

# REALIZING THE BENEFITS OF RURAL BROADBAND: CHALLENGES AND SOLUTIONS

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## HEARING BEFORE THE SUBCOMMITTEE ON COMMUNICATIONS AND TECHNOLOGY OF THE COMMITTEE ON ENERGY AND COMMERCE HOUSE OF REPRESENTATIVES ONE HUNDRED FIFTEENTH CONGRESS SECOND SESSION

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JULY 17, 2018  
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## **REALIZING THE BENEFITS OF RURAL BROADBAND: CHALLENGES AND SOLUTIONS**

**TUESDAY, JULY 17, 2018**

HOUSE OF REPRESENTATIVES,  
SUBCOMMITTEE ON COMMUNICATIONS AND TECHNOLOGY,  
COMMITTEE ON ENERGY AND COMMERCE,  
*Washington, DC.*

The subcommittee met, pursuant to call, at 10:00 a.m., in room 2123 Rayburn House Office Building, Hon. Marsha Blackburn (chairman of the subcommittee) presiding.

Members present: Representatives Blackburn, Lance, Shimkus, Latta, Guthrie, Olson, Kinzinger, Bilirakis, Johnson, Long, Flores, Brooks, Collins, Cramer, Walters, Costello, Walden (ex officio), Doyle, Welch, Loeb sack, Ruiz, Dingell, Eshoo, Butterfield, Matsui, McNerney, and Pallone (ex officio).

Staff present: Jon Adame, Policy Coordinator, Communications and Technology; Kristine Fargotstein, Detailee, Communications and Technology; Sean Farrell, Professional Staff Member, Communications and Technology; Margaret Tucker Fogarty, Staff Assistant; Theresa Gambo, Human Resources/Office Administrator; Elena Hernandez, Press Secretary; Paul Jackson, Professional Staff, Digital Commerce and Consumer Protection; Tim Kurth, Deputy Chief Counsel, Communications and Technology; Lauren McCarty, Counsel, Communications and Technology; Brannon Rains, Staff Assistant; Austin Stonebraker, Press Assistant; Evan Viau, Legislative Clerk, Communications and Technology; Michelle Ash, Minority Chief Counsel, Digital Commerce and Consumer Protection; Jeff Carroll, Minority Staff Director; Jennifer Epperson, Minority FCC Detailee; Alex Hoehn-Saric, Minority Chief Counsel, Communications and Technology; Jerry Leverich, Minority Counsel; Jourdan Lewis, Minority Staff Assistant; Dan Miller, Minority Policy Analyst; and C.J. Young, Minority Press Secretary.

### **OPENING STATEMENT OF HON. MARSHA BLACKBURN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF TENNESSEE**

Mrs. BLACKBURN [presiding]. The Subcommittee on Communications and Technology will now come to order, and the Chair recognizes herself for 5 minutes for an opening statement.

And I want to welcome you to today's subcommittee hearing on rural broadband challenges and solutions. Extending the reach of broadband in rural Tennessee and across America is critical to ensure that everyone can participate in the digital economy. While the percentage of rural Tennesseans still lacking access to high-

speed internet has decreased from 34 percent to 23 percent, we have to continue to push. You can't have a 21st century economy without a 21st century internet.

Since passage of the 1996 Telecom Act, the private sector has invested roughly \$1.6 trillion in their networks using different technologies. Understanding different technologies is key because broadband is more than just fiber. Moreover, we should acknowledge private investment in rural deployment and ensure that government-based solutions complement private investment instead of competing with it. For example, I am pleased to have the Satellite Industry Association testifying, so we can learn about the strides they are making to deploy modern satellites capable of delivering broadband internet anywhere in the country.

Almost 6 months ago, I chaired a hearing on closing the digital divide. These hearings are useful, but, as chairman, I like to focus on results. Today's hearing allows us to check our progress, finding solutions and getting work done.

I am proud to report that members of this subcommittee have worked together and accomplished quite a bit when it comes to expanding broadband access in rural America. In March, Congress passed RAY BAUM's Act, the most significant rural broadband legislation to become law in the last 6 years. The bill is named in honor of the E&C Committee Staff Director Ray Baum, who passed away earlier this year. Ray was a champion for rural America, and naming this bill for him is a fitting tribute.

RAY BAUM's Act incorporated several legislative proposals we examined at our hearing in January. I will allow subcommittee members to discuss the legislative solutions, but I would like to highlight a couple that positively impact the people of Tennessee and Americans everywhere.

Ms. Eshoo and Mr. McKinley took the reins on the broadband conduits, the idea that the Department of Transportation should facilitate broadband infrastructure on highway projects that use Federal dollars. I am pleased that we could work with Ms. Eshoo, who had this great idea, common sense, and we finally got it done.

Mr. Kinzinger and Mr. Loebsack worked together to require the FCC to study the potential of using spectrum more efficiently for rural areas.

Lastly, our full committee chairman, Greg Walden, took on the difficult issue of ensuring the solvency of the Broadcast Relocation Fund. Wireless broadband providers spent over \$19.8 billion at auction for TV spectrum. Ensuring the solvency of the Relocation Fund is crucial to getting this spectrum to use for broadband, especially in rural areas.

After passage of RAY BAUM's Act, the subcommittee passed two more rural broadband bills, the Precision Agriculture Connectivity Act from Mr. Latta and Mr. Loebsack, the ACCESS BROADBAND Act from Mr. Tonko and Mr. Lance. These bills were reported out of full committee last week. All of this shows that Congress can, in fact, roll up our sleeves and get things done.

Rural broadband remains a challenge and there are still unserved areas that need to be connected. With limited federal dollars to go around, we simply cannot afford to allow overbuilding to take place while so many areas are left completely unserved. We

need to encourage states to find solutions that best suit their needs. We will not stop working, and I am proud to lead this subcommittee in working with the President to find good bipartisan solutions.

I yield the balance of my time to Mr. Lance.  
[The prepared statement of Mrs. Blackburn follows:]

#### PREPARED STATEMENT OF HON. MARSHA BLACKBURN

Welcome to today's subcommittee hearing on rural broadband challenges and solutions. Extending the reach of broadband in rural Tennessee, and across America, is critical to ensure everyone can participate in the digital economy.

While the percentage of rural Tennesseans still lacking access to high speed internet has decreased from 34% to 23%, we must continue to push. You can't have a 21st century economy without a 21st century internet.

Since passage of the 1996 Telecommunications Act, the private sector has invested roughly \$1.6 trillion in their networks using different technologies. Understanding different technologies is key because broadband is more than just fiber. Moreover, we should acknowledge private investment in rural deployment, and ensure that government-based solutions complement private investment instead of competing with it.

For example, I'm pleased we have the Satellite Industry Association testifying so we can learn about the strides they're making to deploy modern satellites capable of delivering broadband internet anywhere in the country.

Almost 6 months ago, I chaired a hearing on closing the digital divide.

Hearings are useful, but as Chairman, I like to focus on bipartisan results. Today's hearing allows us to check our progress finding solutions and getting work done.

I'm proud to report the members of this Subcommittee have worked together and have accomplished a lot to expand broadband access in rural America.

In March, Congress passed RAY BAUM'S Act—the most significant rural broadband legislation to become law in the last 6 years. The bill was named in honor of the Energy and Commerce Committee's staff director, Ray Baum, who passed away earlier this year. Ray was a champion for rural America, and naming a rural broadband bill for him is a fitting tribute to his career of public service.

RAY BAUM's Act incorporated several legislative proposals we examined at our hearing in January.

I'll let our subcommittee members discuss their legislative solutions, but I would like to highlight a couple that positively impact the people of Tennessee, and Americans everywhere.

Ms. Eshoo and Mr. McKinley took the reins on broadband conduits—the idea that the Department of Transportation should facilitate broadband infrastructure on highway projects that use federal dollars. I'm very glad we could work with Ms. Eshoo to finally get it done.

Mr. Kinzinger and Mr. Loeb sack worked together to require the Federal Communications Commission to study the potential of using spectrum more efficiently for the benefit of rural areas.

Lastly, our full committee Chairman, Greg Walden, took on the difficult issue of ensuring the solvency of the Broadcaster Relocation Fund. Wireless broadband providers spent over \$19.8 billion at auction for TV spectrum. Ensuring the solvency of the Relocation Fund is crucial to putting this spectrum to use for broadband, especially in rural areas.

After passage of RAY BAUM'S Act, the subcommittee passed two more rural broadband bills:

- The Precision Agriculture Connectivity Act from Mr. Latta and Mr. Loeb sack; and

- The ACCESS BROADBAND Act from Mr. Tonko and Mr. Lance.

These bills were reported out of full committee just last week.

All of this shows that Congress can—in fact—roll up its sleeves to get things done. But we cannot rest on our laurels.

Rural broadband remains a challenge, and there are still unserved areas that need to be connected.

With limited federal dollars to go around, we simply cannot afford to allow overbuilding to take place while so many areas are left completely unserved.

We need to encourage states to find solutions that best suit their needs.

We will not stop working, and I'm proud to lead this subcommittee in working with the President to find bipartisan solutions.

Mr. LANCE. Thank you, Chairman Blackburn.

I have introduced the AIRWAVES Act with Ranking Member Doyle which, among other things, would help spur rural broadband deployment by dedicating 10 percent of spectrum auction proceeds under the bill to rural broadband. Had this rural dividend been in place during the previous two spectrum auctions, over \$6 billion would have been raised for rural buildout. I think that it is incredibly important that rural America be treated the same way as the rest of America.

It is also important that we recognize that any federal funds for broadband deployment will be finite. I have worked hard to pursue policies to ensure coordination between various agencies.

Mr. Chairman, I ask unanimous consent to introduce a coalition letter of support for the AIRWAVES Act, and it includes the African-American Mayors Association, the American Library Association, the National Black Chamber of Commerce, and the Taxpayer Protection Alliance.

Mrs. BLACKBURN. Without objection, so ordered.

[The information appears at the conclusion of the hearing.]

Mr. LANCE. And I yield back the balance of my time.

[The prepared statement of Mr. Lance follows:]

#### PREPARED STATEMENT OF HON. LEONARD LANCE

Thank you, Chairman Blackburn, and thank you to our distinguished panel members for appearing before us today.

As broadband access becomes more and more important to success in the 21st century economy, closing the digital divide is an increasingly important issue facing our Nation.

For my part, I have introduced the AIRWAVES Act with Ranking Member Doyle, which, among other things, would help spur rural broadband deployment by dedicating ten percent of spectrum auction proceeds under the bill to rural broadband. Had this "rural dividend" been in place during the previous two spectrum auctions, over \$6 billion would have been raised for rural buildout.

It is also important that we recognize that any Federal funds for broadband deployment will be finite. I have worked hard to pursue policies to ensure coordination between various agencies involved in broadband deployment, encourage concentration on unserved areas and generally avoiding over building of areas already served by a broadband provider.

I ask unanimous consent to introduce a coalition letter of support for the AIRWAVES Act into the record and yield back the balance of my time

Mrs. BLACKBURN. The gentleman yields back.

At this time, I recognize Mr. Doyle for 5 minutes.

#### OPENING STATEMENT OF HON. MICHAEL F. DOYLE, A REPRESENTATIVE IN CONGRESS FROM THE COMMONWEALTH OF PENNSYLVANIA

Mr. DOYLE. Thank you, Madam Chair.

Before I get started, I want to express my deepest condolences to Robin Colwell, the majority's chief counsel, on the passing of her husband, Bill. I know Robin and her family are grieving their loss, but our thoughts and prayers are with her and her family.

Madam Chair, thank you for holding this hearing.

We live in a divided nation when it comes to broadband access. All too often, people living in urban areas are the digital haves;

whereas, those living in rural areas are being left behind with few or no choices, higher prices, and lower speeds.

As I and many of our colleagues have said in the past, if we are going to bring more broadband to rural America, our government needs to make a sustained investment in building out more infrastructure. That is why I am proud to support Ranking Member Pallone's LIFT America Act, which would dedicate \$40 billion to building out broadband infrastructure in the unserved and underserved parts of the country. We also need to give communities like Pinetops the freedom and flexibility to provision their own service. That is why I am proud to continue to support Ms. Eshoo's Community Broadband Act. Ms. Coker Craig, reading your testimony, reiterates exactly what this is such an important option for rural communities.

I am also proud to have introduced the AIRWAVES Act with Mr. Lance. This bill directs the FCC to conduct a number of spectrum auctions as well as to make significant amounts of new unlicensed spectrum available. The bill would set aside a portion of the revenue from those auctions for the deployment of new wireless broadband infrastructure in unserved and underserved parts of rural America.

Mr. Aiken discusses in his testimony a number of the bands in the bill which would be ideal for buildout of broadband in rural areas, specifically the Citizens Broadband Radio Service, or CBRs, and the lower C-band. It is important to keep in mind that these bands could be structured in a way that would enhance rural broadband deployment, but they don't have to be. The Commission is currently considering changes to both these bands.

The CBRs band was envisioned as a model for an innovative new spectrum licensing system that would cover smaller areas than traditional cellular licenses. This licensing model was supported by a broad range of industries, including rural broadband providers who see tremendous potential in being able to access smaller, more affordable blocks of license spectrum. But the Commission is considering changes to this band that would drastically increase license sizes, crowding out smaller players, so that only the largest wireless providers could bid on these licenses.

The Commission also opened up a proceeding on the lower C-band. Several satellite companies that operate in this band have proposed making a portion of the band available for mobile broadband, which is great, but I agree with Mr. Aiken that this band has a lot more potential. The rest of the band could be shared between satellite operators and broadband providers using fixed wireless service. This proposal has the potential to greatly expand broadband deployment in rural parts of the country.

In both of these bands, the Commission has before it two roads. They can work to make as much spectrum available for mobile broadband services. At the last hearing we had on that topic, every witness acknowledged 5G would not solve rural urban broadband divide. Or the FCC can adopt spectrum policies that bring broadband to all Americans. I think it is important for members on this subcommittee to realize that these are the decisions that the Commission is making right now that could affect the future of broadband in rural communities.

With that, Madam Chair, I want to yield the remainder of my time to Mr. Butterfield.

[The prepared statement of Mr. Doyle follows:]

PREPARED STATEMENT OF HON. MICHAEL F. DOYLE

Before I get started, I want to express my deepest condolences to Robin Colwell, the majority's chief counsel, on the passing of her husband Bill. I know Robin and her family are grieving their loss. My thoughts and prayers are with her and her family.

Thank you, Madam Chairman, for holding this hearing, and thank you to the witnesses for appearing before us today.

We live in a divided nation when it comes to broadband access. All too often people living in urban areas are the digital have's, where as those living in rural areas are being left behind with few or no choices, higher prices, and lower speeds.

As I and many of colleagues have said in the past, if we are going to bring more broadband to rural America, our government needs to make a sustained investment in building out more infrastructure.

That's why I am proud to support Ranking Member Pallone's Lift America Act which would dedicate \$40 billion to building out broadband infrastructure in unserved and underserved parts of the country.

We also need to give communities, like Pinetops, the freedom and flexibility to provision their own service. That's why I'm proud to continue to support Ms. Eshoo's Community Broadband Act. Ms. Corker Craig, reading your testimony reiterates exactly why this is such an important option for rural communities.

I'm also proud to have introduced the Airwaves Act with Mr. Lance. The bill directs the FCC to conduct a number of spectrum auctions as well as make significant amounts of new unlicensed spectrum available. The bill would set aside a portion of the revenue from these auctions for the deployment of new wireless broadband infrastructure in served and underserved parts of rural America.

Mr. Aiken discusses, in his testimony, a number of the bands in the bill which would be ideal for buildout of broadband in rural areas. Specifically, the Citizen's Broadband Radio Service or CBRS and the lower C-Band.

It is important to keep in mind is that these bands could be structured in a way that would enhance rural broadband deployment, but they don't have to be. The commission is currently considering changes to both these bands.

The CBRS band was envisioned as a model for an innovative new spectrum licensing system that would cover smaller areas than traditional cellular licenses. This licensing model was supported by a broad range of industries, including rural broadband providers, who see tremendous potential in being able to access smaller more affordable blocks of licensed spectrum. But the Commission is considering changes to this band that would drastically increase license sizes—crowding out smaller players so that only the largest wireless providers could bid on these licenses.

The Commission also opened a proceeding in the lower C-band. Several satellite companies that operate in this band have proposed making a portion of the band available for mobile broadband, which is great. But I agree with Mr. Aiken that this band has a lot more potential. The rest of the band could be shared between satellite operators and broadband providers using fixed wireless service. This proposal has the potential to greatly expand broadband deployment in rural parts of the country.

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I think it's important for members on this subcommittee to realize that these are decisions that the Commission is making right now that could affect the future of broadband in rural communities.

I yield the remainder of my time to Mr. Butterfield.

I'd like unanimous consent to include letters from CCA and NCTA in the record.

Mr. BUTTERFIELD. Thank you very much, Mr. Doyle, for yielding time this morning.

And thank all of the witnesses for their testimony.

Madam Chairman, one of the privileges extended to members of this committee is to introduce their constituents when the committee invites them to testify. So, you can imagine my surprise when I learned that the committee had extended an invitation to one of my constituents from the town of Pinetops, North Carolina, population 1300, to serve as a witness for today's hearing on rural broadband.

The town is a small, rural community located in my district in Edgecombe County. The town, with a population of 1300, comprises an area of about 1 square mile. In fact, I was in the town on Saturday night. I pass through there quite often. I stopped at Abrams Bar-B-Q, and former Sheriff James Knight was there. And he bought me a plate of barbeque, slaw, and hush puppies just this past Saturday night.

Pinetops, Madam Chairman, is home to my constituent Suzanne Coker Craig, who accepted the Committee's invitation to testify. Ms. Craig and her husband Doug are small business owners in the town. Before starting her business in 2010 that continues to grow, Ms. Craig was Director of Advocacy Programs for the North Carolina Hospital Association. She served as Pinetops' Town Commissioner from 2009 to 2017, played a key role in securing high-speed internet service for the constituents in the town. And so, I am proud to welcome Suzanne to the committee. Suzanne will share her experience of living in an extremely rural community and the challenges that she and others face when not connected to the digital world.

Thank you for yielding this time, Madam Chairman and Mr. Doyle. At this time, I will yield back.

Mrs. BLACKBURN. The gentleman yields back.

At this time, I recognize Mr. Walden, chairman of the full committee, for 5 minutes for an opening.

**OPENING STATEMENT OF HON. GREG WALDEN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF OREGON**

Mr. WALDEN. Thank you, Madam Chair, and I want to thank my colleagues, and certainly our panelists, for being here today.

Mr. Butterfield, we would have thought we would get to sample some of that fine barbeque. Yes, oK, we got that on the record.

I want to welcome our witnesses, as I said, and I really appreciate your being here. Particularly, I want to thank my constituent, Ms. Jenni Word from the Wallowa Memorial Hospital, for coming here all the way from Wallowa County. She is there in Enterprise, a population of 1,916 people, and the county, with 6800 people, spans 3,152 square miles. So, this is big, wide-open country, beautiful mountain ranges, and forests and farmland. It is tucked in the far northeast corner of Oregon. It is larger than the state of Delaware and very rugged and remote.

I have worked over the years with the health center there and the hospital and others on their efforts to build out fiber and get really good connectivity. We recently worked together with the FCC. Chairman Ajit Pai was in Oregon just after he announced he was raising the cap on the FCC's Rural Health Care Program. This really helps the folks to allow a county healthcare district and other rural providers to get affordable broadband service.

Ms. Word will detail the telehealth opportunities that broadband access has opened up, and, most importantly, expanding the care patients can receive locally without having to travel hours to other hospitals. This is certainly of huge benefit in a place where, as a county commissioner once told me, Susan Roberts, it is winter 11 months out of the year and sometimes it snows in August. And that is true.

Telemedicine, however, is only one example of the opportunities provided by broadband access in our rural communities all across America. Eastern Oregon University, Blue Mountain Community College, and others, are taking advantage of distance learning to expand access to higher education in isolated communities. Farmers and ranchers across America, and certainly in my district, are using precision agriculture more and more to regulate their inputs, and the transition to Next Gen 9-1-1 is critical for strengthening public policy.

After all, broadband is the infrastructure investment of the 21st century. Broadband means jobs, and jobs come from deployment of broadband, including towers and cell sites, fiber, launching satellites, upgrading facilities that constitute the physical infrastructure.

And the economic benefits don't stop at that infrastructure investment. Maintaining this infrastructure requires high-skilled jobs in engineering, network management, cybersecurity, advertising, customer service, and much more. Beyond all that, we know broadband is a force multiplier for job creation and providing efficiencies for every sector of the economy.

Our Chair ran through some of the bills, including the RAY BAUM's Act, but the Chair herself deserves credit for spearheading the overall effort. This legislation, now law, included many provisions to improve broadband buildout.

Spectrum auctions, for example, raise billions of dollars in federal revenue for deficit reduction and other investments, but a quirk in the law prevented the FCC from taking upfront payments of auction bidders and depositing the money directly with the U.S. Treasury. Though spectrum is the lifeblood of wireless broadband, this effectively stopped the FCC from conducting further spectrum auctions.

So, this committee, and under the Chair's leadership, took care of that in the RAY BAUM's Act. RAY BAUM's Act fixed this by including a bipartisan bill from Mr. Guthrie and Ms. Matsui that allows the FCC to deposit legally upfront payments directly with the Treasury. As a result, the FCC is now moving forward with its upcoming spectrum frontiers auction, which will make more high band spectrum available for 5G.

RAY BAUM's Act, signed into law March 23rd, as you have heard, I have a feeling the bill's namesake Ray, who was from eastern Oregon and actually represented Wallowa and Union Counties in the state legislature, and called them God's country, would be very proud of our efforts then and now.

While some may have been content with that accomplishment that we did earlier this year, this subcommittee continues to process important bills through regular order. And just last week, the full committee took up four more bills that were unanimously ap-

proved by this subcommittee. So, these bipartisan bills include Mr. Tonko and Mr. Lance's ACCESS BROADBAND Act, which is an important and necessary step to coordinate funding for broadband across different agencies. We also passed Mr. Latta and Mr. Loeb's Precision Agriculture Connectivity Act, which requires the FCC and the U.S. Department of Agriculture to form a task force to evaluate the best ways to leverage broadband for modern high-tech farming and ranching. These bills illustrate what we can accomplish when we work together, as we do often, on a bipartisan basis.

However, other Members have put forward bills to address rural broadband challenges, and these proposals will deserve our attention and consideration as well. And I expect we will hear about some of those today and we will continue to work on those.

I look forward to this hearing as a followup to our January hearing on closing the digital divide and the numerous other infrastructure-related hearings we have conducted this Congress. So, we have got more work to do to improve access and for telehealth, precision agriculture, education, and jobs across America.

But I want to thank Ms. Word for being here today. We really appreciate your coming out. I look forward to your testimony.

I will say in advance we have another hearing going on at the same time, so I will be bouncing back and forth. But we have the testimony from all of you and we appreciate your input.

With that, Ms. Chair, I yield back the balance of my time.

[The prepared statement of Mr. Walden follows:]

#### PREPARED STATEMENT OF HON. GREG WALDEN

Thank you, Madame Chairman. I want to welcome our witnesses to this hearing on the benefits of rural broadband. In particular, I want to thank Ms. Jenni Word with Wallowa Memorial Hospital for trekking in clear from Wallowa County, Oregon to testify here today.

Tucked up in the far northeast corner of Oregon, Wallowa County is larger than the state of Delaware and has a population of just over 6,800 people. It is rugged and remote. I worked closely with the hospital and community to help get fiber built out into the county, and we recently worked together with FCC Chairman Ajit Pai to raise the cap on the FCC's Rural Health Care Program. This helps the Wallowa County Health Care District and other rural providers get affordable broadband service.

Ms. Word will detail the telehealth opportunities broadband access has opened up, most importantly expanding the care patients can receive locally without having to travel hours to other hospitals. That is certainly a big benefit in a place where, as a county commissioner once joked, it's winter 11 months out of the year and sometimes snows in August.

Telemedicine, however, is only one example of the opportunities provided by broadband access in our rural communities. Eastern Oregon University, Blue Mountain Community College, and others are taking advantage of distance learning to expand access to higher education to isolated communities. Farmers and ranchers across my district have taken advantage of precision agriculture technology to reduce inputs. And, the transition to next generation 9-1-1 is critical for strengthening public safety.

Broadband is the infrastructure of the 21st century.

Broadband means jobs.

Jobs come from deployment—building towers and cell sites, laying fiber, launching satellites, and upgrading facilities that constitute the physical infrastructure.

The economic benefits don't stop at construction. Maintaining this infrastructure requires high-skilled jobs in engineering, network management, cybersecurity, advertising, and customer service.

And beyond all that, we know broadband is a force multiplier for job creation, providing efficiencies for every sector of the economy.

Chairman Blackburn ran through some of the bills included in RAY BAUM's Act, but the Chairman herself deserves credit for spearheading the overall effort. The legislation, now law, included many provisions to improve broadband buildout.

Take spectrum auctions for example. Spectrum auctions raise billions in federal revenue for deficit reduction. But a quirk in the law prevented the FCC from taking upfront payments of auction bidders and depositing the money directly with the U.S. Treasury. Though spectrum is the lifeblood of wireless broadband, this effectively stopped the FCC from conducting further spectrum auctions. Bear in mind that we are in a global race to 5G.

RAY BAUM'S Act fixed this by including a bipartisan bill from Mr. Guthrie and Ms. Matsui that allows the FCC to deposit upfront payments directly with the Treasury. As a result, the FCC is moving forward with its upcoming Spectrum Frontiers Auction, which will make more high-band spectrum available for 5G.

RAY BAUM'S Act was signed into law on March 23rd. I have a feeling the bill's namesake, Ray, who was from eastern Oregon and often referred to Wallowa County as "God's country," would be very proud of our efforts and the positive impact RAY BAUM'S Act has made and will make across the country.

While some may have been content with that accomplishment alone, this subcommittee continues to process important bills through regular order. Just last week, the full committee took up four more bills that were unanimously approved by this subcommittee.

These bipartisan bills included Mr. Tonko and Mr. Lance's ACCESS BROADBAND Act, which is an important and necessary step to coordinate funding for broadband across different agencies.

We also passed Mr. Latta and Mr. Loebsack's Precision Agriculture Connectivity Act, which requires the FCC and the U.S. Department of Agriculture to form a task force to evaluate the best ways to leverage broadband for modern, high-tech farming and ranching.

These bills illustrate what we can accomplish when we work together to fix problems on a bipartisan basis.

However, other members have put forward bills to address rural broadband challenges, and these proposals deserve consideration as well. I expect we'll hear about some of those other bills today, and I hope we can continue working on a bipartisan basis to get them signed into law.

I look forward to this hearing as a follow-up to the January hearing on closing the digital divide, and the numerous other infrastructure-related hearings we've conducted this Congress.

I hope we can continue to work together to expand broadband for telehealth applications, precision agriculture, education, and economic opportunity across rural America.

Mrs. BLACKBURN. The gentleman yields back.

Mr. Pallone, you are recognized for 5 minutes.

