers should not apply to small cells and Distributed Antenna System ("DAS"). The FCC should take immediate steps to declare that small cells and DAS technology do not require duplicate and redundant review actions which slow or cease mobile infrastructure deployments. Likewise, the Commission should adopt targeted policy reforms that streamline historic and environmental application review processes, and encourage collaboration between Tribal entities and state and local governments, to reduce or eliminate burdensome deployment procedures for all stakeholders.

The Commission's commitment to reforming mobile broadband infrastructure deployment processes is shared by nationwide, rural, and regional carriers alike. We commend the work done thus far and remain eager for continued collaboration with the Commission, Congress, Tribes, and states to streamline and update infrastructure siting policies and help close the digital divide in rural America.

This letter is being filed electronically with your office pursuant to Section 1.1206 of the Commission's rules.

Respectfully submitted,

W. Allen Gillum
East Kentucky Network, LLC
d/b/a Appalachian Wireless

Michael Prior
Atlantic Tele-Network

Brian Gelfand
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Ron Smith
Bluegrass Cellular

Ben Moncrief
C Spire

Slayton Stewart
Carolina West

Steven K. Berry
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FTC Communications

Maureen Moore
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Nathan Weiss
Inland Cellular

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James Valley Telecommunications

Jon Lightle
Nex-Tech Wireless

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Northwest Missouri Cellular

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Shentel

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Thumb Cellular

Craig Gates
Triangle Communications

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Union Wireless

Ken Meyers
U.S. Cellular

Frank DiRico
Viaero

cc (via email): Rachael Bender
Jay Schwarz
Claude Aiken
Louis Peraertz
Erin McGrath
Amy Bender
Will Adams
Travis Litman
Umair Javed

Senator WICKER. Thank you very much, Mr. Berry.

Mr. DeBroux, have I pronounced your name correctly?

Mr. DEBROUX. Yes, that is correct. Thank you.

Senator WICKER. Well, thank you for joining us and you are recognized.

STATEMENT OF ROBERT DEBROUX, DIRECTOR, FEDERAL AFFAIRS AND PUBLIC POLICY, TDS TELECOMMUNICATIONS, LLC

Mr. DEBROUX. Thank you.

Chairman Wicker, Ranking Member Schatz, and members of the Senate Committee on Commerce, Science, and Transportation Subcommittee. I am Robert DeBroux, Director of Federal Affairs and Public Policy for TDS Telecom.

Thank you for the opportunity to share with you some insights into how Congress can help close the digital divide in rural America. I am not only testifying today on behalf of TDS, but also as a member of ITTA, a Washington, D.C. industry association that includes TDS as a member.

TDS owns 108 separate telephone companies that provide broadband, voice and video services. We serve a mix of rural and urban areas, such as the bottom of the Grand Canyon and islands off the coast of Maine and Michigan, as well as the suburbs of larger cities such as Madison, Wisconsin and Nashville, Tennessee. We also serve communities such as Big Creek, Calhoun City and Sandhill in Mississippi.

TDS has a long history of building and maintaining robust voice and data networks in its service areas. Recently, the administration released the framework for its infrastructure initiative, which includes a broadband component. Unfortunately, the framework does not include dedicated funding for broadband projects in unserved and underserved parts of the country.

The administration's infrastructure plan appears to set forth a process whereby rural broadband projects will compete against other infrastructure projects, for example, roads, sewers and airports, for 40 billion dollars in state-administered block grants. TDS and ITTA do not think that this will be the most efficient and effective way to provide the dollars needed to close the digital divide and move the Nation closer to rural and urban comparability.

Therefore, Congress should specifically designate funds for broadband deployment and ensure the money it designates follows the course that other successful programs to date have followed. Those programs, which include, most importantly, the FCC-administered Universal Service Fund High-Cost program, have a proven track record of success in turning funds earmarked for broadband into broadband networks.

The FCC through the USF can maximize the impact of any infrastructure funding while minimizing waste. The FCC has programs in place that make sure that there are specific tangible obligations associated with funding and that funding goes to the appropriate areas. For example, areas that are not already served by another broadband provider. One such program created by the FCC in December 2016 is the Alternative Connect America Cost Model program. This program allows rate of return carriers the option to re-

ceive USF support to serve high cost rural areas based on a forward-looking cost model in return for their agreement to deploy and maintain broadband to a specified number of households with service standards as defined and enforced by the FCC.

TDS, along with 206 other rural rate of return carriers in 43 states opted into the 10 years ACAM program. In this program TDS will receive over 75 million dollars annually to provide broadband to a 160,000 households in 25 states.

TDS has already begun the process of deploying fiber deep into its network with this money thus improving consumer broadband in various locations including, for example, in Wisconsin and southeast Mississippi. Other ITTA members, including Ritter Communications based in rural Arkansas, have also been able to use ACAM funding to deploy fiber closer to customers. In Nebraska, Great Plains Communications has used ACAM dollars to increase the broadband capacity to schools and libraries in Ponca, Nebraska.

There are hundreds of additional examples of ACAM funding being used to bring broadband to consumers living in rural America. Congress can leverage the ACAM program, as well as the legacy funding mechanisms in the High-Cost program, to increase broadband deployment to rural America by instructing the FCC to increase the High-Cost Fund budget and providing the funding necessary for that increase.

Thank you for the opportunity to testify today and I look toward to answering any questions you may have.

[The prepared statement of Robert DeBroux follows:]

PREPARED STATEMENT OF ROBERT DEBROUX, DIRECTOR, FEDERAL AFFAIRS AND PUBLIC POLICY, TDS TELECOMMUNICATIONS, LLC

Chairman Wicker, Ranking Member Schatz, and Members of the Senate Committee on Commerce, Science, and Transportation's Subcommittee, I am Robert DeBroux, Director of Federal Affairs and Public Policy for TDS Telecom ("TDS"). Thank you for the opportunity to share with you some insights into how Congress can help close the digital divide in rural America. I am not only testifying today on behalf of TDS but also as a member of ITTA, a Washington, D.C. industry association that includes TDS as a member. I recently also have had the pleasure of serving on the Federal Communication Commission's ("FCC's") Broadband Deployment Advisory Committee ("BDAC") as the chair of its "Removing State and Local Regulatory Barriers" work group. This workgroup was tasked with identifying barriers to broadband deployment at the state and local level and providing policy recommendations to help eliminate those barriers. Its report, as voted on and approved by the BDAC, is available on the FCC's website.[1] While I am not here today to speak on behalf of the BDAC, you may find the report useful. Serving on the BDAC provided me with valuable insight into the challenges and barriers of providing broadband in many localities across the country.

TDS owns 108 separate telephone companies that provide broadband, voice, and video services. We serve a mix of rural and urban areas such as the bottom of the Grand Canyon and islands off the coast of Maine and Michigan, as well the suburbs of larger cities such as Madison, Wisconsin and Nashville, Tennessee. TDS has a long history of building and maintaining robust voice and data networks in its service areas.

Closing the digital divide has widespread bipartisan support in Washington. Gone are the days of the "urban vs. rural" debate in telecommunications policy. Today, we can all agree consumers living in rural America deserve exactly the same digital opportunities as those citizens living in urban areas. How we close the digital divide and what steps Congress can take in the short and long-term deserve policymakers' full attention and commitment.

[1] *https://www.fcc.gov/sites/default/files/bdac-regulatorybarriers-report-012018.pdf*

Infrastructure Proposal

Recently, the Administration released the framework for its infrastructure initiative, which includes a broadband component. Unfortunately, the framework does not include dedicated funding for broadband projects in unserved and underserved parts of our country. TDS and ITTA have been clear that if the Administration wants to make closing the digital divide a top priority, dedicated funding for broadband projects must be a key component of the overall plan.

The Administration's infrastructure plan appears to set forth a process whereby rural broadband projects will compete against other infrastructure projects (*e.g.,* roads, sewers, airports) for $40 billion in state-administered "block grants." TDS and ITTA do not think that this will be the most efficient and effective way to provide the dollars needed to close the digital divide and move the Nation closer to rural and urban comparability.

Therefore, Congress should specifically designate funds for broadband deployment and ensure the money it designates follows the course that other successful programs to date have followed. Those programs, which include, most importantly, the FCC-administered Universal Service Fund High-Cost program, have a proven track record of success in turning funds earmarked for broadband into broadband networks.

Ensuring the Correct Federal Agency is Tasked with Administering a Broadband Infrastructure Program

TDS, along with our national association ITTA, supports directing any funding for broadband infrastructure deployment to the FCC to be administered through its Universal Service Fund ("USF"). As noted by FCC Chairman Pai in March 2017,[2] the FCC, through the USF, can maximize the impact of any infrastructure funding while minimizing waste. The FCC has programs in place that make sure that there are specific, tangible obligations associated with funding and that funding goes to the appropriate areas, for example, areas that are not already served by another broadband provider.

Leveraging Existing Programs—FCC High Cost Program

One such program, created by the FCC in December 2016, is the Alternative Connect America Cost Model ("A–CAM") program.[3] This program allowed rate-of-return carriers the option to receive USF support to serve high-cost rural areas based on a forward-looking cost model in return for their agreement to deploy and maintain broadband to a specified number of locations with service standards as defined and enforced by the FCC. TDS, along with 206 other rural rate-of-return carriers in 43 states, opted into the ten-year A–CAM program.

In this program, TDS will receive over $75M annually to provide broadband to 160,000 households in 25 states. TDS has already begun the process of deploying fiber deeper into its network with this money, thus improving consumer broadband speeds in various locations, including, for example, in Wisconsin and SE Mississippi. This work is expected to stabilize the existing broadband delivery platform even in times of peak demand. Other ITTA members, including Ritter Communications based in rural Arkansas, have also already been able to use A–CAM funds to deploy fiber closer to customers.[4] In Nebraska, Great Plains Communications has used A–CAM dollars to increase the broadband capacity to schools and libraries in Ponca, Nebraska. There are hundreds of additional examples of A–CAM funding being used to bring broadband to consumers living in rural America.

Congress can leverage the A–CAM program as well as the legacy funding mechanisms in the High-Cost program to increase broadband deployment to rural America by instructing the FCC to increase the High-Cost Fund budget and by providing the funding necessary for that increase.

RUS

To be sure, TDS and many other rural broadband providers have enjoyed a good working relationship with RUS.[5] While our preference is that any broadband infrastructure money be directed to the FCC for distribution through the existing USF High-Cost program, we recognize that the RUS has the expertise and experience to

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[2] *https://apps.fcc.gov/edocs_public/attachmatch/DOC-343903A1.pdf*

[3] *See Connect America Fund,* Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd 13775 (2016) (*Order* and/or FNPRM).

[4] In the first year of the A–CAM program Ritter has deployed fiber in the economically challenged Mississippi Delta.

[5] Under the RUS Broadband Initiative Program ("BIP"), TDS was awarded 44 grants totaling over $105M with specific buildout obligations. TDS exceeded those obligations, ultimately deploying broadband to 27,125 unserved households in 20 states at a cost of almost $136M.

be able to distribute funds wisely. If Congress decides that RUS should play a role in distributing infrastructure funding, Congress should instruct that entities applying for funding meet the eligibility requirements and service standards applicable to the FCC's USF Program.

State Grant Programs

The FCC's USF programs are successful because they are well defined in terms of the dollars to be spent, the obligations which are required to be met with those dollars, and the consequences for not meeting those obligations. TDS and ITTA are skeptical of programs that simply send money to the states and then rely exclusively on the states to determine how the money should be spent. While many states may be committed to improving their broadband networks, there are many competing interests for dollars that arrive in a state without specifics as to where the dollars must be spent. If such a grant program is ultimately used for distributing infrastructure funding, Congress should set forth specific parameters to ensure that the funds go to areas that are most in need.

TDS has participated in 5 such state grant programs and has been awarded over $28M to provide advanced broadband services to over 18,000 households. Based on its experience, TDS believes that Congress should, in addition to specifically earmarking dollars for broadband deployment, set parameters for such programs that include: (1) defining unserved and underserved areas; (2) setting criteria for selecting projects that include cost per location to deploy, economic impact, matching funds, and network scalability; (3) awarding projects that are technology neutral and not duplicative; and (4) setting the technical, managerial and financial capabilities that private and public entities must possess in order to be eligible to receive funding.

NTIA BTOP Program

Under the 2009 American Recovery and Reinvestment Act ("ARRA"), carriers could apply for grants through the National Telecommunications and Information Administration ("NTIA") to support broadband deployment in unserved rural areas. As well documented through numerous Department of Commerce Inspector General reports[6] and a Government Accountability Office ("GAO") study, the BTOP program had a number of shortcomings. For example, many awardees were public entities with ambitious goals of building their own broadband networks. However, at the time of approval of their applications, many of these entities did not have the expertise or the infrastructure in place to build broadband networks capable of being operational in relatively short order. In order to prevent a similar situation from reoccurring, Congress should mandate that any broadband funding made available through the infrastructure initiative go to providers that have the expertise and infrastructure in place to immediately deploy broadband. In addition, any Federal dollars used to deploy broadband must be subject to the highest degree of scrutiny to ensure that the money is not being used to overbuild existing broadband networks.

Streamlining of the Federal Permitting Process & Streamlining Regulation at the FCC

It is beyond debate that the costs and time involved in securing state and Federal permits to deploy broadband delay projects and increase costs. Congress should work to create a "deemed granted" standard that places the burden on the applicable government agency to approve, deny, or require more information from an applicant within a defined period of time. While TDS recognizes that deemed granted language presents jurisdictional issues among Congressional committees, I encourage the various relevant committees to work together to find a solution that protects the integrity of our Federal permitting process and, at the same time, brings certainty and resolution to broadband projects that are tied up in bureaucratic red tape.

Thank you for the opportunity to testify today. I look forward to answering any questions you may have.

Senator WICKER. Thank you very, very, much, Mr. DeBroux.
Mr. Gillen.

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[6] *https://www.oig.doc.gov/OIGPublications/OIG_Report_No_14-0480_West_Virginia_BTOP.pdf*

STATEMENT OF BRAD GILLEN, EXECUTIVE VICE PRESIDENT, CTIA

Mr. GILLEN. Thank you, Chairman Wicker, Ranking Member Schatz. Thank you for including the wireless industry as part of this important conversation. I want to particularly thank this committee for making sure that broadband is not only a national priority, it's an infrastructure priority.

And from our standpoint there are two core challenges we face together. The first is the digital divide. Despite billions invested and years of work, there are too many Americans from northern county New Hampshire, foot hills of West Virginia, I could go across the dais today. There are too many Americans that don't have access to the wired and wireless broadband we all rely on today. We commit as an industry to work with you on your efforts to close the digital divide and provide more opportunities for more Americans.

The second challenge, and Chairman Wicker alluded to it in his opening, goes to our global competitiveness. We lead the world today in 4G wireless. The LTE phone in your pocket today.

Right now we are on the cusp of 5G, the fifth generation of wireless, and we are in a race, it is a global race. The head of Nokia 2 weeks ago noted we are neck and neck with China to lead the world in 5G. And this is a race that China wants to win. They have seen what U.S. leadership has meant for us. They are investing billions. They have over a hundred active trials of 5G technology ongoing today.

We would like to win too and the United States is prepared to invest in our next generation as well. We have trials ongoing and all four national carriers have announced accelerated deployments of 5G. Years have had to schedule starting later this year.

In all, the wireless industry is estimated to spend 275 billion of its own private capital over the next 10 years to build these 5G networks. So we are here today asking for help to modernize the rules to reflect this new technology. Because 5G is going to be fundamentally different, as a number of the witnesses have already alluded to. It's going to be built with these. They are called small cells. They will attach to streetlights and the sides of buildings throughout the country. Accenture estimates we will have 800,000 of these in place by 2026. To put that in perspective, over the last 30 plus years, we have installed a 150,000 total cell towers across the country. So in about a third of the time we are going to need five times the amount of infrastructure. It's a daunting task.

And right now, the good news is a device like this only takes an hour or two to install. The challenge we face is it can take a year or two to gain approval. And that's because at every level of government; local, state and Federal, these get treated as if they were a 275 foot tower along the side of the highway.

And with your leadership, these new networks will have new rules and there are a number of proposals before this Committee that address the core impediments which give us—make us very optimistic.

The first, Chairman Wicker, and—Chairman Wicker and Senator Cortez Masto have the SPEED Act and the SPEED Act would update Federal regulation for these type of devices. That common

sense proposal would slash the costs to deploy these by a third and would shave months off deploying each of these.

Senator—next turn to Senator Schatz and Senator Thune are working on local siting with respect to how do we update the rules and the guidance to local communities to do siting. This is something the Committee has done in 1992, 1996, and most recently 2012. What are the guardrails around local action?

And Senator Schatz and Senator Thune's proposal addresses what the proper rate structure, the timelines for devices like this while preserving important local authority and retaining that authority, as it should. Senator Heller and Senator Mansion are working on Federal lands and making sure utilizing Federal assets, particularly in rural America, to extend broadband in rural America where Federal lands is the place that makes most sense to site on.

And I can't have a conversation about infrastructure on wireless without talking about spectrum. And Senator Hassan and Senator Gardner's AIRWAVES Act is a central proposal for the future of our country in terms of spectrum policy. We want to win the race to 5G. That gives us a roadmap on the spectrum we will need to do so.

And if we get these policies right, 5G will be transformative. It's going to unlock telehealth and precision agriculture, connected cars and the Internet of things. We are excited about the possibility of jobs. We project 3,000 jobs in downtown Honolulu, three million across the country. We are looking at places like Jackson, Mississippi gaining 140 million dollars to the local economy over next the 10 years thanks to 5G, 500 billion across the country.

So we are excited about what 5G can do and we are excited about your leadership and we think working together this year we can help close the digital divide and win the 5G race together.

Thank you for the time. Look forward to your questions.

[The prepared statement of Brad Gillen follows:]

PREPARED STATEMENT OF BRAD GILLEN, EXECUTIVE VICE PRESIDENT, CTIA

Chairman Wicker, Ranking Member Schatz, and members of the Subcommittee, on behalf of CTIA and the wireless industry, thank you for the opportunity to testify today to discuss the critical role Congress plays in ensuring that wireless broadband infrastructure can be rapidly deployed across the country.

We commend the Subcommittee for its leadership with the MOBILE NOW Act that provides a bipartisan roadmap for future infrastructure and spectrum initiatives to help create new jobs and economic opportunities. MOBILE NOW was focused on promoting the deployment of wireless networks by making more spectrum available for wireless use and facilitating deployment of infrastructure needed to support these networks. We appreciate the opportunity today to address the next set of infrastructure reforms needed to drive wireless investment.

This hearing is timely, as all four nationwide U.S. wireless providers have recently announced plans to roll out the next-generation of wireless networks, 5G, using a variety of spectrum bands. National infrastructure reform can greatly expedite the millions of jobs and billions of investment that 5G deployment will bring. Nations across Asia to Europe are investing heavily in 5G, but none of those countries can match the competitiveness of the U.S. wireless industry. Massive private investment from the national providers and regional carriers will be unleashed in the U.S. if the government modernizes its approach to infrastructure siting this year.

We are confident that, with this Subcommittee's continued leadership, we can win the global race to 5G—as we did for 4G. We are equally confident that reforms can

help the industry expand wireless coverage throughout the country, particularly in rural areas.

The Wireless Industry Invests In Jobs and the Economy

Wireless networks and smartphones have become a central part of Americans' daily lives. There are now more wireless connections in the U.S. than there are Americans, and over the past two years, U.S. mobile data usage has more than tripled. This rapid growth has been made possible by the wireless industry's substantial investment in our Nation's infrastructure. To meet consumer demand, wireless capital expenditures totaled more than $200 billion in the past seven years alone. Overall, the wireless industry supports more than 4.6 million American jobs and contributes roughly $400 billion annually to the economy.

Modernizing Regulation Promises 5G Investment and Jobs

The wireless industry is poised to play an even more significant role in our economy with the arrival of 5G—networks that are expected to be up to 100 times faster than 4G networks, connect 100 times the number of devices, and respond five times as quickly. This increased speed and lower latency will not only improve the way we communicate, but it will unlock innovations in healthcare, transportation, and manufacturing, help deliver the benefits of the Internet of Things, and enable smart communities.

The overall impact on the economy from 5G will be remarkable. Accenture reports that 5G will create three million new jobs and add approximately $500 billion to the economy. To deploy tomorrow's next-generation networks, wireless companies will need to complement today's large towers with small cells that can be the size of a small pizza box and that will often be located discreetly on the side of a building or on a street light. It is estimated that wireless carriers will need to deploy hundreds of thousands of these small antennas over the next few years in order to meet America's consumer demand. This will require a substantial infrastructure build by wireless operators across the country at a projected cost of $275 billion.

Congress Plays an Important Role in Promoting National Wireless Policy

Congress has long played a critical role in setting nationwide guidelines for how localities should treat requests for siting wireless infrastructure. By affirming wireless infrastructure siting as a national priority, just as it did in 1996, Congress can once again ensure Americans benefit from global-leading wireless services.

The wireless industry works in collaboration with local and state governments to facilitate the buildout of wireless infrastructure. Many are good partners, but too often the wireless industry today is encountering policies—long delays, onerous requirements, and excessive fees—that frustrate efforts to deploy new broadband and expand wireless coverage. In too many instances, an installation that takes one to two hours to complete requires one to two years of processing and application procedures. Some cities refuse to allow wireless installations on streetlights, and still other communities effectively foreclose deployment through excessive application and monthly fees (*e.g.,* charging $30,000 per pole per year, or a $15,000 application fee per pole). The U.S. will not win the global 5G race if those timelines and costs are not significantly reduced across the country.

More than 20 years ago, Congress made clear that localities play an important role in the permitting process for wireless facilities, and that localities may not frustrate wireless deployment that will otherwise benefit our economy, and consumers. Specifically, Congress established the rapid deployment of wireless infrastructure as a national priority and set nationwide guidelines for how localities should treat siting requests. Under that Federal regime, the wireless industry constructed 150,000 cell towers and rolled out service nationwide.

The transition to 5G necessitates updating Congress's guidance to localities, as the rules that applied to the infrastructure of the past are no longer appropriate to support next-generation 5G deployment. The most meaningful step Congress can take is to once again provide clear direction to—and guardrails around—state and local government. CTIA is encouraged that Senators Thune and Schatz have circulated a discussion draft that addresses three targeted reform areas that would make a significant difference in promoting broadband investment while preserving local authority. The discussion draft would:

1. *Ensure Cost-Based Fees.* Congress would make clear that localities retain the right to charge for access to government property, provided that such fees are fair and reasonable, competitively and technologically neutral, based on actual costs, and publicly disclosed.
2. *Set Reasonable and Enforceable Timelines.* Congress would establish a reasonable "shot clock" on handling siting applications and deeming applications

granted if there is no action within that shot clock period. This could accelerate deployment while still preserving state and local authority over zoning decisions.

3. *Clarify Permitted Conduct.* Congress would clarify that local roadblocks—like unreasonable, non-objective or discriminatory application review guidelines—are forbidden by Congress's long-standing directive to eliminate rules that "prohibit or have the effect of prohibiting" the provision of communications services.

These reforms, if enacted, would promote billions of dollars in the deployment of new wireless infrastructure.

The SPEED Act Will Help Modernize Federal Requirements

Today, in order to install a new antenna or small cell, Federal regulations require a cumbersome and costly Federal review process that generally disregards the size or location of the new facility. For instance, wireless reviews under the National Historic Preservation Act, or "NHPA," and the National Environmental Policy Act, or "NEPA," can run into the tens of thousands of dollars *per installation,* even for small wireless deployments that are dramatically different in nature than the larger deployments for which these obligations were originally created. FCC Commissioner Mignon Clyburn has correctly noted, "treating small cells differently than large macrocells, that makes all the sense in the world. They're not created equal."

Yet today, NHPA mandates alone recently cost a carrier more than $170,000 to install just 23 small cells in a parking lot. Another provider estimates that reviews under NHPA and NEPA comprised, on average, 26 percent of its total small cell deployment costs last year. And these costs are increasing; one carrier reports that these costs have risen by as much as 2500 percent in some parts of the country since 2010. The direct costs only tell part of the story: these reviews can take months, which add delays and uncertainty to projects, keeping customers from enjoying the benefits of better service.

To be clear, the wireless industry supports appropriate environmental and historic preservation review for sensitive sites and major projects. The current regulatory structure, however, fails to reflect the different impact of new small cells or installations in previously approved locations.

That's why we're pleased with the common sense legislation—S. 1988—introduced by Senators Wicker and Cortez Masto, which would modernize the NEPA and NHPA review process for wireless facilities. While preserving key protections for environmentally or historically significant areas, the SPEED Act recognizes the need to modernize the process to allow antennas in public rights-of-way and where new facilities simply replace existing ones or do not significantly expand existing ones. It also recognizes that a small cell should not face the same requirements as a 250-foot tower. The FCC is also scheduled to consider reform to address modernizing NHPA/NEPA review at its March 22 meeting. CTIA strongly supports the FCC's proposed action as well.

Congress Can Facilitate Deployments on Federal Lands

The Federal Government owns nearly 30 percent of the land in the U.S. and more than 50 percent of the land in the 10 most western states. The Federal Government also owns and manages key buildings in major cities and towns throughout the country.

Leases to place new sites on lands regulated by the Bureau of Land Management or the National Park Service can take two or three years to negotiate. Even simple lease renewals can take 12–18 months. In many parts of the nation, enhanced siting on Federal lands will help wireless carriers more quickly deploy in unserved or underserved communities. Today, the process to deploy wireless networks on Federal lands is too often opaque with different applications requirements and timelines and without guidelines to support timely deployment of new communications facilities.

We support Senators Heller and Manchin's leadership with S. 1363 to streamline and standardize the process by which broadband companies of all kinds obtain access to Federal properties for siting facilities and also ensure that applications for this access are processed in a reasonable period of time. These provisions, along with use of common forms and master contracts, would bring much-needed predictability to the process. S.1363 builds on key provisions included in MOBILE NOW.

The Wireless Industry Shares Congress's Goal of Expanding Broadband's Reach

We are proud of the investment our Nation's wireless providers have made to expand coverage across the country, including to rural areas, and look forward to working with Congress to continue expanding the number of Americans with access

to wireless broadband. The wireless industry—including both national and regional providers—has made substantial strides in the past decade to expand wireless coverage to reach more Americans. Today's 4G LTE mobile broadband services were first introduced in the United States in 2010, and in less than eight years, 4G wireless services are available to more than 99 percent of Americans. This is a remarkable pace of deployment for a new technology in a very short window. And our Nation's wireless footprint continues to grow. In 2016 alone, wireless investment increased coverage by more than 150,000 rural Americans and nearly 50,000 rural road miles.

We share the Subcommittee's desire to further expand broadband to more Americans, and recognition of the important role infrastructure reform can play to do so. Private capital has driven the vast majority of the expanded wireless coverage, and there should be a renewed focus on the steps policymakers can take—like those detailed above—to facilitate wireless providers' investments in rural America by altering the investment calculus of some rural deployments from uneconomic to viable. As FCC Commissioner Brendan Carr has said, reducing the cost of building new networks can "flip the business case for [wireless] deployments in thousands of communities in the U.S."

The government also has the ability to expedite deployment in unserved areas through direct funding. The upcoming FCC Mobility Fund II auction of $4.5 billion over 10 years will be an important step to reach rural Americans currently unserved by wireless broadband. And the bipartisan budget that passed last month included $20 billion for infrastructure programs, including funds for the expansion of rural broadband. Any new Federal funding should consider the increasingly critical role that mobile wireless services play in rural consumers' lives. Greater participation by mobile wireless providers will lead to more effective use of public resources and deployment of high-speed broadband services to more rural areas. Any new funding should also ensure that reaching areas unserved by wireless is reflected in the program's objectives. In making funding decisions, data is key, and rural broadband is no exception. CTIA appreciates that the Senate has attempted to address this issue by passing the Rural Wireless Access Act (S. 1621), and we will continue to work with both national and regional wireless providers to ensure the FCC has information necessary to direct limited Federal resources appropriately.

* * * * *

The wireless industry is eager to work with this Subcommittee in a bipartisan manner to advance U.S. innovation and investment in mobile broadband. CTIA strongly supports this Subcommittee's efforts to help clear the way for 5G and expand wireless coverage. The time for addressing these issues is now. America is in a global race to 5G as China, Japan, South Korea, and the European Union are hard at work accelerating 5G deployments. As Nokia's CEO noted, "it's a neck-and-neck race between the U.S. and China to see who will be the first to deploy" 5G networks. With the right infrastructure, spectrum, and other regulatory policies in place, the U.S. can win this race, and Americans can further benefit from the economic and consumer benefits that flow from continuing to lead the world in wireless. Thank you for the opportunity to testify today.

Senator WICKER. Thank you very much, Mr. Gillen.

Mr. Romano, you are recognized.

STATEMENT OF MICHAEL ROMANO, SENIOR VICE PRESIDENT, INDUSTRY AFFAIRS AND BUSINESS DEVELOPMENT, NTCA—THE RURAL BROADBAND ASSOCIATION

Mr. ROMANO. Good morning. Thank you, Chairman Wicker, Ranking Member Schatz and members of the Subcommittee for the chance to testify today.

NTCA and our 850 small, rural telecom provider members have been singularly focused on the mission of rural broadband, making great strides to reach hard-to-serve areas in the most rural parts of the United States. But as everyone here has noted on the dais as well, there's much more to do to deploy and sustain networks and we are eager to be part of a conversation about developing

comprehensive, coordinated strategies to connect rural America with the world.

My testimony highlights several principles and lessons learned to inform future infrastructure efforts. These are based upon our members' efforts serving their rural hometowns and their experience with prior Federal and state initiatives.

First, no rural broadband effort can succeed if the business case for investment operation does not exist. While rural broadband is difficult, it is not hard to identify the primary barrier, the challenging economics of deploying and sustaining networks in rural America.

Put simply, helping to make the business case for rural broadband is job one. Other measures will help only on the margins at best if there's no business case and dedicated funding in the first instance.

Second, a proven track record of delivering real results in rural areas is important. Finite Federal resources to promote rural broadband are too important a gamble. Building and operating a network in an NFL city is very different than doing so in western Nebraska. We should leverage the experience and existing assets of those that have actually deployed and operated a rural network, to the extent possible, and must verify the technical capabilities of proposals.

Third, we need to demand the best return in leveraging public resources. Broadband networks are a long-term investment. They must scale and be able to meet user demands over the decades long lives of such assets. Investing in networks that seem cheaper up front but cannot keep pace with escalating user demand represent resources potentially wasted and risks leaving rural America behind along the way. As an analogy, we should not be paying for a two lane road when we know a four lane road will be needed in just a few years time. The same is true for broadband.

Fourth, any resources made available for rural broadband should go to where they are needed most based upon an accurate picture of current availability and construction underway. This has been one of the most vexing challenges, but this can be done better, as explained in my testimony, and it's extremely important to do so.

Fifth, and on a related note, we must coordinate new programs and resources with existing initiatives. There may be no greater waste of money or opportunity than dueling programs that overbuild one another where the market can't sustain even one network on its own.

To date most initiatives have complemented one another quite well. But as new programs get created or older programs are repurposed, the risk increases that Federal dollars may compete with one another. Leveraging existing initiatives provides the best means of avoiding such potential conflict and waste.

Sixth, streamlining of permitting is important to help remove barriers and accelerate broadband deployment. This must be part of a comprehensive package, however, and not seen as the singular solution to overcoming our digital divide.

Moreover, any permitting relief must take into account that 5G goals, which are very important, won't be achieved in rural America without robust fiber necessary to connect those cells. It's often

said wireless needs wires and the new saying these days is 5G needs fiber. Seventh, accountability is critical. Providers must demonstrate that they have used resources to deploy networks that do, in fact, deliver on the promises they have made.

With these principles in mind and lessons learned NTCA suggests three steps to take in pursuing a broadband infrastructure plan.

First, any infrastructure package should direct resources for rural broadband toward time-tested initiatives to the greatest extent possible. For example, the FCC's universal service program is a proven mechanism that with additional support in the face of current shortfalls can deliver immediate results in the form of better broadband to more places at more affordable prices. USDA's RUS programs could certainly use additional resources as well, and such funds, if directed there, should be coordinated with FCC efforts to avoid potential conflict and overbuilding.

Second, we must accurately identify where resources need to go, as you said, Chairman Wicker. We suggest looking to how the FCC's universal service programs have done this. While not perfect they at least contain processes intended to overcome mapping limitations, which prior programs have not.

Until more precise and granular mapping is available these programs offer at least the best start in terms of targeting resources. And we can do more to develop better maps going forward and to develop better challenge processes.

Finally, streamlining of permitting is important. It's true that the business case for investment must exist in the first instance, but once that business case is made providers need the opportunity to hit the ground running, as Mr. Gillen described, to deploy networks and deliver services.

Discussions underway in the administration and Congress and at the FCC all offer promise in this regard. The current infrastructure debate represents an opportunity to make great headway on rural broadband. A comprehensive, coordinated plan that leverages existing initiatives and know-how and takes stock of lessons learned can make a significant difference in the immediate availability and sustainability of rural broadband.

We look forward to working with you and we greatly appreciate the long-standing and ongoing work of this subcommittee on rural broadband concerns.

Thank you for inviting me to be with you today.

[The prepared statement of Mike Romano follows:]

PREPARED STATEMENT OF MICHAEL ROMANO, SENIOR VICE PRESIDENT, INDUSTRY AFFAIRS AND BUSINESS DEVELOPMENT, NTCA—THE RURAL BROADBAND ASSOCIATION

Introduction

Chairman Wicker, Ranking Member Schatz, and members of the Subcommittee, thank you for this opportunity to testify today to discuss rural broadband infrastructure. My name is Michael Romano, and I am the Senior Vice President for Industry Affairs and Business Development at NTCA—The Rural Broadband Association.

NTCA applauds the increasing focus on rural broadband from Congress and the Administration. Our association and the approximately 850 small, hometown-based rural telecom providers in our membership stand ready to work with this Subcommittee and others in Congress on comprehensive, coordinated strategies that can help connect rural Americans with the world. NTCA welcomes the prospect of much-

needed additional resources for rural broadband deployment, but, at the same time, it is critical policymakers closely examine not only what is needed, but also what Federal initiatives are already working well and what lessons can be learned from past and current broadband deployment efforts. Any new initiatives must build upon—or at least take stock of—efforts already underway, and also draw upon lessons to be learned from earlier programs.

Background

NTCA's cooperative and small company members live and work in rural America. They operate in the "original unserved" areas—those areas left over when telephone service was first deployed starting over a century ago. These are the most rural parts of the United States, spread across more than 35 percent of the U.S. landmass but containing less than five percent of the U.S. population. The average density is about seven customers per square mile.

In the face of such distance and density challenges, these committed hometown small businesses have nonetheless already made substantial efforts to deploy, upgrade, and sustain advanced networks that connect rural America to the rest of the world and to respond to demands for cutting-edge services. The rural telecom industry has always been resourceful and innovative—leading the way in converting to digital switched systems, deploying creative technological solutions to their hardest-to-reach customers, enabling distance learning and tele-health applications, and ultimately deploying scalable broadband networks.

For all this progress and commitment, however, the job is not done in either the areas our members serve or in the areas not fortunate enough to be served by a small hometown communications provider. In the areas served by NTCA members—again, many of the most rural parts of the country—13 percent of consumers still cannot get 10 Mbps broadband, while 33 percent are unable to obtain 25 Mbps broadband that is considered a threshold level today.[1] And the story appears worse in areas that are not fortunate enough to be served by cooperatives and other small hometown-based telecom companies like those in NTCA's membership; in these other rural communities, we know that many more consumers, businesses, schools, and medical facilities lack access to even basic levels of broadband.

But to be clear, even where broadband *is* available in rural America, the job is never done. Sustaining and upgrading broadband networks is essential because consumers and businesses depend upon reliable and affordable services that will remain high-quality and keep pace with advances in technology and user needs. Indeed, what was considered "high-speed" broadband just seven or eight years ago is today considered antiquated, meaning that networks must be scalable and upgraded over time to keep pace with consumer demand. Furthermore, in terms of comparative operating costs between rural and urban areas, when an urban operator has a "truck roll" to repair service, its technician might need to drive two miles; a "trouble call" for a rural operator by contrast might entail driving two hours—in each direction. Thus, even as we have successes to celebrate and roadmaps to look to for proven track records of success, we as a nation have much more to do *both* to reach unserved areas *and* to sustain robust and affordable rural broadband where it is available today.

Key Principles for Broadband–Focused Infrastructure Initiatives and Lessons Learned from Prior Efforts

As policymakers consider effective and efficient ways to include broadband deployment within broader infrastructure initiatives, it is important to take stock of what has been tried to date—to build upon (or at least take account of) existing initiatives and to draw upon lessons learned from prior initiatives. Based in large part upon such prior experiences, there are a number of principles to consider in shaping policy and crafting infrastructure initiatives going forward.

1. Making the Business Case for Rural Broadband is Job One

While rural broadband is not an easy challenge to overcome, it is not terribly complicated to identify the primary barrier to rural broadband—the economics of deploying and sustaining broadband are difficult, if not impossible, in many rural markets. The rates that rural consumers pay are rarely sufficient to cover even the costs of operating in rural areas, much less the upfront capital expenditures required to deploy reliable, high-speed broadband in rural America. While obtaining permits to build new infrastructure and navigating complex bureaucratic application processes can often be difficult for small businesses in particular, the single biggest challenge

[1] NTCA 2016 Broadband/Internet Availability Survey Report (2017), NTCA–The Rural Broadband Association, Arlington, VA.

in rural America is simply making the business case to build any broadband at all. Put another way, permitting barriers and other impediments to construction are no barriers at all if one cannot justify even building a network in the first place.

Without a reasonable business plan, providers are hard-pressed to justify borrowing funds or using one's own capital to build, and then harder-pressed still to sustain networks in areas where densities are low, distances are great, and terrain and topography complicate operations. Ongoing support from the High-Cost Universal Service Fund (USF) initiatives overseen by the Federal Communications Commission (FCC) has therefore been critical to making the business case for investing in and then sustaining rural broadband. The USF programs help providers to keep rates more affordable and to justify either use of a provider's own cash or financing from the few lenders that tend to serve rural Internet service providers—the Department of Agriculture's Rural Utilities Service (RUS), the Rural Telephone Finance Cooperative, CoBank, and some community banks.

For these reasons, it is essential that infrastructure initiatives include sufficient resources to meet the challenges of deploying and sustaining broadband in rural America. Without such resources, any effort is likely to be effective only on the margins or in very limited respects, leaving behind many areas that still lack broadband access and/or putting at risk investments already made to deploy advanced broadband networks in deeply rural areas.

2. The Importance of Proven Track Records and Technical Know-How

The operational challenges of deploying networks over great distances through sparsely populated rural areas are quite different than any other network construction project. Just because an operator has constructed a network in a downtown business district in an NFL city—where there could be more people in a single building than in an entire rural town and surrounding areas—this does not necessarily translate into success in rural broadband.

It is therefore important to seek a proven track record of delivering real results in rural areas. For example, while both American Recovery and Reinvestment Act (ARRA) programs asked for information on the capability of applicants to perform, only one included an explicit preference for real-world experience in rural broadband. Any finite resources put toward supporting rural broadband are too important to gamble. Although new infrastructure initiatives should consider the merits of all comers willing and able to make the effort to deploy rural broadband, in the first instance we should also look to leverage the experience and existing assets of those that have in fact deployed and operated a rural network and then delivered services atop that network.

This last point is particularly important. Our nation is not building networks just for the sake of building shiny new networks. Congress and the Administration are considering broadband infrastructure initiatives because they care in the end about the consumers and businesses in rural America that will use those networks., and they recognize the benefits to the Nation as a whole To this end, any initiative should look first to operators that are currently in the business of rural broadband, delivering high-quality broadband day after day to hundreds of customers spread over dozens or even hundreds of miles in rural areas. If public resources are leveraged to help make the business case to deploy networks, the sustainability and usability of those networks are just as important as the act of initially constructing them.

On a similar note, it is important to ensure that any entity wishing to leverage Federal resources to deploy a rural broadband network is technically capable of delivering on its promise. The FCC's new Connect America Fund Phase II USF auction program, for example, includes a "screen" that will aim to test technical assumptions of applicants prior to providing any funding; the State of New York's broadband grant program seems to have gone even further in ensuring that those claiming to have solutions for rural broadband can in fact deliver on their promise from a technical perspective. Similarly, the ARRA programs required network proposals to include certification from a professional engineer that the proposal would operate as designed and claimed. Robust but reasonable "technical screens" are essential to establish that a particular solution can in fact deliver upon the promise asserted.

3. A Long-Term Investment Strategy is Far More Effective and Efficient

Any resources provided in connection with an infrastructure plan will be finite, and thus should aim for the best return. In the case of long-term capital investments such as networks that will last for decades, this means that networks must be scalable and capable of meeting user demands over the full life of such assets. Putting resources toward inferior infrastructure that might seem cheaper upfront

but needs to be substantially rebuilt in only a few years' time could turn out to be resources wasted—and risks leaving rural America behind.

This concept can be referred to as "total cost of ownership"—estimating the total costs of owning and operating (and needing to reinvest in) an asset over its economic life, rather than looking merely at the upfront costs of procuring the same asset. Policymakers should craft an infrastructure initiative with this in mind; it will do neither the rural Americans that depend upon broadband nor the broader American economy any good to spend billions of dollars now just to have another conversation about the need to rebuild that broadband infrastructure five years from now. Like bridges and roads, broadband networks are long-term infrastructure assets, and our Nation should adopt a similar planning horizon based upon scalable networks that can meet user demands now and over the useful lives of these valuable assets. Put another way, sustainability is key. It is not just about *getting* broadband out there; from the perspective of consumers and communities, it is about *keeping* broadband out there, and *keeping* it affordable and up-to-date with user demand.

4. Targeting Resources for New Construction is Critical

It is important to target any resources made available to minimize the prospect of overbuilding existing networks. Unfortunately, as discussed further below in connection with broadband mapping, identifying where service is or is not available has proven vexing. The ARRA programs did not contain effective processes to validate existing service coverage, and in some respects their rules all but invited at least limited overbuilding. For example, the Broadband Technology Opportunities Program ("BTOP") overseen by the Department of Commerce largely eliminated any firm bars to overbuilding by the time of its second round of funding, instead merely weighing projects by the degree of unserved areas reached. By contrast, the FCC employs a variety of processes in its USF programs aimed at validating where service is or is not already available in order to direct funding to where it is needed most; these processes may not be perfect in scope or granularity, but each is an improvement upon the baseline data available in the FCC's Form 477 availability database or from any other current source.

5. Coordinating Efforts Among Federal and State Broadband Initiatives is Essential

Coordination among programs—both those that may be created as part of any infrastructure plan and those already in place—is essential to maximize the effectiveness of finite resources and achieve the goal of robust and sustainable universal broadband. In fact, to minimize the likelihood of "making new mistakes" (or even repeating old ones) in the rush to stand up any new program, as discussed further below, NTCA submits that it makes sense in the first instance to leverage existing programs that have time-tested processes and procedures to direct funds to the right places and already have experience in vetting proposals to deploy and sustain rural broadband.

If, however, new programs are to be created, these programs should not only take stock of the lessons learned and principles to be derived from prior experience as outlined in this testimony, but such new efforts must also ensure that they complement—and do not compete with—the existing efforts already underway. For example, some providers receiving Federal USF support have complained that BTOP funds were used to connect anchor institutions that already had broadband service leveraging that USF support. Similarly, RUS resources should work in concert with USF as described further below, rather than having multiple Federal programs stimulate the construction of duplicative networks in rural areas where the costs of deploying and operating even just one network are prohibitive. Any Federal resources made available to promote broadband availability should therefore be directed through existing programs to maximize their effectives, and sufficient "guardrails" should be put into place to ensure that any new efforts complement, rather than undermine, the good work that existing broadband-focused programs already enable.

6. Streamlining Construction Processes is Necessary

Once the business case can be made for deployment and ongoing operation of a rural broadband network, this is where impediments that can delay or deter a project come into play. Steps can and should be taken to mitigate permitting delays, complicated application procedures, and high costs of access. Such efforts are especially important to enable any Federal resources made available as part of an infrastructure plan can begin delivering on their promise as soon as possible.

Smaller providers like those in NTCA's membership have neither the staff nor the resources to navigate complex agency structures in search of permits to build broadband; for companies and cooperatives with an average of approximately 25 employees, time and money spent on such efforts translates to time and money not

spent building broadband. At the same time, in serving many of the most remote parts of the United States, our members have deep experience with the Bureau of Land Management, U.S. Forest Service, National Park Service, and many other land-owning and property-managing agencies across the Federal Government. Especially when crossing Federal lands or railroad rights-of-way, small rural providers must address permitting concerns or contractual obligations that can delay projects and increase their already high costs.

7. Accountability Must be Part of any Program

One final principle to consider in connection with any infrastructure plan is how to hold recipients of any resources accountable for use of the support they may receive. Concerns have been raised in the past, for example, that it is difficult to discern the precise locations reached leveraging ARRA resources. Similar concerns were raised in the past with respect to use of USF funds, particularly in areas where broadband remained lacking notwithstanding the sums disbursed to certain carriers. In more recent years, however, the FCC has established a robust accountability program that imposes specific buildout obligations and requires recipients of USF support to capture the latitude and longitude of every new location to which they deploy broadband using such support. The FCC is also in the process of developing measures by which USF recipients will verify the availability of services at the levels required by the program. Similar measures should be considered in any new program—or, yet again, this provides good cause to leverage existing efforts in lieu of creating new programs and compliance measures from scratch.

Proposed Steps Forward Based Upon These Key Principles and Lessons Learned

The principles and lessons learned described above can provide guidance in considering the most effective and efficient steps in addressing our Nation's remaining rural broadband challenges. I will next discuss a few steps that NTCA suggest should inform and shape any infrastructure plan.

1. Leverage Existing Initiatives to the Maximum Extent Possible

a. Universal Service Fund

Standing up new programs from scratch is not easy, and if a new broadband infrastructure initiative conflicts with existing efforts, this would undermine, rather than further, our Nation's broadband deployment goals. For these reasons, strong consideration should be given to leveraging—and supplementing—the FCC's existing High-Cost USF initiatives as a primary means of implementing a broadband infrastructure initiative.

USF programs have been in place for years, and the FCC has recently reoriented these efforts under the "Connect America Fund" banner to promote broadband in high-cost rural areas. As discussed earlier in this testimony, the high-cost USF/CAF initiatives are essential both in justifying the business case for broadband infrastructure investment in the first instance, and then sustaining such investments by keeping rates for services more affordable once networks are built.