**OPENING STATEMENT OF HON. FRANK PALLONE, JR., A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW JERSEY**

Mr. PALLONE. Thank you, Madam Chair.

From the start of the Trump administration, there has been a bipartisan call to modernize America's infrastructure, including expanding broadband to communities that need it. And this takes significant resources and cannot be done simply through deregulation or streamlining processes. Actual investments are needed, and we must see states and local governments as partners, not adversaries.

Committee Democrats recognize the need for real investment and to develop legislative proposals to build the modern, resilient infrastructure that Americans need and deserve.

First, the LIFT America Act authorizes this \$40 billion in grants for the deployment of secure and resilient broadband. This comprehensive infrastructure bill, which is supported by every Democrat on this committee, will also invest in drinking water infrastructure, energy infrastructure, healthcare infrastructure, and

brownfields redevelopment. These investments will make Americans more competitive, safer, healthier, and connected.

Second, Mr. Luján, along with a number of other Democrats on the committee, introduced the Broadband Infrastructure Finance and Innovation Act. This bill would authorize \$5 billion worth of secured loans, loan guarantees, and lines of credit to finance public/private partnerships for broadband deployment.

Third, Mr. Tonko has introduced the ACCESS BROADBAND Act, which was just reported by this committee to the full House of Representatives last week. This bill would create an Office of Internet Connectivity and Growth to help ensure we are using existing broadband programs, and new ones, to get the most bang for the buck. I urge my colleagues to bring this bill to the House floor as soon as possible.

Committee Democrats have also put forward many other innovative solutions that could make a real change in connecting the unconnected and opening up our airwaves for new wireless broadband services.

Unfortunately, the administration and my Republican colleagues have placed infrastructure legislation on the back burner behind its tax scam that benefits large corporations and the wealthiest few. Rather than making real and substantial investments in our nation's crumbling infrastructure, they instead choose to throw billions of dollars in tax breaks at the wealthy who simply do not need them.

So, I think we need to invest in broadband infrastructure, particularly in rural and urban communities that have been left behind. According to the FCC, 30 percent of Americans in rural areas and 35 percent of Americans living on tribal lands lack access to baseline broadband service, and this is based on mapping data that we know underreports the scope of the problem.

So, it is time to act. Democrats have bold proposals that will actually drive broadband deployment in all 50 states. These proposals are technologically-neutral and open the door to all internet service providers that can deliver fast and secure broadband access. We need to think outside the box in our effort to connect all Americans to the benefits of the internet. I look forward to hearing from our witnesses on how we can ensure access to high-speed broadband throughout America, including rural communities.

On a brief personal note, if I could just say I was incredibly saddened to hear that Robin Colwell of the subcommittee's majority staff lost her husband, Bill, over the weekend following his battle with cancer. I want to offer our deepest condolences from the Democratic side and sympathies to her and her family in this trying time.

I yield back, Madam Chair.

[The prepared statement of Mr. Pallone follows:]

#### PREPARED STATEMENT OF HON. FRANK PALLONE, JR.

From the start of the Trump Administration, there has been a bipartisan call to modernize America's infrastructure, including expanding broadband to communities that need it. This takes significant resources and cannot be done simply through deregulation or streamlining processes. Actual investments are needed, and we must see states and local governments as partners—not adversaries. Committee Demo-

crats recognized the need for real investment and developed legislative proposals to build the modern, resilient infrastructure Americans need and deserve.

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We need to invest in broadband infrastructure, particularly in rural and urban communities that have been left behind. According to the FCC, 30 percent of Americans in rural areas—and 35 percent of Americans living on tribal lands—lack access to baseline broadband service. And this is based on mapping data that we know underreports the scope of the problem.

It is time to act. Democrats have bold proposals that will actually drive broadband deployment in all 50 states. These proposals are technologically neutral, and open the door to all internet service providers that can deliver fast and secure broadband access. We need to think outside the box in our effort to connect all Americans to the benefits of the internet.

I look forward to hearing from our witnesses on how we can ensure access to high-speed broadband throughout America, including rural communities.

On a brief personal note, we were all incredibly saddened to hear that Robin Colwell of the subcommittee's majority staff lost her husband-Bill-over the weekend following his battle with cancer. I want to offer our deepest condolences and sympathies to her and her family in this trying time.

With that, I yield the balance of my time.

Mrs. BLACKBURN. The gentleman yields back. No one is seeking to claim his time.

We appreciate so much the thoughts and condolences for Robin. We know that you all wish Robin and her girls well during this sad time.

This concludes our member opening statements. The Chair would like to remind members that, pursuant to the committee rules, all members' opening statements will be made a part of the record.

We want to thank all of our witnesses for being here today and taking the time to accept the invitation and come before the subcommittee. Today's witnesses will have the opportunity to give their opening statements, followed by a round of questions.

Our panel for today's hearing will include Mr. Tom Stroup, President of the Satellite Industry Association; Mr. Justin Forde, Senior Director of Government Relations at Midco; Mr. Claude Aiken, President and CEO of the Wireless Internet Service Providers Association; Mr. John May, President of Ag Solutions and the Chief Information Officer at John Deere & Company; Ms. Jenni Word, Associate Administrator and Chief Nursing Officer at Wallowa Memorial Hospital in Oregon, and Ms. Suzanne Coker Craig, a former

Commissioner of the town of Pinetops and the current Managing Partner at CuriosiTees of Pinetops.

We appreciate each of you being here today, and we appreciate your testimony.

We will begin with you, Mr. Stroup, 5 minutes for your opening statement.

**STATEMENTS OF TOM STROUP, PRESIDENT, SATELLITE INDUSTRY ASSOCIATION; JUSTINE FORDE, SENIOR DIRECTOR OF GOVERNMENT RELATIONS, MIDCO; CLAUDE AIKEN, PRESIDENT AND CEO, WIRELESS INTERNET SERVICE PROVIDERS ASSOCIATION; JOHN C. MAY, PRESIDENT, AG SOLUTIONS, AND CHIEF INFORMATION OFFICER, JOHN DEERE & COMPANY; JENNI WORD, ASSOCIATE ADMINISTRATOR AND CHIEF NURSING OFFICER, WALLOWA MEMORIAL HOSPITAL; AND SUZANNE COKER CRAIG, A FORMER COMMISSIONER OF THE TOWN OF PINETOPS AND MANAGING PARTNER, CURIOSITEES OF PINETOPS.**

#### **STATEMENT OF TOM STROUP**

Mr. STROUP. Chairman Blackburn, Ranking Member Doyle, and distinguished members of the subcommittee, thank you for having me testify here today.

I am Tom Stroup, President of the Satellite Industry Association.

Satellite communication services are positioned to be the keystone for bringing 21st century broadband capabilities to the entirety of the United States. These services are capable of providing broadband to rural and remote areas of the country, where it remains uneconomical for terrestrial services to deploy, and both provide speeds and prices comparable to terrestrial alternatives. These services are available directly to the consumer today, covering all 50 States and delivering broadband offerings up to 100 megabits per second.

Satellite broadband is also used by business and government enterprises for both fixed and mobile purposes, using a range of spectral bands to deliver assured access to broadband communications. Further, satellites are providing critical backhaul internet connectivity to local internet service providers and community institutions in remote locations. Today, approximately 2 million customers nationwide are enjoying high-quality satellite broadband services at reasonable rates and at speeds that meet and exceed the FCC's definition of broadband service.

The satellite industry is investing tens of billions of dollars to innovate and increase broadband connectivity to the U.S. and across the globe. High-throughput satellites, for example, rely on frequency reuse and spot-beam technology to produce increased output factors upward of 20 times that of traditional satellites.

The industry has seen similar increases in the capacity of its systems. The first broadband satellite began service in 2008 with a capacity of 10 gigabits per second. Today's satellites have capacities of up to 260 gigabits per second, a number expected to increase to 1,000 gigabits per second by the end of the decade. These terabit-capacity geostationary satellites will provide orders of magnitude capacity increases.

In another highly anticipated advancement in the industry, thousands of new, high-throughput, non-geostationary satellites will soon join existing operators in low-earth and medium-earth orbits to provide additional high-speed broadband at low latency levels. Indeed, prototypes of these satellites have already begun to launch.

As Congress develops its broadband policies, it should consider the many positive attributes of satellite broadband. These include, No. 1, competition. Just as it has with radio and television services in the past, satellite services provide market-based competition to terrestrial broadband services. Satellite broadband brings additional package options, pricing, and innovative services to consumers, often in areas with only a single or small number of providers.

No. 2, wide geographic coverage. To address the digital divide, broadband services need to be available for the most rural and remote areas of the country. The nature of satellite's wide coverage ensures that all communities within the satellite's footprint receive the same quality of service, whether they are remote communities or big cities. Public policy makers should leverage terrestrial-style incentives with satellite's geographically-independent cost structure to achieve universal communication services.

No. 3, availability. Unlike terrestrial service, satellite broadband is available today across a significant portion of the country without the buildout of additional infrastructure. Customers can obtain satellite broadband services by simply ordering and awaiting at-home installation.

No. 4, cost efficiency. Because satellite systems have inherently wide area coverage, when technology-neutral incentives are made to encourage capacity redirection, there is no additional cost to build out to rural and remote areas, only lost opportunity costs in more lucrative service areas. This is unlike terrestrial services, where the low density of rural and remote areas makes it costlier and in most cases not economically viable to build out and cover these areas.

And, 5, reliability. Natural and manmade disasters can interrupt terrestrial broadband services. Satellites, however, are less affected by these events, and satellite ground systems or satellite-enabled airborne equipment can be quickly deployed to restore connectivity.

Of course, all of the breakthroughs we have seen because of satellite technologies should not be taken for granted. They depend upon our industry's ability to access spectrum. In order for our industry to sustain and meet the growing demand for satellite services, we encourage regulators to continue to allocate sufficient spectrum for satellite use and to support the national broadband mapping system as to provide a clear and complete map of broadband services.

Thank you, and I look forward to your questions.

[The prepared statement of Mr. Stroup follows:]



**Written Testimony of Tom Stroup**  
**President, Satellite Industry Association**  
**Before the**  
**United States House Energy and Commerce Subcommittee on Communications & Technology**  
**Hearing on**  
**Realizing the Benefits of Rural Broadband: Challenges and Solutions**

The Satellite Industry Association (SIA) is a U.S.-based trade association representing the leading satellite operators, manufacturers, launch providers, and ground equipment suppliers who serve commercial, civil, and military markets. Since its creation almost twenty years ago, SIA has been the unified voice of the U.S. satellite industry on policy, regulatory, and legislative issues affecting the satellite business. SIA represents the satellite broadband industry, whose capabilities can be summarized as follows:

**Satellite broadband is available today**

- Services are available to households and businesses in all 50 states, and offerings include up to 100 megabits per second (Mbps).
- Approximately 2 million customers subscribe at reasonable rates to speeds that meet the FCC's definition of broadband service.

**Satellite broadband is expanding and improving**

- Geostationary satellites have rapidly increased throughput, from 10 gigabits per second (Gbps) in 2008, to 260 Gbps today, to 1000 Gbps expected by the end of the decade.



- Thousands of new non-geostationary satellites from multiple providers will soon be launched into Low-Earth and Medium-Earth orbits to provide low-latency broadband.

#### **Satellite services use spectrum efficiently**

- Satellite service providers have shared the use of spectrum bands amongst themselves and other communications services for decades.
- Frequency re-use and spot beam technology are examples of efficiency innovations that increased output using the same amount of spectrum.

#### **Broadband is an evolving service, and not technology-specific**

- Broadband is a combination of evolving performance characteristics, based on technologies and applications consumers want and use, not a fixed definition.
- A technology-neutrality policy approach will allow solutions most responsive to consumer needs and preferences to succeed.

#### **Satellite services are a domestic economic driver**

- American companies design and manufacture antennas that serve both fixed and mobile satellite broadband applications.
- In 2017, the US satellite industry had an estimated revenue of \$113 billion, supporting over 213,000 American jobs.



Chairman Blackburn, Ranking Member Doyle, and distinguished Members of the Subcommittee, thank you for having me testify before you today. I am Tom Stroup, President of the Satellite Industry Association (SIA). SIA is a U.S.-based trade association providing representation of the leading satellite operators, service providers, manufacturers, launch services providers, and ground equipment suppliers. Before joining SIA in late 2014, I served as CEO of Shared Spectrum Company (SSC), a leading developer of spectrum intelligence technologies. For a little more than ten years, I also served as the President of the Personal Communications Industry Association (PCIA). I have also founded and run several companies in the technology industry, including Columbia Spectrum Management, P-Com Network Services, CSM Wireless, and SquareLoop.

Satellite communications services are positioned to be the keystone for bringing 21<sup>st</sup> century broadband capabilities to the entirety of the United States. These services are capable of providing broadband to rural and remote areas of the country where it remains uneconomical for terrestrial services to deploy, and provide both speeds and prices comparable to terrestrial alternatives. These services are available directly to the consumer today, covering all 50 states and delivering broadband offerings up to 100 megabits per second (Mbps). Satellite broadband is also used by business and government enterprises, for both fixed and mobile purposes, using a range of spectral bands to deliver assured access to broadband communications. Further, satellites are providing critical backhaul Internet connectivity to local Internet Service Providers and community institutions in remote locations.

Satellite service providers are always striving to improve and expand service so that all Americans can take advantage of its capabilities. Approximately 2 million customers nationwide are enjoying high-quality satellite broadband services at reasonable rates, and at speeds that meet and exceed the FCC's definition of broadband service. This includes many of the 8% of consumers that currently are not served by terrestrial broadband. Commercial satellite operators, that have already invested billions of



dollars in the construction and deployment of high throughput satellites, offer service to those consumers today, no matter where they are located.

Satellite services enable communications connectivity even when miles away from available terrestrial infrastructure. American citizens continue to see the benefits of satellites in providing communications-on-the-move, making broadband service available wherever we take our mobile devices. Aeronautical and maritime high throughput communications are largely facilitated by satellite broadband connectivity to aircraft and ships. The sector is growing to keep pace with demand for broadband connectivity for avionics, ships' operations, and Internet access for passengers who are onboard airlines and cruise vessels.

The satellite industry is today investing tens of billions of dollars to innovate and increase broadband connectivity in the United States and across the globe. High throughput satellites, for example, rely on frequency re-use and spot beam technology to produce increased output factors upward of 20 times that of traditional satellites. The industry has seen similar increases in the capacity of its systems. The first broadband satellite began service in 2008 with a capacity of 10 gigabits per second (Gbps); today's satellites have capacities of up to 260 Gbps, a number expected to increase to 1000 Gbps by the end of the decade. These terabit capacity geostationary satellites will provide orders of magnitude capacity increases and resulting consumer broadband benefits, remaining competitive with terrestrial offerings.

In another highly-anticipated advancement in the industry, thousands of new high throughput (non-geostationary) satellites will soon join existing operators in Low-Earth and Medium-Earth orbits to provide additional high-speed broadband at low latency levels; prototypes of these satellites have already begun to launch. Existing high throughput satellites currently support the delivery of 3G and 4G services, as well as enable global machine-to-machine communications. Future satellite fleets will be a



part of a system architecture that delivers new 5G, IoT, and intelligent, connected transportation services to consumers.

In addition, satellites play a critical role when our national terrestrial communications infrastructure is unavailable because of a national disaster, electrical outage or, worse yet, terrorist attack. Unlike its terrestrial counterparts, satellite networks are not susceptible to damage from such disasters because the primary repeaters are onboard the spacecraft and not part of the ground infrastructure. Hand-held terminals, portable Very Small Aperture Terminal (VSAT) antennas, and temporary fixed installations can all be introduced into a post-disaster environment to provide support to relief efforts and enhance recovery efforts. For example, satellite broadband provided connectivity in both Puerto Rico and the Virgin Islands, where 95% and 77% of all cell sites were wiped out by Hurricanes Irma and Maria this fall. This is why the Department of Homeland Security has designated commercial satellite systems as critical infrastructure.

Indeed, emergency preparedness networks are increasingly including satellite networks as part of their system design in order to ensure sufficient resiliency and cost-effectiveness. Public Safety Answering Points (PSAPs) have begun incorporating satellite back-up into their next generation 911 systems to cost-effectively mitigate potential network outage risks caused by any ground-based or environmental disruptions. And the First Responder Network Authority (FirstNet) is expected to rely in part upon satellite communications in order to meet the geographic coverage needs of its nationwide public safety broadband network.

With all the benefits one can gain from using satellite services, satellite service operators will continue to grow and become more available to the average consumer, including those once considered unreachable. Therefore, in order to serve the last unserved households, it is important to understand where broadband is currently available. For this reason, it is as important to have a clear and accurate



map of broadband coverage in America. Ensuring that all broadband platforms are included in broadband mapping will improve the accuracy of the data and help consumers, regardless of location, understand all the competitive options that are available in selecting a broadband provider. Even more, accurate data regarding broadband availability across the nation is important to inform future public policy aimed to address broadband gaps in unserved areas across the nation. For these reasons, SIA supports funding to improve broadband mapping and to continuously update the National Broadband Map. However, such activities should not delay the prompt implementation of Universal Service Fund or other federal funding programs aimed to get broadband service to unserved citizens across the nation.

As Congress develops its broadband policies, it should consider the many positive attributes of satellite broadband. These include, but are not limited to:

1. Competition: Just as it has with radio and television services in the past, satellite services provide market-based competition to terrestrial broadband services. Satellite broadband brings additional package options, pricing, and innovative services to consumers in the United States, often in areas with only a single or low number of providers.
2. Wide Geographic Coverage: To address the digital divide, broadband services need to be available for the most rural and remote areas of the country. The nature of satellite's wide coverage ensures that all communities within the satellite's footprint receive the same quality of service, whether they are remote communities or big cities. Public policymakers should leverage terrestrial-style incentives with satellite's geographically-independent cost structure to achieve universal communications services.
3. Availability: Unlike terrestrial broadband, satellite broadband is available today across a significant portion of the United States without the build out of additional infrastructure. When incentives are provided on a technology neutral basis, a customer can obtain satellite



broadband services by simply ordering and awaiting at-home installation. Accordingly, unlike with respect to terrestrial broadband, no long-term build out of terrestrial network infrastructure is required of satellite broadband.

4. Cost-efficiency: Because satellite systems have inherently wide-area coverage, when technology neutral incentives are made to encourage capacity redirection, there is no additional cost to build out to rural and remote areas, only lost opportunity costs in more lucrative service areas. This is unlike terrestrial services, where the low density of rural and remote areas makes it costlier and, in most cases, not economically viable, to build out and cover these areas.
5. Reliability: Natural and manmade disasters can interrupt terrestrial broadband services. Satellites, however, are less affected by these events, and satellite ground systems or satellite-enabled airborne equipment can be quickly deployed to restore connectivity. Additionally, some satellites serve as a router in the sky, independently switching to provide connectivity to the end user without additional deployed equipment. This level of reliability is often sought by government and businesses alike to ensure continuity and rapid response.

There are no real limitations on what broadband can become and, therefore, it is better to avoid rigid definitions. Rather, it is more appropriate to define broadband in terms of evolving performance characteristics, based on the technologies and applications that consumers want and use, not fixed “top-down” performance definitions. In the past, there has been a singular focus on “speed” as the sole factor that should define broadband (e.g., Gigabit service). While this may be important for some applications, it may not be necessary at arbitrary levels for all essential applications: different speeds may be more suitable for different types of applications.

Other factors such as differentiated service or pricing models, data caps, service availability, jitter, bursting, symmetry, latency, mobility, and portability may emerge to play a role in consumer broadband



choice and requirements. Given a competitive market, those solutions that are most responsive to consumer needs and preferences should succeed, while those that do not are likely to fail. Technology neutrality is especially important in addressing today's expectation of being continuously connected regardless of location. Satellite mobility applications now reach Americans not just in underserved areas, but allow them to stay connected while on airplanes, on vessels, and in transit to remote locations.

One last general note on innovation: the satellite industry is continuously gaining momentum and it plays a crucial role in the growth of the economy. In 2017, the U.S. satellite industry had an estimated revenue of \$113 billion, supporting over 213,000 American jobs. This number includes tens of thousands of well-paying manufacturing jobs as well as construction, design and operational jobs, among others.<sup>1</sup> However, this figure does not reflect revenues generated from businesses made possible by our services, services which, like satellites themselves, are not always apparent. But satellites remain a pillar of the U.S. telecommunications infrastructure, enabling the American economy in ways consumers might not be aware, such as supporting smartphone app transactions, to use just one example.

Finally, the satellite industry is and will continue to grow to heights once considered unreachable. Its uses and unreplaceable abilities will continue to not only assist in the U.S. economy's growth but to also save countless American lives.

Of course, all the breakthroughs we've seen because of satellite technologies should not be taken for granted. They depend upon our industry's ability to access spectrum. And here I would like to note that

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<sup>1</sup> In 2017, there were 72,367 jobs associated with consumer, fixed, mobile, and Earth observation satellite services; 17,510 jobs associated with satellite manufacturing; 51,852 jobs associated with the launch industry, and 71,980 jobs associated with ground equipment manufacturing, installment, and services. The total number of satellite-focused jobs in the U.S. was 213,709. Data retrieved from the Bureau of Labor Statistics, 4<sup>th</sup> Quarter 2017.



satellites can and often do operate in bands with other users. In most cases satellite networks have different – often higher – requirements for sharing. In order for our industry to sustain and meet the growing demand for satellite services, we encourage regulators to continue to allocate sufficient spectrum for satellite use, to support the National Broadband Mapping system as to provide a clear and complete map of broadband services, and to help the industry sustain the momentum it is currently witnessing. Together we have an opportunity to address the digital divide, meet the growing needs of U.S. consumers, and ensure our country's safety. Failure to do so will deny American citizens access to the high-quality, advanced, cost- efficient broadband services that are available via satellite today without waiting years to build out and underrepresent the advances already underway in ongoing satellite broadband technology innovation.

The Satellite Industry Association stands ready to answer questions and to provide any additional information as necessary and would like to thank you for interest in learning more about the current and future capabilities of the industry.

I appreciate the opportunity to appear before you and I am happy to answer any questions.

Mrs. BLACKBURN. The gentleman yields back.  
Mr. Forde, you are recognized, 5 minutes.

#### STATEMENT OF JUSTIN FORDE

Mr. FORDE. Chairman Blackburn, Ranking Member Doyle, and members of the subcommittee, thank you for inviting me here today to discuss the challenges we face and the solutions we are working on to bring the benefits of broadband to rural America.

My name is Justin Forde, and I am the Senior Director of Government Relations for Midco. Midco is the leading provider of internet and networking, cable TV, phone, data center, home security, and advertising services in the Upper Midwest. We serve more than 385,000 residential and business customers in South Dakota, North Dakota, Minnesota, Kansas, and Wisconsin in communities ranging in size from less than 100 people to more than 180,000.

Midco has a history of innovation in the Upper Midwest that continues to motivate our business today. In 2017, we launched the Midco Gig Initiative, a commitment to bring gigabit internet speeds to our entire service area. We have invested over \$56 million in the Gig Initiative over and above the millions of dollars we invest in our network annually. Today, Midco Gig is available to more than 80 percent of our customers, with more communities to come in 2018.

We are also focused on expanding our service to more cities and more communities across the region, but there are challenges and high costs associated with building fiber in our area of the country. While thinking about a creative solution to this challenge, we were contacted by the rural community of Brooktree Park, North Dakota, to help them obtain broadband access. We quickly determined that bringing wireline service to the area was not economically feasible, but we partnered with InvisiMax, a fixed wireless provider, and we were able to offer broadband service to that area within 30 days.

Recognizing the potential of the fixed wireless solution to provide broadband to more rural residents, Midco has acquired InvisiMax, and we have begun to expand fixed broadband wireless with service more broadly in rural areas within our footprint. Fixed wireless allows us to reach areas that are up to 50 miles away from our fiber network, and we can implement that solution relatively quickly without the expense of constructing fiber networks.

We can use fixed wireless to offer internet where the terrain can make it difficult, if not impossible, to provide wire internet, such as the Badlands of North and South Dakota, the granite fields of northern Minnesota, or the limestone cliffs in eastern Minnesota. We can also reach vast areas of farmland where it is not economically feasible to run fiber to every single acre. We can deploy new fixed wireless during the winter months, when difficult winters make new fiber construction impossible.

I, myself, am a Midco fixed wireless customer. I get my internet from the top of a grain elevator in Prosper, North Dakota, to my small farmstead 6 miles west of Argusville, North Dakota. On a normal day, my three kids are streaming video or other content while my wife is using the internet to run a small business. This service has been a great asset to our family. Even today, it allows

me to keep an eye on the farm from Washington, D.C., through a video and security systems enabled by fixed wireless.

Midco supports your hard work to ensure that all Americans have access to broadband services. We greatly appreciate the bipartisan commitment of this committee to produce bills that nurture a broadband-deployment-friendly atmosphere. Your efforts on the RAY BAUM's Act and the MOBILE NOW Act to include broadband deployment provisions like the dig-once policy and a spectrum policy bouncing licensed and unlicensed uses, your thoughtful consideration of the ACCESS BROADBAND Act, have contributed to an environment in which we are more able to easily invest, expand, and deploy.

Today, I would like to offer two suggestions for how you might help us further advance the reach of broadband networks. First, in some cases, government help is needed to bring broadband access to areas it is not financially viable to build. In the past, some broadband funding programs have allowed funds to be used in places that already have broadband service. We were encouraged to see the pilot funding program in the Omnibus Appropriations Act and in the Senate farm bill that both seek to limit funding to areas that need it most. We ask your support efforts to keep broadband funding dollars to unserved areas.

Second, to serve the greatest number of rural residents via fixed wireless, we must have the ability to purchase spectrum. We need more wide channels and spectrum bands where we receive interference protection, and we must have a fair ability to compete for access to any spectrum that is open and appropriate for fixed wireless service.

Congress should support the FCC in its effort to expand the categories of eligible uses for certain underutilized spectrum bands, like 2.5 gigahertz, and support the FCC in adopting smaller license sizes and appropriate auction rules for bands that have potential for fixed wireless in rural areas. These actions will help all Americans, including those in rural America, to receive the full potential of America's broadband networks.

Thank you again for inviting me here today, and I look forward to working with all of you on these important issues.

[The prepared statement of Mr. Forde follows:]

**TESTIMONY OF JUSTIN FORDE  
SENIOR DIRECTOR OF GOVERNMENT RELATIONS  
MIDCONTINENT COMMUNICATIONS**

**on**

**Realizing the Benefits of Rural Broadband: Challenges and Solutions**

**before the**

**Committee on Energy and Commerce  
Subcommittee on Communications and Technology**

**UNITED STATES HOUSE OF REPRESENTATIVES**

**WASHINGTON, D.C.**

**July 17, 2018**

**SUMMARY OF TESTIMONY OF JUSTIN FORDE,  
MIDCONTINENT COMMUNICATIONS  
On Realizing the Benefits of Rural Broadband: Challenges and Solutions  
July 17, 2018**

Midcontinent Communications (“Midco”) is the leading provider of Internet and networking, cable TV, phone, data center, home security and advertising services in the Upper Midwest. More than 385,000 residential and business customers count on Midco services in 342 communities in South Dakota, North Dakota, Minnesota, Kansas, and Wisconsin.