Unfortunately, although the FCC is considering steps to partially address a current USF funding shortfall, these otherwise effective broadband-promoting initiatives remain woefully underfunded to achieve their goals. More than $100 million per year is still needed to fund a USF model that the FCC created to promote broadband deployment. In addition, under a budget control mechanism included within 2016 reforms that applies only to some carriers, many small rural telecom operators have had their support slashed by an unpredictably escalating budget control that now equals 12.3 percent on average, translating into denied recovery of more than $170 million in actual costs this year for private broadband investments *that they have already made.*

Indeed, the impacts arising out of insufficient funding of the USF programs are striking, and they underscore how more sufficient funding could yield compelling results. Because of the USF model budget shortfall, 71,000 rural locations will receive lower-speed broadband, and nearly 50,000 may see no broadband investment at all. Meanwhile, a NTCA survey found that 183 small business member companies were facing annual USF support reductions of more than $500,000 on average, with a corresponding average decline in planned network investment of nearly $950,000 that translated to delays or denials of upgraded broadband to more than 850 customers on average. (This last set of figures would add up to an estimated $91.5 million in reduced USF support leading to nearly $174 million in declined or deferred broadband investment, and more than 150,000 customers estimated to remain without access to upgraded services.) Moreover, NTCA members estimated that the USF

support reduction would contribute to standalone broadband prices $50 higher *per month* than they would otherwise have been for rural consumers.[2]

The FCC's High-Cost USF efforts therefore represent a logical focal point for future broadband infrastructure initiatives. The FCC is the Nation's expert agency in telecom policy, and it is already tackling broadband challenges with respect to availability and affordability. Moreover, recent CAF reforms adopted by the FCC have sought to: (1) reorient the USF programs toward broadband, (2) ensure funding is targeted to where it is needed (*i.e.,* to places where the market does not enable service delivery on its own), and (3) define what the FCC considers an efficient level of support in each area. The FCC will also be conducting an auction later this year that will allow interested bidders of all kinds to seek USF/CAF support for unserved areas. Finally, the reformed program rules compel significant accountability, to the point that support recipients must meet specified deployment obligations and geocode every new location to which they deploy broadband leveraging USF support.

The FCC's various High-Cost USF programs offer a ready-made platform that, with additional resources but with very little additional "heavy lifting" or process, could satisfy the principles articulated above and yield immediate, measurable benefits for rural consumers in the form of additional locations reached and higher-speed broadband. By contrast, creating new programs would require more administrative effort, and the rules for any such new programs must still be informed by the objectives and "lessons learned" articulated above—while also making sure not to undermine the important work that existing programs are already undertaking.

b. Rural Utilities Service

Additional resources for rural broadband could also be directed to the Department of Agriculture's RUS programs that have likewise been important in stimulating rural infrastructure deployment. The RUS has long played a crucial role in addressing rural broadband challenges through its telecommunications programs that finance network upgrades and deployment in rural areas, and these programs remain just as vital today. If any infrastructure resources are directed to RUS rather than to the FCC's USF/CAF efforts, it will then be essential, however, to ensure that such programs are coordinated effectively with and complement, rather than compete with, the ongoing efforts of the Federal USF programs.

At times, some confuse the roles of RUS programs and the USF, thinking them repetitive or redundant. But this reflects a fundamental misunderstanding of the unique and distinct role each has played. USF does not finance networks; banks and other lenders (including RUS programs) provide upfront financing necessary to construct networks (although not too many banks lend to construct broadband infrastructure in rural America where return on investment is typically measured in decades). On the other hand, RUS programs and other banks and financing programs do not *sustain* networks or make services atop them affordable for consumers; again, loans from private lenders or through the RUS programs focus upon upfront financing. It is the Federal USF program that is essential to ensure that consumers can obtain reasonably comparable services at reasonably comparable rates atop the networks once financed and built. In other words, USF is the linchpin of making the business case in the first instance to *obtain* financing from any lender—RUS or otherwise—to build networks in rural areas.

It is essential that this long-standing complementary relationship between RUS and the USF initiatives continue, rather than revising the programs or using any new infrastructure plan resources in a manner that pits Federal efforts against each other. RUS already has policies in place precluding its own programs from competing with one another; it is important to take this a step further and ensure that *all* federal programs work in concert rather than potentially undermining each other's important pro-investment policies. To this end, NTCA suggests ensuring that any Federal RUS program funds and new infrastructure resources not be used to overbuild another provider's broadband network if supported by Federal USF resources, provided that the USF recipient is meeting its buildout obligations under the USF program. Such a reasonable measure will ensure the ongoing complementary nature of these efforts, maximize the effectiveness of any Federal resources put toward broadband infrastructure, and ultimately enhance the likelihood of success of new infrastructure initiatives in reaching as many rural Americans as possible.

2. Conduct Better, Smarter Mapping of Service Availability

This Subcommittee's attention to mapping is much-needed and appreciated by NTCA and its members. We need more accurate, granular data on service avail-

[2] NTCA 2017 USF Budget Control Impact Survey Results (2017), NTCA—The Rural Broadband Association, Arlington, VA.

ability to ensure that government efforts to support broadband target resources as efficiently as possible. Such data serve two important functions, in fact, in the context of broadband infrastructure policy. First, better data will help ensure that Federal support is not withdrawn when still needed because there is no other network in a given area. Second, better data can help avoid the prospect of federally-supported duplicative infrastructure deployment in an area that might at first appear "unserved."

Unfortunately, there is no single, current, fully reliable source of data with respect to broadband availability in the United States. The National Broadband Map administered by the Department of Commerce has not been updated since June 2014—ages ago in the evolution of broadband network coverage and speeds. Moreover, depending on the state process that went into gathering such data, that map appeared to contain anything from carefully vetted information to self-selected claims of coverage based more upon marketing interest than actual network capabilities. In the interim, the FCC has started to publish more tools showing the data gathered through provider Form 477 submissions, but the underlying Form 477 process itself suffers from imprecision and an inherent lack of granularity. The Form 477 is certified by the provider, but there is no means of validating the data submitted. In addition, the Form 477 data is submitted by census block—meaning that in a rural area, one consumer with service in a block can result in unserved consumers miles away looking "served" nonetheless. It is for these reasons that the FCC has engaged in substantial periodic data collections and additional "challenge processes" in the context of its fixed and mobile USF proceedings, so that it can develop a record of better evidence to validate where service truly does and does not exist notwithstanding the face of Forms 477 received.[3]

Better methods to ascertain broadband availability exist. The FCC's High-Cost USF program requires recipients of support to geocode individual locations where new broadband is installed (and, in some cases, for prior deployments, too). Such measures—particularly the geocoding of new installations and upgrades going forward—can bring us closer to identifying where broadband exists with much greater precision, which would then allow targeting of support and other efforts to promote broadband deployment where needed most. On a going forward basis, geocoding could perhaps offer promise in transitioning from the current maps to better information. Whatever means might ultimately be chosen to obtain more accurate and granular data, however, it will be important to: (a) avoid unreasonable burdens in the data-gathering process, including any duties to go back and geocode prior installations; and (b) reconcile and coordinate data-gathering and mapping efforts to avoid duplicative reporting requirements for operators and the prospect of generating inconsistent data due to differing standards among reports at different agencies.

3. Streamline Permitting

As discussed earlier in this testimony, the primary challenge to rural broadband deployment is making the business case at all for rural broadband deployment. Where such business case exists however, removing barriers to deployment through streamlining of governmental permitting procedures can in turn drive more rapid rural broadband deployment at relatively lower cost. Several steps can and should be taken to address such concerns, and NTCA is encouraged that Congress and the Administration continue to examine these issues on so many fronts.

As an initial matter, NTCA and its members have urged that differences in Federal agency policies and procedures with respect to installation of communications facilities should be the exception rather than the rule, applying only where needed to implement a unique statutory directive to the agency in question. A lack of coordination and standardization in environmental and historical application and approval processes across Federal agencies increases the cost and further complicates and delays the deployment of broadband infrastructure—especially for small providers. Several NTCA members joined NTCA's CEO, Shirley Bloomfield on the FCC's Broadband Deployment Advisory Committee's Streamlining Federal Siting Working Group that put forth recommendations, which will hopefully be implemented to further accelerate the broadband deployment permitting process. Those recommendations included:

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[3] *See Connect America Fund, et al.,* WC Docket No. 10–90, *et al.,* Report and Order, Order and Order on Reconsideration, and Further Notice of Proposed Rulemaking, FCC 16–33 (rel. Mar. 30, 2016), ¶¶ 70–71 (directing a challenge process for recipients of model-based USF support) and ¶¶ 116–145 (creating a challenge process for carriers receiving cost-based USF support); *Connect America Fund, et al.,* WC Docket No. 10–90, *et al.,* Order on Reconsideration and Second Report and Order, FCC 17–102 (rel. Aug. 4, 2017), ¶¶ 27–64 (adopting a challenge process intended to direct Mobility Fund support to rural areas that lack unsubsidized 4G LTE service).

- *Standardize and publish fee schedules, and utilize revenue in a way that promotes expediting Federal siting processes.*
- *Harmonize permitting processes across agencies to the extent feasible and ensure the process is uniformly applied across regional and state offices.*
- *Recognize and accept existing completed studies in previously disturbed areas.*
- *Harmonize environmental assessments across Federal landholding or managing agencies, further streamline National Environmental Protection Act and National Historic Preservation Act exclusions, and eliminate duplicative environmental studies.*
- *Make current environmental and historic review streamlining mechanisms mandatory for all agencies.*
- *There should be a single, easily accessible online-tracking mechanism at each Federal agency for the permitting process. All agencies should regularly report on permit status and the number of permitting applications they have processed.*
- *The common application form should accommodate changes to existing installations and applicable leases and easements. Agencies should accommodate and incorporate new broadband infrastructure technologies into their review processes.* [4]

As Congress considers any permitting reforms, however, it is important to emphasize that any changes and coordination with respect to permitting should be made on a "technology neutral" basis. Much of the discussion with respect to streamlining of permitting processes appears driven by a desire to promote the availability of 5G wireless capabilities through the increased placement of small cells. This is understandable given the promise of faster mobile broadband services and the fact that massively expanded small cell placement is critical to the availability of such services.

At the same time, it is important to take realistic stock of whether, when, and to what degree 5G services will be available on a widespread basis in rural America. A technical paper released last year found that the full promise of 5G capability can only be realized in rural America if small cells are placed every several hundred feet apart,[5] and it will take significant amounts of backhaul capacity—"densification" of fiber[6]—to manage the data loads that 5G is hoping to handle.[7] In short, the deployment of 5G-capable networks in rural areas where there are only a few households per square mile would effectively seem to translate to a fiber-to-the-premise construction. Put another way, the old mantra of "wireless needs wires" is quickly becoming "5G needs fiber." In addition, it has been explained that taking steps to rationale 5G permitting alone "will not solve the problem in unserved areas;" it will clearly take both permitting relief and additional resources if the promise of 5G will come to rural America within the foreseeable future.[8]

In the end, for rural consumers to have a broadband experience reasonably comparable to that in urban America, they must have meaningful access to both fixed and mobile broadband services. Placing too much hope on mobility alone without recognizing "wireless needs wires"—or, these days, "5G needs fiber"—is a recipe for insufficient access in rural America.

Conclusion

The current national infrastructure debate represents a significant opportunity to make progress on rural broadband deployment, and we hope that the promise of broadband will be recognized among the many other compelling infrastructure priorities also in need of attention and resources. We look forward to working with you and greatly appreciate the work of this subcommittee in helping to solve the challenges of rural broadband.

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[4] Broadband Deployment Advisory Committee: Federal Siting Working Group, Final Report, (2018).

[5] Evaluating 5G Wireless Technology as a Complement or Substitute for Wireless Broadband, Vantage Point Solutions (2017).

[6] See Remarks of Federal Communications Commission Chairman Ajit Pai at the Mobile World Congress, Barcelona, Spain, February 28, 2017.

[7] The Road to 5G is Paved with Fiber, Fiber Broadband Association, December 2017; Sean Buckley, "Verizon's McAdam: Our multiuse fiber approach offers more cost efficiencies," Fierce Telecom, May 22, 2017.

[8] Holmes, Allan, "5G Cell Service is Coming. Who Decides Where It Goes?" The New York Times, March 2, 2018; *see also* remarks of CTIA during "Closing the Digital Divide: Broadband Infrastructure Solutions" hearing, U.S. House of Representatives Energy & Commerce Communications and Technology Subcommittee, January 30, 2018.

Due in part to the leadership of this subcommittee, small, rural broadband providers like those represented by NTCA–The Rural Broadband Association continue to make great strides in overcoming the challenges of providing broadband to rural America. Your commitment to identifying and solving these challenges is greatly appreciated. Thank you for inviting me to be with you today, and I look forward to your questions.

Senator WICKER. Well, thank you very much, Mr. Romano. And thank you all, gentlemen, you all submitted excellent written testimonies which will be included in the record and your 5 minute summaries were just outstanding. So my hat is off to each of you.

Let's begin, Mr. Gillen, with something you brought up and perhaps others would like to comment on this. This race to win 5G. You say we are in a race with China and Japan, for example, as well as the European Union. What are the consequences of letting someone else win this race? What if China wins the race and we come in second? What does this really mean to Americans?

Mr. GILLEN. It's a great question. Chairman, I think the easiest way to think about it is looking backward. We lead the world in 4G wireless and that lead to things like the app economy developing here. You have global giants like Samsung and Erickson have R&D facilities here in the United States because we have the best networks to innovate off of.

So when we talk about 5G and the exciting things happening in healthcare and transportation and education, we want that innovation to happen here first. And if we aren't first we risk that innovation going overseas.

Senator WICKER. Would someone else like to talk about that? All right. OK. If not, we will move on and I'll get all my questions in.

So do all of you agree with Mr. Gillen?

Mr. Berry.

Mr. BERRY. Yes, Senator, I agree that we do want to be in first because we get the first mover of benefit in an economy.

I'm also concerned about as we move to 5G that we are also ready for 5G in all of rural America. We need to get the 4G LTE, long-term evolution technology, as well as VoLT, voice over LTE, and the faster we get there the faster we can have the benefits in rural America and urban/suburban America of a 5G world. Because I don't think we want to leave half the United States or half the Nation behind this economic opportunity for the new mobile world. And so that's my concern. Yes, we need to be on the forefront of innovation, but we also need to do it in a way that allows the entire economy to benefit from this great opportunity.

Senator WICKER. Thank you very much.

Well, Mr. Berry, let me ask you then to elaborate on the concern that I expressed and that you expressed about data collection and broadband mapping. I think you said it's just totally inadequate. So if you would comment on that first and then anyone else would like to follow-up, please do.

Why is the data so wrong?

Mr. BERRY. You know the simple answer is garbage in, garbage out. And we are not asking—it's clear that I had great hopes that this next round of data request would actually produce a better quality service maps. What we actually got though was very clear

that the FCC requested the wrong perimeters in order to define a granular map that has actual meaning on the ground.

Senator WICKER. When did that request go out?

Mr. BERRY. Well, it was a whole series of discussions and back and forth with the FCC. You know, our carriers, FCC and our members said, listen, you should measure signal strength and you should measure those types of things that consumers expect for usage on the ground. And we didn't do that in this map.

What you have is a map that the FCC produced that says here is the areas that we think are eligible for USF and all those other areas, including like 99 percent of Mississippi is ineligible, and until someone challenges that, it's like having to prove a negative and I—I am very concerned that the map is so disfigured in terms of its reality on the ground that it's almost impossible to have a successful challenge because you're going to have to challenge literally 98 percent of the United States in order to do so.

It's—we can do better. I would suggest that maybe we need all the resources of the Federal Government to focus on broadband data and information. NTIA just last—just a few days ago, David Redl, the new Assistant Secretary of NTIA, suggested NTIA has a great database and has access to local, state and governments and that they can help build a better database that is rational and more accurate about where is broadband and where it is not.

Senator WICKER. Mr. DeBroux——

Mr. BERRY. Not just wireline, but wireless.

Senator WICKER.—you seem eager to jump in.

Mr. DEBROUX. Yes. I think, and I'm not an expert on the wireless side of this, but on the wireline side I think some good starts have been made. We are not there, but take, for example, in the ACAM program, the FCC was extremely careful to make sure that there was no over building. That money wasn't given to households that already had other options available.

And we are in 25 different states and we looked very closely at where the locations would be funded. We've actually engaged in their challenge process in various areas and we actually lost some of those challenges that we thought we should have won, but what that meant was there was no possibility that any money would be going for duplicative networks. And in that particular context, I think the FCC had done a really good job using 477 data in terms of precisely targeting the money that was available for broadband.

So I think there's a start. I don't think it's all, you know, total chaos out there. I think there are various agencies that are collecting data.

In addition, USAC for each location that we build, each household that we build to we have to provide the geocode location to them. So they are building a map as time goes on. So I think with coordination among various Federal agencies, I think we are getting there, but we are clearly not there yet.

Senator WICKER. There are better maps you say.

Mr. DEBROUX. Well, there are better—there's information that hasn't really made its way into the maps. When I looked at the FCC map, there were definitely flaws with it and I think it's the way, partly the way the 477 data was interpreted.

For example, TDS Telecom, our parent company is telephone and data systems. It's also the parent company of U.S. Cellular and there was confusion in the maps in terms of what was represented as an area that telephone and data systems served that could have been either our wireless or our wireline areas. So there's refinement that needs to be done, but I think the underlying data is there.

So it's a matter of evolving these maps and working on them and seeing what needs to be done and moving forward.

Senator WICKER. Senator Schatz.

STATEMENT OF HON. BRIAN SCHATZ, U.S. SENATOR FROM HAWAII

Senator SCHATZ. Thank you, Mr. Chairman. Thank you to all the testifiers for being here.

I want to talk a little bit about tech infrastructure in the context of this broader infrastructure conversation. It occurs to me that Democrats are unlikely to support a shifting of responsibility for infrastructure from the Federal Government to State and local. They are also unlikely to support the undermining of labor or environmental protections. And, likewise, Republicans are unlikely to support, at least at this time, a big unpaid for straight up 1.5 trillion dollar infrastructure plan and yet everybody likes the idea of funding USF to a greater degree.

You have a technical problem I think of just making a straight appropriation into a fund which is—which has always operated under a statute with fee revenue. So that's context.

One more point of context is that the USF contribution factor was five and a half percent in 2000. It's 19.5 percent right now. We have gone from three million broadband subscribers at the residential level to about 100 million now. And that doesn't count anybody who gets high speed Internet in some other way.

So you have this shrinking base of revenue from people who still use traditional telephone service that is funding broadband infrastructure across the country. We all support that, but the math doesn't work out.

And the beauty of this is that the difficulty that a legislative body would normally have in assessing a fee for broadband, because everybody is freaked out about calling it taxing the internet, is set aside because these are appointed officials, not elected officials. The FCC already has statutory authorization to do contribution reform.

And I can understand elected officials not wanting to stand up and tax broadband, but it is actually unconscionable that we are charging a smaller and smaller number of people who are primarily rural in the first place, elderly, not as wealthy, who just have traditional telephone service to subsidize the rest of the world getting on broadband.

We need contribution reform and we need the FCC to step up and act like appointed officials for a quasi-judicial commission.

And, the FCC has already shown this year, without getting into a separate conversation, an absolute determined willingness to do unpopular things. This would be an unpopular thing that would actually make sense in terms of connecting all of our communities to

the internet. And so I'll start with Mr. DeBroux and Mr. Romano and see if you have any comments on that.

Mr. DEBROUX. Well, first of all, I'm not sure I've got much to add to what you said because I could not agree with you more. The base, the current base is shrinking. The need for broadband is there. We have a law that says reasonable comparability. I mean it's not just a good idea, it's the law.

And in order to obtain that, in order to get broadband out into rural areas that is comparable it's going to take a lot of money. I mean there are a lot of things that can be done around the margins in terms of, in terms of helping getting through rights-of-way, getting access, all that kind of stuff.

But without actual dollars being spent we are not going to achieve comparability and so I agree a hundred percent with your analysis.

Senator SCHATZ. Mr. Romano.

Mr. ROMANO. Thank you, Senator. Yes. So, first, you are correct, the FCC does have the authority, regardless of—and I know sometimes this gets into a question of what is broadband. Regardless of what one considers broadband, the FCC has the authority under current law to include some form of broadband within the contributions mechanism, whether it's on a revenues or connections or what have you basis. So that authority is there.

But you raise a fundamental point. This is about equity. We are talking about funding broadband networks. We are talking about finding a way to help make sure broadband gets deeper into rural areas, to lower-income consumers, into schools and libraries. But yet the one service that isn't contributing to that goal of getting more broadband out there, ironically, is broadband.

There's an equity issue there. The consumers who are left paying for this are the consumers who are not making use of broadband. It's a fundamental disconnect in that. Sustainability is critical to these programs, especially with long-term investments like the ones we are talking about here. If you don't have a sustainable universal service mechanism itself in the form of sufficient funding, predictable funding, we're going to have a problem. We are talking about potentially providing more support for broadband. Yet right now the high-cost program operates on levels that were decided in 2011 just because that happened to be what 2010 distributions were.

So we do need to approach this fundamentally as an equity issue and hopefully find a way to make these programs more sustainable.

Senator SCHATZ. Thank you to all of you.

Mr. Mayor.

Mr. RESNICK. Thank you, Senator. It's a great question. In addition to being the Mayor and working with NLC on these issues, I had the privilege of serving on the FCC's Intergovernmental Advisory Committee for 8 years including as its Chair through December 2016.

My committee supported the FCC reforming its programs to recognize that people are getting new technology and the programs don't work anymore based on the old technology, including Life Line program which the FCC did reform to include broadband sup-

port. So there's no reason that these programs can't be expanded to cover broadband service.

Senator SCHATZ. I'm out of time so I'll take the rest of it for the record.

Thank you.

Senator WICKER. Let's go ahead and let Mr. Gillen and Mr. Berry comment briefly.

Mr. BERRY. I'll give you one more factoid for your illogical rationale on how we are spending more and more on broadband and less and less contributions. Wireless is actually spending—making a significant contribution to broadband. That's the one area that's gone up.

Unfortunately, decisions in the last 4 years have reduced the amount of funds that are available under the High-Cost Fund for wireless. While we are paying 45 plus percent, we get about 8 percent now. Five years ago we were paying 45 or 50 percent and we were getting 23 and a half percent. So how do you get high speed mobile broadband when—and you're right, in a fund that's declining, when the policies have actually decreased the amount of funds that are going to mobile.

Senator WICKER. What decisions, what policies?

Mr. BERRY. Within the FCC, when we restructured the USF, you know, I represent wireless. So I think it's a little broadband—I mean I think it's a little wireline biased, but now we are in a broadband world and I think we do need to address the contribution reform issue. It's been on the table for a long time.

We have a lot of companies out there, especially over-the-top companies are making a heck of a lot more on the networks than the people that build and operate and maintain the networks and we need to address that.

Senator WICKER. Mr. Gillen.

Mr. GILLEN. Mr. Berry covered it well. It truly is, for us, a matter of technology neutrality as well. We are paying in roughly 50 percent of the fund, because we still have telecommunication services that all of your cell phones pay into this. But we are only getting 10 percent of the fund back. So I think some of the equities we look at updated methodology is who is paying in and the fairness of that program.

Thank you, sir.

Senator WICKER. Senator Blunt.

STATEMENT OF HON. ROY BLUNT,
U.S. SENATOR FROM MISSOURI

Senator BLUNT. It's highly possible that I don't understand how 5G is going to work. But what I think I understand about 5G would mean that it would be likely to be even more slowly implemented in rural America than what we are doing now. So here's a premise.

The premise is if that's right and you have to have a 5G tower every, you all can fill in the blank, but it all sounds like to me it's pretty close, it might work in Wilton Manors, Florida. It might not work in the rural parts surrounding Wilton Manors, Florida as the example. So the premise would be if—explain to me why 5G would be implemented in those last people's served, and if it's not going

to be implemented, would we be better off to focus on wired broadband for those kinds of locations knowing that there is likely not to be a tower built for a long time every 500 yards. I think that's a big number based on what I have heard.

Mr. Berry, do you want to start? And, Mr. Gillen, I can see your eyes are twinkling there. So, and, Mr. DeBroux too, I would be interested in what you have to say.

Mr. BERRY. Thank you for the question. And it is real interesting issue that I think technology is going to help us respond and address some of those issues, but 5G IoT is a lot of different things and a lot of different services.

There's some new technology the NB, narrowband technology, on the IoT Internet of things can roll out through an LTE and on top of LTE networks. So narrowband LTE. It can reach as much as ten times further than existing LTE technology. So it's not necessarily so that 5G IoT type of services and capabilities are going to be rolled out in rural America last. I think what we may have is an opportunity to actually enhance broadband service, narrowband broadband service in some of the, you know, more cost-effective deployments in rural America earlier. And so if we had——

Senator BLUNT. What do you mean by narrowband?

Mr. BERRY. It's a type of technology that runs on a smaller slice of spectrum and will—DISH technology, DISH is using narrowband technology, as well as T-Mobile has just deployed a narrowband technology running side-to-side essentially on the guardbands of their own LTE network. So technology is giving us great opportunities here.

Senator BLUNT. All right.

Mr. BERRY. So if we have some revenue and dedicated resources for mobile broadband build out I think you are going to see it sooner than you might otherwise expect.

Senator BLUNT. Mr. Chairman, I'm going to have to take this call.

Mr. GILLEN. It's a 5G call.

Senator BLUNT. While—it's a 5G call. It's probably a 4G call. Go ahead and answer the question and I will read your answer in the record.

Mr. GILLEN. Absolutely, thank you, Senator. And I think 5G will absolutely benefit rural America and it is going to start in the denser parts, as any new technology does. So it's going to first go to college campuses like Missoula, it's going to go to the town square, places where you need to have the ability to have a hundred times more devices and a hundred times the speed.

But 5G will have applications, as Steve noted, that require low band spectrum to go distances like connect a car and other applications that is going to be different technology. So for us we separate: there's rural America that absolutely will benefit from 5G and then there are Americans unserved by any broadband today, and those are really two different challenges and we need two different sets of solutions for that, but in terms of 5G benefiting rural America, absolutely.

Senator WICKER. OK. Mr. Udall is next.

STATEMENT OF HON. TOM UDALL,
U.S. SENATOR FROM NEW MEXICO

Senator UDALL. Thank you very much, Mr. Chairman.

This topic of this hearing is timely and important. In New Mexico we have companies, including tribally owned telecommunication companies, rural electric co-ops and traditional rural, local exchange carriers that are working hard every day to serve the highest cost areas, but basic economics tells us they need more support from Federal programs. And by support we mean dollars, not simply press releases and rhetoric.

As I sit here and listen to some of the testimony it is striking as major wireless companies tout winning the race for 5G, too many people in New Mexico and those living on tribal lands are stuck without 1G. While carriers have been vocal about what they see as delays, I hear from many rural areas and tribal communities about these same carriers refusing to build towers or serve those areas.

For example, the Village of Reserve, New Mexico was approached by a wireless company in 2014 to build a tower within village limits. Surveying was completed, but then the company has failed to return a single phone call or e-mail from local officials. That was 4 years ago.

So as we hear from companies asking for more latitude to build in mostly urban areas, everyone on this Committee must push them hard to expand to rural areas where so many communities still do not have adequate internet.

And at this point, Mr. Chairman, I would just seek to put in the testimony of Godfrey Enjady, the General Manager of the Mescalero Apache Telecommunications, Inc. in New Mexico. And he's also the head of the tribal entities——

Senator WICKER. Without objection it will be.

[The information referred to follows:]

PREPARED STATEMENT OF GODFREY ENJADY, GENERAL MANAGER, MESCALERO APACHE TELECOMMUNICATIONS, INC.

Chairman Wicker, Ranking Member Schatz and members of the subcommittee, thank you for this opportunity to submit testimony. I am Godfrey Enjady, General Manager of Mescalero Apache Telecom, Inc. (MATI) located in Mescalero, New Mexico. I also serve as President of the National Tribal Telecommunications Association (NTTA) which is comprised of the nine Tribally-owned and operated telecommunications companies that provide voice, broadband and other communications services to their communities. Those companies are Cheyenne River Sioux Telephone Authority, Fort Mojave Telecommunications, Inc., Gila River Telecommunications, Inc., Hopi Telecommunications, Inc., Mescalero Apache Telecom, Inc., Saddleback Communications, San Carlos Apache Telecommunications Utility, Inc., Tohono O'odham Utility Authority, and Warm Springs Telecom.

Mescalero Apache Telecom serves the entirety of the Mescalero Apache Reservation located in the remote South Central Mountains of New Mexico. Prior to MATI purchasing its service area and building its network in 2001, 52 percent of the Mescalero Apache Tribe received no service, and 48 percent received only basic voice service. Nearly 100 percent of the Tribe now has access to some level of broadband service. MATI provides services in what is considered a rural, high-cost area and serves an average population density of two customers per square mile. This situation causes the average cost per loop to substantially exceed the national average. In addition, 84 percent of the Tribe is eligible for Lifeline Support, compared to the national average of 21.8 percent.

The recent 2018 Broadband Deployment Report acknowledges that only 31.6 percent of rural Tribal areas in the lower 48 states have access to 25/3 fixed broadband

service. MATI attests that, in its specific case, extremely high costs are incurred to build out its Reservation and maintain network operations to provide modernized telecommunications and broadband services to its community and close the digital divide.

The difficulties in serving remote, dispersed communities situated in hard to serve, rough terrain has been thoroughly illuminated in Congressional testimony and on the record at the Federal Communications Commission (FCC), and with USDA's Rural Utilities Service (RUS).

Access to capital is a major roadblock to network growth and viability. Because most Tribally-owned carriers cannot collateralize their assets, RUS is our only lender and I appreciate the work that they do. In 2015, my company received the first RUS loan under the 2008 Farm Bill's Substantially Underserved Trust Area provision. RUS loans and FCC Universal Service Fund (USF) support go hand-in-hand. Reliable and predictable cash flow is required to get any sort of loan, including RUS loans.

The National Broadband Plan, in numerous instances, outlined the need for greater efforts to be made to make broadband available on Tribal lands. There is a lack of FCC development of broadband performance goals and measurements on Tribal lands. We recommend the development of training, mapping, data collection, and performance goals and measurements for broadband development in Native communities.

The arbitrary budget cap that has been established for the FCC's USF high-cost program does not allow for adequate funds to build and maintain the broadband networks that are demanded by regulators, policy makers and consumers. There continues to be a debate about broadband capacities and speeds, no matter what the platform of delivery. Fiber optic networks, with the complement of wireless and satellite technologies, delivers the most rewarding Internet experience to consumers. And that network requires a viable and predictable funding source, especially in areas that are remote, sparsely populated and hard to serve. An examination and reform of the USF contribution regime is long over-due, and may eliminate any need for the arbitrary budget cap.

In June of 2015, NTTA went on record at the FCC with a proposal to adopt a Tribal Broadband Factor (TBF) as part of the reform of the long term USF for rate-of-return carriers. The TBF included a multiplier for targeted support on Tribal lands, and had specific obligations for any carrier, Tribally-owned or not, that uses the program. The proposal was straightforward and easily understood, and was narrowly-tailored to address the specific need to promote broadband while causing very little impact on the overall USF mechanism. The FCC did not adopt this proposal. In February of last year, the FCC began circulation of a portion of the TBF proposal that would allow funding relief for operational expenses for communications companies serving Tribal lands. To date, this proposal has not been adopted. We call on this committee to weigh-in with the FCC to immediately act on this opex relief order and work to bring stability and predictability to USF support for Tribal communities.

NTTA recommends that a pilot program be established to locate existing infrastructure in Indian country. In many Tribal areas, current infrastructure facilities (water, sewer, gas, electricity) are not properly identified or mapped. The preference of burying new broadband infrastructure leads to unintended cuts and/or damage to existing utility facilities that can prove to be inconvenient and possibly dangerous to the local community as well as adding significant cost to a broadband build out. There are numerous instances of Tribally-owned and operated telecommunications companies using a major portion of their broadband project funding to repair damaged infrastructure. For example, MATI recently incurred over $350,000 of additional construction costs resulting from hitting unmarked water and sewer lines during its current fiber-to-the-home build. In the case of Tribally-owned companies, this funding would be provided primarily through RUS loans. With aging infrastructure on Native lands, the scope of this problem is significant and unknown. A pilot program, with adequate funding, would allow all parties involved to develop best practices and methods to identify unmarked infrastructure to avoid damage and unneeded additional cost.

We also recommend additional funding for the development of more robust middle mile infrastructure and capacity. Most Tribally-owned telecommunications companies serve rugged and remote areas. Issues related to distance and capacity make connecting to the "outside world" very costly. As Tribal companies build out broadband to their communities, they add more customers and therefore more traffic on their network. Customer usage has also driven the need for more capacity (Netflix, YouTube, etc.). An injection of funds to build more middle mile capacity for Tribal use would greatly benefit those communities.

Also, there needs to be a reallocation of spectrum for Tribal use. The current process of spectrum allocation makes it very difficult for smaller entities to access spectrum. This includes Tribal communities which need both wired and wireless services to prosper. One way to address the scale of size issue is to establish a Tribal Spectrum Network to increase the capacity "buying power" of Tribal entities.

There are many other issues that can be addressed to enhance broadband deployment in Tribal areas: expansion and increased funding for USDA's Community Connect Grant program, the reduction of regulatory compliance reporting for small companies, an enhanced Tribal Lifeline credit, and a better Tribal engagement and consultation processes.

Mr. Chairman, much more work needs to be done on infrastructure growth in Tribal areas, most importantly in the area of broadband deployment.

Senator UDALL. My question to Mr. Berry and Mr. Gillen, there is much talk about the great future and capabilities of 5G, 5G wireless services and the need for more infrastructure to build out that network. The FCC is currently examining sweeping changes to Section 106 requirements that have been a good example of government-to-government engagement between tribal entities and the Federal Government.

How do your member companies view this Section 106 historic preservation mandates and tribal consultation requirements in light of the FCC's draft report and order?

Do you believe these mandates should be weakened and are your members seeking to eliminate fees that cities and states charge as well?

Mr. Berry and Mr. Gillen.

Mr. BERRY. Thank you, Senator. Thank you for the concern you expressed on the local tribal issues, as well as the cultural heritage issues.

I would ask sort of a success story to be entered into the record. One of our carriers, Commnet Cellular, actually worked with the Pueblo tribes there in New Mexico to actually provide a tower that is commensurate with their historical and cultural acquisitions and worked very closely with them to bring them their number one priority, which was service that was culturally acceptable in its application.

So we very—most of our carriers are smaller carriers. They live in the community. If they don't like something, you may hear it at church and you may hear it at the PTA. So we are very concerned about that in the local context.

But, we do believe that we need a modifications of Section 106 and National Historic Presentation Act, as well as NEPA. As well as some of those tribal review requirements should be focused more on actual addressing historical, cultural antiquities and preservation.

It doesn't make any sense, Brad just mentioned, sometimes you file an application and 2 years later you get approval. The technology has moved so quickly that the antenna that you were going to put up there is now no longer the antenna that works in your network and so you have to refile.

So I think there are rationale, reasonable and logical progression of how we can not only address those issues, but also speed them up and bring that service to rural America and we are totally in favor of that. And I'll share with you the story that I think was a model of how we should address the tribal issues.

Senator UDALL. Thank you.

Mr. Gillen.

Mr. GILLEN. Thank you, Senator. And we can and need to do better in serving your residents in New Mexico. With respect to the tribal question you raised, I think it's important from the FCC's perspective what they are doing next week. It does not actually govern actual tribal areas or reservation, it goes to the consultation process of areas of significance.

And the challenge we face right now is there is an example, a carrier wanted to site in Houston before the Super Bowl last year 23 small cells in an existing parking lot. That process cost $173,000 to site something on a parking lot.

And so I think what the FCC is trying to do is find the right balance to retain the important tribal rights, but also ensure we are deploying in a timely manner. We think the FCC has struck the right balance, but happy to work with you on that issue.

Senator UDALL. Mr. Chairman, I think my time is up, but the Mayor I think wanted to comment on this.

Mr. RESNICK. Just briefly. I just wanted to bring to the attention of the Senator and the Committee that the issues with respect to deployment are not only in rural areas. I happened to be at a public hearing in Leon County, Florida, which is where Tallahassee is located. I know the representative is here from Tallahassee.

And that when asked by a county commissioner whether a company would install 5G technology in inner city Tallahassee where residents do not have affordable broadband, do not have reliable service, frankly, the industry in a candid moment said, no, that there's not an economic case for that. We have absolutely no intention of deploying 5G technology in inner city Tallahassee and there's nothing in Florida law that allows the city to require a buildout.

So it's not just the rural and tribal areas that are going to suffer from a lack of this technology, it's the inner city areas as well.

Senator UDALL. Thank you.

Senator WICKER. Thank you, Mr. Mayor.

Senator UDALL. And thank you for your courtesies.

Senator WICKER. Thank you, Senator Udall.

Senator Fischer.

STATEMENT OF HON. DEB FISCHER, U.S. SENATOR FROM NEBRASKA

Senator FISCHER. Thank you, Mr. Chairman.

In Nebraska one-in-four jobs is agriculture related. I recently held an Internet of Things, an agriculture roundtable, to explore the needs of rancher and farmers leveraging new technologies that increase efficiencies and enhance crop yields.

As we discussed precision agriculture technologies are estimated to improve American farmer's crop yields by an average of $40 per acre.

Mr. Gillen, in your view, how will 5G networks impact precision agriculture to increase productivity and better manage risk?

Mr. GILLEN. Thank you, Senator. And thank you for your leadership on this issue. Absolutely, we are very excited what precision agriculture can do.

We tend to think about 4G made each of our lives easier, made it simpler, made it more convenient. And 5G will do that for industries and agriculture is certainly one of them. You see the forty dollar example you gave. There's also examples of reducing water usage by 50 percent thanks to sensors and better utilization of data to keep farmers on farmland.

So we are very excited about what precision agriculture can do and we have the challenge of deploying the networks to help Nebraska be better farmers.

Senator FISCHER. How do you think farmers can better manage their risk through IoT?

Mr. GILLEN. I think you know better than I, but I think data is key here, just like it is when we talk about maps that the more data we can give farmers about their crops, about their land and their yield, they, they know-how to do their job. So the more information we can give them the better they will be.

Senator FISCHER. Great.

Mr. Romano, do you feel different metrics or approaches would be needed to properly address network coverage on our Nation's ranch lands and the crop lands as well?

Mr. ROMANO. Thank you, Senator. I do. I think there's a—there are two fundamental issues today with the mapping structures that are in place. Now, the FCC's Form 477 data right now is the best available source we've got. But there are two primary I think issues with it. The first is that it is not granular enough. If there is one location served within a census block the entire location is deemed served. And as we know in rural areas, those can be pretty big census blocks, particularly when you have got agricultural communities at issue.

The second issue is the fact that those are self-reported. There's no verification process behind it. They are certified. Providers have to certify that they are doing it, but there's no verification of that. And as we seen in the mobility fund context, as Mr. Berry described, as we have seen even in the ACAM process or other processes, statements of overcoverage lead to false positives of customers being served. And that means, for example, that agricultural community does not have the service throughout that is, in fact, claimed to be. It might only be in the town and not to the surrounding areas.

Senator FISCHER. How can we get better mapping? How can we find those dead spots that are out there? Because in my area they certainly exist.

Mr. ROMANO. So there are two things there. With respect first to how do we get better data set beyond the 477? The FCC has sought comment on that. One thing that we have suggested, and Mr. DeBroux mentioned this a moment ago, is this notion of geocoding.

So we initially had actual questions about the process of geocoding, but what we found is that on a going-forward basis with respect to figuring out where customers were actually served it's not an unmanageable process as long as it's done again going forward. And it could help to provide a transition to actually figuring out at each and every location does this customer have what the provider says they have there.

Senator FISCHER. And, Mr. Romano, in your testimony you referenced important distinctions in the FCC's USF and USDA—sorry, RUS programs in terms of persistent rural broadband challenges. You also stated that it is essential that these longstanding complimentary relationship between RUS and the USF initiatives continue.

How do you envision improved coordination going forward between the two Federal agencies? So that we can avoid possible believe overbuilding. So we can look for more enhanced accountability and still maintain the integrity of these programs.

Mr. ROMANO. Thank you, Senator. RUS and the FCC have worked very well together in the past, I believe. There have been times where communication might have been improved as some of the reforms were going through and one agency was moving quicker than another or in different directions, but by and large I think the communication has been highly effective and relatively consistent.

The question now as we talk about branching into new programs, potential infrastructure initiatives, farm bill coming up, what have you, this is an opportunity to make sure we have got the right guardrails in place. What we don't want to have happen is have two programs funding two different providers to operate broadband networks to the same location.

We are going to be pitting programs against each other and you are making use of resources that then could have gone to other unserved areas or to help with the affordability of networks. So having guardrails in place for affordability of services. Having guardrails in place to make sure that a program recognizes, for example, well, there's a FCC CAF II build going on over here or an ACAM build going on over here is going to be important and make sure those two programs work in concert.

Senator FISCHER. And how are we going to make sure that this is extended to the State levels so that those dollars can be maximized? Do you have any thoughts on that?

Mr. ROMANO. So, yes, Senator. We have been looking at the prospect of potential State block grants. And this, to us, is one of the most important questions to think about in the State process is the states are going to be racing to get money out the door as fast as they can and standing up a new program. We are going to have to make sure that the same sorts of guardrails are in place.

So, for example, New York had to do this in their program. They made sure that they coordinated their program with the CAF II initiatives to avoid that very prospect of overbuilding. And I think the same care needs to be taken if we go to the State route.

Senator FISCHER. Thank you.

Thank you, Mr. Chair.

Senator WICKER. Senator Hassan.

STATEMENT OF HON. MAGGIE HASSAN,
U.S. SENATOR FROM NEW HAMPSHIRE

Senator HASSAN. Thank you very much and thank you to all of our witnesses for being here this morning. Look, since joining the Senate connecting Americans to robust broadband service has remained a central focus of mine. I thank both Mr. Gillen and Mr.

Berry for mentioning a couple of the efforts I have been involved in.

For starters, I work closely with Senator Gardner to introduce the AIRWAVES Act which would free up more spectrum resources to power our Nation into 5G. And the bill would also set aside a portion of auction proceeds to invest in rural broadband initiatives. Additionally, I worked with Senator Capito to introduce, and here's a name that just rolls right off the tongue, the Rural, Reasonable and Comparable Wireless Act of 2018, which would help close the digital divide and expand access to broadband in rural parts of the country.

So I would just like to give you both, Mr. Gillen and Mr. Berry, an opportunity to talk to us about how these bills would assist us in reaching our connectivity goals and spurn growth in our economy.

Why don't we start first with Mr. Gillen and then Mr. Berry.

Mr. GILLEN. Thank you, Senator.

Absolutely, airwaves and spectrum policy are key to solving this puzzle. When you look at the low band spectrum we sold last year, that's enabling carriers now to reach rural America, including some building out to Montana right now because that spectrum goes a great deal of distance. So that spectrum is definitely a key part of this puzzle.

And as you alluded to, one of the unique things in airwaves is the idea of the rural dividend and that money raised through the auction would go back into rural deployment. And that does get to Senator Schatz point earlier where is this money coming from and this is the wireless industry supporting the wireless industry bill where you guys want us to build. So I think it's a rather unique way of doing this and you are able to do both spectrum and siting policy in the same item.

Senator HASSAN. Great. Thank you.

Mr. Berry.

Mr. BERRY. Thank you not only for your interest in those two bills, but generally in support of broadband deployment.

We totally agree the AIRWAVES Act gives a road map on the type of spectrum you can reasonably expect to be coming up and it will give carriers an opportunity to say this is where I'm going to go in my deployment scenarios. We would love to see, you know, band 24 and I think 47 included in that, because I think those two, you know, usable high speed mobile broadband bands.

So I—we appreciate that and we also appreciate the ten percent set aside that you included in the bill. I think it will focus a lot of attention on how do we get that new service out there sooner rather than later. So thank you for your help.

I think if the FCC had read your bill on comparable, reasonably comparable wireless services, we might have had a little more due thought to designing the perimeters around the data requests that they made. Thank you.

Senator HASSAN. Well, I appreciate that. And I was just going to add my voice to the chorus to speak about how inaccurate the data and the maps are. At the end of last year, as I think you all know, I held a field hearing to examine the state of broadband in the Granite State and mapping came up frequently throughout the con-

versation. It continues to be a serious challenge that throws off our efforts at ensuring adequate coverage, particularly in rural areas.

Last week I joined a bipartisan group of Senators in a letter to the FCC regarding their recently released map which shows that most of New Hampshire is covered and, therefore, ineligible for further support through the universal service program mobility fund.

I will tell you, you can drive from Concord, New Hampshire, our State capital, to our biggest city in the southwest corner of the state, Keene, along Routes 202 and 9 and you cannot get cell phone coverage for most of that trip. I, as Governor, I had to try to respond to public safety emergencies while traveling that route and if it hadn't been for a State Police radio in the car it would have been extraordinarily difficult.

So your own members, Mr. Berry, testified at our field hearing about their own lack of mobile service between Manchester and Keene. So how can we work to address these issues so that small carriers are not overburdened and states like New Hampshire are not left to bear the brunt of the digital divide?

Mr. BERRY. Thank you for the question. You know, I think we—years ago my grandfather owned an old two ton truck and every time you wanted to take out a groundhog, meaning go a little faster, you had to change the gears, but you had to double-clutch it.

Senator HASSAN. Yes.

Mr. BERRY. And I think we need to double-clutch this data access requirement. We need to get the right data to put this thing in a higher gear because our carriers want to build out. And so I think we double-clutch that by getting all sources of Federal data and information included in it.

David Redl, as I mentioned to the Chairman Wicker, suggested that NTI has a lot of data. They have good relationships with states and counties, municipalities and they already have some of that information that has not been tapped, not been utilized. I think we can do a better job of that and hopefully we can come up with a better map of where there is and is not.

One thing that I would mention on the data that Mr. Romano mentioned is it's a little easier to identify where you have a fiber or a wire. Wireless is a lot different in their measuring devices and their measuring scenarios are different.

I do want to thank the FCC for changing the wireless measuring devices away from the centroid. So they finally recognized that measuring the centroid, you know, whether it's a part of the center. So, you know, we are working on it. We are trying to do better, but we could, I think we could use some help from some of the other agencies.

Senator HASSAN. Well, thank you. I know that I'm over time, Mr. Chair. So thank you and I look forward to hearing the rest of the hearing.

Senator MORAN. Thank you, Senator Hassan. I now recognize myself.