Midco has a history of innovation. In 2017, it launched the Midco Gig Initiative – a commitment to bringing gigabit internet speeds to its entire service area. As of today, Midco Gig is available to more than 80% of its customers, and the rest of its customers have a choice to receive speeds anywhere from 50 Mbps to 250 Mbps. Midco has invested over \$56 million in the Gig Initiative, in addition to the millions of dollars it invests in its network annually. In 2017 alone, it invested more than \$125 million in capital projects.

Midco is also focused on expanding its service to unserved communities. There are challenges and high costs associated with building fiber in some rural communities, due to difficult terrain or sparse population. In areas where bringing wireline service to the area is not economically feasible, Midco has developed the innovative solution of using fixed wireless to provide broadband to more rural residents. Midco fixed wireless provides internet connectivity at speeds up to 50 Mbps download and 10 Mbps upload and higher, and allows Midco to reach remote, rural areas that are up to 50 miles away from its fiber network. Midco can implement this solution relatively quickly and without the effort or expense of constructing fiber networks.

Midco supports the Committee’s hard work to ensure all Americans have access to broadband services, and greatly appreciates the bipartisan commitment of the Committee to produce bills that nurture a broadband deployment-friendly atmosphere. The Committee’s efforts in the RAY BAUM’S Act and MOBILE NOW Act to include broadband deployment provisions like the Dig Once policy and a spectrum policy balancing licensed and unlicensed uses, and its thoughtful consideration of the ACCESS Broadband Act, have contributed to an environment in which Midco is able to more easily invest, expand, and deploy.

There are two ways Congress can help companies like Midco further advance the reach of broadband networks. *First*, scarce government resources should be targeted to those who will build out to areas that do not yet have access to all the benefits broadband provides. Congress should support efforts to focus broadband funding dollars on unserved areas. *Second*, to serve the greatest number of rural residents via fixed wireless, Midco must have the ability to use or purchase more spectrum. Congress should support the FCC in its efforts to expand the categories of eligible users for certain underutilized spectrum bands like 2.5 GHz, and support the FCC in adopting smaller license sizes and appropriate auction rules for bands that have potential for fixed wireless use in rural areas.

These actions will help all Americans – including those in rural America – receive the full potential of America’s broadband networks.

Chairman Blackburn, Ranking Member Doyle, and Members of the Subcommittee, thank you for inviting me here today to discuss both the challenges we face and the solutions we are working on to bring the benefits of broadband to rural America. We at Midco have developed innovative approaches to help us get high speed and reliable broadband to all of our customers, and I'm excited to share them with you today.

My name is Justin Forde, and I am the Senior Director of Government Relations for Midcontinent Communications ("Midco"). Midco is the leading provider of Internet and networking, cable TV, phone, data center, home security and advertising services in the Upper Midwest. We also operate a regional sports network, Midco Sports Network, which broadcasts live, local high school and regional college sports.

More than 385,000 residential and business customers count on Midco services in 342 communities in South Dakota, North Dakota, Minnesota, Kansas, and Wisconsin. Midco community populations range from less than 100 in places like Dodge, North Dakota, to our largest community, Sioux Falls, South Dakota, which has a population of more than 180,000.

Innovation and foresight have shaped Midco's course for more than 85 years. At Midco, we have made it our mission to ensure that the rural communities we serve are at the leading edge of technology. Our goal throughout our footprint is always to continue to find ways not only to meet, but to exceed, the communications needs of our customers.

#### **Midco's History of Innovation**

Midco has a history of innovation in the Upper Midwest. Founded in 1931, Midco began by operating movie theatres, with a vision of always staying one-step ahead of ever-changing technology. Midco then entered the radio business, and in 1954, became the owners of the first television station in South Dakota. We continued to innovate with the introduction of cable

television and phone service, and on April 15, 1996, in Aberdeen, South Dakota, launched our broadband internet service, which today is the largest portion of our business.

Our commitment to innovation continues to motivate our business initiatives today. We own and operate four data centers in North Dakota and South Dakota to give local businesses a cost-effective way to secure critical data and their IT infrastructure. We provide solutions for regional and national banking, healthcare, energy, and government customers, among many other industries. We combine our data center services with powerful network solutions through our wholly-owned, operated and engineered Midco fiber network. Our data centers are directly connected to our network backbone, giving businesses access to some of the fastest internet speeds in the country.

In 2017, we launched the Midco Gig Initiative – a commitment to bringing gigabit internet speeds to our entire service area – from the region’s smallest towns to its largest cities. Today, Midco Gig is now available to more than 80% of our customers – with more communities to come in 2018 – while the rest of our customers have a choice to receive speeds anywhere from 50 Mbps to 250 Mbps. In this regard, it is important to remember that the majority of the communities we serve are very rural. In fact, according to the U.S. census, nearly all of the 342 communities we serve have less than 50,000 people, with most having a population closer to 500 than to 5,000. To date, we have invested over \$56 million to upgrade our network to deliver gigabit speeds to some of the most rural areas in America – in addition to the millions of dollars we invest in our network annually. In 2017 alone, we invested more than \$125 million in capital projects in our service area.

We are also deeply committed to giving back to the communities we serve. This spring, the Midco Foundation awarded more than \$97,000 in grants to charitable organizations. This

funding helped non-profits in 34 communities in our Midwest service area. To date, the Midco Foundation has contributed more than \$3.8 million in grants to the work of non-profits, local governments, and schools.

We are also focused on expanding our service. Communities large and small want Midco to come to them – and we respond whenever we can, bringing our service to more and more cities and communities across the region. Last year, we extended our fiber-optic network to Littlefork, Canby, Porter, Tauton, Minneota and Ghent, Minnesota – six small communities that now have access to Midco's fiber network, Gig speeds, and our data centers.

#### **Midco's Innovative Use of Fixed Wireless To Reach More Communities With Broadband**

While extending the Midco network and bringing our service to rural communities has always been part of Midco's culture and priorities, there are still folks out there who lack access to our network, or to any reliable and affordable internet source. There are challenges and high costs associated with building fiber in many communities in our area, due to difficult terrain or sparse population in the vast farms of the Upper Midwest.

While thinking about a creative solution to this challenge, we were contacted by the rural community of Brooktree Park, North Dakota. Residents had appealed to their elected officials to help bring broadband to the area, and those officials turned to Midco. Midco quickly determined that bringing wireline service to the area was not economically feasible, but we partnered with InvisiMax, a fixed wireless provider, and we were able to provide broadband service to the area within 30 days. Recognizing the potential of the fixed wireless solution to provide broadband to more rural residents, Midco has since acquired InvisiMax, and has begun to expand fixed broadband wireless service more broadly in rural areas within our footprint.

A fixed wireless option is a huge benefit to our friends and neighbors who are not on Midco's wired network. Currently, Midco fixed wireless provides internet connectivity at speeds up to 50 Mbps download and 10 Mbps upload and higher, depending on customer need. Data travels over our fiber network to a tower fed by our fiber, called a "fiber backhaul tower," and then the signal is broadcast from tower to tower and ultimately to the customer using spectrum. Fixed wireless allows us to reach remote, rural areas that are up to 50 miles away from our fiber network, and we can implement this solution relatively quickly and without the effort or expense of constructing fiber networks. We can also deploy new fixed wireless networks during the winter months, when harsh weather makes fiber construction impossible.

Fixed wireless allows Midco to offer internet where the terrain makes it difficult, if not impossible, to provide fiber internet connectivity, such as through the Badlands of North Dakota and South Dakota, the granite fields in Northern Minnesota, or the limestone cliffs in Eastern Minnesota. This technology also allows Midco to reach vast areas of farmland where it is not economically feasible to run fiber to every farm, because there may be many miles between each farm.

I can personally speak to the benefits of the fixed wireless approach, as I myself am a Midco fixed wireless customer. I get my internet from the top of the grain elevator in Prosper, North Dakota to my small farmstead six miles west of Argusville, North Dakota. On a normal day, my three kids are streaming video or other content, while my wife is using the Internet to run a small business, so this service has been a great asset for our family. Even today, it allows me to keep an eye on the farm from Washington, D.C., through a video and security system enabled by fixed wireless.

**How Congress Can Support Broadband Deployment in Rural America**

As you can see, Midco supports your efforts to ensure all Americans have access to broadband services, and we have invested many millions of dollars to help make that goal a reality. We greatly appreciate the bipartisan commitment of this Committee to produce bills that include and reflect the key components of a broadband deployment-friendly atmosphere – prioritizing unserved areas, instituting competitive principles for awarding broadband dollars, and embracing technological neutrality. Your efforts in the RAY BAUM’S Act and MOBILE NOW Act to include broadband deployment provisions like the Dig Once policy and a spectrum policy balancing licensed and unlicensed uses, and your thoughtful consideration of the ACCESS Broadband Act, have contributed to an environment in which we are able to more easily invest, expand, and deploy. This Committee is leading the way in Congressional efforts to close the digital divide and should be commended for its efforts.

Today, I would like to offer two suggestions for how you might help us further advance the reach of broadband networks.

*First*, we recognize that government help may be needed to bring broadband to areas that are beyond the reach of private risk capital. In areas where it is not financially viable to build – because they are too difficult to reach, geographically remote, or are otherwise very hard to serve – broadband deployment grants can alter the financial calculation, making serving an area possible. It is critical, however, that such help and government resources used for this purpose are directed to bring service to areas that are truly unserved.

In the past, some government broadband funding programs have allowed funding to be used in places that already have broadband service. Midco has been overbuilt with our own tax dollars in places like Mitchell, South Dakota, as have others in our region. We believe that

scarce government resources should be targeted to those who will build out to areas that do not yet have access to all the benefits broadband provides.

We were encouraged, therefore, to see that the pilot broadband funding program in the Omnibus Appropriations Act directed that funds be used in areas that are at least ninety percent unserved, and that the Senate Farm Bill similarly limits funding to areas that are unserved. These approaches, implemented in a technology-neutral manner and with appropriate guardrails to ensure areas targeted are truly unserved, can complement the work of this Committee to make a meaningful impact in reducing the number of Americans lacking broadband access.

*Second*, we believe using alternative technologies like fixed wireless can help Midco and others reach those last, difficult hard-to-reach miles. But for us to make this solution a reality, we – and other wireless providers – need access to more and better spectrum.

To serve the greatest number of rural residents via fixed wireless, Midco must have the ability to use or purchase spectrum, through a license or lease system. But not all spectrum is equal when trying to deliver broadband service. Only certain bands of spectrum can broadcast a signal from tower to tower (called “point-to-multipoint” or “wireless backhaul”) or to the customer (called “access” or “point-to-point”). While the rules for acquiring spectrum for wireless backhaul use are generally working well, our ability to acquire spectrum to deliver service to the customer is severely hampered by existing laws and rules.

The technology for delivering “last-mile” service to the customer can use spectrum in the 2.4 GHz, 3.65 GHz, or 5 GHz bands, but each of these bands has problems. The 2.4 GHz unlicensed band is simply too crowded for effective delivery of broadband service. Use of the 5 GHz band is similarly growing, and while well-suited for in-home Wi-Fi networking, lacks the interference protection we need to provide reliable fixed broadband access to customers, and has

regulatory power limitations for devices deployed in this band. Consequently, Midco does not typically use this band for fixed wireless. Instead, like many providers, Midco uses the 3.65 GHz band.

The 3.65 GHz has its own issues. Today, we can use only two channels of 20 MHz each, but to offer the broadband Internet speeds that consumers and businesses demand today, Midco needs at least 80 MHz of spectrum – twice the amount that it currently uses.

It is important that rural Americans have access to broadband of a sufficient speed, so that they can stream video on multiple devices, attend webinars and virtual meetings, operate a home security system, and, importantly in Midco's service areas, use the Internet for a variety of precision agriculture needs. We need access to more spectrum so that our customers can engage in all of these activities.

The Federal Communications Commission ("FCC") is in the process of revising its rules for different spectrum bands, but it is important that those rules be implemented in a way that will allow us to use the bands for fixed wireless.

For example, the FCC is changing the rules for the 3.5 GHz Citizens Broadband Radio Service spectrum, which can be used for fixed wireless. However, under those rules, after 2020, we will lose our interference protection in the 3.65 GHz band, and we will then need to either use general authorized access spectrum, in which case our operations would not be entitled to interference protection, or bid on priority access licenses in the 3550-3650 MHz range that will be auctioned. Moreover, only 70 MHz of spectrum will be auctioned, and there is no guarantee Midco will be able to gain access to that spectrum.

In addition, the FCC's priority access licenses in the 3.5 GHz range will only be truly effective in helping rural areas if they are offered in small enough geographic areas that

companies like Midco that want to provide broadband via fixed wireless in rural markets can compete for their purchase. Large licenses are more expensive to purchase at auction and cover more territory than companies like Midco may serve. Moreover, large licenses that contain both urban and rural areas are often priced based on the urban market, pricing out rural service providers like Midco.

Fixed wireless providers should be able to compete for the ability to purchase licenses in this spectrum, and the licensing rules should not favor one category of provider who want this spectrum for use in populated areas, but do not plan to serve the rural residents that Midco can.

Beyond the Citizens Broadband Radio Spectrum, the FCC is also considering instituting different rules for the 2.5 GHz, or Educational Broadband Spectrum (EBS), band that might allow fixed wireless uses. The licensed spectrum in the 2.5 GHz band is attractive because it is powerful enough to provide speeds in excess of 100 Mbps download and 20 Mbps upload, and to beam through dense tree lines and forests. The 2.5 GHz band also provides an internet solution for precision agriculture and cutting-edge farm technology, since the spectrum (and the power levels allowed under the license) can penetrate through tree barriers and wind blocks often found in farmland. Currently, however, the 2.5 GHz band can only be licensed to educational institutions or other entities dedicated to educational purposes, who may then lease the spectrum to others. This is true even though much of the spectrum remains unused. Indeed, the FCC estimates that current licensees only cover about half of the geographic area of the United States today, with significant amounts of spectrum going unused in rural areas. Opening the 2.5 GHz band for licensing by other, non-educational entities would allow Midco to provide fixed wireless service to even more rural residents, including those living in dense tree areas and in hilly terrain – but use of this band is not an option for us today.

Finally, some have suggested that other spectrum bands could be used for fixed wireless. Even if those assertions are true, however, those bands will not be made available quickly enough to meet the needs of rural America. For example, the FCC is considering opening spectrum in the “C-Band” (between 3.7 and 4.2 GHz) for 5G wireless or shared fixed point-to-multipoint use, for example, but the band is used heavily today by cable programmers and cable operators, including Midco, to transmit and receive television programming that operators then distribute to customers via coax and fiber. Thus, at least in the near term, until interference concerns are resolved and existing users compensated for any transition, this band cannot accommodate the fixed wireless services Midco offers.

To better serve rural residents and businesses, like those in Brooktree Park, North Dakota, with fixed wireless, we need more spectrum options. We need access to more spectrum, and that must spectrum must offer an ability to limit interference so we can provide reliable service. I ask you today that when opening new areas of spectrum, you and the FCC keep in mind the need to ensure that companies like Midco, who are trying to use fixed wireless to reach otherwise unserved areas, are able to compete for access to the spectrum.

I commend the Subcommittee for its focus on ensuring that all Americans – including those in rural America – receive the full potential of America’s broadband networks. Thank you again for inviting me here today, and we look forward to working with all of you on these important issues.

Mrs. BLACKBURN. The gentleman yields back.  
Mr. Aiken, you are recognized.

#### STATEMENT OF CLAUDE AIKEN

Mr. AIKEN. Good morning, Chairman Blackburn, Ranking Member Doyle, and members of the subcommittee.

I am Claude Aiken, President and CEO of WISPA, the Wireless Internet Service Providers Association, representing more than 800 small businesses who are closing the digital divide in rural America. I am honored to offer our perspective on how fixed wireless broadband is making a difference in rural America.

The majority of our members got their start the same way. They were bootstrapping entrepreneurs who saw the need for better broadband in their communities and answered the call. Whether it was via maxed-out personal credit cards, small loans from family members, or putting their life savings on the line, our members have built workable, cost-efficient, local networks and given their neighbors what they never had before, high-speed broadband internet.

Our members use whatever spectrum is available, unlicensed, lightly licensed, or licensed spectrum. They lease whatever infrastructure is available to hang radios. It may be commercial towers, local water towers, or a neighbor's grain silo or barn. They transmit internet data, often over many miles, to small fixed receivers on their customer's premises, and they provide high-speed, low-latency, uncapped broadband, typically in the range of 5 to 50 megabits per second, and speeds of up to 1 gigabit per second are possible with current technology.

Our members are overwhelmingly small, local, rural providers. More than half have fewer than 1,000 customers. Almost three-quarters have fewer than 10 employees. But, despite their small size, they are making a difference, serving more than 4 million people across our nation, and the majority do this without any government subsidies.

Most importantly, WISPs can deploy fixed wireless service to residential consumers at about one-seventh the cost of fiber and one-fourth the cost of cable. That is right, we can deploy broadband for a fraction of the cost of fiber and cable, and we can deploy much more quickly, usually in months, rather than years.

Clearly, we are a significant part of the solution. So, how can we in D.C. help unleash the power of fixed wireless economics to better serve your communities? The most important thing the subcommittee can do is to support more flexible, shared, and lightly licensed use of underutilized spectrum bands. Our members are often frustrated that they have potential customers within range of their towers, but insufficient spectrum to serve them, all the while licensed spectrum in their areas goes unused.

Thankfully, this subcommittee has been a part of the solution. We commend your work to lower barriers to infrastructure deployment, streamline regulations, and widen the spectrum pipeline. Legislation like the AIRWAVES Act and the ACCESS BROADBAND Act will make a difference in rural America.

WISPA also commends the FCC for moving forward on rule-making proceedings that could and should make more spectrum

available for rural broadband deployment. The FCC is at a critical juncture on one proceeding that I will briefly highlight, the ongoing Citizens Broadband Radio Service, or CBRs, proceeding. It is no exaggeration to say that this proceeding is vitally important to the future of rural broadband.

In 2015, the FCC adopted innovative rules that would have auctioned seven 10-megahertz spectrum licenses in blocks the size of Census tracts, about 4,000 people each. But, last summer, the FCC reopened the rule seeking comment on greatly enlarging the license areas, up to the size of a partial economic area which generally contain both urban and rural areas and often cross state lines.

For our members, enlarging the license areas would be like requiring an entrepreneur who wants to open a kiosk to purchase an entire shopping mall. Our members need the FCC to keep the existing unlicensed or GAA spectrum allocation intact and retain small, Census-tract-sized licenses in the CBRs band. This would increase auction participation and revenues and enable our members, and all kinds of entrepreneurs and innovators, to participate in the auction, not just our largest companies.

And here's another reason why balanced spectrum policy is so important. If rural service can be deployed at much lower cost by fixed wireless providers, there is much less need for doling out subsidies to large carriers to offset their much higher costs. For example, ZIRKEL Wireless in Colorado is serving areas with one person per square mile without any government subsidies. With the right spectrum policy, access to private capital will become easier for small providers, and broadband deployment in rural and small town America will accelerate.

To the extent subsidiaries are necessary, they should be made available in a technology-neutral and a provider-neutral manner. Too often, small WISPs find themselves overbuilt by providers receiving state or federal subsidies. We need to work together to find solutions that will prevent small companies that have invested private capital from facing competition from large companies backed with government subsidies, grants, and loans.

Madam Chairman, our members are closing the rural broadband gap without subsidies, and we call on you to help modernize and rebalance U.S. spectrum policy, so that we can reach even more Americans in underserved areas.

We thank you for the opportunity to testify, and I look forward to your questions.

[The prepared statement of Mr. Aiken follows:]

**Written Testimony of  
Claude Aiken  
President/CEO, Wireless Internet Service Providers Association**

**Before the House of Representatives  
Committee on Energy and Commerce  
Subcommittee on Communications and Technology**

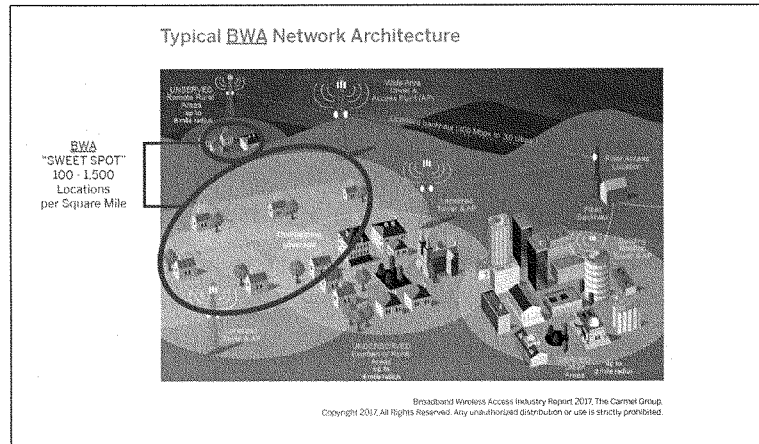
**“Realizing the Benefits of Rural Broadband: Challenges and Solutions”**

**July 17, 2018  
2123 Rayburn House Office Building  
Washington, DC**

Good morning, Chairman Blackburn, Ranking Member Doyle, and members of the Subcommittee. I am Claude Aiken, President and CEO of WISPA, the Wireless Internet Service Providers Association, which is a national trade association of fixed wireless broadband providers and related businesses. I’m honored and pleased to offer my perspectives on how *fixed* wireless communications is meeting the challenge of providing broadband service to rural Americans.

**About WISPA and Fixed Wireless Broadband**

The U.S. fixed wireless industry is comprised of more than 2,000 mostly small businesses that deliver reliable, affordable, high-speed broadband to customers in fixed locations such as residences, businesses, and community anchor institutions. In a typical Wireless ISP (WISP) network, middle-mile broadband transmissions are sent and received by the provider via fiber or microwave connections. The last mile is covered via wireless transmitters on towers or other tall structures like grain silos or water towers and even barns. Customers receive the content via small antennas that are attached to their premises.



Our operator members serve more than 4 million people across our nation using a mix of unlicensed, lightly licensed, and licensed spectrum bands.<sup>1</sup> Many WISPs also rely on underground and aerial fiber to deploy hybrid wireless-fiber networks where it is economically feasible to do so. Typical download speeds are in the range of 5 to 50 Mbps, and those speeds will continue to improve as technology improves and equipment costs become more competitive. Speeds of up to 1 Gbps are possible with current technology.

Our industry is one of the most dynamic in all of broadband, characterized by rapid, cost-effective deployment, speedy technology innovation, and many credible new entrants. According to the FCC's *2017 Internet Access Report*, residential fixed wireless connections quadrupled

<sup>1</sup> See The Carmel Group, *Ready for Takeoff: Broadband Wireless Access Providers Prepare to Soar with Fixed Wireless*, the BWA Industry Report (2017) (“Carmel Group Report”), available at [http://www.wispa.org/Portals/37/Docs/Press%20Releases/2017/TCG's\\_2017\\_BWA\\_FINAL\\_REPORT.pdf](http://www.wispa.org/Portals/37/Docs/Press%20Releases/2017/TCG's_2017_BWA_FINAL_REPORT.pdf) (last visited July 5, 2018) (“Carmel Group Report”), at 5.

from June 2012 to June 2016, the largest increase of any terrestrial broadband technology.<sup>2</sup> To date, the WISP industry has served mostly rural and exurban areas where telephone and cable broadband deployments are not cost-effective, but WISPs are emerging as viable competitors in more populated areas as well.

According to our latest member survey, more than 75 percent of WISPA's operator members serve primarily rural areas and have fewer than 2,000 customers. More than half serve fewer than 1,000 customers. Significantly, almost all of our members have fewer than 25 employees, and almost 70 percent have 10 or fewer full-time employees. These are truly small, entrepreneurial companies with a local, rural, and small-town focus.

For reasons that I'll explain in moment, WISPs boldly go where other technologies and companies do not go. According to a 2017 report by the Carmel Group, WISPs can deploy fixed wireless service to residential consumers at about one-seventh the cost of fiber-to-the-premises (FTTP) and about one-fourth of the cost of cable.<sup>3</sup> These favorable economics enable WISPs to serve smaller and more remote communities where it is not cost-effective for wireline technologies to be deployed.

Allow me to give you a real-world example. One of our members with operations in rural Illinois and Missouri estimates the cost of fiber deployment to 100 customers to be about \$928,600. Based on an average customer service fee of \$69 per month, it would take 11 years for a fiber deployment to deliver a return on investment. However, in the same area, to deliver broadband via fixed wireless technology, our member's cost to deploy to 100 customers is approximately \$37,500 – an almost \$900,000 savings – and at an average service fee of \$39 per

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<sup>2</sup> See "Internet Access Services: Status as of June 30, 2016," Industry Analysis and Technology Division, Wireline Competition Bureau (April 2017) ("*2017 Internet Access Report*"), at 18, Fig. 16 (speeds of at least 3 Mbps downstream and 768 kbps upstream as reported on FCC Form 477).

<sup>3</sup> See Carmel Report at 12, Fig. 6.

month for speeds up to 150 Mbps, they are in the black in just 10 months. The economics for both the provider *and* the consumer make much better sense.

Moreover, fixed wireless can be deployed much more quickly than wireline alternatives. The basic network elements are a tower or tall building, commercially available radio transmitters and consumer-premises equipment, and, of course, *spectrum*. There's no need to trench or lash fiber or install hundreds of low-power radios on vertical infrastructure, which can be hard to find in many parts of rural America. And WISPs don't need thousands of subscribers to make a business case; often, only a handful of potential customers will justify deployment to an area. That is true of most. WISPs have typically built their networks with their own capital and are profitable and sustainable in a short period of time without government subsidies or incumbent-protecting regulations.

### Challenges

Given this industry profile, WISPA members are deeply concerned about – and working actively to address – the challenge of delivering broadband to those 24 million mostly rural Americans who have no broadband choices today. According to the FCC's *2018 Broadband Deployment Report*, 16 percent of rural Americans lack access to fixed broadband service at 10/1 Mbps (the lowest speed tier evaluated by the FCC), and just over 30 percent of rural Americans lack access to 25/3 Mbps service, which is the Commission's benchmark for assessing whether a fixed service provides "advanced telecommunications capability."<sup>4</sup> According to the U.S.

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<sup>4</sup> *2018 Broadband Deployment Report*, 33 FCC Rcd 1660, 1686 (2018); *Id.* at 1667-68, ¶ 21.

Department of Agriculture, 85 percent of persistent poverty counties – those that have been high in poverty for at least 30 years – are in rural areas.<sup>5</sup> Chairman Pai recently summed it up:

If you live in rural America, you are much less likely to have high-speed Internet service than if you live in a city. If you live in a low-income neighborhood, you are less likely to have high-speed Internet access than if you live in a wealthier area. The digital divide in our country is real and persistent.<sup>6</sup>

As the above statistics and statements confirm, rural consumers are less likely to have access to affordable residential broadband service than their urban counterparts. And this urban-rural digital divide has very negative social and economic impacts on thousands of rural communities, including many represented by the members of this Committee.