STATEMENT OF HON. JERRY MORAN,
U.S. SENATOR FROM KANSAS

Senator MORAN. Let me direct this to Mr. Romano. The FCC is in its finishing stages it seems of the high-cost program and as you

have testified, as we know there has been insufficient funding that's resulted in cuts, uncertainty for small and local broadband providers. We know it's clearly true in rural Kansas.

So this lack of sustainability puts the investments that have been made at risk, their future, and it creates an unwillingness or could create an unwillingness for additional investment in the arena.

This may be, you may have answered this question when in response to Senator Schatz, but what is the long-term solution for making certain that the investments made have a return and that there is enough certainty that we will make future investments?

Mr. ROMANO. Thank you, Senator. So there are two parts to this. There is the answer I gave to Senator Schatz, which relates to the sustainability of the funding mechanism itself.

I think your question goes to a certainly related issue, which is the sustainability of the networks that the providers are able to invest in, their reliance upon the program ultimately to make their investments. We are making investments here that they are talking about measuring in decades. These are assets that are going to be long-term infrastructure assets over which there is going to be cost recovery over the course of decades.

The FCC had tried to reposition those for broadband in 2016, the mechanisms to support those. It rebuilt the engine, but it didn't put enough gas in the engine and that has been the fundamental problem. We have seen in Kansas that the impacts have been worse than average and unfortunately in terms of what it means both for recovery of existing investments and in the ability to plan for future investments.

We are deeply gratified that the FCC seems inclined to take steps perhaps to mitigate some of the budget shortfalls that have hit carriers hardest in Kansas and a number of other rural states. We are hopeful those actions will come through.

But we are still going to be in a case, to your point about sustainability, come July 1 the budget control hits again. And so we are going to be right back in the same thing with providers looking at it saying, can I make investments for the next year? Should I hold off because I don't know what the budget controls are going to be? It's an ever escalating set of cuts so far.

So we are hoping the FCC will act, stabilize the ground, and give us an opportunity for a conversation as soon as possible about what long-term sustainability really means in these programs.

Senator MORAN. Do you have any basis for that hope?

Mr. BERRY. The FCC has been talking about an Order that would address some of these issues in the near term and immediately address, mitigate some of the budget shortfalls that have occurred for this 12 month period. And we understand that they are going to be asking questions about what should the budget be going forward.

Our hope is that that will meet the standards of the Act which look for reasonably comparable services or reasonably comparable rates and the standards for predictability and sufficiency.

Senator MORAN. Thank you, Mr. Romano.

Mr. Berry, I want to talk about spectrum incentive auction. Your testimony indicates that CCA supports completing the 39 month

broadcaster repack in a timely fashion with adequate resources provided to broadcasters to expedite the transition and prevent delays to the winning bidders.

I'm an advocate for that repack and for adequate funding. CCA members made up most of the winning bids for this particular spectrum. Can you confirm and explain how funding certainty for relocated broadcasters translates into competitive wireless carriers expeditiously deploying broadband?

Mr. BERRY. Thank you, Senator. Thank you for the question. Thank you for sponsoring the Viewer Protection Act also.

Six hundred megahertz was the largest—second largest auction that actually ever occurred in the United States and it is critical for our members to get 600 megahertz deployed in their networks. Its great propagation characteristics, networks in rural America. That's why 600 megahertz LTE is going to be, you know, a great opportunity to get high speed mobile broadband. We need to repack with a—we think the 39 month timeframe that Congress set is the right timeframe. We were very supportive of the broadcasters' efforts to not only repack, but do it in a timely fashion and a safe fashion.

So I think additional funds that, my understanding, is they have identified the cost of additional funding need and I think it's reasonable to respond to that. We made, U.S. Treasury made probably 13, 14 billion dollars net on that. Almost seven billion dollars went into the first responder program, as you will remember, out of that auction. So I think that's fair and reasonable. Let's get that spectrum out there as soon as possible. Let's build those networks.

Senator MORAN. Thank you very much. I won't ask a question, but I'll make a comment that there has been a theme about the map or mapping or data accuracy. Senator Wicker led a letter, which a number of us joined and if we can send a message through this hearing to the FCC in regard to the accuracy of the map we are particularly now talking about the Mobility Fund Phase II map, and I heard what Mr. DeBroux said about there is a standard there, a place to start we can work from, but let me, in particular, complain about the appeals process or trying to get the map changed. It puts a burden on people.

You start from, first of all, I think you start from a map that is improperly determined, the accuracy or the value of the map is nearly nil, in my view, but even if you start with the baseline, the ability to modify the map, the actions that are going to be necessary for a carrier or a community to get it changed, I don't think it's going to be something that's going to be easily done.

And so my hope is we start with a different map as compared to trying to correct this one through an appeals process that I don't think will work and will leave behind the folks that we are desperately trying to provide service to.

Mr. Chairman, thank you.

Senator WICKER. We might as well say it, Senator Moran, that the map is utterly worthless in terms of giving us good information.

Senator Tester.

Senator MORAN. You one-upped me, Mr. Chairman.

STATEMENT OF HON. JON TESTER,
U.S. SENATOR FROM MONTANA

Senator TESTER. Thank you, Mr. Chairman.

And kudos to you, Mr. Berry, for the double-clutching getting out of groundhog. We used to call it granny, but you are probably more politically correct.

My first question is to Mr. Gillen, and that is it has been referred to before that we need to win the race to 5G. What constitutes a win? Is that people covered? Businesses covered? Geographic area covered? What constitutes a win to 5G?

Mr. GILLEN. For us it is that next generation of innovation and opportunity happened here first. So it is a matter of having enough scale that we have enough entrepreneurs and innovators to build off of that platform. And so absolutely it starts with a number of people covered in a timely manner.

Senator TESTER. OK. So that and, by the way, that's the definition of expect. The number of people covered in one block of New York City is far more than the county I live in and my county is bigger than most of the states. Not most of, but a fair number of states at the table.

So the question is, is it—how do we get—how do we get 5G into rural America? How do we get it there? The Senator from Nebraska talked about, you know, precision farming, but it's more than that. So how do we get it there?

Let me put it this way. I'll be more specific. Will you commit to a pilot program for Montana on 5G?

Mr. GILLEN. I'm happy to work with your office and put something that looks like. I think for us 5G starts with the densest area. So it is places like Missoula, it is town squares, and then it goes go from there.

Just like 4G, and we continue to work on getting 4G more and more in Montana. The job is not done by far.

Senator TESTER. OK. So, and I'm not picking on Verizon, but I happen to have one of your phones in my pocket. OK. Have you seen the map on the advertisement that Verizon puts up? And, by the way, I think all of them are this way. I'm picking on you because I've got this.

Have you seen that advertisement?

Mr. GILLEN. Yes, sir.

Senator TESTER. Do you agree with that map?

Mr. GILLEN. I've only had the chance to be in Missoula, which had great coverage, but I have not been in the rest of your state.

Senator TESTER. Well, let me tell you something, Missoula and Big Sandy is a hell of a lot different. I'll just say that. It's 75 mile drive for me to Great Falls from my farm and I bet I don't have coverage 25 miles of that and yet that map is all red.

Do you want to talk about that?

Mr. RESNICK. Just, yes, sir. And I do appreciate the question and this is something that National League of Cities and governments across the country are facing is that there's a real misunderstanding as to 5G, especially when they ask states to preempt local governments with respect to deployment.

So the industry comes in and says we will have 5G in your communities and throughout the state and it's the next generation

broadband and we absolutely need it. Really, what they are doing is densification of 4G networks in very dense city areas for the most part.

Just to give you an example. The State of Nebraska is currently debating a preemption small cell deployment bill, the same as Florida passed last year, and the cities, lead by the City of Lincoln, talked about lowering their rates for attachment to city owned polls, to city and county owned polls. They were willing to reduce the rate from the market rate of about $2,000 per poll to $95 per poll if the industry would agree to build out the entire state over reasonable period of time with 5G service.

Senator TESTER. Yes, but that isn't the problem. The problem is you look at the bars on this phone, when I go home, there are none.

Mr. RESNICK. Right.

Senator TESTER. There are no bars on this phone. So we are not even close to talking about 4G or 3G or any G where I live. We are not even close. I might be able to get a text message, but unless I'm standing in the right corner of my house with my mouth held in the right direction this phone does not work. OK. And it's that way—I live in one of the more populated areas of the state.

Go ahead.

Mr. BERRY. Well, Senator, get back to the eligibility map which, and you raise a really important point, it says it's covered.

Senator TESTER. Yes.

Mr. BERRY. And it says a lot of places are covered.

Senator TESTER. Yes.

Mr. BERRY. What the FCC did was decide——

Senator TESTER. So how do we fix that? The FCC is wrong, they screwed up. We are getting screwed because they screwed up. So how do we fix it?

Mr. BERRY. Well, you've got to get better data. What they decided was to collect data that was not what I would call——

Senator TESTER. Who did they collect it from? Who did they collect it from? Who did they collect it from?

Mr. BERRY. They requested perimeters for the data and information from all the carriers and the carriers gave the FCC exactly what they requested. We suggested that that was the wrong conclusion.

What they chose was the recommendation from the two largest carriers on how to measure coverage, and I'll tell you that in the last 8 years, the FCC is time and time again under very—several administrations said we had 98 percent coverage throughout the entire United States.

Senator TESTER. You made the statement in your opening statement, garbage in, garbage out. There has got to be a way to get the FCC's attention on this, Mr. Chairman, on this issue. It has come up in almost every one of these questions.

We are not going to solve the problem of wireless, broadband, anything in rural America if we don't have good information. And I would just say I've got 400 questions to ask you guys. I'm not going to be able to do it. So put them in writing and you'll have a lot of work to do, but the bottom line is if we don't get this right——

Senator WICKER. Actually, you are limited to 300 questions.

Senator TESTER. 300, OK. I'll par back to 299, with due respect, but the truth is I know there is plenty of folks out there that say things like, why do these guys even live in rural America, they knew they didn't have the coverage when they moved there.

I have got to tell you, I looked at my grandfather's diary from 1915 and, you're right, he said, "you know, damn it, there is no cell coverage out here."

We have to do better, folks. It's not working. Thank you.

Senator WICKER. Senator Klobuchar.

STATEMENT OF HON. AMY KLOBUCHAR, U.S. SENATOR FROM MINNESOTA

Senator KLOBUCHAR. Well, thank you very much. I think Tester said it all down there.

But I want to start out, I noticed, Mayor, that you mentioned the Dig Once bill that I've been leading for quite a while and we are hoping we can finally get it done. It was included in the MOBILE NOW Act and recently passed the House as part of the FCC reauthorization bill.

As you know, this allows for better coordination between state departments of transportation and broadband providers during construction. You want to, I know you, I think, have a comment on this, but maybe, Mr. Berry, do you want to add anything? If you want to add anything, Mayor, that would be great.

Mr. RESNICK. No, I appreciate it, Senator. You know it's nice when occasionally common sense makes its way into law.

Senator KLOBUCHAR. Really?

Mr. RESNICK. And it doesn't happen that often. So we do appreciate it.

My city, for example, well this is around the country, received Federal funds through our MPO to do about ten million dollars in road improvements and I wanted to put in conduits. It's very simple. It makes sense. We are digging up the roads. It's no real extra expense. And we were frankly told, because these were transportation and Federal dollars that we were not allowed to put in conduits.

So we appreciate the Dig Once bill and the new legislation and I think that's going to go a long way around the country to speed up deployment of broadband.

Senator KLOBUCHAR. Thank you.

Mr. BERRY. Same here. Not only thank you for that, but also signing the letter to the FCC on the eligibility map. We greatly appreciate that.

All of our, and believe it or not, it does have a real impact in rural America also. When you are building that road if you can dig once it makes a huge difference. And what we are talking about is how do you get that initial Cap X investment down so that you can use that money to build out.

I was just in Shenandoah Valley last week with Commissioner Carr and Shentel, which is a small carrier—larger carrier for our purposes—saying if they can decrease their cost of deployment to comply with Federal rules and regulations they can put 13 more towers just on that one area. So that's significant broadband buildout.

Thank you.

Senator KLOBUCHAR. Different subject.

Mr. Romano, we just got the Rural Call Quality and Reliability Act passed, something I worked on with Chairman Thune as well as Senator Tester. This is all these dropped calls that have been going on in rural areas and the President just signed it into law and it's going to establish some basic quality standards and a registry at the FCC.

Can you talk about how that will be helpful?

Mr. ROMANO. Yes. Thank you, Senator. Thanks to all of you who supported that bill. Thank you for introducing it.

To echo the Mayor's comments, another case of common sense making it into law. We should have reasonable expectation that our calls are going to go through and that was an epidemic we were seeing in rural America. Calls were not reaching rural America and they still aren't today.

There have been efforts to try to improve the situation. And it's a bit like wild fire, you put it out and then all of a sudden it pops back up in a different space. So what this bill will do and it's critical, it brings transparency to this marketplace. It helps the FCC, it helps states, it helps the industry to understand who is involved in taking these calls, finds out—makes them register and finds out are they doing the basic job of completing those calls.

We ask basic business registration for conducting business in jurisdictions. This bill simply does a similar thing in terms of calling those people out and making sure that we can find them if we need to to ask the questions and get the calls completed. So thank you.

Senator KLOBUCHAR. OK. Thank you.

Mr. Gillen, in the run up to Super Bowl LII, I like to mention that we had Super Bowl LII whenever I can, hundreds of small cells were installed to accommodate the increase in demand before, during and after the game. The deployment effort will lay the groundwork for 5G communications capabilities in the Twin Cities. How do small cells help address surges in data usage?

Mr. GILLEN. Thank you, Senator. We should all visit Minneapolis because it has the best wireless network in the country now as a result of the Super Bowl.

Senator KLOBUCHAR. Thank you.

Mr. GILLEN. And that really is the result of what Minnesota state and Minneapolis as a city to create a rate structure and the timelines to allow those small cells to be invested. So you have 5,000 more bio tons capacity in Minneapolis today than you did this time last year and you saw 71 times more traffic during that Super Bowl than you did just last year's Super Bowl.

And so in terms of where Minneapolis is with that small cell infrastructure, they are ready for 5G in a way that other cities aren't today.

Senator KLOBUCHAR. And how could that be helpful at all in rural areas? I can tell you we don't have that coverage in the rural parts.

Mr. GILLEN. Yes. Absolutely, Senator. I think it goes to part of it is starting in the rural town centers, college campuses and areas that are denser.

When we are talking about truly unserved areas, we need to talk about how the mobility fund and other programs work. And the challenge, as we all said, is getting the data right in order to make sure we are funding the right places. But truly unserved areas we are going to need your help.

In areas more dense where there's coverage today, 5G will absolutely serve rural America as well.

Senator KLOBUCHAR. All right. Thank you very much.

Senator WICKER. Now that item sitting on your witness table there.

Mr. GILLEN. Yes, sir.

Senator WICKER. That alone won't solve the question that Senator Klobuchar asked about rural coverage?

Mr. GILLEN. This will be rural coverage in a town square. There is other more tradition technology that will be used for truly coverage areas and more rural communities.

Senator WICKER. OK. Why is that going to work in a town square and not five miles out of town?

Mr. GILLEN. Well, this is only supposed to go about meters in terms of how far the actual signal will go. And when we are talking about in terms of serving rural Mississippi we need to go miles.

Senator WICKER. OK. Well, darn.

Mr. GILLEN. The technology is getting better every year.

Senator WICKER. Mr. Romano.

Mr. ROMANO. Thank you, Senator. That's one point that I think is important to make is there are many tools in the tool kit to solve rural broadband challenges. Small cells may offer help in small towns. You know, our average density of our membership's customer base is about seven people per square mile. So we talking about 40 percent, 35 to 40 percent of the U.S. land mass. It's going to be difficult to get those small cells out there. We hope that they will, but it's going to require ultimately as well a densified—the term densification has been used a great deal today.

Densified fiber network to feed those small cells. So at the end of the day in rural America, you are almost talking about a fiber to the home network because those cells will need to be several hundred feet apart in order to achieve the promise of 5G in rural areas. It's going to take an integrated solution of wired and wireless networks to achieve the universal broadband that we are talking about.

Senator WICKER. Senator Capito.

STATEMENT OF HON. SHELLEY MOORE CAPITO, U.S. SENATOR FROM WEST VIRGINIA

Senator CAPITO. Thank you, Mr. Chairman. Thank all of you.

I think we worked with just about everybody on the panel, again, for echoing what many of my colleagues have said, but I have now figured out how to get rural broadband to West Virginia, host the Super Bowl. It's that easy.

But I was recalling the conversations, I was listening to your testimony several years ago that I had with our major provider and I said, what is it going to take, what is it going to take, insisting like Senator Tester was. Two things, time and money. Well, you know, I get tired of hearing the same thing, time and money.

That's what you all are telling us, time and money. So we try to focus the money.

We have a rural broadband caucus that Senator Klobuchar is on. It's bipartisan. We have the desire, but you know I hear about 5G development and I know 5G obviously the President's decision this morning to disallow a merger because of security reasons around 5G tells me how important that is on one, and, Mr. Gillen, you have spoken to that.

But it also tells me when you keep talking about density in town squares and college campuses, we are still not—they are going to have 5G, but we are still not going to even have the ability to do a lot of what we want to do. So I'm as frustrated, as I'm sure you all are, and everybody else is to try to get to that last, that last mile.

So let's talk a little bit about the census track. We talked a lot about that. We have that same issue. We actually have a broadband council in our state that has asked people to do a self-test to see how fast. El flunko. I mean the results are terrible.

So we know the data is not reflective of, and better yet, what they are paying their bill, the service to receive is not matching with what their data test is. But so what would it take? Now it's like if one person is served in the census track, the whole census track. So what would be a better metric, 50 percent, 51 percent?

Mr. Romano.

Mr. ROMANO. I would submit actually that this geocoding opportunity or geocoding method is a good opportunity. The FCC, as Mr. DeBroux mentioned, is requiring those carriers that receive universal service support to geocode. Get the latitude and longitude of every location to which they are installing fixed broadband.

And Mr. Berry mentioned about mobile. It's a slightly different case. But fixed broadband you are then required to show you actually have the service that you are saying you are delivering to each of those locations. If we can get to that level and it's going to take time because there's a transition. Trying to go back and geocode every location where anybody ever installs is a huge burden.

Senator CAPITO. So would you consider that a third-party verification?

Mr. ROMANO. It's not. So this is—each carrier is going out and geocoding when they do a new installation to a new rooftop, to a premise, they are geocoding that they installed service there and reflecting what they installed. So it is still carrier reported.

The verification process I think ultimately when you are talking about universal service dollars or other infrastructure funds, for example, you are going to need to to set up a more robust challenge process, which is the issue we are now seeing with the mobility fund and we have had with other funds before. Making sure that you are not having to prove a negative. There isn't service there, but rather the provider who says there is service there comes forward to validate, yes, there is service there such that you should not then put Federal dollars toward a program to invest there.

Senator CAPITO. So the other thing is money. We talked a lot about the Universal Service Fund and the Connect America Fund and where those dollars are going. We had the stimulus package, the West Virginia stimulus package was a 126.3 million dollars,

and guess what, a lot of it was wasted. It was a wasted opportunity for our state and sort of embarrassing too in some ways when some of the stories came out.

So I put together an Act called the GO Act, a Gigabyte Opportunity Act, which is trying to use the tax code to drive investment to these last areas. So the Governor could designate, much like he's going to be doing under these opportunity zones that we created in the tax reform bill, but the Governor designates these deserts of development.

So you could, the Governor could designate an unserved area in the broadband area and you could create a fund that would draw investment through the tax code into those gigabyte opportunity zones. So I would ask you all to take a look at that if you haven't looked at that to try to drive more private investment into these areas before we give 5G to everybody else and we are still sitting there with very little and no service.

My last question is, Mr. Gillen, you mentioned telehealth. That's really important to an elderly state. Chronic conditions can be monitored so well to people who lack transportation, mobility, you know, physical mobility themselves or any family members nearby to take them to their healthcare provider.

How do you see that rolling out into the really remote areas?

Mr. GILLEN. And, thank you, Senator. It goes exactly to the challenge you just faced. Those that need the telehealth the most are the ones we still need to reach often.

Senator CAPITO. Right.

Mr. GILLEN. And so, absolutely, what you talk about on a global scale it's a huge amount of savings and better outcomes for patients and the challenge is connectivity in places like West Virginia. But that we do see a great promise in the ability to really revolutionize healthcare and drive down costs by bringing healthcare closer to you and not having to have to drive to Wheeling, or anywhere else, to get care. It will be transformative when we get there.

Senator CAPITO. I know the VA is moving in this direction too, which I would highly encourage and I think that would be good sort of test drive how, I mean I know it's being done everywhere because I've actually been to a couple demonstrations, but really important.

And, last I'll say, Mr. Chairman, one of the biggest phenomenon with our elderly is loneliness and connectivity can help with that. You know, it's not waiting by the mailbox to get a letter. Just think if you could Facetime with your grandchildren or something like that to try to help with all of the other issues that go with your mental health as you age. I think it holds great promise.

So thank you all very much.

Senator WICKER. Thank you, Senator Capito.

Senator Peters.

STATEMENT OF HON. GARY PETERS,
U.S. SENATOR FROM MICHIGAN

Senator PETERS. Thank you, Mr. Chairman.

And, Senator Capito, thank you for bringing it up, the statement about the elderly. I will tell you I think the person that is most

skilled at Facebook is my 93 year old mother. She is amazing with it. And it is about being connected, it's transformative to her life and countless other seniors. So thank you for bringing that up.

Each of the folks for your testimony, thank you today for that and certainly I think it is clear from the panel here we all agree that broadband Internet and high speed internet in rural areas is absolutely critical.

In fact, I really equate it to our country's effort in the last century to make sure that everybody no matter who you are or where you lived you had access to electricity, that it was absolutely critical that we make sure that everybody had access to it. In today's age high speed internet is in that same category.

Certainly that's why I'm disappointed that it seems as if President Trump doesn't necessarily share that in the fact that the infrastructure package that was put before us doesn't include any, none, zero, dedicated funding for rural broadband, which I think is a big mistake.

My question for you though is that I've heard from many local business leaders in Michigan that have reached out to me about the rural utility service community connect to grant program which prioritizes grants to communities that have zero or very little access to broadband. Certainly an important goal, but they have identified a problem with that grant and I want to run that by you and get your thoughts on it.

As it currently stands, if any one household within the applicant's defined geographic area has broadband service at or above 4/1 megabytes per second speeds, the entire community becomes ineligible to be considered for those funds. And while it's important for these grants certainly to target communities most in need, the 4/1 speed threshold has not been updated in years. It's substantially below FCC's definition of broadband coverage at 25/3.

So what I'm considering now is some legislation that will modernize the grant program. The eligibility cutoff is intended to be the base minimum for broadband coverage and preserve the program's ability to prioritize the most underserved and unserved rural communities. However, it's my understanding that 4/1 is simply no longer a bare minimum.

Do you think that the 4/1 speed threshold currently used by the USDA should be updated? And that's to anyone. What do you think about that?

Mr. DEBROUX. Well, I'll start out. Thank you for your question.

You know I do think we need to take the law seriously. And the words, reasonably comparable, there's a little bit of fuzziness on the edge, but there's no way 4/1 is reasonably comparable to what you can get in major metropolitan areas.

The FCC tracks speeds and prices in major metropolitan areas and I think that there needs to be something in place that makes sure that the speeds in rural areas get ratcheted up as those go up in metropolitan areas. So there needs to be a connection in there.

Senator PETERS. Any others agree?

Mr. ROMANO. Yes, Senator, thank you. We do agree. Our members have actually made effective use of the community connect grant program as it's constituted so far. But I think a refresh, an

update would be helpful to make sure that we are continuing to raise the bar.

Your question also goes again to this point do you disqualify an entire area, an entire community simply because one location may be lucky enough to be served? In fact, there are some cases, and this goes to the homework gap. You have a school that happens to have gotten a State regional network together, but the surrounding community doesn't have service. That would disqualify it, if I understand the parameters of community connect grant appropriately.

So it's a good point and one well taken and we look forward to working with you on that.

Senator PETERS. Mr. Berry.

Mr. BERRY. Again, I go back to reasonably comparable service, but also data. I mean how can you set a standard? How do you know what it is unless you have qualified data?

We may be to the point that a third-party verifier, collector and verifier of data may be. NTIA has put fifty million dollars in their budget for data collection and producing a new broadband map. Maybe the time has come so we have a third-party verifier that would actually collect the data and information, authenticate it and provide that information to every agency in the Federal Government saying this is where there is and is not broadband coverage.

And you can put the speeds with it. And, you know, 4/1 in most urban/suburban areas would not be considered useable video streaming capability. So you have some definitional problems there. And I think the data is the key to whether or not you can make that happen.

Senator PETERS. So it's pretty clear that that is simply a worthless standard to have 4/1 right now as part of it. That we should be modernizing that. Any idea as to where we should set that threshold or any advice?

Mr. BERRY. Well, I would say—I wouldn't say it's a worthless standard when you have no connectivity at all.

Senator PETERS. Well, yes.

Mr. BERRY. It's a pretty important standard. So we are still going back to no connectivity versus, you know, 4/1. 4/1 sounds pretty good.

But it would be nice if you knew where those speeds were and where that connectivity level was and have that in a map that you could utilize for all different types of funding programs. Not only the RUS program, but the FCC program and the other two sources that you're going to make available, which is under the budget act, 20 billion dollars there.

And then you've also identified additional funds that will be in the infrastructure bill. We don't know what they are right now, but wouldn't it be nice to have the ability to put all these programs together on a map that says here's how we can reach those most unserved areas in the United States.

Senator PETERS. Right. Thank you so much.

Senator WICKER. Thank you, Senator Peters.

Senator Blumenthal.

STATEMENT OF HON. RICHARD BLUMENTHAL, U.S. SENATOR FROM CONNECTICUT

Senator BLUMENTHAL. Thank you, Mr. Chairman, thanks for having this hearing.

I want to talk a little bit about urban areas which, in my view, are as important as rural areas in lack of adequate service. Ellen Katz, who is the Consumer Council for the State of Connecticut, recently testified at the House Energy and Commerce hearing on closing the digital divide with regard to the gap in Hartford. She called it "the homework gap." I think that's a common way of putting it.

Her report observed that many students lack adequate broadband at home. They go to fast food restaurants or they sit outside in all kinds of weather trying to pick up Wi-Fi from another building in order to do their online school work. If this problem exists in Connecticut where fiber services are available in excess of 90 percent across the state they must be even a bigger problem in other urban areas around the country.

So let me begin with Mr. Resnick. Would you agree that the digital divide certainly exists in urban as well as rural areas?

Mr. RESNICK. Yes, Senator. Thank you for the question.

I actually included that in my testimony earlier today that we are seeing within the urban areas lack of broadband access by so many people simply because it's just not affordable. As I indicated, the library in my city, the libraries in our areas are packed after school with children just trying to get online to do homework. We actually, through the National League of Cities, had a conversation with FCC Commissioner Rosenworcel about this very issue and she's from Connecticut and she made very strong statements confirming that there are so many children that just do not have access to needed broadband simply to do their homework and they are being very creative.

They are, as you indicated, going wherever they can find a good Wi-Fi hot spot, but that's certainly not the answer. And this is happening not just in inner cities, but in suburban areas, like my city, throughout the urban areas. So this is a significant problem to address as well.

Senator BLUMENTHAL. What's the best way of meeting that urban need?

Mr. RESNICK. Well, I think we need to focus on ways to possibly reduce the cost of broadband. Currently to get ten megz of broadband service costs many families over a hundred dollars a month. That's just not affordable.

Communications costs for a family now easily are over four hundred dollars. My neighbor who is a retired, 88 year old gentleman, talk about connectivity for seniors, I mean of course he wants to have Facebook to stay in touch with his grandchildren across the country, to stay involved in the community. He spends over four hundred dollars a month for communication services and he's not getting anything special, he's getting basic service. So I think we have to address the affordability.

Senator BLUMENTHAL. The Connecticut office of state broadband, which is a division of the office of consumer council headed by Ellen Katz assessed this homework gap in Hartford and the report

noted that a lot of Connecticut families are frustrated that a smart phone is regarded by policymakers and the public as a substitute for a home connection for broadband Internet access.

Of course smart phones are typically expensive and difficult to use to complete written school work or write papers. I don't know how anyone could possibly use a smart phone to do a paper.

Would you agree that a smart phone is no substitute for a home connection for broadband access?

Mr. RESNICK. Yes, sir. And we were actually disappointed that some members of the FCC wanted to include wireless broadband service as satisfying the requirements for meeting broadband deployment.

As you indicated, children cannot do homework on a mobile device, especially on a smart phone. It's just impossible to do papers, to do significant research. It's really going to create more of a digital divide if some students will be relegated solely to that technology as opposed to have full broadband access to do the work that they absolutely need to do. It's just no substitute. So we do recognize that.

Senator BLUMENTHAL. It's a form of sort of second class citizen.

Mr. RESNICK. Exactly.

Senator BLUMENTHAL. In the broadband world.

Mr. RESNICK. Exactly.

Senator BLUMENTHAL. Thank you.

Senator WICKER. Thank you, Senator Blumenthal.

Senator Sullivan.

STATEMENT OF HON. DAN SULLIVAN, U.S. SENATOR FROM ALASKA

Senator SULLIVAN. Well, thank you, Mr. Chairman. I appreciate the panel's insights on a lot of the tough issues for us.

You know, I'm going to go back to the rural focus which has been a lot of the discussion here in this hearing and, you know, sometimes we talk about rural and then we can talk about my state, which is I'm not sure how you would define it, but extreme rural.

In terms of size we are about almost one-third the size of the continental United States and have 730,000 people and dozens and dozens of communities that are not connected by roads. If you can put yourself in the shoes of Alaskans right now, you know, hearing like this talks about 5G siting and cells and, you know, a lot of my communities don't have 2G yet. So excuse us if we are not kind of getting fired up about 5G when we are not far down the line at all on some of the previous technology.

So I'll start with you, Mr. Romano, but really open it up to anybody. What would, what would be some of the most important ways in which to address this, just, I mean we are a big country obviously and Connecticut is a lot different than Alaska. But what would be ways to really address, kind of, the challenges that we have in the most extremely rural parts of America, whether it's Alaska or some of the other communities that you heard here?

I always look at this some ways as kind of a balance between streamlining the permitting to actually get technologies out and not delay, delay, delay, which is an enormous problem with infra-

structure in America whether it's telecommunications or roads. And, of course, funding.

But, again, looking at some of the extreme rural communities like we have in Alaska, what would you say are the big issues and what are the problems? Is it NEPA? Is it the National Historic Preservation Act?

I mean where do we need to focus to really get to, you know, deal with communities that have been left behind? Unfortunately, I have thousands if not tens of thousands of my constituents who, they never talk about 5G because they are still waiting for 2G.

Mr. ROMANO. Thank you, Senator. Yes, we have 13 members that cover a significant footprint in your state.

So we are very familiar with the challenges they face that your constituents face.

Alaska has some very unique challenges, but generally speaking with respect to rural challenges we believe an infrastructure package could contain at least two maybe three key elements. First is funding, second is permitting and the third is tax incentives.

There are going to be different tools in the tool kit depending on what the particular challenge is that's faced. I would suggest with respect to Alaska in particular funding is a big issue. There's just no way around it.

The fact is that these remote villages are going to be very tough to connect and build and your build season is short, supplies are costly. All of those things drive higher cost in Alaska for sure. Never mind distance and density alone.

So infrastructure funding and in that regard we believe looking and leveraging existing initiatives is going to be critical. Those places in Alaska where we have seen the best success have been those places where there has been predictable and sufficient universal service funding for those carriers that can invest there.

The villages that are left behind are in many respects those areas where universal service has not worked as well, although the FCC has tried to recalibrate it to do so. The one last piece I'll just mention quickly is middle mile. This is a challenge that is often overlooked in universal service context because everybody always thought about local telephone service, that's where universal service started. But we need those connections to connect rural Alaska, rural Montana, rural New Hampshire, everywhere else to the rest of the world.

And those are connections that are today not supported at all. Those are connections that are going to be critical, increasingly critical as you are sending mission critical data across those communications in terms of agricultural data, connectivity, streaming video, whatever it is, that's a big challenge in Alaska in particular of course.

Senator SULLIVAN. So just on that your kind of three areas, would you kind of place one above the other or kind of all, all of the above; taxes, streamlining, the permitting process and funding? What would you say, is there a hierarchy there or just got to attack all three?

Mr. ROMANO. There is a hierarchy. Financing, funding is first. Because if you don't have the business case to invest it doesn't mat-

ter that I can get permits more quickly, I can't build the network to begin with.

So that's going to be first and foremost where it is needed. If the business case is not there you need funding to help make the business case. Then if the business case is there, whether it's through funding or through the ability to make it on its own in the marketplace you then move to permitting. The ability to hit the ground quickly, remove barriers, cost of deployment, and get those networks working for consumers.

And then the third piece is tax incentives. To be candid, tax incentives are an interesting tool in the tool kit but in deeply rural areas you are not going to move the margins very much because they are areas where it's hard to make any money investing in the first place. If you are not going to make money you don't need a tax break on the money you are not going to make.

Senator SULLIVAN. OK. Thank you very much.

Senator WICKER. Thank you.

Senator Gardner.

STATEMENT OF HON. CORY GARDNER, U.S. SENATOR FROM COLORADO

Senator GARDNER. Thank you, Mr. Chairman. Mr. Gillen, and thanks to all of you for your time and testimony today.

Mr. Gillen, you talked a lot about infrastructure for the future. Today's hearing spectrum is obviously a critical piece of this and that infrastructure for wireless, the juice that is going to keep innovation running; satellite, Wi-Fi and other technologies.

This Committee has done a lot of great work under the Chairman's leadership and I'm grateful for his leadership on this issue including the MOBILE NOW Act that recently passed the House as part of the Ray Bonds Act. And I just want to say something about the name of that bill.

Ray is a, was a beloved figure in the House and a great person. Just need this recognition to have happened.

I believe we have got to continue to keep up the pressure to free even more spectrum and help close that digital divide. That's why Senator Hassan and I introduced the AIRWAVES Act to free up more license and unlicensed spectrum and to invest in the buildout of rural broadband networks.

Do you agree that we should consider legislation like the AIRWAVES Act as we continue to evaluate future spectrum policy?

Mr. GILLEN. Thank you, Senator Gardner. I think we should—it should be airwaves. Airwaves is the road map for the future of our country when it comes to spectrum policy. In one place we have low, mid, high band spectrum license and unlicensed and the opportunity to make a difference in terms of a 5G race.

And the other thing that you guys have done, including that bill, is the rural dividend to ensure that money coming in through the Treasury will go back out to serve rural America, to serve the plains, to serve the parts of Colorado that don't have coverage today. You get to do both spectrum and infrastructure policy and that's not we have seen before.

Senator GARDNER. Thank you, Mr. Gillen, for that. And following up on kind of that rural comment. Mr. Berry, the FCC recently re-

leased a new map for the dispersal of mobility fund Phase II support. I appreciate the FCC's attempt to improve the map and I continue to have—but I continue to have concerns that it doesn't reflect actual coverage on the ground in my home state of Colorado and I can tell you that because I can tell you the mile markers south of town that, according to the map, has excellent coverage, but somehow I don't have coverage for mile upon mile upon mile when I'm driving it.

On the eastern plains, for example, nearly the entire region is shown that it is served when I know firsthand large service gaps exist. And so pleased about this decision, but are many of your member companies planning to participate in the challenge process? What would that look like and what do you expect?

Mr. BERRY. Thank you, Senator. And thank you for the AIRWAVES Act.

Also, I could add two additional bands in there if you would like to add 24 and 47 gigahertz in there.

Senator GARDNER. Get the bands together, that sounds good to me.

Mr. BERRY. You got it. You're absolutely right. I was going to congratulate you on getting a hundred percent coverage in Yuma because that's what the map says you have, but obviously I was premature in my congratulations, but——

Senator GARDNER. My neighbors think I'm nuts because I have to walk to the end of the block to get a cell phone signal.

Mr. BERRY. Yes. Many of our carriers are going to participate in our challenge process. The problem is the map is so distorted in terms of reality of the coverage that it will be exceedingly difficult for smaller carriers to challenge vast territories of the map.

And this is one thing that we mentioned today, and I think Senator Hassan also mentioned it, if you don't challenge it then you're not going to be eligible for USF for 10 years. Because that reverse auction is going to occur.

They are going to make a decision. Those areas that are not deemed eligible, if they are not challenged, the auction will occur 4.53 billion dollars will go out over the next 10 years.

Senator GARDNER. How do we fix this? How do we make sure we get this right?

Mr. BERRY. I suggested earlier that you need to utilize all the resources that we have available at the Federal Government. I mean the NTIA indicated, David Redl, new Assistant Secretary, said they have information, they have data, they have data points that can contribute and inform the FCC on that and I think we need to do that. The problem is, the 2009 Stimulus Act, the money went out the door before the broadband map came in. We should not, you know, commit the same error this time.

Let's try to get the data right as we are getting ready to provide the funds available. And I think those are some of the areas, innovative ways that we can inform the database.

Senator GARDNER. Thank you, Mr. Berry, for that.

Mr. Romano, when the BTOP program was created in 2009 many people were hopeful about the money that it would bring into rural infrastructure, underserved, unserved areas. A hundred million dollars went to an outfit called Eagle Net in Colorado. I strongly—

and obviously they overbilled existing providers, failed for years to meet their service obligations and now are gone.

I strongly support including specific funding for broadband in any infrastructure package, but I also want to make sure that we never again have a situation like we did with Eagle Net. Both from a competition standpoint and the fact that somehow the Denver Cherry Creek School District was unserved and underserved under its definition.

Will you commit to supporting strong oversight of any new broadband dollars and robust buildout obligations for providers?

Mr. ROMANO. Thank you, Senator. Absolutely, yes, sir. In fact, that's one of the reasons we suggest leveraging existing initiatives such as the Universal Service Fund. While it has shortcomings in terms of the data that's available and the challenge processes, it is by far the best way of ensuring that we are targeting the money in the right places that exists right now.

It also has great accountability on the back end in the form of measuring where broadband is actually being deployed and whether the provider's network can do what it actually says.

Senator GARDNER. Thank you, Mr. DeBroux. I'm out of time. Thanks for the work you are doing in Colorado.

Thank you.

Senator WICKER. Thank you, Senator Gardner.

Senator Baldwin.

STATEMENT OF HON. TAMMY BALDWIN, U.S. SENATOR FROM WISCONSIN

Senator BALDWIN. Thank you, Mr. Chairman and Ranking Member Schatz for holding this hearing, and to our panel of witnesses for sharing your expertise. And I want to particularly welcome Bob DeBroux, fellow Wisconsinite, from the Madison-based TDS Telecom. I'm really pleased to have a Wisconsin voice at the table today and thank you also for your membership on the FCC Broadband Deployment Advisory Committee.

I also want to associate myself, Mr. Chairman, with remarks of my colleagues earlier during this hearing who have emphasized the need for dedicated funding for broadband as part of any infrastructure measure that moves forward. Like a number of my colleagues on the Subcommittee, from both sides of the aisle, I wrote to President Trump urging him to include dollars specifically for broadband and particularly in rural America.

And while I'm disappointed that he chose not to do so, the Senate Democrats in putting forward our own infrastructure proposal did include broadband. And I think as Congress advances on an infrastructure package that we must address this critical need for our communities.

Now, we are not starting from scratch regarding Federal support for broadband deployment. In fact, we have current or historic programs of the FCC, USDA and Commerce that have supported expansion of broadband including in rural areas.

These can inform how we make future investments. So, Mr. DeBroux, TDS telecom is a significant recipient of funds under the Phase II of the FCC's Connect America Fund specifically through the it's alternative connect America model program, and I'm won-

dering if you can tell us how you believe your company's experience with this program should inform how any new resources are employed with the goal of ensuring the most effective deployment of broadband to areas that are currently unserved or underserved?

Mr. DEBROUX. Well, thank you, Senator Baldwin, and thank you for, apparently you have a lot of clout, because not only was I put on the BDAC, but I was made Chair of a work group. So it only tripled my work, but that was OK. Yes, I think there are a lot of things that the FCC got right. I think their programs have evolved and I think the accountability that's built into their programs, and especially the certainty. I mean, one, it's difficult, I think, for companies under the old universal service programs where how much money you got depended on a lot of things like how much your neighbors spent on their programs and things went up and down to really make predictable investments.

With the ACAM program and now with some of the improvements that hopefully are coming with the legacy program it will be easier to have more certainty in terms of how many dollars you have. And with the ACAM program, the number of locations are specified and with each extra dollar that goes into there the number of locations that get higher speed broadband go up.

So it's a program that is scalable in that sense that you can feed more money into it and you automatically get more broadband and at the end of the day you have to report to USAC how many locations you served including the exact location, within feet, of where those locations are. So USAC is collecting that data and they will then know going forward what is served.

So the program, it did utilize the 477 data in order to make sure that we weren't building duplicate networks and I think that worked in the context of that program. People have pointed out issues with the maps, but I think at least that was a good starting point. So I think those are the types of features, I think, that are critical that any programs, if money goes to RUS or to NTIA in terms of having—and in addition having specified dollars set out for infrastructure specifically.

Senator BALDWIN. Thank you.

Last year I had the opportunity to meet with a variety of community stakeholders in different regions of the State of Wisconsin: Washburn County, Green County and Eagle River, the community, and Vilas County, Wisconsin, which is in the far northern part of my home state. One thing I heard from participants in this particular roundtable was their frustration that the local and state planning efforts like the one they undertook in Eagle River which helped identify the unique needs of an area and how best to address them aren't necessarily taken into account when distributing Federal supports for broadband deployment.

So, Mayor Resnick, do you agree that there should be more engagement with local and State planning processes and, if so, what steps can Congress take to ensure local communities are a part of the broadband deployment process?

Mr. RESNICK. Well, thank you, Senator. And thank you for your support of so many members of my community.

It's tremendously important that local governments, counties, and cities have a seat at the table. I appreciate being invited here

to be part of this panel, but so often in this discussion we are not. Look at, for example, and no offense to my colleague at the table who is part of BDAC and we appreciate his work on that, its ratio of industry members to local government members is ten to one.

They drafted a model code for states without the input of any single local official. So we do not feel right now that the FCC is serious about engaging in dialogue with local governments and we think that that's going to result in bad broadband policy frankly.

So we do—any efforts that you can make to try and ensure that local governments have more of a voice and a seat at the table we would appreciate. Also, you cannot forget, you know, we have heard throughout the hearing today about the frustration of getting affordable broadband available in every area.

Rural areas, inner city areas, et cetera, and the Federal programs apparently are not providing enough incentive to make the business case for the private investment that the industry is looking for, but municipal broadband does have a way of solving the needs of their communities.

Local governments are very good being creative coming up with ways of solving of the needs of their communities. Mayors like to get things done and if a problem exists in available broadband for my community we are going to get it done. If we have to build a municipal network to do it, we are going to try and undertake efforts to do it.

So when you are talking about ways to engage local governments and make sure that the needs of our communities are met, we should not forget about the possibility of municipal broadband systems. Too often we are preempted from doing so, especially at the State level.

There's a situation, or an example, I think Wilson, North Carolina, where they actually passed a referendum. The taxpayers supported building a municipal network. It was built. It was operating. It was providing great service and because of State law they had to discontinue using it.

So there are plenty of examples like that where municipalities and counties want to take the effort and spend their residents' funds on these networks and State law simply does not allow them. If there's something you can do with respect to that, we would appreciate it.

Senator WICKER. Thank you very much, Senator Baldwin, and thank you to the members of the panel and to the members of the Subcommittee. I will tell you that almost one-fifth of the U.S. Senate attended this hearing today. I think that tells us of the interest we have in this subject.

Now, according to our procedures the hearing record will remain open for two weeks. During this time Senators are asked to submit any questions for the record. On receipt, the witnesses are requested to submit their written answers to the Committee as soon as possible. So we invite your cooperation there.

Again, thank you for very excellent testimony and for valuable information provided to the members.

This hearing is now adjourned.

[Whereupon, at 12:06 p.m., the hearing was adjourned.]

APPENDIX

PREPARED STATEMENT OF UTILITIES TECHNOLOGY COUNCIL

The Utilities Technology Council (UTC) thanks the Subcommittee on Communications, Technology, Innovation and the Internet for the opportunity to submit these comments for the record regarding the above-referenced hearing. As the Subcommittee considers policies on America's broadband infrastructure, UTC members are supporting broadband deployment by both providing access to utility infrastructure for third-party broadband providers and, where allowed, deploying broadband services in unserved and underserved areas. UTC therefore supports the development of policies which promote utility broadband deployment and infrastructure access.

Established in 1948, UTC is the global association representing energy and water providers on their needs related to the deployment of reliable and resilient information and communications technology (ICT). Energy and water providers use ICT networks as the backbone for the infrastructure that delivers safe, reliable, and secure energy and water services. These networks are essential for reliability, safety, resiliency, and security.

UTC applauds the Subcommittee for holding this important hearing. Our membership represents energy and water entities of all sizes and ownership types, from investor-owned utilities to publicly and consumer-owned utilities located in small towns and rural areas. Although our membership is diverse, they all share the belief that access to affordable and reliable broadband is a key economic driver for our Nation.

Indeed, electric utilities, in particular, enable broadband access in multiple ways. In many cases, where not prohibited by state or local statute, a number of utilities are actually providing broadband in locations where private firms have decided not to deploy such services. Most of these locations are in rural, unserved or underserved areas.

For electric utilities, the decision to provide broadband services to their customers and beyond is a natural progression because in most cases these utilities have already built communications networks to enhance electric reliability and resiliency; these networks include wireline and wireless services that have narrowband and broadband features. Therefore, electric utilities can use both their existing knowledge and, in some cases, their infrastructure to deliver broadband. As such, electric utilities can deploy future-proof, often fiber-based, networks offering robust, affordable and reliable broadband to potential customers inside and outside their service territories. Importantly, the services these electric utilities provide are reasonably comparable to the cost and quality of broadband available in urban areas.

In addition, some electric utilities are willing and able to provide wholesale services and infrastructure access to third-party commercial communications service providers to enable broadband deployment. As stated above, electric utilities have extensive infrastructure that includes wireline and wireless communications networks, as well as power poles and rights of way. Many utilities offer wholesale capacity and dark fiber services over their communications infrastructures at rates, terms and conditions that are just and reasonable.

As this Subcommittee addresses broadband issues, we urge acknowledgement of electric utilities as key partners in bringing broadband to all Americans. Utility-owned infrastructure is an important piece of the broadband-deployment puzzle, as power poles are not only essential for delivering electricity, they are also used by third parties to enable voice, data, and broadband services. Power poles are designed first to deliver electricity to homes and businesses, and in so doing they also power the carrier-provisioned telecommunications services which cannot operate without electricity. These poles are built to withstand tough weather conditions and hold equipment that transforms high-voltage electricity into lower voltages safe for homes and businesses.