A primary reason for the urban-rural digital divide is that wired technologies such as FTTP and cable broadband cannot be cost-effectively deployed in areas with sparse population density.<sup>7</sup> Last year, the *Wall Street Journal* reported that “[r]ural America can’t seem to afford broadband: Too few customers are spread over too great a distance. The gold standard is fiber-

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<sup>5</sup> *The Economic Report of the President*, White House Council of Economic Advisors, March 2014 at 233 available at [http://www.whitehouse.gov/sites/default/files/docs/full\\_2014\\_economic\\_report\\_of\\_the\\_president.pdf](http://www.whitehouse.gov/sites/default/files/docs/full_2014_economic_report_of_the_president.pdf) (last visited July 11, 2014), citing to The United States Department of Agriculture, Geography of Poverty available at <http://www.ers.usda.gov/topics/rural-economy-population/rural-poverty-well-being/geography-of-poverty.aspx#.UurSXhBdXA0> (last visited July 11, 2014).

<sup>6</sup> Remarks of Chairman Ajit Pai at the American Enterprise Institute, “The First 100 Days: Bringing the Benefits of the Digital Age to All Americans,” May 5, 2017, at 2. Chairman Pai also recently noted that “[i]n urban areas 98% of Americans have access to high-speed fixed service. In rural areas, it’s only 72%. 93% of Americans earning more than \$75,000 have home broadband service, compared to only 53% of those making less than \$30,000.” Remarks of FCC Chairman Ajit Pai at “Broadband for All” Seminar, Stockholm, Sweden, June 26, 2017, at 1.

<sup>7</sup> See, e.g., *Google Curbs Expansion of Fiber Optic Network, Cutting Jobs*, New York Times, Oct. 25, 2016, available at [http://www.nytimes.com/2016/10/26/technology/google-curbs-expansion-of-fiber-optic-network-cutting-jobs.html?\\_r=0](http://www.nytimes.com/2016/10/26/technology/google-curbs-expansion-of-fiber-optic-network-cutting-jobs.html?_r=0), (“In June [2016], Google Fiber announced that it was acquiring Webpass, a company that beams high-speed internet into apartment buildings using a fiber-connected antenna. This and other wireless technologies provide a quicker and less expensive way to expand access to faster web speeds”); Hal Singer, *Assessing the Impact of Removing Regulatory Barriers on Next Generation Wireless and Wireline Broadband Infrastructure Investment*, (June 2017) (“Singer Infrastructure Report”), at 32 (estimating that, even if infrastructure barriers are removed, only 71 percent of the nation’s premises will be economically viable for fiber).

optic service, but rural internet providers say they can't invest in door-to-door connections with such a limited number of subscribers."<sup>8</sup> A 2017 report provides the following example:

To illustrate, consider a neighborhood of 100 homes requiring a [fiber] network of 1,000 feet. If the average labor and materials for the labor was \$20/foot, then this network would cost \$20,000 to build, or \$200 per home passed. Now, consider the same neighborhood with 10 homes, but still has the same network requirements to reach them all – the cost per home increases to \$2,000, a decidedly less profitable and economically feasible arrangement. *Unless the cost structure or the revenue potential of an area changes, then all else equal, a more rural area will not be built with fiber.*<sup>9</sup>

Clearly, our nation's large FTTP and cable broadband providers cannot be reasonably expected to have the bottom-line interest to provide fixed broadband service to most rural communities that lack access. The numbers just don't work.

But the numbers *do* work for fixed wireless broadband providers. And thus we respectfully submit to you that government policy needs to be modernized and re-balanced to make more room at the table for fixed wireless.

Another aspect of our industry's profile is that we are sensitive to the burdens of intrusive government regulation. Our members are small business, with small workforces, working mostly with their own private capital. Too often, they have been saddled with regulations designed to restrain large telecom providers – regulations that they are ill-equipped to handle and which divert scarce, private capital to compliance efforts that are disproportionate to the problem.

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<sup>8</sup> Jennifer Levitz and Valerie Bauerlein, *Rural America is Stranded in the Dial-Up Age*, Wall Street Journal, June 16, 2017 at A1. The article estimates that it costs \$30,000 per mile to install optical fiber.

<sup>9</sup> Singer Infrastructure Report at 14 (emphasis added).

**Solutions**

How can we be a part of the solution to these challenges? If policymakers want to see more broadband service and choices in rural areas – and more competition and innovation in all areas – we respectfully suggest that the most important thing this Subcommittee can do is support more flexible, shared, and lightly licensed use of under-utilized spectrum bands, which will unleash the power of fixed wireless economics. We also urge you to be vigilant and ensure that regulations designed for large telecom companies are not imposed in the same fashion on small companies.

Thankfully, this Subcommittee has been part of the solution. We commend the work that the Subcommittee has undertaken to lower barriers to infrastructure deployment, streamline regulations, and open up a spectrum pipeline. We applaud the AIRWAVES Act, which would preserve General Authorized Access (GAA) spectrum in the CBRS band, modernize mid-band spectrum policy, and set aside some auction revenues for rural wireless broadband deployment.

Likewise, the Rural Spectrum Accessibility Act begins to address a significant problem that we hear from our members constantly: that secondary markets for spectrum do not work. The ACCESS BROADBAND Act also could help our small businesses that want subsidies, have more streamlined access to them. And, of course, the RAY BAUM'S Act took action on a number of issues that would improve the operation of the FCC and increase our national understanding of broadband deployment and adoption patterns, particularly among groups like our veterans and Tribes.

WISPA also commends the FCC for moving forward on rulemaking proceedings that could – and should – make more spectrum available for rural broadband deployment.

However, a critical spectrum policy matter that is of vital importance to the future of rural broadband remains unresolved in the Citizens Broadband Radio Service band (CBRS, 3550-3700 MHz). In 2015, the FCC adopted innovative rules that opened up 100 megahertz of the CBRS band for commercial users to share with incumbent government users and satellite earth stations. This band is adjacent to the 3650-3700 MHz band that WISPs have used heavily since 2008, and thus it represents a tremendous opportunity for WISPs to expand and upgrade service. The 2015 rules were designed specifically to encourage deployments in rural areas and in a variety of use cases all over the country.

More than 60 percent of our surveyed operator members tell us they have made investments in their networks in reliance on the 2015 rules and the prospect of expanding their reach to more rural consumers. But last summer, at the urging of the mobile wireless industry, the FCC re-opened the rules in a way that could essentially convert the band from one that is available to small businesses serving rural communities to one that would favor only the large mobile companies. Our member survey showed that 60 percent had curtailed investment based on the threat of new rules that would undo many of the benefits that the FCC adopted just three years ago.

Specifically, proposals to greatly enlarge the size of license areas in the CBRS band would be devastating to the WISP industry and would greatly affect the ability of businesses that can make the economics of delivering broadband to rural America work. Large license areas would require local businesses wishing to serve their neighbors to compete against very large companies seeking to serve much larger areas. In other words, a small WISP would need to acquire a license covering huge areas of a state – like a cellular market area or partial economic area – when all it wants and needs is a census tract. It would be like requiring an entrepreneur

who wants to open a kiosk to purchase an entire shopping mall. If we go in that direction, no small businesses will be able to enter the CBRS band; it will become useful for mobile wireless only; and rural consumers will remain on the wrong side of the digital divide.

A more balanced spectrum policy would keep the existing GAA spectrum allocation intact; would reject the idea of using giant geographic areas for all the licenses; and would maintain a role for small, census-tract-sized license areas. This approach would allow a variety of business cases to thrive in this band, including rural broadband, Industrial Internet of Things, private venues and, yes, even mobile wireless and 5G.

Another spectrum band where we are encouraged that the FCC is seeking comment and where we need an inclusive, innovative approach is the C-band, a 500-megahertz swath in the 3700-4200 MHz band. This band is currently severely underutilized by satellite receive stations and can be shared responsibly with fixed terrestrial users. Last year, WISPA helped form the Broadband Access Coalition, representing a broad variety of potential users. We filed a petition for rulemaking with the FCC, seeking to share a large portion of this band with commercial broadband providers, with a goal of promoting gigabit-speed broadband to rural Americans. That's a potential game-changer of critical importance to millions of Americans, and we're pleased that the FCC just last week adopted a Notice of Proposed Rulemaking seeking comment on our proposal, as well as proposals to clear a portion of the band for mobile services. We think the FCC has a golden opportunity to create a "win-win-win" solution here: more spectrum for fixed wireless in rural areas, more spectrum for 5G where it is needed, and protection of existing C-band communications.

We are also pleased that the FCC is looking at making spectrum in the 4940-4990 MHz band available for commercial purposes on a shared basis with public safety and utilities. Again,

this is an underutilized band that can be more efficiently zoned to facilitate rural broadband deployment. We therefore do not agree that auctioning this spectrum would be good public policy. That is a prescription for putting more spectrum in the hands of a few companies and keeping it out of reach of public safety entities and small providers that are willing to invest their private capital now to extend more and better services to rural areas.

Here's another great reason why balanced spectrum policy is so important. Because fixed wireless technology can be deployed at a fraction of the cost of the traditional wireline alternatives, it can reduce the burden on the federal government and the states to provide billions of dollars in subsidies to support build-out. It's easy to see that if service can be deployed at one-fourth to one-seventh the cost, then there is much less need for doling out subsidies to large carriers to offset their much higher costs. With the right spectrum policy, access to private capital for small providers will become easier, and expansion of fixed wireless in rural and small-town America will accelerate. Thus, you can think of modernized, balanced spectrum policy as a much better substitute for costly subsidies.

Speaking of subsidies, WISPA believes that if subsidies are necessary, they should be made available in a technology-neutral and provider-neutral manner. A number of WISPs are participating in the FCC's ongoing Connect America Fund auction, which will make available more than \$2 billion to help close the digital divide. But, too often, small WISPs that are serving areas that other providers will not serve without subsidies, are overbuilt by providers receiving state or federal subsidies. To get and keep those subsidies, companies with just a handful of employees are stuck with meeting compliance obligations that are designed for much larger companies. We need to work together to find solutions that will prevent small companies that have invested private capital from facing competition from large companies backed with

government subsidies. Fixed wireless technologies can make scarce federal and state dollars go further, and local WISPs are willing and able to deploy in their communities; let's help them do so.

In closing, let me also take this opportunity to commend the Congress and FCC for their continued work on infrastructure reform. That work is critical to ensuring that our members are able to deploy fixed wireless infrastructure in a timely fashion. Less red tape and more partnerships with state and local governments will help ensure that WISPs are able to deploy broadband to more people, and sooner, not later.

Thank you for the opportunity to testify here today, and I look forward to your questions.

Mrs. BLACKBURN. The gentleman yields back.  
Mr. May, you are recognized.

#### STATEMENT OF JOHN MAY

Mr. MAY. Chairman Blackburn and Ranking Member Doyle, thank you for the opportunity to be here today and speak about rural broadband, a very important issue for many farmers and others in the agricultural sector.

My company, John Deere, is the global leader in manufacture of agricultural, construction, turf, and forestry equipment. For 181 years, Deere has been helping farmers get more production from their fields in an efficient and sustainable manner. Technology, a big part of agriculture and the John Deere story, is the key to helping farmers meet the world's needs for food and agricultural goods in the future. And having access to broadband internet services is absolutely essential to leveraging the benefits that technology has to offer.

The evolution of technology in agriculture is critical. That is because global demand for agricultural output, which has more than tripled since 1960, shows no signs of easing. Given forecasts of global population growth and dietary improvements, farm output will need to roughly double from 2000 levels to meet the projected demand in 2050. What's more, these output gain will need to take place with essentially the same amount of land and water, and probably less labor. By and large, the technologies needed to produce these gains depend on the delivery of reliable internet connections to farmers in the field, something many farmers can't count on today.

The extent of the broadband access problem in agriculture is hard to measure in exact terms, but we know anecdotally it is a significant issue. Based on the rate of successful connections between our John Deere customers and our data management platforms, we know there are many instances where producers cannot fully leverage the benefits of their data on account of nonexistent or unreliable internet service. This is to say nothing about connections that are never made or even attempted by those who lack internet service and don't bother to invest in the technologies in the first place.

The nature and the extent of the problem is exactly why we believe Federal policy and programs should give more consideration to the needs of farmers and ranchers. Without a better understanding of the problem, we can't begin to design the right solution.

John Deere commends the Energy and Commerce Committee's approval of H.R. 4881, the Precision Agricultural Connectivity Act. Along with our partners in the Agricultural Broadband Coalition, John Deere endorsed the bill. We see it as an important first step to addressing agricultural broadband issues. We are hopeful this legislation will be enacted this year, either as part of the farm bill or on its own.

We also believe federal agencies with broadband deployment mandates should view access through an expanded lens, one that incorporates a geographic and functional usage metric, as opposed to looking only at population centers. In our view, broadband access on active cropland should be included as a metric for identi-

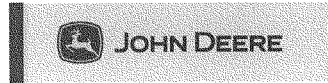
fying areas where broadband infrastructure investment is most needed.

Cell towers are for the time being the key for delivering high-speed LTE terrestrial signals, and we need more of them over croplands and ranchlands. As you know, farms represent a significant source of commercial activity in rural communities. Owners, employees, buyers, vendors, and service providers all conduct business in and around the farm operations. Supporting increased wireless broadband deployment in the very places where farming activities occur, in the fields, will bring many benefits to rural communities. These include increased economic growth, improved environmental stewardship, and enhanced food security.

John Deere's higher purpose or mission is to help people live better lives through our commitment to those that are linked to the land. Today, we are expressing that commitment in the many ways we are developing and using technology, almost all of which is digital in nature and internet-based. That will help feed the world in a sustainable manner for generations to come.

Thank you, and I look forward to your questions.

[The prepared statement of Mr. May follows:]



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Written Statement  
of

John C. May  
President, Ag Solutions and Chief  
Information Officer  
Deere & Company

Before The

Subcommittee On  
Technology and Communications  
Committee on Energy & Commerce  
U.S. House of Representatives

"Realizing the Benefits of Rural  
Broadband: Challenges and Solutions"

July 17, 2018

**Written Statement of  
John C. May  
Deere & Company  
July 17, 2018**

Chairman Blackburn and Ranking Member Doyle:

My name is John May. I am President, Ag Solutions and Chief Information Officer for Deere & Company. Our company, better known as John Deere, is a global leader in the manufacture of agricultural, construction, turf and forestry equipment. Deere provides advanced agricultural and other equipment and services to customers that work the land to meet the world's dramatically increasing need for food, fuel, fiber and infrastructure.

For 181 years, John Deere has been helping farmers get more production from their fields, and do so in the most efficient, sustainable manner possible.

Technology is a big part of agriculture in general, and the John Deere story in particular. It's the key to helping farmers be more successful and making sure they can meet the world's need for food and other agricultural goods in the future.

And, as I will discuss, broadband is a big part of leveraging all that this technology has to offer.

**Agriculture's Technology Evolution**

Our industry's technological march can be divided into four categories – Farming 1.0, 2.0, 3.0 and 4.0.

The first phase involved using implements such as John Deere's original steel plow, propelled by draft-animal power;

The second phase – which started roughly 100 years ago -- involved using power equipment such as early tractors or threshers;

Agriculture 3.0 – which dates back about 20 years -- refers to the use of guidance- or GPS-based systems, which introduced new levels of precision into farming operations.

The fourth phase, where we are today, refers to the advantages of connected farming, in which planting, spraying and harvesting decisions are determined by computer-generated prescriptions.

In this phase, we are seeing the emergence of productivity-boosting concepts such as artificial intelligence and machine learning. These technologies have game-changing promise in terms of improving yields and making more efficient use of fertilizers, herbicides and other chemicals.

The continued evolution of technology in agriculture is critical. Why?

Global demand for agricultural output – which has more than tripled since 1960 -- shows no signs of easing. Given forecasts of global population growth and dietary improvements, farm output will need to roughly double from 2000 levels to meet projected demand in 2050.

These output gains will need to take place with essentially the same amount of land and water we use today, and with even less labor. For this reason, continual improvements in agricultural productivity are essential.

And, in many cases, the technologies that will produce these gains depend on the delivery of reliable broadband connections to farmers in the field. The fact is, farmers need reliable internet access to capitalize on the great technological advancements that modern farm equipment offers.

Many farmers, however, cannot do so today.

The extent of the broadband access problem for agriculture is difficult to define. We know, for example, the rate of successful connections between our John Deere customers and our data management platforms. That tells us that there are missed opportunities for producers to fully leverage the benefits of their data. But we don't know the extent of successful connections experienced by producers using other platforms. And we don't know about connections that are never made because the producer, knowing he has poor coverage, never invests in the technologies and solutions that could improve his productivity.

The nature and extent of this problem is exactly why federal broadband policies and programs should focus on the needs of farmers and ranchers. Without a better understanding of the problem, we can't begin to design the right solutions.

### **Precision Agriculture**

When we talk about precision agriculture, we mean the use of data and technology to increase the productivity and profitability of agricultural operations, such as row crops, livestock, aquaculture, dairy, forests and orchards.

The introduction of data-driven insights and decision-making have transformed agriculture into a technology-driven sector that is more and more dependent on access to broadband. GPS-enabled precision steering systems, modems, sensors, third-party and cloud applications, and powerful in-cab and farmhouse analytic and mapping programs comprise the highly specialized systems that make up modern agricultural operations today. Agricultural equipment has evolved into a mobile data platform used to receive, use, sense, store and transmit data as an essential part of the producer's performance. The "Internet of Things" in rural America includes not only smart meters and appliances, but also smart tractors, combines, and production systems. We see the adoption of information technologies and services in agriculture as no less

transformative than the introduction of self-propelled machines to farming a century ago.

Today, farmers can plant seeds and apply chemicals to within a few centimeters of accuracy thanks to innovative GPS-enabled positioning systems that are now standard on virtually all modern farming equipment. Using wireless broadband connections, advanced agricultural equipment and services now include technology that generates real-time agronomic data for analysis. This allows farmers to optimize the precise amount of seed, fertilizer and pesticides needed; reduce costs for fuel, labor, and water; and identify best practices for fields in any given location.

What's more, producers use these technologies and wireless connections to communicate with their customers and vendors. They can request machine diagnostics remotely, follow commodity markets, receive real-time information on weather and field conditions, manage their fleets, and achieve regulatory compliance. Access to mobile broadband services also lets farmers employ innovative machine-to-machine operations in the field and machine-to-farm data transfers from the field. This improves real-time decision making and cost management.

Precision technologies are also positive for the environment and help farmers operate in a more sustainable manner. They promote the more efficient use of water, fertilizer, herbicides and fuel by allowing producers to tailor farming practices and applications to the conditions of an individual field.

### **The Importance of Mobile Broadband**

Without reliable, extensive wireless broadband connections, many of these benefits cannot be realized. Real-time connections allow machines to sync up in the field, have remote access to in-cab displays, gain access to planting, application and yield data, adjust variable-rate prescriptions and consult with advisors while in the field. Digital connections also enable section control and prevent over-application of fertilizers and pesticides. And they allow for remote

machine diagnostics that can identify and resolve machine performance issues at an early stage. In other words, mobile wireless broadband helps farmers reduce downtime, optimize assets, curb costs, and increase yields.

As a matter of public policy, Deere believes the necessity of connecting agricultural lands is clear: Indeed, the agricultural sector's ability to meet the rising global demand for food will depend on continuous improvements in farm productivity, efficiency, and sustainability. And it is only through the intensive use of data and technology that farmers will be able to make these improvements.

A range of technologies can contribute to meeting the need for rural broadband on agricultural lands. Fiber optic facilities, satellite and fixed wireless services can play a role in meeting demand for broadband service on ag lands. Even low power unlicensed services may have the potential to meet certain needs on ag lands. However, none of these technologies alone is sufficient, and it is clear that cellular mobile services are essential to addressing the need for high speed broadband on ag lands. Cellular technology is uniquely suited to certain smart farming applications that require full mobility, superior coverage and throughput, particularly in areas not otherwise served by fixed facilities.

John Deere commends the Energy & Commerce Committee's approval of H.R. 4881, the Precision Agriculture Connectivity Act. Along with our partners in the Agricultural Broadband Coalition, John Deere has endorsed this bill. We see it as an important first step in getting the FCC and USDA to work more closely together to address the agricultural-broadband issue. We are hopeful this legislation will be enacted this year, either as part of the Farm Bill or on its own.

We also believe federal agencies with broadband-deployment mandates should view access through an expanded lens -- one that incorporates a geographic and functional usage metric, as opposed to looking only at population centers. In our view, broadband access on active croplands should be included as a metric for identifying areas where broadband infrastructure investment is most needed. Cell towers are, for the foreseeable future, the key

for delivering high-speed LTE terrestrial signals, and we need more of them in croplands and ranchlands.

Farms represent a significant center of commercial activity in rural communities. Owners, employees, buyers, vendors and service providers all conduct business in and around farming operations. By supporting increased wireless broadband deployment in areas where most farming operations occur -- in the fields -- rural communities and the U.S. economy will benefit through increased economic growth, improved environmental stewardship, and enhanced food security.

### **The Future of Farming**

Deere believes that precision agricultural practices in use today are laying the foundation for the future of farming: a continually smart, evolving and more efficient farm. Key technologies advancing this future include Artificial Intelligence, or AI, and Machine Learning.

Deere is investing to bring AI and machine learning to the farm. Through our recent acquisition of Blue River Technology, we are exploring the use of cameras, computers and AI to allow machines to see every plant in a field. This will allow more precise application of herbicides or fungicides, potentially reducing the use of chemicals in the field by up to 90%.

Another application, introduced in our newest combines, is ActiveVision - the use of embedded image processing so that the combine understands how it's performing and automatically adjusts settings to maintain optimal performance.

In the next several years, we see several key developments taking place that will deliver more intelligent and productive equipment to customers, including higher degrees of automation, and machines being able to react intelligently in a second or a millisecond.

In short, agriculture's tech evolution is moving rapidly. Decisions once made at the field-level are evolving to section-level, row-level, even to the plant level.

In each and every case, these technologies need reliable access to broadband internet connections in order to be effective.

### **Conclusion**

John Deere's higher purpose, or mission, is to help people live better lives through our commitment to those linked to the land.

We take this mission seriously, as we have for many generations.

We are demonstrating it today in the many ways we are developing and utilizing technology and solutions – almost all of which are digital in nature and internet-based -- that will help feed the world in a sustainable manner for generations to come.

Thank you. I look forward to your questions.

Mrs. BLACKBURN. We thank the gentleman.  
 Ms. Word, you are recognized for 5 minutes.

#### STATEMENT OF JENNI WORD

Ms. WORD. Good morning, Chairman Blackburn, Ranking Member Doyle, members of the subcommittee. Thank you for this opportunity to appear before you today.

My name is Jenni Word. I serve as the Associate Administrator and Chief Nursing Officer at Wallowa Memorial Hospital in Enterprise, Oregon. Our facility is a 25-bed critical-access hospital and Level IV trauma center. I am proud to report we have been named one of the top 20 critical-access hospitals in the Nation for the past 2 years.

Our hospital serves Wallowa County and, as Congressman Walden referred to before, has a population of just under 7,000 people spread over 3,152 square miles in frontier northeastern Oregon. That is a population density of 2.2 persons per square mile. The next nearest hospital, also a critical-access hospital, is 65 miles away.

I would like to focus my testimony on the important role broadband plays in bringing telehealth services to rural and frontier areas. Our hospital provides a wide array of services, but not all the services our community needs. Telehealth has enabled us to fill this gap and ensure access to high-quality care in our frontier county.

In my written testimony, I provided three examples that illustrate the lifesaving role telehealth can play in areas like ours. Broadband infrastructure is the foundation on which providers like ours can use telehealth technology to meet health crises like these.

Moving forward, reliable, affordable broadband in homes and remote rural hospitals and clinics will be critical as we transform the current healthcare delivery system. Our goal is a system that effectively coordinates care for our patients, rewards value, improves quality and patient safety, and reduces costs. Broadband is the lynchpin of that effort.

We are fortunate in Wallowa County to have good broadband infrastructure. But, even so, our county has many remote areas that do not yet have broadband connectivity. Nationwide, the Federal Communications Commission reports that 34 million Americans still lack access to adequate broadband.

Oregon has made significant progress in the deployment of broadband connectivity. However, a 2014 survey of broadband adoption in Oregon found that rural areas lagged behind their urban neighbors in having access to broadband connectivity and rural residents are less likely than their urban counterparts to use broadband technologies.

The Mississippi State Extension Service Index identified Wallowa County as one of 10 Oregon counties with the highest digital divide index. Congress took steps in the fiscal year 2018 omnibus appropriations bill to address the digital divide, and the FCC recently increased funding available through the Rural Health Care Program, which supports broadband adoption for the non-profit rural healthcare providers. We applaud both of these actions and thank you for your role in making them a reality. As these pro-

grams are implemented, we look forward to taking advantage of these new resources.

Finally, I would like to say something about telehealth. The potential for telehealth to expand access to medical treatment seems limitless, especially in rural and frontier areas where vast distances make it difficult to get to a doctor or to a hospital. However, there are barriers preventing us from realizing that potential. For example, Medicare payment policy restricts sites eligible for reimbursement, limits distance site providers, and restricts the services for which Medicare will reimburse. Medicare does not reimburse for remote patient monitoring, a potentially vital tool in monitoring patients with chronic conditions, especially those in rural areas. Medicare also doesn't reimburse for phone, email, fax-based services, or store-and-forward technology.

Providers would like these geographic and setting location requirements eliminated and expansion of the types of technology that can be used, and coverage for all services that are safe to provide. Rural communities also need additional capital to develop telehealth capabilities as well as adequate funding to operate systems, once they are up and running.

I am pleased that the Bipartisan Budget Act of 2018 expanded Medicare coverage for telestroke and provided waivers for some alternative payment models, but more should be done. Every week, it seems, new technologies become available to help patient needs. The use of telehealth and other new technologies will improve access to healthcare, improve outcomes, and reduce costs. Public policy should not hold us back as we seek to realize the potential these new technologies hold.

I applaud the Committee and its Chair and my Congressman, Greg Walden, for the leadership it has shown in addressing these challenges. There is certainly more work to do, and Wallowa Memorial Hospital and other rural hospitals stand ready to work with you in that effort.

Thank you.

[The prepared statement of Ms. Word follows:]

**Statement of  
Jenni Word, RN  
Associate Administrator and Chief Nursing Officer  
Wallowa Memorial Hospital  
Enterprise, Oregon  
Before the House Energy and Commerce Committee  
Subcommittee on Communications and Technology  
July 17, 2018**

Chair Blackburn, Ranking Member Doyle and members of the subcommittee, thank you for the opportunity to speak to you regarding the importance of broadband and telehealth in rural and frontier areas.

My name is Jenni Word, and I serve as the associate administrator and chief nursing officer of Wallowa Memorial Hospital in Enterprise, Oregon. Our facility is a 25-bed critical access hospital and Level IV trauma center that serves Wallowa County, with a population of 7,008 people spread over 3,152 square miles in frontier northeastern Oregon. Our county is home to Hells Canyon National Recreation Area, Wallowa Lake and the Eagle Cap Wilderness Area, known as the Swiss Alps of Oregon. The nearest hospital – another CAH – is 65 miles away.