With the advent of 5G wireless technologies, policymakers and industry are looking at new ways to reduce pole-attachment costs and expedite the regulatory proc-

ess. This "race to 5G" is seen as the next wave of broadband development that will enable greater communications access to more people. Again, power poles play a key role in the deployment of this technology, as small cellular wireless devices that can be attached to electric infrastructure will be used to bring 5G service to the Nation. These devices can weigh as much as, if not more than, a pizza oven or a full-size refrigerator. In addition, different companies will want to attach their own "pizza ovens" to power poles or other devices, not necessarily recognizing that adding so much weight to a pole could interfere with its first responsibility—delivering the electricity that fuels everything from our homes to the devices and systems 5G technology is intended to serve.

UTC recommends this Subcommittee, as it looks to encourage broadband deployment, consider the following:

- Supporting broadband-funding programs that promote the deployment of future-proof networks which provide robust, reliable and affordable broadband services to all Americans;
- Supporting pole attachment policies that promote safety, reliability and security of electric utility infrastructure while accelerating broadband deployment; and
- Passing rights-of-way legislation that would clarify that electric utilities may use their existing rights-of-way for communications purposes. Doing so would promote broadband deployment by preventing class-action lawsuits against electric utilities that offer these services.

Ensuring that all Americans have access to affordable, reliable broadband is just as important today as electricity was for the growth of the Nation a century ago. Now as then, electric utilities are critical partners in doing so and stand ready to assist.

UTC thanks the Subcommittee for holding this important hearing and appreciates the opportunity to submit this statement. We look forward to working with you and the full Commerce, Science, and Transportation Committee in ensuring that all Americans have access to robust, affordable and reliable broadband networks and services.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. GARY PETERS TO HON. GARY RESNICK

Question 1. The next generation of technological advances—like self-driving vehicles—depend on increased connectivity and massive amounts of data. I am deeply concerned that President Trump's infrastructure and budget proposals do not appear to mention or prioritize infrastructure needs of the future, particularly around mobility, 5G, or connected infrastructure. What should Congress include in an infrastructure package to support these initiatives? What Federal investments are needed now to prepare for the future of mobility and 5G?

Answer. Cities agree that a national infrastructure framework must be forward-looking, reimagining the infrastructure of the future while repairing and rebuilding existing infrastructure networks. To that end, broadband deployment and planning must be incorporated into other infrastructure projects and programs, such as transportation projects that could incorporate deployment of fiber or wireless equipment.

Congress should avoid focusing on the deployment of small cell or 5G-focused technologies to the exclusion of other broadband tools. Closing the digital divide and enhancing mobile connectivity will require a mix of wired, wireless, and satellite technologies. Even wireless technologies will require an enormous amount of fiber backhaul to support their transmissions, and support for smart cities and connected infrastructure will require fiber investments to make the wireless connectivity function. Congress must not be in the business of picking winners and losers in the broadband industry.

Congress should also prioritize the inclusion of cybersecurity in major infrastructure programs. As we have seen repeatedly over the past several years, our increasingly connected workplaces and infrastructure networks are much more vulnerable to cyberattacks, and these attacks will have increasingly dangerous consequences. Finally, Congress should prioritize digital inclusion efforts, not just the buildout of physical broadband infrastructure. Too often, low-income residents are left out of the benefits of our connected world, even if they live in neighborhoods with broadband service. Without digital inclusion, low-income residents of smart cities will be left further and further behind.

Question 2. The omnibus spending bill provides $600 million to RUS for a new pilot program of grants and loans for rural broadband deployment. How should the RUS plan to use these additional funds?

Answer. Cities were pleased by the inclusion of $600 million for rural broadband through the USDA's Rural Utilities Service. To have the most impact, this pilot program should coordinate closely with local and regional governing bodies, as well as the Federal Communications Commission and the National Telecommunications and Information Administration. This coordination must not only be focused on preventing duplicative efforts across subsidy programs, but also sharing best practices gleaned from existing or past subsidies, encouraging economies of scale where possible, and coordinating network build in adjacent communities or within regions. For example, Congress should consider whether existing subsidized buildouts, such as provision of E-Rate broadband service to a community institution such as a school or library, can be expanded by a new infusion of funds to serve the surrounding residential and business communities.

Congress should also ensure that rural service does not mean second-class service. Federal support should be prioritized to providers who can actually offer minimum upload/download speeds of 25Mbps/3Mbps or higher—the current Federal broadband standard—even in low-density rural areas. Without some equity in the standard of service available to all residents, rural communities will continue to fall further behind in the digital economy.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. GARY PETERS TO STEVEN K. BERRY

Question 1. The next generation of technological advances—like self-driving vehicles—depend on increased connectivity and massive amounts of data. I am deeply concerned that President Trump's infrastructure and budget proposals do not appear to mention or prioritize infrastructure needs of the future, particularly around mobility, 5G, or connected infrastructure. What should Congress include in an infrastructure package to support these initiatives? What Federal investments are needed now to prepare for the future of mobility and 5G?

Answer. While it is important to lead the world in 5G technologies, we must immediately focus on preserving and expanding mobile broadband services to those who remain on the wrong side of the digital divide. To ensure that all consumers have access to the latest mobile broadband services, Congress should focus efforts on three critical elements: sufficient and predictable funding for services in rural America based on reliable data, certainty regarding policies for deployment, and access to low-, mid-, and high-band spectrum.

Question 2. The omnibus spending bill provides $600 million to RUS for a new pilot program of grants and loans for rural broadband deployment. How should the RUS plan to use these additional funds?

Answer. As RUS works to distribute $600 million through a new pilot program for rural broadband deployment, emphasis should be on grants over loans. Additionally, RUS should work with the FCC to ensure that future grants or loans do not impose obligations on future USF decisions.

Question 3. The omnibus spending bill for FY 2018 allocated $7.5 million for NTIA to use for the National Broadband Map, and the Administration has requested $50 million for FY 2019. Do you think the FCC or NTIA should be in charge of the National Broadband Data Map? How should the FCC and NTIA leverage and coordinate their resources to provide more accurate and granular data?

Answer. NTIA and the FCC should coordinate their expertise and resources to develop a National Broadband Data Map that reflects the reality American consumers experience every day.

Administrator Redl has noted the need for better broadband mapping data that is more accurate, granular, and verified. Unfortunately, the parameters selected by the FCC for the one-time data collection to determine initially eligible areas for Mobility Fund Phase II have produced a map that fails to reliably reflect coverage. Data collected to shape the National Broadband Data Map should balance real world coverage without unduly burdening wireless carriers or state and local governments.

Question 4. As noted during the hearing, I am considering legislative options for modernizing the RUS Community Connect grant program. The program currently sets an eligibility cut off that makes communities ineligible if a single household has broadband service at or above 4/1 megabits per second. This speed threshold has not been updated in years, and it is substantially below the FCC's definition of

broadband coverage at 25/3 speeds. In addition to my questions we discussed regarding the 4/1 speed threshold, do you have other recommendations for modernizing these RUS grants?

Answer. RUS grant programs should provide support for an increasing range of speeds based on technology and spectrum availability. However, eligibility should be determined from geographic coverage based on reliable data, not an outdated model where service available at one location could eliminate entire areas from funding eligibility.

Question 5. Your testimony "encourages the use of grants instead of loans due to the costly, unnecessary bureaucratic red tape that accompanies current RUS loans." Can you elaborate on what makes grants preferential?

Answer. Mobile carriers today rely on various funding models, especially to fund deployments in rural and high cost areas. While carriers must already navigate bureaucratic processes in the application and review process, additional steps to satisfy Federal loan programs can add additional delays and costs compared to loans available through commercial channels.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. CATHERINE CORTEZ MASTO TO STEVEN K. BERRY

Question 1. In Nevada we have the most public lands of any state in the Nation. In some of these remote areas, Internet access is extremely slow or nonexistent. This presents a number of challenges for both the residents who live in these areas to the government employees who manage them, but there's also opportunities in these places.

Can you give an examples of any partnerships that have been done with land management agencies that have increased access to high speed broadband for these outposts?

Can you give examples of any of these partnerships being used to increase access to high speed broadband to communities in these areas?

Answer. CCA is continuing outreach to members for examples of successful partnerships with land management agencies and will provide any additional updates to your office.

Question 2. 5G will rely on small cells with short signal ranges. This raises questions about how they will be deployed and utilized in remote areas like those we have in Nevada. Can you give examples of these cells being deployed and befitting in rural areas?

Answer. Small cells are not only for big cities, and are being used in addition to traditional macro-cell towers to provide coverage in both urban and rural areas. Small cells can be particularly useful in rural areas with areas where people congregate and need greater data capacity, such as schools and universities, local sporting events, designated areas of commerce or government, rural areas of recreation and sport, and events such as state fairs and festivals. Additionally, small cells may be deployed in rural areas where other considerations may present challenges to deploying traditional towers.

Question 3. Can you describe the approval process by which telecom carriers install components of their networks on Federal land?

Answer. Carriers must navigate a lengthy, complicated process to gain regulatory approval to site mobile infrastructure, rife with potential for delays or costs. The attached chart, produced by CCA, describes the siting process for telecom equipment. CCA supports the SPEED Act and appreciates your leadership on these issues, which will benefit both urban and rural areas.

Question 4. What improvements are needed to the process to ensure better connections for our residents and visitors to many of our beautiful public land destinations, like Great Basin National Park?

Answer. Enacting the SPEED Act will help streamline deployment and provide improved mobile broadband services. Enhancing mobile broadband can also support residents and visitors to national parks and public land destinations through allowing connectivity when desired for social media and augmented reality experiences, as well as critical connections to public safety and 9–1–1 if necessary. As policies are updated, it is important that specific master plans are updated to allow for telecommunications deployments, particularly if existing master plans stretch over a decade or longer.

Question 5. The administration's proposal includes no direct funding for rural broadband but $50 billion for rural infrastructure, 80 percent of which comes in the way of formula grants to the states who will have the discretion to doll that money

out as they see fit. States often do not have institutions dedicated to allocating grant money for rural broadband like they do for projects like water or highways. What has been your experience in states prioritizing broadband over other projects like highways or water?

Answer. While state focus on broadband deployment policies and funding varies from state to state, traditional state infrastructure policies have not focused on broadband deployment and have prioritized other projects. CCA supports Congressional efforts to include direct funding for rural broadband programs in any infrastructure legislative package.

Question 6. One issue of concern in ensuring that Federal funds that are included in any plan are well spent and not wasted. How do we ensure we have the proper oversight or metrics in place to ensure that Federal funds are well spent and reach the intended people without adequate service?

Answer. You cannot manage what you cannot measure; reliable coverage data is critical to structuring a program to provide funding to reach the intended areas. Absent reliable data, areas that should be eligible for funding will be left behind. Additionally, using lessons learned from Mobility Fund Phase I, oversight of disbursed funds should not freeze capital through withholding reimbursement until after separate USAC certification, and build out time frames should be flexible to accommodate for any delays outside a carrier's control, including in the application process. Balancing oversight with flexibility will encourage participation in programs, particularly in remote areas, to ensure that Federal funds are being used as intended.

Question 7. Is increasing the amount of resources to RUS and the FCC sufficient to meet our Nation's needs?

Answer. Congress directed the FCC to administer the Universal Service Fund to provide eligible carriers with support that is both predictable and sufficient. To close the digital divide in high cost areas, additional resources are needed to support a business case where private capital alone may not be sufficient.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. GARY PETERS TO ROBERT DEBROUX

Question 1. The next generation of technological advances—like self-driving vehicles—depend on increased connectivity and massive amounts of data. I am deeply concerned that President Trump's infrastructure and budget proposals do not appear to mention or prioritize infrastructure needs of the future, particularly around mobility, 5G, or connected infrastructure. What should Congress include in an infrastructure package to support these initiatives? What Federal investments are needed now to prepare for the future of mobility and 5G?

Answer. Successful deployment of 5G requires more than just wireless "towers." It requires, for the most part, fiber connections to the network. In rural areas, especially, the business case for these connections, *i.e.,* covering the cost of these connections, may require specific funding. Thus, any goal of deploying 5G broadly will need dedicated funding.

Question 2. The omnibus spending bill provides $600 million to RUS for a new pilot program of grants and loans for rural broadband deployment. How should the RUS plan to use these additional funds?

Answer. The omnibus spending bill provided a solid framework for the RUS to follow in establishing the new broadband pilot program. Most important is Congress's acknowledgment that government funded projects should be directed to unserved areas and to only one entity per service area. I would recommend that Congress direct RUS to not only consult with the FCC, but require that the RUS use the FCC's data to verify that areas are unserved. In addition, RUS can allow current Universal Service Fund ("USF") recipients' to have the right of first refusal prior to funding any incumbent provider's service area when applying for funding. The FCC can also verify to the RUS which applicants are USF recipients.

Question 3. The omnibus spending bill for FY 2018 allocated $7.5 million for NTIA to use for the National Broadband Map, and the Administration has requested $50 million for FY 2019. Do you think the FCC or NTIA should be in charge of the National Broadband Data Map? How should the FCC and NTIA leverage and coordinate their resources to provide more accurate and granular data?

Answer. The FCC should be the primary agency tasked with collecting and interpreting broadband data. However, Congress has designated that NTIA host and maintain the National Broadband Map and it's now up to Congress to make sure that NTIA is not duplicating efforts taken by the FCC or using different standards or benchmarks when collecting broadband data. I would also add that the Census

Bureau can also be very helpful in providing broadband data to NTIA and the FCC. For example, as the Census Bureau begins work on the 2020 Census, Congress should direct the Census Bureau to geocode all parcel locations and provide that information to the FCC and NTIA so that rural broadband carriers can better identify where households are located.

Question 4. As noted during the hearing, I am considering legislative options for modernizing the RUS Community Connect grant program. The program currently sets an eligibility cut off that makes communities ineligible if a single household has broadband service at or above 4/1 megabits per second. This speed threshold has not been updated in years, and it is substantially below the FCC's definition of broadband coverage at 25/3 speeds. In addition to my questions we discussed regarding the 4/1 speed threshold, do you have other recommendations for modernizing these RUS grants?

Answer. The Farm Bill must be reauthorized by Congress by the end of this year. Reauthorizing the Farm Bill, presents a real opportunity for Congress to improve not only the RUS Community Connect Program but also the RUS Rural Broadband Program. TDS suggests that the Community Connect Program be rolled in the RUS Rural Broadband Program to gain the greatest efficiency and to ensure better participation by perspective applicants

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RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. CATHERINE CORTEZ MASTO TO ROBERT DEBROUX

Question 1. I have heard from other people in your industry that personnel is a major challenge. They feel that there is insufficient personnel at state and national level agencies to review applications quickly. This gets at the heart of the problem which is that this administration wants to roll back the time it takes to do these reviews and permitting but has also neglected staffing many of these agencies responsible. How has, in your experience, staffing affected the speed of the process?

Answer. It has been our experience that in some instances, lack of staff has contributed to delays in applications However, when staff has to comb through thousands of Federal and state laws just to approve an application then it's easy to see why permit applications are delayed. By appropriately streamlining the permit process and waiving some of the more onerous requirements that in most cases, shouldn't apply to broadband permit applications, the Federal government will be making Federal agencies more efficient while at the same time promoting the stated policy goal of expediting broadband deployment on Federal lands.

Question 2. How can we have "shot clocks" work if agencies are not staffed to meet demand?

Answer. The alternative to not having "shot clocks" is what we have today, thousands of permits pending before the Federal government. Congress needs to find the right balance between providing adequate time for agencies to review applications but not allowing the weight of Federal bureaucracy to ensure broadband permits are never be approved.

Question 3. A recent Wireless Infrastructure Association report notes that engineers and technicians need new training as we advance 5G infrastructure.

What workforce development challenges is the industry facing?

What is being done to ensure that women and minorities have the chance to fill these well-paying and technical positions?

Answer. As a primary wireline company I do not have any insight into the challenges of 5G infrastructure.

Question 4. The administration's proposal includes no direct funding for rural broadband but $50 billion for rural infrastructure, 80 percent of which comes in the way of formula grants to the states who will have the discretion to doll that money out as they see fit. States often do not have institutions dedicated to allocating grant money for rural broadband like they do for projects like water or highways. What has been your experience in states prioritizing broadband over other projects like highways or water?

Answer. To my knowledge, the Trump Administration's proposal on infrastructure would be the first time Federal broadband projects would have to compete against more traditional infrastructure projects such as highways and bridges. So while TDS doesn't have any experience in competing against projects like bridges and roads I would caution Congress and this Administration from establishing such a precedent.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. JERRY MORAN TO BRAD GILLEN

Question 1. I understand that the next generation of 5G wireless networks will require hundreds of thousands of small cells that will be placed on existing infrastructure. I'm encouraged that the FCC recently released a draft decision that would exempt some of these small cells from the burdensome and costly environmental and historic process reviews that the FCC is required to conduct. Does CTIA favor the proposed action?

Answer. Yes, consistent with the helpful direction in your legislation, the RAPID Act, the Federal Communications Commission's decision to update the environmental and historic preservation reviews designed for large cell towers will accelerate 5G deployment, spur significant new investment, innovation and job creation and help the United States win the global race to 5G.

The wireless industry is preparing to install 800,000 small cells in the next few years to make 5G a reality. These small cells are roughly the size of a pizza box and can be installed in an hour or two on a streetlight or utility pole, but it can take a year or more to get the necessary siting permits due to rules designed for 200-foot cell towers.

The Commission's March 22 decision to modernize some NEPA and NHPA permitting reviews will mean tremendous time and cost savings that will boost network investment and job creation, without impacting the environment or historic properties, as reviews will still happen when appropriate.

A recent Accenture report found that almost a third of the cost of next-generation wireless deployments go to Federal reviews that the FCC modernized with their decision. Accenture projects reforms like those the FCC adopted could bring $1.6 billion in savings, helping jumpstart 5G deployment.

In addition to these reforms, the most important thing the Federal government can now do is update its nationwide guidelines for how state and local governments treat siting requests.

Question 2. To win the global race of 5G, the wireless industry needs to rapidly deploy small cells, but many of today's rules were designed for the large macro towers. I appreciate the work that the FCC is doing this month to modernize the environmental and historic preservation rules, but what should Congress do to ensure the United States remains the world's leader in wireless?

Answer. Congress can help the United States remain the world's leader in wireless by focusing on two main issues: (1) infrastructure reforms and (2) building a spectrum pipeline.

(1) To unlock hundreds of billions of investment in new networks, the U.S. needs a modernized siting framework. The most meaningful step Congress can take is to provide clear direction and guardrails to state and local governments for wireless infrastructure siting. CTIA is encouraged that Senators Thune and Schatz have circulated a discussion draft that updates congressional guidance to localities to reflect how wireless infrastructure has evolved. The draft's "shot clock" provision provides reasonable timelines for states and localities to act on siting applications and creates an important enforcement mechanism—the "deemed granted" remedy. The FCC has already had a "deemed granted" tool in place since 2014 for certain facilities requests, but this should be broadened to cover all siting reviews to expedite deployment decisions. The draft also clarifies that localities retain the right to charge for access to public property, provided that rates are fair and reasonable, competitively and technologically neutral, and based on actual costs. The impact of excessive fees is real: disproportionate costs to site wireless infrastructure hinder deployment, particularly in rural areas. These proposed reforms would promote broadband investment, while preserving local authority in key areas like zoning, safety, and aesthetics.

When it comes to the Federal review process and siting on Federal lands, we applaud recent reforms. The FCC's action to streamline environmental and historic preservation reviews designed for large cell towers, consistent with your commonsense legislation, the RAPID Act (S. 2576) as well as the SPEED Act (S. 1988) introduced by Senators Wicker and Cortez Masto will accelerate 5G deployment. In addition, the inclusion of a shot clock on Federal agencies and other provisions to streamline wireless deployments on Federal lands in the Consolidated Appropriations Act, 2018 was important progress. Congress can further facilitate wireless deployments on Federal property by creating a deemed granted remedy for siting applications that are not addressed in a timely manner like that included in the Rural Broadband Deployment Streamlining Act (S. 1363) introduced by Senators Heller and Manchin.

(2) We need a new schedule of spectrum auctions to support consumer demand and 5G. Congress has already identified a number of bands including low-, mid-, and high-bands for both study and auction, including those proposed by Senators Gardner and Hassan in the AIRWAVES Act (S. 1682). The FCC has recently announced at least one high-band auction this year, and a clear schedule of additional spectrum auctions would create certainty, encourage investment, and allow wireless providers to plan and build their 5G networks to maximize efficiency and robustness.

Question 3. Are Congress, the FCC, and the Administration doing enough to help the U.S. win the race to 5G, or are we in serious danger of ceding the mantle of wireless leadership to China, Japan, and South Korea?

Answer. The U.S. is in a very tight race to lead in 5G. China, South Korea, and other nations are threatening to overtake our wireless leadership by investing billions, allocating huge blocks of spectrum, and conducting hundreds of 5G trials.

The good news is that America's wireless industry is already investing in the next generation of wireless with trials across the country and some initial 5G deployments planned for this year. According to Accenture research, the U.S. wireless industry contributes $475 billion annually to America's economy and supports 4.7 million jobs and the industry is poised to invest $275 billion of its own private capital to build next-generation wireless networks. This will create more than 3 million new jobs, and add $500 billion to our economy, according to Accenture.

The wireless industry will continue to invest, deploy, and innovate, but our continued global leadership depends on a committed and comprehensive spectrum and infrastructure policy.

If Congress follows through on these key reforms in 2018, we will be well positioned to be the world's leader in wireless:

- *Address wireless infrastructure needs.* Federal policymakers can help the U.S. win the race to 5G by updating its guidance for state and local governments on wireless infrastructure siting, and further build on recent reforms to streamline siting on Federal lands. The U.S. will not win the global race if timelines and costs are not significantly reduced across the country.
- *Spectrum pipeline.* We are encouraged that congressional leaders and the FCC are focused on the key spectrum bands we need for our future, and the challenge now is executing quickly on these priorities. The U.S. has no mid-band spectrum (3–24 GHz) currently available for commercial use. The FCC is focused on finalizing more investment-friendly rules for the 3.5 GHz band, but a timetable for bringing that spectrum to market remains unclear. While the FCC is exploring other mid-band spectrum bands, including the 3.7–4.2 GHz band, which is a key band for 5G globally, there is no clear timetable for a future auction. We applaud the FCC's announcement that at least one high-band auction will be held in 2018, and we encourage policymakers to ready additional high-band spectrum for 5G networks. Additionally, underused Federal spectrum should be reallocated for commercial use where possible. We strongly support Senators Gardner and Hassan's AIRWAVES Act, which provides a clear plan for additional spectrum across a wide and diverse range of frequencies.

Question 4. A growing number of states have adopted legislation to accelerate the deployment of small cells. Are any of these new state laws a particularly good model for us to follow if we undertake an effort to create a Federal framework for the deployment of small cells?

Answer. A new Accenture study shows the powerful impact of wireless investment and innovation across all 50 states. In Kansas alone, the wireless industry contributes $7 billion to the State's economy and supports 63,000 jobs. Fifteen states, including Kansas, have enacted legislation to modernize rules impacting the deployment of small cells, with other legislatures actively considering bills. The key provisions of the state bills that make the biggest impact is the inclusion of clear timetables for government action on siting requests and setting cost-based rates for siting. States that are the first facilitate wireless infrastructure deployment will likely see the greatest benefit.

At the Federal level, Congress has repeatedly prioritized the rapid deployment of wireless infrastructure as a national priority and previously set nationwide guidelines for how localities should treat siting requests. The race to 5G necessitates updating Congress's guidance to localities, as the rules that applied to the infrastructure of the past are no longer appropriate to support next-generation 5G deployment. CTIA is encouraged that Chairman Thune and Sen. Schatz have circulated a discussion draft that seeks to provide clear direction—and guardrails around—

state and local governments, while preserving local authority over zoning, safety, and aesthetics.

We support state and Federal efforts to provide reasonable access to rights of way, reasonable costs and fees, and streamlined processes for the deployment of small cells.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. GARY PETERS TO BRAD GILLEN

Question 1. The next generation of technological advances—like self-driving vehicles—depend on increased connectivity and massive amounts of data. I am deeply concerned that President Trump's infrastructure and budget proposals do not appear to mention or prioritize infrastructure needs of the future, particularly around mobility, 5G, or connected infrastructure. What should Congress include in an infrastructure package to support these initiatives? What Federal investments are needed now to prepare for the future of mobility and 5G?

Answer. The key infrastructure reform for wireless is modernizing our siting rules and regulations. Our industry stands ready to invest $275 billion in private capital in tomorrow's networks according to Accenture.

The good news is Congress already enacted several important reforms in the recently passed Appropriations Act that will assist in the deployment of 5G networks on Federal lands. These include shot-clocks for reviewing applications, the creation of contracts and applications that would be consistent across Federal agencies, further streamlining such applications, and adding information about facilities able to support communications facilities to the existing Federal assets database. There is more work to be done on Federal siting. First, the newly created shot-clock for the review of applications for facilities on Federal property should include a "deemed granted" remedy when the shot clock rules are violated. The shot clock has limited utility if there is no enforcement mechanism at the end. In basketball, when the shot clock expires, you lose the ball.

The most significant reform Congress can take is to update the guardrails on state and local governments to prevent unnecessary delays or impediments to the development of broadband infrastructure. Congress should also clarify that fees charged for siting wireless facilities should be non-discriminatory and based on the state or local government's actual, direct, and reasonable costs to manage the right of way or issue permits. These changes will go a long way towards reducing the costs and speeding the deployment of 5G infrastructure.

Additionally, Congress should reallocate spectrum, the invisible infrastructure that is necessary to power mobile networks, to the private sector. Not only is this important in that it will help bring broadband to more Americans, but revenue from auctioning Federal spectrum can help fund other congressional priorities. The AIRWAVES Act, sponsored by Senators Gardner and Hassan, would allocate 10 percent of auction proceeds to fund mobile broadband in rural areas. These funds would go a long way to ensuring rural consumers can benefit from mobile broadband.

Question 2. The omnibus spending bill provides $600 million to RUS for a new pilot program of grants and loans for rural broadband deployment. How should the RUS plan to use these additional funds?

Answer. RUS should use technologically neutral criteria and focus on the best way to get rural Americans online. All technologies, both wireless and wired, should be viable funding options, especially next-generation wireless networks that can meet the broadband needs of consumers and businesses. RUS should also work cooperatively with other agencies, including the FCC, to ensure funding is not duplicative and is focused on those Americans that do not benefit from broadband access today.

Question 3. The omnibus spending bill for FY 2018 allocated $7.5 million for NTIA to use for the National Broadband Map, and the Administration has requested $50 million for FY 2019. Do you think the FCC or NTIA should be in charge of the National Broadband Data Map? How should the FCC and NTIA leverage and coordinate their resources to provide more accurate and granular data?

Answer. Good data is key to effective program management and congressional oversight and we applaud your focus on getting the right data for mobile wireless coverage. NTIA and the FCC should work together on the broadband map, incorporating data that both agencies have as well as data commercially available from third parties. Any new information collections should be carefully balanced in light of the significant data our industry provides the government today. We are hopeful that Congress gets the data needed without the need for any additional burdensome collection mandates.

Question 4. As noted during the hearing, I am considering legislative options for modernizing the RUS Community Connect grant program. The program currently sets an eligibility cut off that makes communities ineligible if a single household has broadband service at or above 4/1 megabits per second. This speed threshold has not been updated in years, and it is substantially below the FCC's definition of broadband coverage at 25/3 speeds. In addition to my questions we discussed regarding the 4/1 speed threshold, do you have other recommendations for modernizing these RUS grants?

Answer. RUS should gear the program to what consumers' and businesses' broadband needs are, then determine what technologies and services can meet those demands. Today's wireless broadband services should be an option for funding.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. CATHERINE CORTEZ MASTO TO BRAD GILLEN

Question 1. In Nevada we have the most public lands of any state in the Nation. In some of these remote areas, Internet access is extremely slow or nonexistent. This presents a number of challenges for both the residents who live in these areas to the government employees who manage them, but there's also opportunities in these places.

Can you give an examples of any partnerships that have been done with land management agencies that have increased access to high speed broadband for these outposts?

Can you give examples of any of these partnerships being used to increase access to high speed broadband to communities in these areas?

Answer. Last year, NTIA produced a report on the use of public-private partnerships to expand broadband access to rural areas. It strongly endorsed those partnerships, and included several examples of successful partnerships. These partnerships can be an important tool in promoting broadband deployments to rural areas using all available technologies, including developing 5G networks, which will offer speeds and latency comparable to or better than wireline networks. In addition to partnerships with land management agencies, Internet access can be increased if wireless companies have better access to Federal lands. That will allow those companies to provide service both on and adjacent to Federal property. Recent changes to the process required by the 2018 Appropriations Act will help, but more work is necessary to reduce the time it takes wireless companies to site facilities on Federal land.

Question 2. 5G will rely on small cells with short signal ranges. This raises questions about how they will be deployed and utilized in remote areas like those we have in Nevada. Can you give examples of these cells being deployed and befitting in rural areas?

Answer. While much of the discussion surrounding 5G networks has focused on high-band frequencies that will use small cells, 5G will operate in a variety of different bands and will also take advantage of the 150,000 cell towers across the country. For example, CTIA member T-Mobile has announced that it is rolling out 5G service using the 600 MHz band spectrum it won in the FCC's landmark Broadcast Incentive Auction. 5G networks using 600 MHz spectrum will not necessarily use small cells because that spectrum can propagate further, making it useful to deploy in rural areas. But there will be 5G small cell use in rural areas as well. Small cells will be employed to provide additional capacity and coverage in targeted areas like school campuses, town squares, and areas such as tourist destinations and other high-traffic outdoor recreation areas. So, in rural locations, 5G will be delivered using a variety of facility types.

Question 3. Can you describe the approval process by which telecom carriers install components of their networks on Federal land?

Answer. Unfortunately, there is no single approval process by which carriers install components of their networks on Federal land. The process for companies to site facilities on Federal land remains slow and unpredictable. Different agencies have different siting approval processes and even within agencies, procedures may be inconsistent between different organizational units. CTIA is encouraged that in the recently passed Appropriations bill, Congress took several important actions to facilitate siting on Federal lands. First, agencies are now required to act within a uniform 270-day period on siting applications. Second, GSA is required to develop common forms and applications for siting facilities on Federal property, which will standardize the process of obtaining permission to deploy these facilities. Third, GSA is required to update and make public the existing Federal property database in order to make it easier to find available sites for these facilities. Finally, GSA

and NTIA will work with the relevant Federal agencies to produce recommendations on how to streamline these processes even further.

Question 4. What improvements are needed to the process to ensure better connections for our residents and visitors to many of our beautiful public land destinations, like Great Basin National Park?

Answer. CTIA is encouraged by the actions that Congress recently took to ensure better connections on and near public lands. However, more work must be done. CTIA looks forward to working with NTIA, GSA and others to develop the new common forms and agreements required by the Appropriations Act and to consider other actions, as Congress has directed, to streamline siting on Federal lands. For example, Congress could direct that relevant agencies implement new regulations to reform the process of considering applications for siting on lands under their jurisdiction. These reforms could focus on making the process more uniform across different parts of an agency, tracking application reviews, setting cost-based fees, and speeding the review of applications with minimal impacts on protected lands, such as when the facilities will be located in existing rights-of-way.

I would also like to note that the SPEED Act, which you sponsored with Sen. Wicker, is the type of smart, targeted streamlining measure that the Federal government should continue to explore. The legislation wisely balances the need to expand the deployment of broadband while ensuring the environmental impact is minimized. This is especially relevant in places like the Great Basin National Park, where both visitors and public safety officials rely on broadband for communications.

Question 5. I have heard from other people in industry that personnel is major challenge. They feel that there is insufficient personnel at state and national level agencies to review applications quickly. This gets at the heart of the problem which is that this administration wants to roll back the time it takes to do these reviews and permitting but has also neglected staffing many of these agencies responsible.

How has, in your experience, staffing affected the speed of the process?

How can we have "shot clocks" work if agencies are not staffed to meet demand?

Answer. The wireless industry recognizes that budget constraints exist for all government agencies and that delays in review of applications may stem from lack of resources. This is why CTIA has supported actions that would permit government agencies to charge cost-based fees for processing siting applications and for siting on government land. While fees should not be revenue-generating tools for governments, they can and should account for the cost of reviewing and processing applications to ensure that reviews are completed within any periods required by shot-clocks. The industry is committed to working with state and local governments to ensure deployment is efficient and timely.

Question 6. A recent article in the Las Vegas Review Journal reports that large areas of Las Vegas still have spotty access to cellular coverage.[1] This is not acceptable in a major metropolitan area.

Some have accused providers of "redlining" certain neighborhoods, can you provide a comment on this, including how you ensure it doesn't exist?

Can you speak to any other challenges to LTE access facing larger cities, particularly in low income and minority communities which are disproportionately affected?

Answer. Wireless coverage gets better every year and we all work hard to improve that coverage. One of the amazing things about the wireless industry is the vast competition: competition to find new customers and meet their demands. As a result of these market dynamics, wireless providers compete every day to serve new markets and consumers, and according to the FCC's best available data, more than 99 percent of Americans have access to 4G LTE networks and nearly 97 percent having access to three or more LTE providers. Not only are nation-wide carriers, rural and regional providers, and resellers of wireless services competing to reach these consumers, but they also offer competitive service plans that fit within consumers', including low-income consumers', budgets. To further facilitate wireless affordability, CTIA is a strong supporter of the Lifeline Program, which provides support to those consumers who may not be able to afford voice and broadband service.

In order to further reduce disparities in coverage and ensure that more consumers have access to and can afford wireless services, Congress should continue to support policies that lower the cost of deployments and support targeted funding mechanisms like the Mobility Fund. As FCC Commissioner Carr has said, shifting the business case can spur carriers to invest in areas that were previously uneconomic.

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[1] Dead spots remain for many cell customers in Las Vegas Valley. *Las Vegas Review Journal.* Available at: *https://www.reviewjournal.com/business/dead-spots-remain-for-many-cell-customers-in-las-vegas-valley/*

Smart reforms such as reducing barriers to accessing public rights of way, establishing shot clocks and enforceable remedies for the entire permitting process, and promoting cost-based fee methodologies can help bring the benefits of these networks to more Americans, including those in low-income communities, whether in rural or urban areas.

Question 7. A recent Wireless Infrastructure Association report notes that engineers and technicians need new training as we advance 5G infrastructure.

What workforce development challenges is the industry facing?

What is being done to ensure that women and minorities have the chance to fill these well-paying and technical positions?

Answer. The wireless industry prides itself on the opportunities it provides to all Americans to have well-paying jobs that will continue to be vital for decades to come. As a recent report from Recon Analytics showed, America's leadership in 4G LTE connectivity brought $100 billion to the U.S. GDP and spurred an 84 percent increase in wireless-related jobs. Today, wireless underpins much of our economy, supporting 4.6 million core wireless-related jobs and creating 6.5 more jobs for each direct wireless job. And next-generation 5G is expected to produce three million new long-term jobs for Americans of a variety of skills and backgrounds.

Further, a snapshot of publically available data shows that the wireless industry values diversity in its workforce. AT&T was ranked number 3 on Diversity Inc.'s 2017 Top 50 companies for diversity; as of September 2017, 62 percent of T-Mobile's workforce is comprised of minorities; and 6 of 12 of Verizon's board members are women and/or minorities.

Question 8. In your testimony you said, "NHPA mandates alone recently cost a carrier more than $170,000 to install just 23 small cells in a parking lot. Another provider estimates that reviews under NHPA and NEPA comprised, on average, 26 percent of its total small cell deployment costs last year. And these costs are increasing; one carrier reports that these costs have risen by as much as 2500 percent in some parts of the country since 2010." Can you provide more detailed information and background on these statements?

Answer. These examples come from public filings made by wireless carriers with the FCC, summarized in a February 2018 CTIA ex parte presentation.[2] The first example is from Sprint, which described the situation it faced in deployments leading up to the 2017 Super Bowl in Houston, Texas in a filing with the FCC in May, 2017. The second example is from Verizon Wireless, which noted this figure in an ex parte presentation filed with the FCC in February, 2018. The third example is from a submission by AT&T to the FCC in February 2018.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. GARY PETERS TO MICHAEL ROMANO

Question 1. The next generation of technological advances—like self-driving vehicles—depend on increased connectivity and massive amounts of data. I am deeply concerned that President Trump's infrastructure and budget proposals do not appear to mention or prioritize infrastructure needs of the future, particularly around mobility, 5G, or connected infrastructure. What should Congress include in an infrastructure package to support these initiatives? What Federal investments are needed now to prepare for the future of mobility and 5G?

Answer. Preparing for 5G infrastructure means preparing for broadband infrastructure generally. We will need densification of fiber for small cells; the data demands and throughput necessary to realize the promise of 5G services will require placement of small cells every several hundred feet, and substantial new fiber connectivity to connect those small cells to one another and the rest of the world. It will therefore take a mix of dedicated funding resources and common-sense permitting reforms to ensure that rural Americans share in the communications revolution for both mobile and fixed services, all of which are enabled by and dependent upon a robust underlying fixed network.

Question 2. The omnibus spending bill provides $600 million to RUS for a new pilot program of grants and loans for rural broadband deployment. How should the RUS plan to use these additional funds?

Answer. RUS should target the funding to areas where no provider is currently operating, or for use in areas where only one provider is currently providing service

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[2] CTIA Ex Parte Presentation to FCC, WT Docket nos. 17–79, 16–421 (filed Feb. 26, 2018), *https://ecfsapi.fcc.gov/file/10226219719241/180226%20CTIA%20Ex%20Parte%20on%20Costs%20Associated%20with%20NEPA%20and%20NHPA%20Reviews.pdf.*

below speeds of 10/1. Additionally, RUS and the FCC should coordinate on how new pilot program funds can best work in concert with the Universal Service Fund (USF). It would be a waste of taxpayer resources if multiple government programs fund competing networks in high-cost rural areas that can barely sustain even a single network, while leaving other areas entirely unserved.

Question 3. The omnibus spending bill for FY 2018 allocated $7.5 million for NTIA to use for the National Broadband Map, and the Administration has requested $50 million for FY 2019. Do you think the FCC or NTIA should be in charge of the National Broadband Data Map? How should the FCC and NTIA leverage and coordinate their resources to provide more accurate and granular data?

Answer. NTCA is agnostic to what Federal agency is charged with creating the map, so long as providers only must report once. We would also strongly encourage the mapping entity to consider geocoding new installs. The best way to get data that can drive informed decision-making and funding decisions in particular is to get as granular as geocoding new installs. Even then, a robust challenge processes will also be needed thereafter to ensure self-reported data are correct and legitimate, so that we do not leave unserved locations behind based upon self-proclaimed "false positives" of service availability.

Question 4. As noted during the hearing, I am considering legislative options for modernizing the RUS Community Connect grant program. The program currently sets an eligibility cut off that makes communities ineligible if a single household has broadband service at or above 4/1 megabits per second. This speed threshold has not been updated in years, and it is substantially below the FCC's definition of broadband coverage at 25/3 speeds. In addition to my questions we discussed regarding the 4/1 speed threshold, do you have other recommendations for modernizing these RUS grants?

Answer. We urge RUS to use more granular data and robust challenge processes to avoid "false positives" that deny support/loans where needed despite the fact that much of a community may in fact be unserved. Speeds of 4/1 should be updated to 10/1, but once areas lacking 10/1 are identified, providers should be required to aim for even higher speeds, with the goal of making the new networks that are built leveraging this program "future-proof"—that is, built for effective, scalable use by consumers over the entire life of the network asset. Finally, as noted in other answers, it is important however to coordinate RUS and FCC efforts, so that program efforts are working in concert rather than potentially overbuilding one another in the form of duplicative, competing networks operated by two different providers.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. CATHERINE CORTEZ MASTO TO MICHAEL ROMANO

Question 1. All of our infrastructure pushes in the past outlined a bold vision, such as connecting our communities with railroads and highways. I believe that smart, interconnected communities should be that vision in the 21st century, obviously broadband is a critical component of that. I recently saw that NTCA announced four Smart Rural Community Collaboration Challenge grants as part of the annual Smart Rural Community initiative. What are the major issues that rural communities are trying to overcome with smart technology?

Answer. Many rural areas face the same exciting opportunities and challenges as urban areas as the incorporation of technology into all facets of life expands. In rural areas, however, these advancements are even more critical, as broadband-enabled telehealth, tele-education, and Internet-enabled commerce enable rural regions to reach resources that would be otherwise unavailable. Small rural high schools might lack a critical mass of students to justify the offering of certain niche or advanced courses. Residents of rural areas may be so far from comprehensive health care facilities that they either must take a full day for a medical appointment or may defer care altogether. This not only risks losing the benefits of preventative medicine, but also increases the likelihood of greater expense if untreated chronic or acute illnesses advance.

The goal of the Smart Rural Community initiative and, in parallel, our members who engage these efforts, is for rural broadband providers to work with other community leaders to ensure that broadband is leveraged to improve educational opportunities, health care, public services and other vital aspects of life. The innovative efforts of our Smart Rural Community and other NTCA members strengthen their rural areas and, as studies exploring the interdependencies of rural and urban America have demonstrated, the Nation as a whole.

Question 2. Can you provide examples of interesting things that have been done with this funding?

Answer. In Princeton, Missouri, a Smart Rural Community grant supports a business incubator designed to train area high school students in business development; the facility will be staffed by senior citizen volunteers.

In Havre, Montana, a Smart Rural Community grant supports a Tribal-owned economic development agency's establishment of a virtual workplace suite and training center to provide educational resources and training for call center and other telework industries.

In Brandon, Minnesota, an NTCA member relied upon a Smart Rural Community grant when partnering with a faith-based hospice to deploy Mi-Wi technology that enables social and medical connectivity for patients.

Question 3. What are some challenges, besides the obvious lack of high speed broadband, that face rural areas when implementing smart technology?

Answer. According to our most recent survey, 41 percent of NTCA members' customers enjoy fiber to the home, and about 80 percent enjoy speeds 10 mbps and above (67 percent enjoy speeds of 25 mbps). More than 100 NTCA members have been certified as Gig capable. But, we have many members whose deployment plans are not yet complete; and all members face the on-going challenges of maintaining and upgrading networks. Beyond those issues, NTCA members are meeting the challenges of introducing their customers to new technologies and demonstrating how the integration of those devices and applications can help assure rural vitality and viability. These are critical as rural demographics change, and as traditional employment opportunities advance to middle-skills jobs and other careers that require greater technical education. NTCA, working with its members, champions collaboration among our rural providers and local K–12 and secondary education providers.

Question 4. In Nevada we have the most public lands of any state in the Nation. In some of these remote areas, Internet access is extremely slow or nonexistent. This presents a number of challenges for both the residents who live in these areas to the government employees who manage them, but there's also opportunities in these places. Can you give an examples of any partnerships that have been done with land management agencies that have increased access to high speed broadband for these outposts?

Can you give examples of any of these partnerships being used to increase access to high speed broadband to communities in these areas?

Answer. Navigating byzantine application and review processes within individual Federal land-managing and property-managing agencies can be burdensome for any network operator, but particularly for the smaller network operators that serve the most rural 35 percent of the U.S. landmass. The review procedures can take substantial amounts of time, undermining the ability to plan for and deploy broadband infrastructure. For ways to improve the process and promote partnerships, we suggest reviewing the Broadband Deployment Advisory Committee's Streamlining Federal Siting Working Group report for recommendations on improving the process of building broadband on Federal lands; an overview of some of those recommendations was included with my submitted testimony.

Question 5. The administration's proposal includes no direct funding for rural broadband but $50 billion for rural infrastructure, 80 percent of which comes in the way of formula grants to the states who will have the discretion to doll that money out as they see fit. States often do not have institutions dedicated to allocating grant money for rural broadband like they do for projects like water or highways. What has been your experience in states prioritizing broadband over other projects like highways or water?

Answer. Several states, including New York, Minnesota, and Wisconsin, have established successful broadband programs that direct limited resources to areas in most need in an effective and efficient manner. These programs focus, however, primarily upon defraying some of the upfront costs of network construction, and do not specifically address the ongoing need for support to sustain service on networks once built or to ensure the affordability of services provided over those networks. Separately, 22 states have established state universal service programs to help provide additional cost recovery for telecommunications networks and services in high-cost areas. However, at the end of the day, the only program that helps enable reasonably affordable and comparable rural broadband services in most states—and provides much-needed additional support even in those states that themselves provide some level of funding—is the Federal Universal Service Fund.

Question 6. One issue of concern in ensuring that Federal funds that are included in any plan are well spent and not wasted. How do we ensure we have the proper

oversight or metrics in place to ensure that Federal funds are well spent and reach the intended people without adequate service?

Answer. To ensure proper oversight and metrics, strong consideration should be given to leveraging—and supplementing—the FCC's existing High-Cost USF initiatives as a primary means of implementing broadband infrastructure initiatives. The FCC is the Nation's expert agency in telecom policy, and it is already tackling broadband challenges with respect to availability and affordability. Moreover, recent reforms adopted by the FCC have sought to: (1) reorient the USF programs toward broadband, (2) ensure funding is targeted to where it is needed (*i.e.,* to places where the market does not enable service delivery on its own), and (3) define what the FCC considers an efficient level of support in each area. At the very least, such principles and practices should guide any program that distributes Federal funds, regardless of which agency administers the program.

Question 7. Is increasing the amount of resources to RUS and the FCC sufficient to meet our Nation's needs?

Answer. Additional resources are needed to meet our Nation's broadband goals. For example, broadband-promoting initiatives remain woefully underfunded to achieve the goals for small, rural broadband providers. More than $66 million per year is still needed to fund a USF model that the FCC created to promote broadband deployment. In addition, under a budget control mechanism included within 2016 reforms that applies only to some carriers, many small rural telecom operators have had their support slashed by an unpredictably escalating budget control that now equals 12.3 percent on average, translating into denied recovery of more than $180 million in actual costs per year for private broadband investments. Although the FCC took steps to mitigate this budget control for the most recent twelve months, the budget shortfall will begin anew as of July 1, resulting in tens of millions of dollars per month in denied recovery for broadband infrastructure investment.

Beyond these concerns, there are many areas—especially in rural America—where broadband remains lacking, and there is no prospect of the private sector stepping in to fill that gap given the challenges of distance and density that make a business case for investment impossible to justify. Additional resources to help defray the upfront costs of construction and/or provide ongoing support that helps to make the business case for investment and operation are needed if we will realize the goal of universal broadband access.

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