Wallowa Memorial Hospital provides a wide array of services including emergency and primary care, general surgery, obstetrics, chemotherapy and infusion and transitional care. We have been named a Top 20 Critical Access Hospital in the nation by the National Rural Health Association for the past two years.

We are also proud to claim Rep. Walden as our representative in the U.S. Congress. We certainly appreciate his leadership on the issues the subcommittee is considering today.

**Telehealth is Key to Access to Health Care in Rural Areas**

I would like to focus my testimony on the important role broadband plays in encouraging greater use of telehealth to ensure access to high quality care in rural and frontier areas.

As in all rural areas, meeting the health care needs in our community can be challenging. We are fortunate that Wallowa Memorial Hospital provides a wide array of services – but not all that members of our community need. Increasingly, telehealth technology has enabled us to fill this gap. Here are a few examples of what this has meant in our community:

- A baby is delivered in our hospital by a family practice physician during a snowstorm on a January night. The closest hospital with a Neonatal Intensive Care Unit (NICU) is more than 150 miles away. Roads out of the county were closed early in the day due to ice, and snow has been falling off and on for most of the day. An hour after delivery, the newborn is struggling to breathe and oxygen levels are lower than normal.

The physician has been on the phone with a neonatologist who recommends transferring the baby to a NICU, but, due to weather, a fixed wing plane or helicopter is unable to land in Enterprise, and road conditions are not safe enough to make the four-hour highway trip to the NICU.

The solution: we were able to use a telemedicine robot to allow the neonatologist to assess the newborn throughout the next week. From more than 150 miles away, he was able to

listen to the baby's heart, lungs and belly. He could see the baby's color, hear its breathing and talk with the parents.

With this technology, with the guidance of the neonatologist, we were able to provide all the care necessary for this family. The baby was discharged a week later.

Telemedicine made possible a high quality outcome for this family, allowed them to stay in their hometown and prevented their having to incur Life Flight and NICU costs.

- A 68-year old man experiencing shortness of breath, severe chest and jaw pain dials 911. On the scene, the EMS crew performed an EKG and transmitted it to the emergency room where the physician confirms that the patient is having a severe heart attack. When the patient arrived at the ER, a helicopter was waiting to transport him to a tertiary hospital for an angioplasty.
- A 72-year old woman finished packing in preparation to head south for the winter. Relaxing in her chair, she suddenly drops her drink and mumbles incoherently to her husband, who dialed 911. Based on the symptoms, the Stroke Protocol is activated and, within minutes, a stroke neurologist from Portland is on the video screen talking to the physician, nurses, patient and family members.

Following a CT scan and diagnosis by our local physician and the neurologist in Portland, a plan of care was developed. She was ultimately transferred to a tertiary hospital, but due to the rapid treatment provided, she is expected to make a full recovery.

These are just three examples of the impact telehealth technology has had in our community. There are many more. Wallowa Memorial Hospital provides oncology, rheumatology, cardiology for adults and children, orthopedic, psychology, neurology and palliative care services through telemedicine. This technology saves patients two-and-a-half hours of driving – and many gallons of gas – for what is usually a 15 to 30 minute visit with a specialist.

Other services available via telehealth at Wallowa Memorial Hospital include remote pharmacy, EKG transmission to the emergency department from the field, remote cardiac monitoring, radiology and language translation services.

Telehealth technology also benefits health care providers. Our local providers access monthly continuing education sessions via our telehealth technology. We also have collaborated with other organizations in simulations of trauma situations. Telehealth technology helps keep our providers up-to-date while minimizing their time away from the facility.

#### **The Importance of Broadband in Rural Communities**

The key to utilizing the full potential of telehealth technology is an adequate broadband infrastructure. According to the Federal Communications Commission (FCC), 34 million Americans still lack access to adequate broadband. Lack of affordable, adequate broadband infrastructure impedes routine health care operations, such as widespread use of electronic health records and imaging tools, and limits the ability to use telehealth in both rural and urban areas.

Congress took steps to address this challenge in the FY 2018 omnibus appropriations bill, which included \$600 million to the Department of Agriculture for a new pilot program offering grants and loans for broadband projects in rural areas with insufficient broadband. Thank you for that action.

In addition, the FCC recently increased the funding available through its Rural Health Care Program, which supports broadband adoption for non-profit rural health care providers. We very much appreciate that action.

We're fortunate in Wallowa County to have a good broadband infrastructure. But, even so, our county has many remote areas that do not yet have broadband connectivity.

One example of why this is important is the Holter Monitor, a portable device that continuously monitors heart activity. If a patient has broadband connectivity, the results are sent to a monitoring center in real time and the ordering physician is notified of abnormalities.

There are many other examples of the potential new technology holds for patient care. But its usefulness depends on access to broadband.

Oregon has made significant progress in the deployment of broadband infrastructure over the past 15 years, yet a Digital Divide still exists in our state. Ten years ago, the Digital Divide was considered to be between those areas that had digital subscriber line services and those that only had "dial-up" Internet access. Today the divide is between those areas that have access equal to or greater than the latest FCC broadband standard and those that have transmission speeds under 25 Mbps.

Rural areas are especially affected by the digital divide. Only 55 percent of people living in rural areas have access to the service transmission speeds that the FCC currently considers broadband, while 94 percent of people living in urban areas do have access.

A 2014 survey of broadband adoption in Oregon found that our state's digital divide is not only in infrastructure deployment and service availability between urban and rural areas, but also in the rates of adoption and utilization of broadband technologies between urban and rural residents.

This divide is not just related to population density, but also to factors of income, age, ethnicity and education. Fewer than 50 percent of households in the bottom income quintile use the Internet at home, compared to 95 percent of households in the top income quintile. The Mississippi State University Extension Service Index identified Wallowa County as one of 10 Oregon counties with the highest digital divide index.

Narrowing this divide is even more important as health care moves from a volume- to a value-based system. Success in this new model in rural areas will require the use of telehealth technology.

#### **Barriers to Expanding Telehealth**

The potential for telehealth to expand access to high quality health care services seems limitless. However, there are a number of barriers preventing us from realizing that potential.

Medicare payment policy restricts sites eligible for reimbursement, limits distant site providers eligible to provide telehealth services and restricts the services Medicare will reimburse. For telehealth to be reimbursed by Medicare, the service must be via two-way video – a “face-to-face” interaction between the patient and provider. Medicare does not reimburse for remote patient monitoring, which could be especially important in monitoring patients with chronic conditions. Nor does it reimburse for phone, e-mail, fax-based services or synchronous “store and forward” technology.

Providers would like these geographic and setting location requirements eliminated, an expansion of the types of technology that can be used and coverage for all services that are safe to provide.

State licensing requirements are another barrier. To provide services to patients located at an Oregon originating site, distant site providers must hold a current Oregon license consistent with their professional discipline and be credentialed to practice at the originating site facility.

This could be resolved at the federal level with legislation that redefines the “place of service” from the site of the patient to the site of the provider delivering care. A provider then would only need to be licensed in the state in which he or she is physically located, as opposed to the state of the patient. As a facility bordering Washington and Idaho, this is an especially burdensome requirement for us.

A third barrier is the capital cost associated with developing telehealth programs. Federal grant and loan programs are needed to help small rural providers make the investments needed to implement telehealth programs. Wallowa County has four telemedicine robots – made possible through the U.S. Department of Agriculture’s Rural Utility Service grant programs. This has given us the capability to expand our telehealth services. Our challenge is in sustaining the program due to the annual service costs, which far outweigh the reimbursement for originating sites. That’s a challenge for us.

In addition, establishing telehealth capacity requires expensive videoconferencing equipment, adequate and reliable connectivity to other providers, and staff training, among other things. The fiscal year (FY) 2018 omnibus appropriations bill included more than \$50 million for rural telehealth programs, but greater support is needed.

I am pleased that the Bipartisan Budget Act of 2018 expanded Medicare coverage for telestroke and provided waivers in some alternative payment models, but more fundamental change is needed.

**Conclusion**

On behalf of rural eastern Oregon, I would like to thank the committee for its work to expand the broadband infrastructure in rural areas. I want to especially thank you for your work to pass the Ray Baum's Act. We appreciate your commitment to removing federal barriers, increasing spectrum availability and funding broadband for rural America. I especially want to acknowledge the work Mr. Walden has done in this area.

Finally, I applaud your continued commitment to addressing the digital divide in unserved and underserved rural areas. Rural hospitals stand ready to work with you to achieve this goal.

Thank you.

Mrs. BLACKBURN. We thank the gentlelady.  
 Ms. Coker Craig, you are recognized for 5 minutes.

**STATEMENT OF SUZANNE COKER CRAIG**

Ms. COKER CRAIG. Thank you all for your invitation this morning. I appreciate the opportunity to be here.

And thank you to Congressman Butterfield for the introduction. I am glad to hear you are hanging out at Abrams.

[Laughter.]

My name is Suzanne Coker Craig, and I am a small business owner and former Commissioner in the town of Pinetops, North Carolina. Our little town is 65 miles east of Raleigh and is centrally located between Greenville, Wilson, and Rocky Mount. We have a significant number of our residents who live well below the poverty level, and we are located in Edgecombe County, which is one of the poorest counties in the State. Unlike much of North Carolina, our local population has declined over the last 20 years, and we struggle to attract and keep college-educated people as well as small businesses and small industry in our area.

Even with all of these challenges, Pinetops is a wonderful community in what I consider to be the best part of North Carolina. We have all the benefits of small town life, but are an easy drive to small cities around us. We are a great place to live and to raise a family. And in March of 2016, our little town got symmetrical gigabit speed broadband internet service that made my 25-year-old nephew in Raleigh jealous.

But our own State legislature has constantly fought to disconnect us and take away the best economic, educational, and lifestyle benefit we have had in 50 years. Like most small areas, ours got left way behind in the technology boom. As the internet exploded, we struggled to get much more than a dial-up connection. Our only provider showed little interest in upgrading their antiquated services beyond what they billed as high-speed internet, which was defined as up to 10 megabits of service. Speed tests commonly showed that that was really between 4 and 6 megabits download with less than 1 megabit upload. And that was within a quarter mile of their hub. This would have been great service in 2000, but in 2015 it was a serious challenge to running a small business and providing access to modern education or healthcare. Other providers served nearby towns in our area, but were not at all interested in serving Pinetops.

So, around 2008, the city of Wilson, which is 17 miles west and in neighboring Wilson County, began providing gigabit-speed fiber-to-the-premises internet service to their citizens. They borrowed money from private investors and have repaid them with revenues from the network without using taxpayer dollars.

The city of Wilson has provided electric service to the town of Pinetops for well over 40 years and has been a great partner for our little town. So, we asked Wilson if they could bring that fantastic internet service our way. Well, in 2011, the North Carolina General Assembly passed a law that not only put significant restrictions on building municipal broadband networks, but also specified that Wilson could not take their network beyond the Wilson County line, which was 6 miles away from Pinetops. So, we were

sentenced by our own legislature to being 6 short miles away from technology that could help us help ourselves.

In 2015, the FCC preempted that state law and opened a window for Pinetops to invite Wilson to bring their internet service, which is called Greenlight, to us. So, in March of 2016, Pinetops residents eagerly began signing on as Greenlight customers.

I spoke with several people in town who telecommute or have small businesses, and the difference in service was amazing. One neighbor who works for a large banking operation described downloading and uploading her daily work files in 15 minutes instead of the hours it had taken with the fastest service that CenturyLink could provide. A small furniture manufacturer in town reported downloading large files from international customers in an hour or two rather than the 12-plus hours it had taken earlier. A local fire chief was able to use for the first time online video resources to train his volunteer firemen. Families with multiple children no longer had to timeshare to finish their online assignments. The service was fantastic, and we on the town board were working to promote Pinetops as the little town with symmetrical gigabit internet service.

But, once again, our legislature betrayed us. The state sued to overturn the FCC's ruling, and they won. Greenlight would have to be forced to leave Pinetops, and we would be forced to take 10 giant steps back economically.

About the same time, Hurricane Matthew hit, and we were flooded terribly. The Greenlight techs were there within hours of the roads opening and hooking up the emergency shelters and the disaster operations. Our town board, with the enthusiastic backing of the residence and business, were eager to fight to keep Greenlight. And so, we were able to get an exemption, with a lot of fighting, that would allow Pinetops to keep Greenlight. But, if another provider came in providing fiber services, Greenlight would have to leave. And we couldn't get language in the legislation that would make that service have to be comparable or serve everyone in town.

So, we got the exemption and we were happy with that. But now, Suddenlink has decided that, since they didn't want to serve us with basic service, now they are bringing fiber to Pinetops. So, Greenlight has to leave.

Good internet service in today's economy is as essential as electric power was in the forties and fifties. Rural areas and small towns then had to be creative and resourceful and rely on municipalities and co-ops to provide electricity in areas that private providers weren't willing to serve. If not for the forward-thinking leaders of that time, it is hard to imagine how small-town America would have survived. We still have to be creative and resourceful in keeping our towns alive. We have to be given the freedom to use all the tools we have.

I need to emphasize that, while Pinetops now has broadband access, that great service is limited to our 1-mile-square town limits. Wilson would be connecting those homes, small towns, farms, and outlying areas if the state barriers didn't exist.

The solution to getting rural communities connected will not come from one-size-fits-all legislation. It will not come from waiting for large providers to come to our communities.

Mrs. BLACKBURN. The gentlelady's time has expired. If you can wrap up?

Ms. COKER CRAIG. Yes, ma'am. I am sorry about that.  
[The prepared statement of Ms. Coker Craig follows:]

**Testimony of Suzanne Coker Craig to Subcommittee on Communication and Technology**

**July 17, 2018**

My name is Suzanne Coker Craig and I am a small business owner and former Commissioner in the Town of Pinetops, North Carolina. Our little town is 65 miles east of Raleigh and centrally located between Greenville, Wilson and Rocky Mount. We have a population of around 1300, and a significant number of our residents live well below the poverty level. We are located in Edgecombe County, which is one of the poorest counties in North Carolina. Unlike much of our state, our local population has declined over the last 20 years and we struggle to attract and keep college-educated people as well as businesses and small industry in our area.

Even with all of these challenges, Pinetops is a wonderful community in what I consider to be the best part of North Carolina. We have all the benefits of small town life, but are an easy drive to small and large cities. Our residents are friendly, welcoming and generous, and our little downtown business district is fairly healthy compared to the small towns around us. We are a great place to live and raise a family -- and in March of 2016 we got symmetrical gigabit speed broadband internet service that made my 25 year-old nephew in Raleigh jealous. But our own state legislature has constantly fought to disconnect us and take away the best economic, educational, and lifestyle benefit we have had in 50 years.

Like most small, rural areas, we got left way behind in the technology boom. As the internet exploded, we struggled to get much more than a dial-up connection. Our only provider, CenturyLink, showed little interest in upgrading their antiquated services beyond what they billed as "high speed internet" defined as "up to" 10 mbps. Speed tests commonly showed between 4 and 6 mbps download, with less than 1 mbps upload -- and that was within a quarter-mile of their hub. This would have been great service in 2000, but in 2015 it was a serious challenge to running a business and providing access to modern education or healthcare. Other providers served nearby towns in the area, but were not at all interested in serving Pinetops even when their lines were only 3 miles outside of town. Our population is small, our residents tend to be older and poorer, so there was simply no profit to be made. None of those companies wanted to challenge CenturyLink for our business and CenturyLink had no

incentive to update or improve.

Around 2008, the City of Wilson, 17 miles west of Pinetops in neighboring Wilson County, began providing gigabit speed fiber-to-the-premises internet service to their citizens. They borrowed money from private investors and have repaid them with revenues from the network without using taxpayer dollars. The City of Wilson has provided electric service to the Town of Pinetops for at least 40 years and has been a great partner for our town. So we asked Wilson if they could bring that fantastic internet, cable and phone service our way. We didn't have the resources to build our own system and we couldn't get other providers to serve us, so why not go to a trusted partner that was a long-time utilities provider?

Because in 2011, the North Carolina General Assembly passed a law that not only put significant restrictions on building municipal broadband networks, but also specified that Wilson could not take their network beyond the Wilson County line. Pinetops is 6 miles east of that line and sentenced by our own legislature to being 6 short miles away from technology that could

help us help ourselves. Why would legislators deny our struggling small town an economic lifeline that wouldn't take a dime out of the state budget? It just didn't make any sense.

In 2015, the FCC preempted the state law restricting municipal broadband service, opening a window for Pinetops to invite Wilson to bring their gigabit internet service ("Greenlight") to us. The town supplied the utility poles for the installation (as is usually the case with any utility provider) and in March of 2016, Pinetops residents eagerly began signing on as Greenlight customers. Not only was our internet faster and much more reliable, but if there were any problems we had the distinct advantage of calling the customer service department and speaking with people who knew where Pinetops was and could usually get technical support to us that same day.

I spoke with several people in town who telecommute or have small businesses in their homes and the difference in service was amazing. One neighbor who works for a large banking operation described downloading and uploading her daily work files in 15 minutes instead of the hours it had taken with the fastest service CenturyLink could provide. Another was only able to keep her job at home because she had access to Greenlight's internet speed. A small furniture

manufacturer in town reported downloading large files from international customers in an hour or two, rather than the 12+ hours it had taken earlier. A local fire chief was able to use online video training resources for the first time. Families with multiple children no longer had to use “time-sharing” to finish their online assignments. The service was fantastic and we on the town board were working on ideas to promote Pinetops as the little town with gigabit internet. As economic announcements were being made about large tire manufacturing operations and a CSX rail hub coming to the region, Pinetops was going to be well positioned to attract new families and ancillary businesses coming in with those operations.

But once again, our own legislature betrayed us. The State sued to overturn the FCC’s ruling and won. Greenlight would be forced to leave Pinetops and we would be forced to take 10 giant steps back economically. About that same time, our area was hit with major flooding from Hurricane Matthew. Even though they were being forced to leave Pinetops, Wilson’s Greenlight technicians were in our town as soon as the roads were open, hooking up essential communications for emergency shelters and a disaster response operation from Samaritan’s Purse. People who had been brought out of their homes in boats were able to get word to their families that they were okay because of the quick response from Greenlight.

Our town board, with the enthusiastic backing of our residents and businesses, were eager to fight to keep Greenlight services. So, as a last resort to keep us connected, the Wilson City Council opted to provide existing Pinetops customers their Greenlight phone and internet services at no charge while we explored a legislative solution. It was the only way to legally keep Pinetops connected. We generated electronic and paper petitions to the General Assembly demanding an exemption allowing Pinetops to keep Greenlight. We contacted the governor’s office, the governor-elect, legislative leadership, local media and anyone who would listen to enlist their help. It was incredible to all of us that our own state would force us to lose

great internet service, especially given all the reports and lip-service being given to the urban-rural divide and the desperate need to expand internet service to rural areas. But it was a very difficult fight against the well-financed lobbyists from the telecom industry. Suddenly, all of those companies that weren’t interested in serving Pinetops paid us quite a bit of attention. We had bills introduced in the state House and Senate, but they stalled in committee.

Pinetops representatives appeared before a committee to plead our case. The best we could get was an exemption for Pinetops until another provider offered fiber-to-the-premises internet service in town, and at that point, Greenlight would have to disconnect us. We could not include language that specified the service had to be comparable to Greenlight or that it would have to be provided to the entire town.

A Suddenlink representative came to our town board meeting during this time to announce that his company was now interested in bringing their premier fiber internet service to Pinetops. When board members asked if the service was symmetrical (as Greenlight is), he had to answer that it was not. But, this man -- who had never been to Pinetops and knew nothing about our town -- said we didn't need that level of service. He was asked why his company had refused for years to bring even their basic services to Pinetops, but now were willing to run fiber. He got quite upset when we expressed our support for Greenlight and he made it clear that Suddenlink would refuse to compete with Greenlight. He left the meeting very unhappy with the reception he had received from the town board.

In the last day of the legislative session, the bill exempting Pinetops was passed with the conditions noted. Pinetops residents celebrated the tenuous victory, hoping no other providers would go to the considerable expense of bringing fiber to our town that was so well served by Greenlight. Sadly, we were wrong.

Suddenlink has spent a small fortune running underground fiber from 25 miles away, solely to force Greenlight to disconnect from Pinetops. Their installation crews broke water lines, destroyed yards and made very few friends over the last several months, but we received notice from Greenlight that they would be forced to disconnect services to Pinetops on July 12 -- this past Thursday. Suddenlink sales reps swamped our little town, approaching people at gas pumps and the grocery store and knocking on every door to sign people up. They were not met with many friendly faces, but what choice did we have?

A private company has made an offer to Wilson to buy their Pinetops fiber network and that sale is now in process. The new owner plans to continue to serve Pinetops and will hopefully eventually expand the service into neighboring areas. That's great news for us, but it is beyond ridiculous the obstacles we have faced in just trying to give ourselves a desperately needed economic tool.

Good internet service in today's economy is as essential as electric power was in the 1940s and 50s. Rural areas and small towns then had to be creative and resourceful and rely on municipalities and co-ops to provide electricity in areas private providers weren't willing to serve.

If not for the forward-thinking leaders of that time, it's hard to imagine how small town America would have survived. Small town and rural leaders still have to be creative and resourceful in keeping our towns alive. We have to be given the freedom to use all the tools we have.

I need to emphasize that while Pinetops now has modern broadband internet access, that great service is limited to our one-mile square town limits. People living just outside town can't even get DSL and neighboring small towns struggle to survive with 20th century technology. Wilson would be connecting those homes, small towns, farms and outlying businesses if the state barriers didn't exist. I get asked most every day why they can't get connected and I tell them the blame lies squarely on the shoulders of our state legislative leaders.

The solution to getting rural communities connected will not come from one-size fits all legislation. It will not come from waiting for large providers to come to our communities. It will certainly not happen if state legislators continue to limit creative local interventions. The solution will come from the resilient local business and municipal government leaders who know their communities and know how to find creative pathways to solve difficult problems.

Mrs. BLACKBURN. You are perfectly fine. We are so appreciative that each of you are here. We appreciate your testimony.

This concludes our testimony, and we will now move into our Q-and-A portion of our hearing. And I will yield myself 5 minutes for questions.

Mr. Stroup and Mr. Aiken, I want to start with you. In your testimony, you mention existing alternatives in the marketplace to a big government approach that removes the ability for states to make important decisions that directly impact their financial health. One of the bills that does cause me concern is the Community Broadband Act, which I think would threaten to undo much of the progress that is being made across the country. The bill is essentially a further-reaching version of the FCC's failed 2015 Municipal Broadband Order, which basically preempted the fiscally-responsible measures that Tennessee had put in place regarding municipal networks.

So, Mr. Stroup, can you expand on the differences, the specific advances, that some of your member companies have made in recent years that have positioned them to become competitors in the broadband market across the country? And is there anything additional that we can do to help increase competition?

And then, Mr. Aiken, to you, kind of looking in that same vein, but from the wireless side, talk about how fixed wireless has become a viable alternative. And are there specific examples that might be illustrative to the committee?

Mr. Stroup, to you first, please, sir.

Mr. STROUP. As I noted in my testimony, certainly the most important things that our members have done is to increase the capacity of the satellites that have been launched as well as the speed, which ultimately makes the services more cost-effective. So, I noted just the change in the last 10 years, there has been a 20 times increase in the capacity of the satellites. Satellite services start at \$49 a month. And so, those are the two and three most important things that the industry has done.

As I also noted, there are plans to launch additional LEO satellite systems. To give you a sense of that, there are approximately 1700 satellites on orbit today. There are satellite applications that have either been granted or pending at the FCC for over 18,000 satellites. So, the growth in the industry is tremendous. The capacity that will be available is increasing accordingly.

And the thing that is most important to us is continued access to spectrum and technology neutrality. Without spectrum, we do not have the opportunity to grow, and we just want to make sure that neither Congress nor the FCC weights the scale against any one industry against the other.

Mrs. BLACKBURN. OK. Mr. Aiken?

Mr. AIKEN. Thank you for the question.

I think it is best illustrated with a story. Many farms across our great country are not connected to broadband, and this was the story of Lone Oaks Farm in Middleton, Tennessee, that didn't have any broadband connectivity to the farm. Along came Crossroads Wi-Fi, a fixed wireless provider who offered a robust business-grade broadband connection to that farm using the spectrum band that I mentioned in my opening testimony, the CBRS band.

Through that broadband connection, that 2,000-acre farm was on the short list to be considered by the University of Tennessee for purchase. The University of Tennessee purchased that farm, turned it into a 4H state facility and a research institution. And that small, local provider was able to grow the bandwidth with the university, and it is just a great story of how a small provider can provide big solutions to rural America.

Mrs. BLACKBURN. I appreciate that, and that is a beautiful property.

Mr. Forde, permitting issues are a struggle. I would assume small providers are disproportionately impacted. But we hear about permitting issues regularly. They talk about the burdensome application process. I wish you would elaborate on that and, also, the fact that the Senate now has a discussion draft that would streamline small-cell deployment.

What we need to do is look at what more is needed to unleash this private capital, to streamline this process, and to make available more small cells that are like on the grain elevator at your location.

Mr. FORDE. Well, thank you, Chairman Blackburn.

Regarding the first part of your question, we have worked very hard to continue to deploy broadband. We have had some issues in some areas. Recently, in North Dakota we tried to run some fiber from the Killdeer area up to Watford City and to Williston. We had to hire several engineering firms, and some difficult permitting issues crossing the Missouri River. So, that is certainly one of the issues that we faced. That project was delayed by several months that allowed service to get to those areas.

Regarding the small cell, certainly utilizing those areas and some of our more urban areas in our footprint in that legislation, but also I don't know if that is the solution for some of our rural areas. We believe that the fixed wireless technology will be able to cover much greater distances between those elevators, between those farms, and the small cell will be good for some areas that are a little bit more urban, a little bit more populated.

We want to make sure, also, that we have a level playing field there, us as a provider, that those folks—

Mrs. BLACKBURN. My time has expired.

I recognize Mr. Doyle for 5 minutes.

Mr. DOYLE. Thank you, Madam Chair.

Mr. Aiken, the Commission is currently considering changes to the license structure of the CBRs band. Based on your testimony, it sounds like many of your members had already started making investments in new technology based on how this band was to be structured.

First, I would like to ask you, do you think that if the Commission acts to expand the geographic size of the spectrum licenses, that your members and other rural providers will be able to successfully bid for those licenses?

Mr. AIKEN. The short answer there, Congressman, is no.

Mr. DOYLE. And what do you think will be lost if the licenses in these bands are made to be like traditional cellular licenses?

Mr. AIKEN. So, this band, it is absolutely critical to expand rural broadband. As you mentioned, a number of our members have al-

ready built out in the band. We polled our members. Over 60 percent of them had made investments in reliance on the rules. Like I said in my testimony, these are small companies providing big service in rural America, and this would hamper their ability to reach new customers that are within range of their towers.

Mr. DOYLE. Basically, it is your opinion that expanded license size will actually hurt the deployment of broadband in rural areas?

Mr. AIKEN. I believe so, and we have a proposal before the FCC that is backed by a large number of rural providers that would retain some small area license that would enable our providers to participate in the auction.

Mr. DOYLE. I want to talk about the lower C-band, too. In the lower C-band, several satellite providers have proposed freeing up a portion of the band to be auctioned for mobile broadband license service. However, a broad array of stakeholders have proposed spectrum-sharing rules in the rest of the band that would enable fixed, locked, wireless broadband. What are the merits of this proposal over the other proposals that would seek to transition the entire band to mobile broadband use? And to be honest, are these proposals even realistic?

Mr. AIKEN. Thank you for the question, Congressman.

I think in this band we have a fantastic opportunity to enable gigabit fixed wireless in rural America and a way to do so consistent with everybody getting a win here. We are part of a much broader Broadband Access Coalition that includes, again, a broad array of rural interests. And we put forth a proposal that would effectively clear some of the spectrum for 5G, would put some rational protections in place for satellite earth stations, and would make the remainder of the band available for license point-to-multi-point fixed wireless. We believe this approach would have a significant impact of the availability of broadband in rural America.

Mr. DOYLE. Thank you.

Ms. Coker Craig, your testimony and the story of your community is very compelling. And apparently, you have good barbeque down there, too, although Butterfield didn't share any of that with us.

[Laughter.]

But we have had other people from communities that have provisioned their own broadband infrastructure here to testify before us. It seems to me that every one of them seems to be happier with the service they provided themselves than any other available commercial option.

Tell me what some of the advantages are of self-provisioning.

Ms. COKER CRAIG. Well, it was amazing the difference to be able to call if there was any problem or any problem with anything with the connection, to call and you talk with someone in Wilson who knew where Pinetops was. And the speed and the reliability of their services and technicians were amazing. They know us. They are our friends and neighbors. We could usually get things fixed sometimes within a couple of hours. Sometimes they could do it over the phone. But, if not, they would have a technician there sometimes in 30 minutes.

And it was just a tremendous asset to a business. When you are operating a business, that time is money. And when you are having

to wait for 2 and 3 days for a technician to come and fix your internet, it is well worth it to switch over to Greenlight.

Mr. DOYLE. Yes.

Well, Madam Chair, I see my time is almost expired. So, I will yield back.

Mrs. BLACKBURN. The gentleman yields back.

The chairman of the full committee, Mr. Walden, is recognized for 5 minutes.

Mr. WALDEN. Well, thank you, Madam Chair.

And again, to our witnesses, thank you for being here. I thought I might put a photo up, or two, of Wallowa County, just so you can enjoy the home view.

And while we are working on that, Ms. Word, this is Chief Joseph, a statue—they do a lot of bronze work there—with the Wallowas behind. And Chief Joseph Days are coming up the weekend after next. So, if you have got spare time and want to come out and enjoy Chief Joseph Days, we would be happy to host you. But you can see these photos, the wide-open spaces, some of the farming community out there, and then, another look with the Wallowas in the background.

When I learned for the second year in a row rural healthcare facilities like yours were facing a 25-percent cut in their requested funding under the Rural Health Care Program, I encouraged the FCC to take a close look at the program in order to help telehealth facilities pay for the cost of this connectivity. I talked to the Chairman and his team.

So, I was really pleased in June when the FCC increased the funding for the Rural Health Care Program by \$171 million a year, increasing the cap for the program to \$571 million, effective immediately. It is a 43-percent increase in funding. It represents what the funding level would have been today if the original \$400 million cap that was established in 1997 had been adjusted for inflation.

If the additional funding had not been provided, what would these cuts have meant to Wallowa Memorial Hospital from your perspective?

Ms. WORD. Thank you for the question.

I think, simply, it would have been decreased access, increased travel time, inconvenience for patients. It is ones that aren't feeling well; travel is difficult. Family members are often taking time away off work as well. And then, increased cost to the patient and to the community to provide services or allow services out of town.

Mr. WALDEN. In your testimony, you identified several barriers to expanding telehealth. You mentioned restrictions on Medicare reimbursements for remote patient monitoring, burdensome state licensing requirements, and the capital associated with developing and maintaining telehealth programs. Of these barriers, which do you think is most significant? What impacts you the most?

Ms. WORD. Because we are very patient-centered and patient-focused, I think the biggest barrier is the remote monitoring or access for those remote, whether it be a remote clinic, hospital, so that we can service the patients.

Mr. WALDEN. And are there additional barriers the way the current Rural Health Care Program is formulated by the FCC? Anything there we need to be aware of?

Ms. WORD. Not that I can think of off the top of my head.

Mr. WALDEN. All right. When you mentioned that the nearest critical-access hospital after yours is 65 miles away, do you want to describe what that journey is like in the winter?

Ms. WORD. Well, if the roads are open, not snow and ice, it is a windy, two-lane highway. You are traveling with log trucks, potentially farm equipment, not so much in the winter probably. It is 65 miles, but it takes over an hour to make the journey.

Mr. WALDEN. That is down a narrow, windy, two-lane road down into the river bottom and, then, up the canyons and out and around. It is tough territory. So, if you lose service, if the fiber gets severed, what happens then?

Ms. WORD. You have no connections. You are relying on your own internal services within the county, within the cities. And that is not unusual. We have lost all connection. Your electronic health record goes down, your phone communication. We do drills around this. We are prepared for it because, for us, it is a reality.

Mr. WALDEN. And talk to me about the interconnectivity among the other providers in the community there, the clinic, pharmacy, some of those things.

Ms. WORD. Sure. We are really very fortunate in eastern Oregon and Wallowa County, especially that we have separate clinics, we have our hospital, but we really function together. If you came from the outside, you would think it was one entity. Some of these specialists, they may be initially contracted with a non-hospital-owned clinic. Yet, we can still use them for an inpatient in the hospital. The clinic will use services that we have set up in the hospital as well. Wallowa Valley Center for Wellness, mental health and behavioral health, has a great telemedicine program that benefits everyone as well.

Mr. WALDEN. All right. My time is about expired, Madam Chair. Thank you. And thanks again for making the journey.

Mrs. BLACKBURN. The chairman yields back.

And, Mr. Welch, you are recognized for 5 minutes.

Mr. WELCH. Thank you very much.

Mr. Butterfield has left, but I will tell a story behind his back, but don't tell him. Shortly after he got elected to Congress, he thought he was kind of a big deal, like a lot of us. And he was back in Wilson, right next to Pinetops, and he went into a diner. A number of women were there, and they knew him. They looked at him and they said, "You know, that is pretty good you got elected. Someday you may amount to something. You may be mayor of Wilson."

[Laughter.]

And it is that hometown commitment, actually, that is so wonderful about a lot of your testimony.

Mr. Walden, just the description in those pictures, they are very evocative for so many of us in our rural areas.

I just loved your testimony about how important it is to get that broadband there.

Now there are two things. No. 1, I think, Madam Chair, it is a little premature for us to congratulate ourselves on what we have done for rural broadband because it kind of stinks in a lot of places. It really does.

No. 2, what Congress has to do, first and foremost, is we have got to dedicate funds to the buildout of broadband. There is just no escaping that. It is just like we made a decision in this country in the thirties about electricity. There was no economic case to be made for our utility companies to build out electricity in rural America, none. But we made a decision here, our predecessors did, that there was a social case to be made for it because rural America has the kind of people like you are describing, like Mr. Walden is describing. And we need them.

So, money is really going to be important. I just have to say this. All of us who are dedicated to our rural constituencies, unless we are going to put some money in there, it is not going to go there. So, that is No. 1.

No. 2, how to do it? We have got to be flexible. That is why I really enjoyed your testimony, Ms. Coker Craig, because I live on a dirt road, an 8-mile dirt road, and we have got great broadband. It was local people created a nonprofit. I don't know how they managed to defy expectations, but they went up and down the roads and they got each of us to invest a little bit. And we get that kind of service that you are talking about.

So, I want to start asking a few questions. I will start with you, Mr. Aiken. If we get the money—and that is what we need—how do we deploy it in a way that is flexible? Because some of those pictures I saw from Mr. Walden, we don't have those in Vermont. There is a lot of hills and valleys. And one size does not fit all. So, how could we, if we had the money, deploy it in a way where we don't micromanage how to do it in Pinetops versus Tennessee? Do you want to comment on that?

Mr. AIKEN. Sure. Thanks for the question, Congressman.

We represent predominantly small businesses. We have a couple of dozen providers who are participating in the upcoming Connect America Fund Auction. But what I have heard from my members time and time again is that complicated applications and difficulty—

Mr. WELCH. Well, how do we make it simple, but accountable? I do think it has got to be done at a local level. Anybody else, comment on that? You did it in Pinetops, right?

Ms. COKER CRAIG. We did.

Mr. WELCH. How did you do it?

Ms. COKER CRAIG. Well, like I said, we worked with the city of Wilson. The only thing, we had that small window of time with the FCC ruling. That was the only way we were able to do it because the state legislature had said there would be no more expansion past the Wilson County line.

Mr. WELCH. OK. Anybody else want to comment on that? How do we have accountability if we deploy money, but flexibility? So, where a community is ready to go and they have got whatever it takes, we can get them going. Anyone?

Mr. AIKEN. I can take a stab at that, Congressman.

I think accountability on the back end is important. I think we are comfortable with a reverse auction design like that which is included in the LIFT America Act. We think that a streamlined, but accountable application is important. That is one of the reasons why we think the principles in the BROADBAND ACCESS Act are so important.

Mr. WELCH. OK. Thank you.

Ms. Word?

I am going to yield back. I am out of time. Thank you.

Mrs. BLACKBURN. The gentleman yields back.

I will say, we put \$670 million in the omni, our U.S., for deployment, and \$171 million at the FCC for rural healthcare.

Mr. Lance, you are recognized, 5 minutes.

Mr. LANCE. Yes, thank you.

That brings me to my questions regarding the additional funding that we put into our U.S. for a new loan and grant program for rural broadband.

To Mr. Forde and Mr. Aiken, from your perspective in rural America, what is the best way this funding could be deployed in order to reach the most Americans in need with the amount of resources that the government has placed in that program?

Mr. FORDE. Certainly, focusing on those areas that are truly unserved to make sure that we take care of them first I think is very important, and, obviously, being technology-neutral. We, of course, have our fiber networks. We deliver gig through high-frequency cable, and then, we use the fixed wireless tools to reach the last mile. So, having all those things work.

And I think there are some unique broadband grant programs out there. The State of Minnesota has a program where you get more points if you put more private capital into it. There is a challenge process to make sure that there is no overbuilding taking place, and a lot of unique things with that program that we work with that really help to find those areas that are truly unserved that need it most, and we are not spending too many federal dollars on those.

Mr. LANCE. Do you know, do other states intend to proceed the way Minnesota has proceeded, as you have outlined it?

Mr. FORDE. Not currently in our Midco footprint. Kansas, I believe, has looked at it a little bit, but they are in the initial stages of that process.

Mr. LANCE. Thank you.

Mr. Aiken?

Mr. AIKEN. Yes, I would echo what Mr. Forde said, that a focus on unserved areas is critical. Ensuring that private capital isn't overbuilt by government subsidies is also critical. And we also believe that there should be a focus on cost-effectiveness in the program. We have a limited number of dollars. We have a lot of people to serve. And we need that money to go as far as possible.

Mr. LANCE. There is, of course, a difference between underserved and unserved. Mr. Aiken, from your expertise, how many Americans are completely unserved?

Mr. AIKEN. The number is smaller than those that are underserved. I think the FCC counts 24 million as not having access to advanced telecommunications capability. That number includes

folks who have access to less than 25/3 broadband. But our members are focused on providing that high-speed service that rural Americans need.

Mr. LANCE. Thank you.

Would anyone else on the panel like to comment?

Mr. STROUP. Yes, I would like to comment a minute.

Mr. LANCE. Yes, of course.

Mr. STROUP. I would like to emphasize that last year alone two of our member companies, ViaSat and EchoStar, launched satellites with the advanced technologies that I talked about with 25/3 FCC-defined broadband speeds. Both of those companies have announced plans for their next satellites. And I talked earlier about the LEO systems that have been announced. So, our members are not looking for subsidies in order to provide these services. They are moving forward with launching this capacity, and certainly, as I noted earlier in my testimony, provide coverage across the entire country. So, certainly the industry is moving forward with launching additional capacity to provide service to all areas of the country without any subsidies.

Mr. LANCE. Yes. Thank you.

I live in a State, New Jersey, that is the most densely populated in the nation. We are well served, by and large, but I want to assure the panel that I will continue to work on this issue, as the sponsor of one of the pieces of legislation that is important for this area.

And to those from the great State of Tennessee, my wife and I met in law school at Vanderbilt, and I have a great affection for your wonderful state, not only because the chairman is from that state, but also from personal experience.

I yield back a minute, Chairman.

Mrs. BLACKBURN. The gentleman yields back.

Mr. Loeb sack, you are recognized.

Mr. LOEBSACK. Thank you, Madam Chair. I do, first, want to thank the Chair and the ranking member for holding this important meeting today. It has been great testimony.

And thanks to all of you on the panel today for your testimony and for answering the questions.

It is clearly no secret to those of us on the committee here that I do like to talk about rural broadband. I am from Iowa. I have 24 counties in Iowa. It is not quite a fourth of the State geographically, but it is quite a bit. And then, how to build out capacity in Iowa and the rest of rural America. At one point, the Chair even called me "Broadband Loeb sack," and that is a flag that I am very happy to fly while I am on this committee, while I am in the Congress.

In my district, as many of you know, farming is a huge part of the economy. I thank Mr. May and John Deere for all the great work that those folks do with respect to the farming community in Iowa and around the country, and, indeed, around the world for John Deere.

Farmers across America are facing a lot of challenges right now. We don't need to talk about trade, but there are a lot of things that are facing these farmers right now, a lot of challenges. It makes it more important than ever I think for our communities in the

rural areas and the agricultural communities to be as efficient and productive as possible.

To help lend our farmers a hand, I joined with Representative Latta in introducing the Precision Agriculture Connectivity Act. I really appreciate the fact that you folks were behind that, obviously, Mr. May. That bill, as was stated, as you know, would create a task force to help the FCC figure out how to deploy broadband on agricultural land to promote more precise farming techniques.

Mr. May, I would just like to ask you, from your company's perspective—you did mention this already a little bit—what would having robust broad access mean to so many of your customers who really need precise and efficient farming equipment? What does this technology mean for agricultural productivity as well?

Mr. MAY. Sure. Thank you for the question.

Maybe I will give you a couple of examples of products that will unlock a lot of productivity and, frankly, more sustainability within agriculture. No. 1, I will go back to the sixties and where we saw a three times increase in productivity because of technology introduced at that time. That journey continues. Today, what is driving that journey is access to machines in the farm, on the farm field.

For example, we have the ability today to stream computer-generated prescriptions directly to a planter based on the field conditions in that field and have the planter plant in the most optimum way. When the farmer is in combining, picking the corn in the field, we are sensing the environment that that combine is in and connecting back to the cloud to stream recommendations on how to optimize that combine, based on exactly what it is sensing within that field.

Also, when we have a machine go down, you know what that means to a farmer. When that machine stops, it is dollars flowing out the window of the cab, and we need to get the machine up fast. With internet connection, we can connect remotely directly to that machine and diagnose the problem that is happening and get them back up and running quickly.

So, we believe this phase of internet-based agriculture is going to unlock tremendous value and productivity and sustainability.

Mr. LOEBSACK. Right, and feed America and feed the world.

Mr. MAY. Absolutely.

Mr. LANCE. Just briefly, last September I went to visit a farmer in one part of my district. I got there and he was getting the corn in. And I knew how important that time was to him. So, I said, "Listen, we don't have to go in your house for an hour and talk about the issues. Do you mind if I get in the cab with you?" And that is what we did to bring the harvest in. And he was talking to me about the technology. It was really quite amazing.

But this particular bill, I am proud. I have worked with Congressman Latta on that. We have got to make sure that we have the information, so that these machines can operate as effectively as possible.

Are there any other things you would like to add that we could be doing along those lines?

Mr. MAY. First of all, thank you for your work on that. We believe that that will bring a significant amount of value to agriculture across the United States.

I think one of the other things that could be helpful is maybe a joint study between the FCC and the USDA——

Mr. LOEBSACK. Right.

Mr. MAY [continuing]. To truly understand where do we have the issues, where it is unserved, as was mentioned——

Mr. LOEBSACK. That is right.

Mr. MAY [continuing]. And underserved, so that we can attack these problem areas directly.

Mr. LOEBSACK. And that is connected to my other question, actually, too. I am probably just going to have to ask this question for the record of you, Mr. Aiken, but it has to do with mapping, obviously. I am very happy to get my mapping bill through.

But I do have a letter, Madam Chair, from Chariton Valley Electric Cooperative. If I could put that in the record with unanimous consent?

Mrs. BLACKBURN. Without objection.

Mr. LOEBSACK. Thank you so much.

[The information appears at the conclusion of the hearing.]

Mr. LOEBSACK. And then, I will just submit a question to you, Mr. Aiken, for the record.

Mr. LOEBSACK. And I yield back. Thank you, Madam Chair.

Mrs. BLACKBURN. The gentleman yields back.

And next week, he will have the opportunity to ask the FCC about doing that study, and I am sure he will.

Mr. Latta, you are recognized for 5 minutes.

Mr. LATTI. Thank you, Madam Chair, and thanks very much for having this hearing today. It is very, very needed.

I represent the largest farming and producing district in the State of Ohio. It is important to our agricultural producers out here to have this technology.

I have served and serve as the Co-Chair of the Rural Broadband Caucus and also Co-Chair of the Rural Telecommunications Working Group. We believe that it is absolutely important that we get the broadband out to our rural areas of our country. And it is not only the ag side, but from the testimony we have heard from the other witnesses, if you can't operate a business or you can't operate a hospital, you can't do certain things out there if you don't have that technology. So, it is absolutely important that we have that.

My area is a little bit different from the chairman of the full committee, where you saw the mountains in the background. If you look at my district, it is probably as flat as your table that you are sitting at. But we grow things and we are very productive there.

But if I could ask my first question, Mr. May, does it matter to you what type of technology is used to deliver that broadband service to connect agricultural producers, customers, and vendors across America, as long as the service is safe, affordable, and effective at meeting the needs of those users?

Mr. MAY. There are lots of technologies that can be applied to make agriculture more productive. Frankly, we think each one of them has a place and we are open to all of them, whether you talk guidance, GPS systems, using satellite-based networks, to guide vehicles in the field within centimeters, that plays a critical role. Internet connections and the ability to stream large quantities of data is also significant. For us, we think there are several tech-

nologies that can be leveraged within agriculture, but, certainly, internet connectivity is critical from the data side of agriculture.

Mr. LATTA. What would you say especially on the GPS and being able to be within centimeters? About 2 years ago, I was out in the southwest part of my district. What we were doing at that time, they were showing how—my mom grew up on a farm. My grandfather used horses back in the thirties. I saw in your testimony that Deere has been around now for 181 years. My wife's family has been on the same farm in northwest Ohio for 185 years.

Mr. MAY. Excellent.

Mr. LATTA. But that day that we were out, they were putting in fertilizer in furrows to keep from having runoff or anything like that. But in the spring, when they were going to go out and plant that corn, they were going to be able to put it within an inch of where that furrow was. That is what that technology does. So, we appreciate that.

Mr. MAY. Absolutely.

Mr. LATTA. Mr. Stroup and Mr. Forde, if I can ask you, will both of you provide examples of how your industries are working to promote rural broadband for precision agriculture, and what are some of those broadband solutions?

Mr. STROUP. I would like to start by noting that precision begins with GPS, as you noted. It is important to recognize that GPS is provided via satellite. Also, precision agriculture involves earth observation, weather information which is gathered via satellite, and the ability to take the imagery and refresh it on a daily basis, all one of the capabilities of the satellite industry.

But, to get to the communications aspect of it, the addition of the capacity that we have been talking about is an important aspect of what the satellite industry is doing. That, in combination with flat-panel antenna technology, which provides the ability to build it into every tractor/combine and provide continuous connectivity, because, ultimately, one of the great advantages of the satellite industry is ubiquitous coverage. So, we have complete coverage of rural America. The important thing that we are doing in terms of the capacity is adding additional satellites and the high technology that we have talked about.

Mr. LATTA. Thank you.

Mr. Forde, I have got about 49 seconds, if you can answer that?

Mr. FORDE. Absolutely. One of the greatest examples is we have a small group of elevators, and the farmers in that region are now able to use Midco fiber running to some of those elevators and connecting that group of elevators through fixed wireless technology. So, the farmers are able to tell and direct their trucks when they are dumping out their grain and instantly be able to see where their grain was going in, and being able to see those records immediately online. So, I think that tool has been great for that, that group of elevators and the farmers in the area to make sure they know how much grain was going and how much was unloaded.

Additionally, we have grain dryers. Of course, drying corn takes a tremendous amount of stuff. You have folks and farmers that are monitoring grain dryers almost 24 hours a day to keep those things running. Well, fixed wireless technology allows them to do some of

that from their easy chair in their homes and spend more time with their families

Mr. LATTA. Thank you very much. Madam Chair, my time is expired.

Mrs. BLACKBURN. The gentleman yields back.

Mr. McNerney, you are recognized.

Mr. MCNERNEY. I thank the chairwoman and I thank the panelists.

Ms. Craig, state and local governments in California are doing important work right now with private industry to build out broadband in the state. I believe our state is leading the Nation when it comes to forward-leading policies in this area. But I am worried about calls to preempt state and local government in the name of streamlining wireless siting policies. In fact, California just rejected such a proposal on the state level. What we need, I believe, instead, is industry and cities working together to meet individual constituents' needs like what just happened in San Jose. Do you think the Federal streamlining of local government siting policy will make meaningful progress for bringing high-speed fiber to unserved and underserved areas?

Ms. COKER CRAIG. Well, I think if that streamlining would give us the flexibility in local areas to work with our partners—and like I said, our partnership with Wilson was well-established. To me, it was a natural partnership. We trusted them. We knew that they were being fiscally responsible with this network. So, if that streamlining would simplify and give us the flexibility that we need, because rural areas are very unique. Some things may work for one area, but not in another.

Mr. MCNERNEY. Well, that is the point, isn't it, that you don't want a uniform federal policy that preempts local/state policies in some name of streamlining?

Ms. COKER CRAIG. Right, but we also need to get past those barriers, those barriers that we had, and our response was the state government.

Mr. MCNERNEY. Well, thanks. Rather than fighting against local governments, I think local governments and industry could work together to find meaningful solutions. The Broadband Finance, Investment, and Innovation Act that Congress Luján introduced—and I am cosponsor of—would help public/private partnerships gain access to capital for deploying high-speed broadband. I think you could make a real difference in districts like mine and others. Do you think the use of PPPs, as this legislation envisions, would allow Federal Government to work constructively with local governments?

Ms. COKER CRAIG. It sounds like it would. I am not terribly well-versed on that legislation, but it sounds like it would.

Mr. MCNERNEY. OK. Thank you. I appreciate that.

Mr. May, for some time now I have been raising concerns about cybersecurity and internet-connected devices. The LIFT America Act, of which I am a cosponsor, would acknowledge these concerns by requiring that all broadband projects funded by the Act would have to meet network and security specifications. What might cybersecurity vulnerabilities mean to farmers who are using advanced agricultural technology?

Mr. MAY. Farmers today that are utilizing these advanced technologies are streaming large quantities of data, not only to their own farm, but to their trusted advisors to help them make better decisions.

John Deere has been very transparent in our role to make sure that that data is as secure as possible, it is accessible, and it is easy to share. We have also tried to work with Farm Bureaus to develop more standards around what sort of security protocols should be in place. We believe that the security of data is critical and we support continuing to invest in that.

Mr. MCNERNEY. But what risks do farmers have, the ones that are actually using the technology?

Mr. MAY. The risk the farmer could have is if their data gets in the hands of somebody they didn't intend it to. So, their yield data or how they planted the fields, what seed they used, that is their IP, and if that got in the hands of, I planted this hybrid, I sprayed with this sort of application, and I created a yield 10 percent higher than you, that is IP. And if that were to get in the hands of somebody else, then it is a loss to the farmer.

Mr. MCNERNEY. Thank you.

Ms. WORD. In your testimony you point out that fewer than 50 percent of households in the bottom income quintile use internet at home, and that narrowing this divide would become even more important as healthcare moves to a value-based system. Can you expand on your testimony and talk about the health implications if lower-income middle Americans are unable to afford access to broadband at home?

Ms. WORD. Sure. Thank you for the question.

Those patients at that lower socioeconomic status are often some of the less healthy patients or they don't access healthcare as frequently. So, there are ways that we could do in-home monitoring, whether it is video, phone, email, monitoring of their health conditions that would prevent readmissions maybe to the hospital, improve their health, get them regular visits with their doctor when maybe they can't even afford to drive in to the clinic.

Mr. MCNERNEY. Thank you, Madam Chairman. I yield back.

Mrs. BLACKBURN. The gentleman yields back.

Mr. Guthrie, 5 minutes.

Mr. GUTHRIE. Thank you, Madam Chairwoman, for holding this meeting.

I would like to start by thanking my Co-Chair from California, Doris Matsui. We have worked on the Spectrum Caucus together. It seems like every meeting we have here we talk about spectrum, but it is so important.

I just want to point out, in the RAY BAUM Act, there was also just nuances of technology policy. It is amazing. We had actually put in there the Spectrum Auction Deposits Act, just so they could deposit bank deposits for selling of spectrum. That was asked for by Chairman Pai. And the chairwoman was great to work with us and have this in the mark, so that we could move forward. And I appreciate you doing that.

I am also pleased with the Commission's work on midband, licensed and unlicensed bands, that can help us keep the U.S. on the

cutting edge of 5G, rather than letting China or any other person try to beat us to that.

Mr. Forde—and also Mr. Aiken, I might ask you to comment on the question for Mr. Forde, but if you would comment? Starting with the spectrum question, I know that you are trying to provide service for unserved areas by using fixed wireless technology. And you say in your testimony that you need access to more spectrum in order to accomplish that. Charter is doing similar things in Kentucky. So, thanks for your efforts.

And for Mr. Forde and Mr. Aiken, how much spectrum do you think is needed for fixed wireless and what would be the results for consumers? And what more can we do on this front? We can start with Mr. Forde and, then, Mr. Aiken.

Mr. FORDE. Yes, certainly, access to more spectrum, most importantly, the type of spectrum that works best for our customers and our people in rural areas. We need to make sure that the spectrum is offered, provides interference protection out there. I know the C-band has been talked a little bit about today, but we are, of course, an existing cable television provider and we use that C-band to provide television service to tens of thousands of customers across all the states that we serve. And that is the only option that we have. So, if we were to look at that band for fixed wireless, we need to make sure that that is also protected.

And one of the bands that isn't being used as much in our area is the 2.5, the educational broadband. One of the reasons we really like that spectrum is because it is able to go penetrate dense forests, tree lines, things like that, and get through those obstacles. Obviously, it does have a certain educational benefit. I live in a very rural area. My kids go to a school out in the country 5 miles from my house. And I am amazed, even at their young age, how much work that is destined on having that good, reliable internet connection.

So, yes, I think we need more spectrum in all these areas to accomplish it, but let's make sure it works for everybody.

Mr. GUTHRIE. Thank you.

Mr. Aiken?

Mr. AIKEN. Thanks for the question, Congressman.

Yes, I would echo what Mr. Forde said. We are looking at a lot of midband spectrum, so the same sort of spectrum bands that Mr. Forde mentioned, the EBS spectrum at 2.5 gigahertz, the 3.5 gigahertz spectrum, the CBRS band which the FCC is currently considering, as well as the 3.7 to 4.2 spectrum band. That midband spectrum has great characteristics to be able to go a long ways and carry a significant amount of bandwidth, which is perfect for radios that have to go many miles to houses in rural America.

Mr. GUTHRIE. Thanks.

Another concern, I have a district that could be a little bit of—Bob Latta just said his is as flat as a table, some of the best farmland in the country. And I have some that doesn't have the mountains quite that my friend from Oregon has, but beautiful mountains and lakes, and Mammoth Cave, if anybody wants to visit, is there as well. So, it is a beautiful place, but it is rural and, also, it is suburban and urban.

I live in Bowling Green, which is kind of a boom, tied in with the work our chairwoman has done in Middleton, such a boom town. We are kind of tied in with that. I am hour from Nashville.

If you look at mapping, so I am talking about if you look at mine, you would say Bowling Green is covered with broadband. And we have some friends out here from Connected Nation which is a local hometown group that does the mapping. But it depends on where you live. I have very rural counties that is exactly what we are talking about. But, even where I live, some people won't develop; they can't move forward because people don't want to buy a home that doesn't have broadband access moving forward. So, just in mapping, getting more specific in mapping, I think we are talking about it is just too broad to say that one county is covered or not.

My question is for the panel. I didn't leave you much time. But what recommendation do you have to improve the granularity and accuracy of the data collected? And what recommendations do you have to improve it? Should NTIA coordinate with the Commission or are there other ideas about giving it to NTIA solely? Anybody? I only have two seconds, so if one of you wants to get that? Just making mapping better, NTIA.

Mr. STROUP. Certainly, I would start with ensuring that the information is up-to-date. We have recognized that, given the advances in the satellite industry, the fact that we do provide 25/3 coverage is not included in the current map.

And one other technology that I would acknowledge that I think will be useful in terms of the broadband mapping is technology that is being deployed that allows for RF mapping from space. Ultimately, I would recommend that that company's technology—they are launching their first three satellites this year—be considered to be able to identify where there is actually a signal, rather than just identification of hopes that there is a signal.

Mr. GUTHRIE. Thank you. We are out of time. I yield back.

Mrs. BLACKBURN. Ms. Matsui, you are recognized.

Ms. MATSUI. Thank you very much, Madam Chairman.

We talked about spectrum is absolutely necessary to meet the coverage requirements of rural broadband networks. In 2004, Congress created the Spectrum Relocation Fund to assist Federal agencies relocating or sharing spectrum for wireless broadband use. And in 2015, Congress made improvements to the SRF by allowing agencies to use SRF funds for engineering research and development. But current law limits how much of these funds can be used by agencies to fund the research and related activities necessary to potentially reallocate or share their spectrum. Last month, my spectrum partner, Congressman Guthrie, and I, along with Senators Wicker and Schatz, introduced the SPECTRUM NOW Act to fix this problem. Specifically, the framework of the SPECTRUM NOW Act could provide a pathway for NTIA and DoD to make additional 100 megahertz of spectrum available in the 3.4 gigahertz band.

Mr. Aiken, what potential does a 3.4 gigahertz band have for WISP networks, and how could the SPECTRUM NOW Act help meet the growing demand for networks across rural America?

Mr. AIKEN. Thank you, Congresswoman, and thank you for your leadership on this issue. We are incredibly supportive of that legis-

lation, and it could make a real difference in rural broadbands, particularly if the FCC gets the rules right on the 3.5 gigahertz or CBRs rulemaking, because that would allow these fixed wireless radios to just simply have a software upgrade and be able to utilize the spectrum in that band as well.

Ms. MATSUI. Right. OK. Thank you.

Narrowband IoT networks are particularly useful for long-range, low-power applications. Specifically, these networks improve capacity, spectrum efficiency, and power consumption levels of user devices. Narrowband IoT networks have potential both nationwide and particularly for rural coverage. These networks can co-exist with commercial mobile networks, and their propagation characteristics provide better range and reduce coverage costs for consumers in both rural areas and across the country.

The entire panel, what potential benefits do narrowband IoT networks have in rural areas from a spectrum efficiency, cost, and deployment perspective?

Mr. Stroup, would you like to start?

Mr. STROUP. Certainly. I think, as you noted, narrowband signals are more spectrum-efficient and you can put them in smaller allocations. Companies like Iridium, which is a satellite-based company that has been providing IoT services in rural America for some time. So, those services are already deployed. They tend to be more cost-effective just because they do not have the same power requirements, either, that broadband systems do.

Ms. MATSUI. Thank you.

Mr. Forde?

Mr. FORDE. We would be happy to get back to you on that.

Ms. MATSUI. Oh, certainly.

Ms. MATSUI. Mr. Aiken?

Mr. AIKEN. Sure. We generally view those networks as incredibly complementary to fixed wireless networks. It enables a lot of connectivity on farms that have a lot of benefit to precision agriculture efforts. We view those networks as complementary, and we see customers of our members who are farmers utilize both.

Ms. MATSUI. OK. Fine.

Mr. May?

Mr. MAY. That technology we believe will play a role in machine-to-machine communication—

Ms. MATSUI. Yes.

Mr. MAY [continuing]. But very limited capability if you have to upload data to the cloud. So, where we are sharing maps within a field between planters, it makes a lot of sense. But if we need to transfer data to or from that machine, it has limited capability.

Ms. MATSUI. OK. Fine.

Ms. WORD. I will claim a little bit of ignorance, being a healthcare practitioner and not as much on the technology side. But I can say, with our diverse terrain in our county, I think we take advantage of just about every opportunity that is out there.

Ms. MATSUI. I am sure.

Ms. WORD. Certain technologies are going to work better in different areas.

Ms. MATSUI. Absolutely.

Ms. Craig?

Ms. COKER CRAIG. I will also claim ignorance in this, proudly. But it sounds to me like it is just another option, and it points again to the flexibility that small communities need to have in working with whatever tools they can get.

Ms. MATSUI. OK. I don't have much time, but I want to ask the question on the C-band, about the particular clearing mechanism that could be used to allow additional terrestrial use in the 3.7–4.2 gigahertz band. In particular, NRPM has sought comment on whether market-based or the auction approach could be utilized to clear the spectrum that could, then, be made available for terrestrial mobile use.

Mr. Stroup, I am interested in how a voluntary market-based mechanism would function for the very services currently being utilized in the C-band.

Mr. STROUP. I think one of the most important things to keep in mind with respect to the C-band is just how heavily used it is. As part of the NOI process that the FCC went through, there were a number of users that came forward, and there are thousands of earth stations serving over 120 million people for video distribution services. Ultimately, if the FCC does decide that they are going to make any of that spectrum available, a market-based approach where they have an opportunity to work with a customer base, meaning the satellite companies have an opportunity to work with the existing customer base, is more likely to achieve the goals in the short term.

Ms. MATSUI. OK. Thank you very much, and I have run out of time. Thank you very much.

Mrs. BLACKBURN. The gentlelady yields back.

Mr. Olson, you are recognized.

Mr. OLSON. I thank the Chair.

And welcome to our six witnesses. Not to mislead you all, Texas 22 is two-thirds the suburbs of Houston, Texas, and one-third rural. That means corn, milo, cotton, and cattle. Our smallest farms and ranches are doing just fine. They have the broadband access that greater Houston has, but that access can disappear in a few hours in a natural disaster, like Hurricane Harvey.

We learned a lot from Hurricane Ike that hit us in 2008. We bury our lines deep in the soil, so that stayed up a lot. We still lost some connectivity during the storm. And as you know, the most precious, lifesaving commodity in a disaster is information. We found out, too, our process for permits needs to be streamlined to provide that lifeline.

And that is why I introduced H.R. 4045, the Connecting Communities Post Disasters Act. This legislation allows Federal disaster areas to be exempt from the National Environmental Policy Act and the Historical Preservation Act. That just lets communities get going quickly to rebuild.

Madam Chairman, I would like to ask unanimous consent to introduce two letters of support for my legislation, one from the NTCA and one from the WIA.

Mrs. BLACKBURN. Without objection.

[The information appears at the conclusion of the hearing.]

Mr. OLSON. Mr. Stroup, a question for you, sir. What are your main considerations from your perspective in the industry that

Federal agencies can streamline disaster requirements and just streamline process for permits overall, especially in disasters? Any advice for Federal Government to act, so we don't have the problems we had with Hurricane Harvey?

Mr. STROUP. Certainly, the satellite industry provides important capability in hurricane and natural disaster events because we have our infrastructure in the sky. From a permitting perspective, just the opportunity to be able to get our earth stations located, if they are not already in place, and work with existing customers, like the cellular industry, in order to be able to get their portable systems up and running. So, our infrastructure we don't need permitting with respect to that. It is the earth stations where we can benefit from a streamlined process.

Mr. OLSON. As a side note, DIRECTV addition to our home was basically weather radar. Without the TV, guess what is going to hit us in about 10 minutes? A big, nasty thunderstorm. So, thank you for that.

My next question is for you, Mr. May. I saw the third generation of agriculture revolution in northwest Fort Bend County a few years ago. The farmer was not a farmer. He was what I call a manager of farm technology. He had this massive, huge John Deere tractor, a big, self-contained cockpit, air conditioning. It had a little radio, a satellite radio. The tractor was driving itself. What made that so special is he was putting every seed down perfectly, the same distance apart, the same depth, making all the turns. And so, that is exciting.

You talked about, also, 4G. It is just the fourth agricultural revolution which uses artificial intelligence and machine learning to allow farmers to be more productive, be better farmers. Can you discuss the benefits of AI in the agricultural sector?

Mr. MAY. Absolutely. We are really excited. We call this the fourth generation, if you will, of farming. The new technologies that are available to us are going to bring—the way I like to describe it is, today, a farmer, that farmer still relies heavily on his eyes for vision to see what is happening in the field. He relies on the 30 years of knowledge he has in head. And then, he makes adjustments with his fingers on the computer to optimize the machine. Computer vision, artificial intelligence, and robotics are going to help make that farmer even more better.

We recently acquired a company called Blue River that is focused on eliminating up to 90 percent of chemicals that are used in the field by only spraying the weeds that are located within the fields. So, it is a huge advantage to productivity and, more importantly, sustainability.

Mr. OLSON. Thank you. I have 18 seconds left. So, I would like to offer my help to you, Mrs. Coker Craig, the whole town of Pine-tops, North Carolina. My dear friend, Mr. Butterfield, talked about having barbeque at Abrams. With all due respect, ma'am, if you want the best barbeque in America, that is in Texas, Texas barbeque.

[Laughter.]

I offer you to come to either Killen's in Pearland, Texas, or The Swinging Door in Fort Bend County to have the best barbeque in America.

I yield back.

Mrs. BLACKBURN. And I will challenge that.

[Laughter.]

Anybody ever heard of Memphis and the barbeque competition?

[Laughter.]

All right, Ms. Eshoo, 5 minutes.

Ms. ESHOO. Well, I can't recommend a barbeque in Silicon Valley, but—

[Laughter.]

Thank you, Madam Chairwoman, for having this. This is a very important hearing. When at least a third of our country is either underserved or not served in the second decade of the 21st century, that is a major issue for our country. Our Founding Fathers knew that, to be a united country, that Americans needed a nationwide communication system. And so, this is a very important responsibility that we have.

I want to thank the witnesses. Each one of you I think has been excellent. And you have touched, in a deep and broad way, either what your association members are doing, what your companies are doing, what is happening in healthcare, and what is happening in municipalities.

I want to thank the chairwoman for, in her opening statement, making a positive comment about the dig-once policy that was in the RAY BAUM legislation. It is sensible, dig once. I don't know why no one ever thought of it before we did it. I guess it was, as my grandmother used to say, the most uncommon of the senses is common sense. But, at any rate, we got that one done.

Now, at the same time, she was critical of the Community Broadband Act, and that undermines state legislatures. Now I had very purposefully introduced that legislation because I think it is important to examine what is standing in the way, why are we not making headway, especially in rural areas. And I have that, too, in my district. Imagine, in Silicon Valley there are people that are either underserved or have no service whatsoever. I think most people would be stunned to realize that.

There are today about 20 states that have outright prohibitions or bans relative to municipal broadband. Now I think that these state legislatures are undermining local municipalities from coming up with their own solutions. I come from local government, like you, Ms. Craig, and I really have a reverence for local government. I prefer a bottom-up than a top-down in many cases. Now there are some cases where I believe a national umbrella is very important relative to Federal policy for our country.

I want to ask you, Ms. Craig, why do you think anyone would do that? It has been proven to be effective. Cities like Chattanooga and Wilson were stopped from deploying high-speed broadband access to people who want it. Now there is a whole variety of reasons that we can stitch together why we are where we are, one-third of the country. But who did this in your state?

Ms. COKER CRAIG. Well, the primary—

Ms. ESHOO. Who are the interests? Who are the interests that went to the state legislature to make sure that this access was banned?

Ms. COKER CRAIG. My understanding is it was the big telecom industry.

Ms. ESHOO. You got it.

Ms. COKER CRAIG. It was the large——

Ms. ESHOO. That is my softball or hardball question to you.

So, I think we need to put the facts on the table. And that is that the very large interests, very large money holds sway, and this is holding back local communities from creating a choice. In most cases, it is much cheaper, too. So, that is what is happening in the country. If people want to stay with, stand with their state legislature for especially screwing their local communities, so be it, but that is what is happening. That is what is happening, and that is a very big thing in our country, especially because one-third of the country is not getting what they need.

I want to ask the panel—well, I don't have enough time. So, I will put that question to the full panel. Your single one best idea on how we can advance? I will put that in writing and look forward to your response.

Thank you for being here today. I think you are all part of the solution.

Ms. ESHOO. Again, I thank the chairwoman for having this hearing.

Mrs. BLACKBURN. The gentlelady yields back.

Mr. Johnson, you are recognized for 5 minutes.

Mr. JOHNSON. Thank you, Madam Chairman.

And thanks to our panel for joining us today.

I represent a very rural part of the country, the entire eastern flank of the State of Ohio, all along the Ohio River. Broadband access is one of my top priorities. We must figure this out. A one-size solution doesn't work everywhere in the country. And the digital rural divide is very, very real. We are losing a tremendous amount of intellectual capital from young people to entrepreneurs, to you name it, kids that can't do their homework, businesses that won't come into a rural area because they can't get access to the internet to connect with their customers, their suppliers, manage their employees. There is a host of reasons why this is somewhat urgent, I would even say in many cases desperate, situation for economic development.

And some people think that it is a pie-in-the-sky luxury to have access to high-speed internet, and that is simply not true. In a digitized world that we live in today, where we do business across the oceans like we used to do business across town, you have got to have access to the internet. And I think that starts with being able to accurately identify those areas that are unserved and underserved. And that has been a complicated, and yet, inadequate effort up until now.

That is why I was glad to introduce the MAPPING NOW Act, reasserting NTIA's authority to go do this. I am also pleased that the discussion draft to reauthorize NTIA tasks the administration with facilitating more accurate granular maps of broadband coverage, so that we can get on with this process.

Mr. Aiken and Mr. Stroup, Administrator Redl recently stated in his testimony before the Senate Commerce Committee that "NTIA has long been a leader in gathering and analyzing broadband adop-

tion and data, and on May 30th, 2018, NTIA published a Request for Comment to determine the most efficient path forward.”

Gentlemen, could you offer your thoughts as to what NTIA should consider when thinking about how to get the most accurate and reliable data to properly inform broadband investment decisions? I don’t think it is rocket science, and I am really frustrated with the length of time and the lack of progress.

Mr. Aiken, let’s go with you first; then, we will come down to Mr. Stroup.

Mr. AIKEN. Sure. Thank you, Congressman.

We are actively engaged with NTIA on its rulemaking on mapping efforts and appreciate their work on this issue.

We share the frustration at the lack of good data out there on broadband deployment. It means that folks who might be eligible for the Connect America Fund aren’t. And there are a host of other problems that you accurately identified.

One of the things that we think we can potentially do is move, particularly for a fixed wireless perspective, to a polygon method of characterizing deployment. That is something that we think we can do without unduly burdening our smallest members. Our association is made up of mom-and-pop companies. So, regulatory burden is a pretty significant concern. But we are actively working towards finding solutions that will work both for our members and for the data needs of our country.

Mr. JOHNSON. Mr. Stroup?

Mr. STROUP. We also have engaged with NTIA and encouraged them to take advantage or to reflect the most up-to-date capabilities, as I note with respect to the satellite industry, the 25/3 capabilities. And also, the point that I had made earlier about utilizing new technologies to be able to do RF mapping, to be able to determine where there is, in fact, a signal.

Mr. JOHNSON. Sure. Well, like I have said, I don’t think it is rocket science, but guess what? Even if it is a rocket science, we have got rocket science in this country.

[Laughter.]

We ought to be able to figure this out, and it ought not to be this dadgum complicated.

But, with that, Madam Chair, I yield back.

Mrs. BLACKBURN. The gentleman yields back.

Ms. Brooks, you are recognized for 5 minutes.

Mrs. BROOKS. Thank you, Madam Chairwoman, and thank you so much for holding this really important hearing.

And thank you all. I am sorry some of us have been going back and forth between other hearings.

But this is critically important. I represent Indianapolis suburbs and rural communities in central Indiana. Not too long ago, I had the opportunity with FCC Chair—and one of the members of the committee—Carr to visit Beck’s Hybrids and saw something that was really quite amazing.

And so, I guess, Mr. Aiken, and maybe Mr. May, they have what they call FARMserver, where they have created their own server and service to help with precision ag. And it is simplified, but it allows their clients, not just their own customers, but others who are participating in FARMserve, to generate reports such as yield

by soil type, yield by hybrid, yield by prescription. It is seed selection streamlined, field-focused recordkeeping, full support, taking information from a farm office out into the field very precisely, but, then, aggregating all of this data. And they have this massive server system data storage up in northern Hamilton County. I was not aware they were doing something of this level of sophistication, although they are an incredibly tech-savvy company, and always have been.

We talked about data security, and that is not what I am going to go into. But their customers and those who they are working with, I asked about whether or not 5G, which is now being implemented in Indianapolis and some of the surrounding areas—you mentioned 4G. That is what, Mr. May, made me think about 5G. This type of service could have, I think, a dramatic impact on the ag industry. They used a WISP called On-Ramp.

Can you all talk with us? Is this happening anywhere else in the country or are they truly unique in the country? I am just curious, Reynolds Farm Equipment, a great John Deere dealer, is right down the road from them. Can you all talk about this a little bit, Mr. Aiken maybe, and you may or may not know about this, Mr. May, in 5G. Yes?

Mr. AIKEN. Sure. So, thank you, Congresswoman, and I really appreciate you going out to visit our member, On-Ramp Indiana, and see the work that they are doing as a really small company, but bringing big connectivity and enabling the kind of innovations that you just mentioned in your statement.

I think this is indicative of what our members are doing across the country. A lot of our members are actually farmers, in addition to being broadband providers. So, they understand what farms need in order to be able to be successful, both in the broadband world and in the farming world.

But, as far as 5G is concerned, I think we have to remember, when we talk about 5G, that 5G is not only mobile. 5G is also fixed wireless.

Mrs. BROOKS. Right.

Mr. AIKEN. And a lot of the same technical innovations that we see going into the mobile space also will be in the fixed space. So, our members, if we have adequate access to spectrum, can provide these gigabit or multi-gigabit speeds to farms who desperately need the connectivity for big data.

Mrs. BROOKS. Mr. May, anything you would like to talk about 5G?

Mr. MAY. Yes. Yes, absolutely. First of all, 5G would bring additional capability in streaming larger sets of data. But, today, we have a similar system. It is the John Deere Operations Center, where a John Deere farmer today is streaming on a real-time basis from the field directly to our cloud-based ecosystem all of their agronomic data that, then, they can share with any of their trusted advisors in order to make better decisions and stream it directly back to the machine in the field. So, as we advance the internet connectivity, that is only going to unlock more value within the field.

Mrs. BROOKS. Are there many companies like John Deere and Beck's doing this across the country or is it really just the largest? And the other thing I want to mention is, so many of these compa-

nies are also near small towns. We often think of urban and rural, but small towns like Pinetops and others. Do we think we are going to get 5G to small towns, to Pinetops, North Carolina? I mean, what are we going to do? Because I think we are going to be jumping to 5G very fast.

Mr. MAY. Yes, our system is a global system that extends across the globe that uses multiple different internet capabilities. 5G, frankly, is a luxury from a data transmission standpoint, but we are leveraging today 3G and 4G as well to do the same thing.

Mrs. BROOKS. Thank you. Thank you all so much for your testimony. I really appreciate all your work.

I yield back.

Mrs. BLACKBURN. Yields back.

Mr. Bilirakis, you are recognized for 5 minutes.

Mr. BILIRAKIS. Thank you, Madam Chair. I appreciate it very much.

I thank the panel for their testimony.

One of the most important topics of discussion as we continue to build new connections and upgrade systems is resiliency. We saw what happened, of course, in Florida, Texas, and Puerto Rico. Now we are hurricane season, 2018 hurricane season. Similarly, other parts of the Nation face their own natural disasters, not just hurricanes. They face the threats that can impact connectivity and slow emergency communications.

Mr. Forde, as Midco continues to expand to unserved markets, as well as upgrade existing systems, what precautions are being taken to help ensure that these systems are resilient to natural disasters, which for your area would be tornado threats, of course?

Mr. FORDE. Yes, the first thing is, obviously, we build a lot of redundancy into our system. Multiple fiber rings of sizes large and small allow that technology to go back around the ring. So, if we do have a fiber cut or an instance, that instantly reroutes, and is the first step in keeping up for lost service.

Additionally, we have had some disasters in North Dakota and tornadoes and flooding. We have responded with providing free Wi-Fi and things for those communities on an instant basis. We have some trailers and things that we do. They are our friends. They are our customers. We do the best we can to make sure their communications are always working and up and running as fast as possible. If, for some reason, the main lines aren't working, we provide alternate forms of technology to get them up and running right away.

Mr. BILIRAKIS. Thank you.

Continuing on the top of natural disasters, Mr. Stroup, in your written testimony you stated that satellite technology can deploy temporary-fix installations and very small aperture terminal antennas in the aftermath of a disaster to help communities get reconnected. The question is, how long does it take to deploy these systems to an impacted area? And what actions need to be taken by consumers in order to use these temporary systems if they do not have a preexisting relationship with that satellite provider?

Mr. STROUP. The systems can be deployed in a matter of hours, depending upon where the equipment is located. I think what happened in Puerto Rico is a good example, where carriers have come

forward and noted that satellite needs to be considered an important part of the infrastructure for the rebuilding process because of the speed and capability of the industry. For consumers, very often it is a matter of going to a point where there is a satellite connection. A good example is in Puerto Rico where people lined up at a grocery store to be able to use satellite technology. So, it is something that very often is used in conjunction with cellular systems. So, they are providing the backhaul where the cellular system has gone down. With other technologies, point-to-point technologies, it is not necessarily as applicable in terms of providing the point-to-point technology, but more being able to provide the backhaul capability.

Mr. BILIRAKIS. OK. Very good. I appreciate it very much.

And I yield back, Madam Chair. Thank you.

Mrs. BLACKBURN. The gentleman yields back.

Mr. Cramer, you are recognized.

Mr. CRAMER. Thank you, Madam Chair.

And thanks to all of you. My goodness, I am sitting here. As you know, I have sat here the whole time, and I have loved every minute of it because I see solutions. I have to agree with Ms. Eshoo. She said, you look at the six of you and you find the solution to the problem.

I was thinking about the Precision Agriculture Connectivity Act, and what would that task force that the FCC will set up, should we pass this bill, look like. And I think it looks a lot like this, quite honestly.

We do have competing technologies collaborating to create a ubiquitous network that is not reliant on any one of you. It is reliant on all of you and several others. That has, I think, been both the opportunity and the challenge, that we do have competing technologies. We didn't have that with the Interstate Highway System. We need a ubiquitous transportation system to move products to market and people from coast to coast. And so, we have this very public highway system. When it was time to bring electricity to the farm, the REA did it beautifully, but there weren't competing technologies. Today, of course, there are more community-based power sources, things like that, but not at the time.

But you all are in something where there is a lot of competition, and you all are in something that needs the product. How it gets there is not as relevant as that it gets there, right? So, I think we have the makings of a great collaboration among competitors.

We hear a lot now today, of course, about satellite. We hear a lot about cable and fiber and fixed wireless and community-based, all of those things. And then, we haven't talked a lot about mobile, but some, and not a lot about nomadic, but, of course, some. All of that has got to work together to get it there.

But I want to ask you, Ms. Word, as I hone in a little bit on the tremendous opportunity that I see in telemedicine in rural America. With 36 hospitals in North Dakota, and still a lot of space between them, the bill we were able to do a couple of years ago, it allowed Universal Service funds to be used, for example, to connect nursing facilities, which I think was a good step in the right direction.

One of the things, though, we always hear about—and God bless Mr. Welch for raising the fact that some of this does cost money, right, particularly in unserved and underserved and maybe profit centers it requires some money. And we provided some and more, and probably need to do more.

But, at the same time, we often don't talk about the savings or the opportunities. For example—and this is what I want to get to you—in your testimony you talked about that telemedicine, the benefit of it, the value of it. Has there ever been a cost-benefit analysis of people being able to stay at home longer or maybe be in a community-based health center longer because they have ubiquitous access to the experts somewhere else? Because we always talk about the cost, not necessarily about the savings.

Ms. WORD. I don't know about an official study. I am sure they have been done. I know our facility, and also Grande Ronde Hospital, the one that is 65 miles away, has looked at the number of miles saved. That translates to gallons of gas, the hotel rooms, the time off of work that, whether it is the patient or family member, don't have to take.

Most of the savings I think is for the hospital and probably our primary care providers. They are able to assist these specialists. Often, they will do their visits side-by-side with the primary care provider in the room.

Mr. CRAMER. Sure. What I wonder, because you talked about reimbursement issues, right—

Ms. WORD. Yes.

Mr. CRAMER [continuing]. And what is not allowable. It would seem to me that we ought to take a real serious look at how, whether it is private insurance or Medicare in most cases, is reimbursing, how they might save by reimbursing something that they might not think is healthcare, if that makes sense.

Ms. WORD. Absolutely. Reimbursement is a huge issue, both for the originating site and the distant site. I will tell, we don't really even consider for us, being the originating site, reimbursement. We often don't even bill. Whoever we are working with on the other end, they pay us \$25 per patient, a max of \$100 a day. We could do six, eight, twelve patients; we will get \$100. We are about the patient and what makes it better for them. Healthwise, they often feel better if they are at home and they are with their loved ones, their spouse, their children, more comfortable with being at home.

Mr. CRAMER. Excellent.

And I am just going to wrap up my last 10 seconds here with the aggies. Thank you, John Deere. We haven't talked about unmanned aerial vehicles and the opportunity for imagery there, and the ability to use—the beautiful thing about rural America, besides the fact that they grow enough food for the world, is that they do have a lot of available spectrum. It might be owned by somebody or licensed by somebody else or just not available, but it is available. If we can find ways to enhance the imagery, there is no reason we shouldn't be able to change the world with precision agriculture, and I know that you all are about doing that.

And I have overstepped my time, Madam Chair. I yield back.

Mrs. BLACKBURN. The gentleman yields back.

Mr. Long, you are recognized.

Mr. LONG. Thank you, Madam Chairwoman.

As a point of personal privilege, just for the record, I would like to state that, as everyone knows, Arthur Bryant's Barbeque in Kansas City would make Memphis and Texas barbeque want to run and hide.

[Laughter.]

So, I just want to get that out.

Mr. Aiken and Mr. Forde, in this Congress I have introduced H.R. 4817, the PEERING Act. The focus is on improving broadband infrastructure in rural America. The bill would set up a matching grant program at NTIA to make peering centers more resilient where ones already exist and create new ones where they are needed, mainly across the Midwest, where Arthur Bryant's Barbeque is.

Do you think this bill would help combat the strain on rural providers having to deliver consistently increasing amounts of internet traffic, including high bandwidth video transmissions? Mr. Aiken?

Mr. AIKEN. Sure. Thank you for the question, Congressman.

And I have to say, also, for the record, that I will be making a road trip through Tennessee, Missouri, and Kentucky this summer. So, I will have to sample the barbeque.

Mr. LONG. We will look for your report.

[Laughter.]

Mr. AIKEN. I will submit that for the record.

[Laughter.]

But I appreciate the question. The cost of backhaul is a very significant cost for a lot of rural providers in terms of getting to that point where they can peer with other providers. So, I really appreciate your efforts to try to do things to reduce that.

Mr. LONG. What else can be done in more rural areas? I have several rural areas in my 10 and a fraction counties. A lot of it is rural America, and I don't think that the kids trying to do their homework should be affected differently than the kids in the city. So, what else can we do in more rural areas to keep service high quality and the speed fast?

Mr. AIKEN. From our perspective, Congressman, the answer is spectrum, and spectrum done in a way that makes sense for small companies. We have a ton of small providers out there in rural America providing broadband now, but the spectrum they are using is crowded. Like I mentioned previously, we have folks who have customers within range, potential customers within range of radios right now, but insufficient spectrum to do it.

Mr. LONG. OK. Thank you.

And, Mr. Forde, do you think this bill that I have introduced would help combat the strain on rural providers having to deliver consistently increasing amounts of internet traffic, including high bandwidth video transmissions?

Mr. FORDE. Obviously, we are delivering gigabit speeds across all of our footprint from Bowman to Battineau and Williston to Wahpeton in North Dakota.

So, I wanted to make sure I said "Hi" to my Congressman Cramer up there as well. Excuse me, Congressman Long.

But, yes, we certainly really believe that increasing those speeds would be great. One of the ways that we can really do that is, again, as Mr. Aiken said, more spectrum. Again, we really like the

2.5 gigahertz band of spectrum to put out that speed because it allows for interference protections and also to get through some of those tough, hard-to-reach areas through trees and woods, and things like that. So, yes, we constantly have efforts to increase speeds all across our footprint.

Mr. LONG. And what else can be done in more rural areas to keep service high quality and speeds fast?

Mr. FORDE. I think that the continued deregulation to allow us to keep focused on investing in our networks is very helpful. Allowing us not to have teams in rooms and even a floor full of people working on some of those regulations allows us to do what we do, and we do real broadband and continue to invest for our customers.

Mr. LONG. Thank you.

And I didn't realize Senator Cramer had joined us, but thank you for pointing that out.

I appreciate everything this committee does, and has been doing, in promoting broadband deployment.

I would like to submit for the record a letter from the Missouri Electric Cooperatives about what they have been doing in Missouri. [The information appears at the conclusion of the hearing.]

Mr. LONG. And last, but not least, I would love to get bipartisan support for my bill, H.R. 4817, the PEERING Act, and hope to work with my colleagues on the other side of the aisle on this.

Madam Chairwoman, I yield back.

Mrs. BLACKBURN. The gentleman yields back.

Mr. Costello, you are recognized, 5 minutes.

Mr. COSTELLO. Mr. Forde, as you state in your testimony, you acknowledge that government assistance is sometimes necessary to reach areas of the country where there is no business case for private investment. But, to efficiently leverage USF funds to the areas that need it most, we need the federal government to collect and disseminate data that more accurately reflects the digital divide. This is why Representative Loeb sack and I introduced the Rural Wireless Access Act, signed into law with the help of this committee in the spring. This bill directs the FCC to establish consistent data collection practices for mobile service coverage. Can you highlight some of the problems that arise from overbuilding with Federal dollars and how this committee can steer agencies to more efficiently focus efforts on the truly underserved areas of the country?

Mr. FORDE. Yes. I think Midco, as a company that is already providing robust service, and some of the communities already had multiple providers, and, of course, we had been overbuilt in many of those communities with those Federal dollars. What we have seen is there are still areas just outside those fairly large communities—places like Mitchell, South Dakota, population of approximately 15,000, had multiple providers there providing a high level of speed. But, yet, there are still people just not far from town that are unserved or underserved in that area. So, to the extent that we can focus on those first, that will be a much better use of those federal dollars, and let's make sure that we do that in a technology-neutral manner. Whether it is a fiber connection, whether it is the high-frequency cable, or the fixed wireless technology to reach those, let's use the best tool that we have in the toolbox.

Mr. COSTELLO. Mr. Stroup, I recently introduced the WI-FI STUDY Act to highlight the economic benefits that result from unlicensed spectrum use in assisting internet traffic management, and how that will help us realize the benefits of an interconnected world with more efficient transmission of data. Can you talk about some of the roles that unlicensed spectrum can play in closing the digital divide in rural America? Second, can you also specifically touch on how unlicensed spectrum may play in the satellite industry?

Mr. STROUP. Yes. Certainly, at least one of our members is working to show the value of community Wi-Fi connected by satellite systems. Wi-Fi, as you know, utilizes unlicensed spectrum. I think it is a combination of those technologies that provides an opportunity to be able to provide low-cost services in many of the areas that do not otherwise have access to service, and that is a great combination of unlicensed spectrum and satellite backhaul capability.

Mr. COSTELLO. Mr. Aiken, do you have anything to add on the issue of unlicensed spectrum and the role it can play in closing the digital divide in rural America?

Mr. AIKEN. Absolutely. Thank you, Congressman.

Unlicensed spectrum is absolutely critical in closing the digital divide. The large majority of our members who are small businesses who have been, for lack of a better word, locked out of the license spectrum play for too long, have utilized unlicensed spectrum in predominantly the 2.4 gigahertz and the 5 gigahertz bands to provide service. So, as I said in my testimony, additional unlicensed spectrum would be an incredible boon for rural broadband.

Mr. COSTELLO. Very good. Thank you. I yield back.

Mrs. BLACKBURN. Mr. Flores, you are recognized.

Mr. FLORES. Thank you, Madam Chairman, for hosting this great panel.

And, Panel, I appreciate your testimony. I echo what Mr. Cramer said. It has been a fascinating discussion so far.

In terms of what Congress has done in this area to look at rural broadband, we have helped auction off spectrum for 5G deployment; we have streamlined the permitting processes; we are hoping to change the regulations, so we can put more broadband satellites in the sky; we are encouraging technological innovation, and we are simply funding government agencies and programs that drive broadband development. With that said, it is reassuring to see you all get together, as Mr. Cramer said, and offer us what we think are the solutions, what could possibly be the solutions for the future.

My district, 90 percent of the population lives in about 5 percent of the footprint. So, in terms of population, it is mostly urban and suburban. On the other hand, 10 percent of the population lives in 95 percent of the land area and it is rural. And so, broadband roll-out is incredibly important to me in terms of representing that 10 percent of the population that has more limited access to broadband.

Congress last year was working hard to deal with this when it took my Radio Broadband Consumer Protection Act, which ensured that broadcasters were protected in the repack to follow the first

of its kind broadcaster incentive auction. In 2012, the broadcast incentive auction, which raised \$19 billion, was part of Congress' effort to grow broadband development and access, but that legislation had an unforeseen impact, because at the time nobody realized that the radio broadcasters had not been protected. So, our legislation took care of that part of the repack of the spectrum, so that the wireless rollout for 5G and advanced 4G could continue on time. And that became part of the RAY BAUM'S Act, and that has become law now.

Moving on to the next section, which has to do with regulations, last January I introduced H. Res. 701. That called for environmental and historic reviews conducted by the FCC or any entity regulated by the FCC to be limited to the area of impact. This resolution was part of this committee's effort to build out broadband. It promotes a more practical and efficient model for the modern deployment of broadband while respecting the oversight of historical and environmental impacts.

I would like to start with that last issue first regarding regulatory reform. So, I would like to go through the entire panel. And this is the question: how important is it for broadband buildout that Federal requirements be proportional to the actual area being disturbed?

Mr. STROUP, we will start with you. It is probably not as important for you as it is for the other folks on the panel.

Mr. STROUP. Yes, certainly because the satellite industry's issues are somewhat different than the terrestrial systems.

Mr. FLORES. Right.

Mr. STROUP. Our infrastructure is in the sky.

Mr. FLORES. Right.

Mr. STROUP. So, for us, it is more a matter of ensuring that there is access to spectrum and that any technology that is adopted be technology-neutral. In terms of deployment of the infrastructure, certainly we utilize fiber systems, but that is not typically an impediment to the deployment of our systems.

Mr. FLORES. That is what I thought. How about in terms of your ground-based stations? Have you had any regulatory impacts in this regard?

Mr. STROUP. So, we do have issues, but it is not a major impediment to the industry.

Mr. FLORES. OK. That is good to hear.

Mr. Forde?

Mr. FORDE. Certainly we have, as I may have mentioned earlier, we have had some issues with the Army Corps and the permitting process in those environmental issues in reaching those tough areas. We also do feel that the fixed wireless tool can be very helpful in reaching some of those. So, those rules are also allowing us to do that without too much burden on our company. But, certainly, those regulations do slow us down in doing rural broadband.

Mr. FLORES. OK. Mr. Aiken?

Mr. AIKEN. Yes, I would agree with what Mr. Forde said. It is tough for a mom-and-pop business to have to pay \$5,000 for a permit in order to hang a small radio on an existing tower. So, we appreciate the help that Congress and the FCC have been affording us on permit streamlining.

Mr. FLORES. Mr. May?

Mr. MAY. Yes, we would agree. I think that speeding up the process would certainly help reach the areas that don't have service, and I think it is broader than we think. And we do those, but we are doing it in a sustainable way.

Mr. FLORES. OK. I would like to go to the next question. I will ask you all to answer supplementally.

Ms. Coker Craig, you may have a response to that. Ms. Word, I don't know if it impacts you or not.

Mr. STROUP. I suspect the satellite industry faces its own very unique regulatory impediments. Can you address the hindrances for deployment that the satellite industry faces?

Mr. STROUP. Can you repeat that?

Mr. FLORES. Yes. Can you address the hindrances for deployment that the satellite industry faces?

Mr. STROUP. Issues for deployment that the industry—

Mr. FLORES. Yes, hindrances.

Mr. STROUP. Again, going back to the point that I made before, in terms of deployment, the biggest issue that we have is access to spectrum. We have a number of companies that have announced plans for deployment of their next generation technology, both GEO systems and LEO systems. So, the processing at the Commission is certainly an issue. We are going through a process with expediting small satellite licensing. But I think that the key points for us, again, are technology neutrality and access to spectrum.

Mr. FLORES. OK. Thank you, Madam Chairman. I yield back the balance of my time.

Mrs. BLACKBURN. The gentleman yields back.

Seeing that there are no further members wishing to ask questions, I thank all the witnesses for being here today. We appreciate your participation so much.

Before we conclude, I ask unanimous consent to enter the following documents into the record:

And I will start with you, Mr. Doyle. You have some to enter?

Mr. DOYLE. Yes. Thanks, Madam Chair.

I know that it has been pointed out, the money that Congress has given to the Department of Agriculture's Rural Utility Service, and the FCC on the Rural Health Care Program. I just want to point out that the problem in rural America is way bigger than those efforts.

I want to submit for the record an FCC study here that shows it will take \$40 billion to build out 98 percent of the country. So, if we give the Agriculture Department the same amount we gave them this year, \$600 million, it would take 66 years before we got to 98 percent of the country. So, that is just a drop in the bucket, and we need to do a lot better.

So, I would like to submit this study for the record.

Mrs. BLACKBURN. Without objection, so ordered.

[The information appears at the conclusion of the record.]

Mrs. BLACKBURN. Unanimous consent to issue this following list of documents: a letter from ITTA; Wireless Industry Association; American Hospital Association; USTelecom; NTCA; the Rural Broadband Association; ACT, the App Association; CCA; Advanced Communications Law and Policy Institute; CTIA; a blog post from

NCTA; a letter from Rural Broadband Caucus members to House appropriators; Chairman Walden's slides; a letter from several associations supporting the AIRWAVES Act, from Mr. Lance; a letter to Mr. Olson from NTCA, submitted by Mr. Olson; a letter to Mr. Olson from the Wireless Industry Association, submitted by Mr. Olson; a letter to Mr. Long from the Association of Missouri Electric Cooperatives, from Mr. Long; and a letter to Mr. Loeb sack from the Chariton Valley Electric Cooperative, from Mr. Loeb sack.

Without objection, so ordered.

[The information appears at the conclusion of the hearing.]

Mrs. BLACKBURN. Pursuant to committee rules, I will remind the members that they have 10 business days to submit additional questions.

And to you, our panel, if you will respond to those in writing within 10 business days of receipt?

Mrs. BLACKBURN. Seeing that there is no further business to come before the committee this morning, the subcommittee is adjourned.

[Whereupon, at 12:32 p.m., the subcommittee was adjourned.]

[Material submitted for inclusion in the record follows:]

June 11, 2018

The Honorable Leonard Lance  
United States House of Representatives  
Washington, DC 20515

The Honorable Michael Doyle  
United States House of Representatives  
Washington, DC, 20515

Dear Congressman Lance and Congressman Doyle,

On behalf of a diverse group of public advocates, educational organizations, taxpayer organizations and associations, we write to express our support for H.R. 4953, the Advancing Innovation and Reinvigorating Widespread Access to Viable Electromagnetic Spectrum (AIRWAVES) Act.

This bipartisan legislation is critical for the United States to produce a pipeline of spectrum necessary to reap the benefits that next-generation 5G wireless networks and new opportunities for unlicensed services will generate for U.S. consumers, innovation and economic growth. The AIRWAVES Act will also help close the digital divide by setting aside 10% of proceeds from the auctions required by the Act to build out wireless in unserved and often rural areas. This will help close the digital divide without using taxpayer dollars.

**Winning the Global Race to 5G.** Undeniably, there is a global race for 5G leadership and superiority. According to a new report from Analysys Mason, a telecommunications research firm, the U.S. is currently behind China and South Korea in the race for 5G deployment. These countries are aggressively making spectrum available for 5G. The AIRWAVES Act provides the certainty necessary for the U.S. to reclaim global wireless leadership by establishing clear auction deadlines for substantial amounts of low-, mid- and high-band spectrum.

**Freeing Up Licensed and Unlicensed Spectrum for Commercial Use.** The AIRWAVES Act provides a pipeline to make available both licensed and unlicensed spectrum necessary for next generation services. Without a healthy infusion of both exclusive use licensed spectrum and shared use unlicensed spectrum into the private sector on a predictable schedule, industry cannot adequately plan capital investment to support 5G services and devices.

**Driving Economic Growth and Innovation.** The wireless industry is poised to invest \$275 billion to build out 5G networks, generating \$500 billion in economic growth and 3 million new jobs. Not only will 5G networks transform our economy, but 5G networks will also prompt significant innovation and advancements for every sector including consumer tech, transportation, energy, agriculture, and healthcare. The AIRWAVES Act will help make that investment and future innovations a reality by providing a predictable supply of licensed and unlicensed spectrum. We need to ensure that leadership of the industries of the future and tomorrow's advancements in health care, transportation, energy are not exported overseas by ceding 5G innovation to other countries.

**Helping Rural Communities.** The AIRWAVES Act recognizes the importance of ensuring that all Americans, including those in rural areas, are connected. That's why the Act will fund the deployment of wireless broadband services in unserved and underserved areas through a set-aside of spectrum auction proceeds without taxpayer dollars. If this set-aside had been in place, the previous two spectrum auctions alone would have resulted in a rural broadband investment of more than \$6 billion dollars—an amount more than the FCC's Mobility Fund will make available over the course of a decade.


The AIRWAVES Act will help ensure the U.S. leads the world in 5G, spur economic growth in industries of the future, and help rural communities. Thank you for your bipartisan leadership and we look forward to working with you to advance and pass this important bill.

Sincerely,





## Chariton Valley Electric Cooperative, Inc.

Your Touchstone Energy® Partner 

July 17 2018

The Honorable David W. Loebsack  
U. S House of Representatives  
1527 Longworth House Office Building  
Washington, DC 20515

Dear Representative Loebsack,

Thank you for the opportunity to share the Chariton Valley Electric Cooperative vision for rural broadband with members of the Communications and Technology Subcommittee of the House Energy and Commerce Committee.

Chariton Valley Electric Cooperative (CVEC) was organized in April, 1945, and began providing electric service to farms in 1947. It serves around 6,000 homes and businesses in the city of Albia and portions of the seven Iowa counties of Appanoose, Davis, Lucas, Marion, Monroe, Wapello and Wayne. CVEC owns and maintains 1,300 miles of overhead and underground line.

The CVEC service territory sits in a broad section of South Central Iowa, just north of the Missouri border. The seven counties, which were once the hub of Iowa's coal country, feature rolling hills, farmland and dozens of small towns – none of which have a population greater than 3,600.

CVEC's members reside in a region that has a median household income below the state average. Every county served has seen its population decline and the average age of its residents increase. Economic development efforts are ongoing, but issues ranging from available workforce to housing to access to capital create constant barriers.

However, no barrier to growth is as dramatic as the digital divide that exists in our region.

Broadband access in our territory is primarily limited to slow, outdated service from a few large investor-owned telecommunications companies. Even then, their service is focused on town centers with little availability in the rural areas. And none have expressed any interest in expanding speeds or capacities in order to allow residents and businesses in South Central Iowa to adequately access information, digital content or the global economy.

For that reason, CVEC has begun developing a plan to extend fiber to the homes of member homes and businesses. This cooperative can no longer stand by and allow its members and region to operate at an economic and educational disadvantage.

And, there is no doubt residents are frustrated. Earlier this year, when plans for the CVEC Broadband Project were announced, more than 2,000 members sent in postcards to express their support and interest. Those postcards were included in the USDA Community Connect grant application, as were 40 letters of support and need from local businesses, hospitals, schools and colleges. We also received support letters from you and Senators Grassley and Ernst.

As you know, the value of fiber-to-the-home for rural electric cooperatives is great. That fiber gives us better control of our electric systems, monitoring, efficiencies and operations. But it also provides us with a tremendous opportunity to benefit our members.

CVEC plans to extend fiber to the home of each member, and will be able to offer members up to 1 Gb service at a reasonable and affordable cost as we exist to improve the quality of our members lives – not to increase the profits to shareholders.

The convergence of new technology and partnerships has made rural broadband deployment more achievable than ever. Yet despite these advances, the high cost of rural broadband deployment remains the biggest obstacle to successfully closing the digital divide.

Our plan requires three phases to reach every CVEC member. Yet, we plan to accomplish that feat in a 24-month period once we begin construction. We anticipate the overall cost of implementation to approach \$35 million.

To accomplish our goals, CVEC will need the support of partners like USDA's Rural Utilities Service, the Federal Communications Commission and others. We have already applied for a \$3 million USDA Community Connect grant to begin the \$4.9 Phase I of our project, which is focused on unserved Appanoose County (a recently-designated Opportunity Zone). We have plans to pursue other USDA financing options, including those recently made available in the FY18 Omnibus Appropriations bill.

Another barrier we have encountered is related to faulty data that overstates rural broadband service. The FCC maps, reliant on Form 477 data, reflect the wishful thinking of existing providers and entities who lack a presence in the region yet submitted inflated performance metrics. They are precluding CVEC from accessing the resources it must have to provide the 6,000 households and businesses with broadband speeds readily available in urban areas.

Recently, CVEC was disqualified from the upcoming CAFII auction due to questionable data used to populate FCC broadband maps. According to the FCC map, 100 percent of residents in Appanoose, Davis, Lucas, Marion, Monroe, Wapello, and Wayne counties have access to a download speed of 10 Mbps. But, independent tests run in these counties show that can only happen 17 percent of the time.

This committee has a great opportunity to drive the discussion of rural broadband and the policies that will expand it. Since 2001, the FCC has used the Universal Service Fund to deliver \$114 billion to build out rural communications infrastructure. But the digital divide still plagues our nation. Existing federal programs have failed to solve the rural broadband problem, and it's time for a new approach.

There exist four keys to empowering rural electric cooperatives to partner in those efforts.

1. Additional financing support with a combination of grants and loans.
2. All capable providers with experience in serving rural infrastructure needs should have equal access to federal funding, regardless of technology.
3. Grants should prioritize projects in areas with the lowest population density given that is a prime cost driver for rural broadband deployment.

4. Broadband systems funded with limited federal funds should meet the growing speed and data consumption needs of today and into the future.

We're glad that expanded rural broadband access is a topic of conversation in state legislatures and in Washington. And CVEC, like electric co-ops nationwide, is committed to rural America and the people who live there. Yet, 23 million rural Americans lack broadband access.

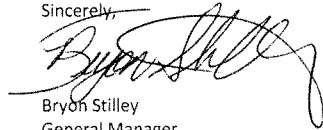
Congress should support investment in forward-looking, modern broadband systems that will stand the test of time. It should take an all-inclusive approach to solutions in unserved and underserved areas. It is critical that these solutions recognize the need to remain viable for years into the future.

And it should recognize that in today's 21<sup>st</sup> century economy, broadband systems built to 10/1 or slower speeds cannot support a modern household much less attract and retain new businesses.

Chariton Valley Electric Cooperative is ready to bring the rural Iowans it serves a 21<sup>st</sup> century technology. We just need help overcoming barriers that prevent us from accomplishing that.

Thanks in advance for your assistance and support.

Sincerely,



Bryon Stilley  
General Manager  
Chariton Valley Electric Cooperative  
Albia, Iowa



July 16, 2018

Honorable Pete Olson  
House of Representatives  
2133 Rayburn House Office Building  
Washington DC, 20515

Dear Representative Olson:

On behalf of the nearly 850 small, rural broadband network providers represented by NTCA–The Rural Broadband Association, thank you for your work on HR 4845, the Connecting Communities Post Disasters Act of 2018.

As you know, it is difficult, if not impossible, to make the business case for broadband network deployment and ongoing operations through much of rural America due to the challenges of distance, population density, and the high costs of deploying, maintaining, and upgrading networks—challenges that are often compounded by cumbersome and duplicative state and federal permitting requirements. While these barriers to broadband deployment are present in rural areas even when the weather is excellent, the occurrence of a natural disaster heightens the daunting task of restoring service to customers as quickly as possible.

The Connecting Communities Post Disasters Act of 2018 would provide a five-year categorical exclusion from environmental and historical reviews for communications facilities in presidentially-declared disaster areas to aid the replacement and improvements to such facilities. Small rural telcos would welcome the changes of the kind contemplated by HR 4845, which would allow them to focus on the work of restoring and improving service in the wake of a disaster instead of spending precious time and resources on securing duplicative permitting approvals for areas that have already been disturbed by previous network deployments.

Thank you for your leadership on federal permitting reform and broadband deployment. We look forward to working with you on these issues as HR 4845 moves toward enactment.

Sincerely,

A handwritten signature in cursive script that reads "Shirley Bloomfield".

Shirley Bloomfield  
Chief Executive Officer



Wireless  
Infrastructure  
Association

July 17, 2018

The Honorable Pete Olson  
United States House of Representatives  
Washington, D.C. 20515

Dear Rep. Olson:

On behalf of the Wireless Infrastructure Association (WIA), I would like to express our appreciation for the introduction of H.R. 4845, the Connection Communities Post Disasters Act of 2018. WIA is the principal organization representing the companies that build, design, own, and manage wireless facilities in the U.S. and throughout the world. Our mission is to expand wireless broadband everywhere.

As you and your constituents well know, getting communications facilities back online after a disaster is of the utmost importance. Unfortunately, there are often a myriad of regulations that could slow down efforts to repair or replace wireless infrastructure. H.R. 4845 is designed to expedite the process for replacing, repairing or improving communications facilities following a major disaster or presidentially declared emergency.

Thank you again for your introducing H.R. 4845 and for your efforts to lower or eliminate many of the obstacles faced by network operators after an emergency. WIA looks forward to working with you as H.R. 4845 moves through the legislative process.

Sincerely,

A handwritten signature in black ink, appearing to read "Jonathan Adelstein".

Jonathan Adelstein  
President and CEO  
Wireless Infrastructure Association



## Association of Missouri Electric Cooperatives

2722 East McCarty Street, P.O. Box 1645  
Jefferson City, Missouri 65102  
Telephone: (573) 635-6857  
Fax: (573) 635-2314  
www.amec.coop

The Honorable Billy Long  
2454 Rayburn House Office Building  
Washington, DC 20515

Dear Representative Long:

We applaud the Subcommittee on Communications and Technology for holding today's hearing "*Realizing the Benefits of Rural Broadband: Challenges and Solutions.*" Access to broadband for rural Missourians is a priority issue for Missouri's Electric Cooperatives.

The Federal Communications Commission estimates that 23 million rural Americans lack access to high-speed internet. The vast majority live in electric co-op service territories. High-speed internet access is essential to a healthy 21st century rural economy. Broadband access plays a vital role in health care, education and access to global markets.

For more than 75 years, America's electric cooperatives have powered local economies across 56 percent of the nation. Now, nearly 100 electric co-ops across the country are reinvesting in rural America by bringing high-speed internet access to rural homes, businesses, schools and farms. This connectivity serves two key purposes: bridging the digital divide for co-op members and enhancing the co-op business operation network, allowing the co-op and members to adopt emerging energy management technology.

In Missouri, seven of the state's electric cooperatives — United Electric, Ralls County Electric, Co-Mo Electric, Callaway Electric, Barry Electric, SEMO Electric and Pemiscot-Dunklin Electric — are providing or building fiber-to-the-home high speed internet services. In addition, Intercounty Electric Cooperative has purchased an internet provider with plans to expand its service to its members when feasible.

Elsewhere, broadband has been a hot topic at just about every electric cooperative board meeting in the state. Many studies have been undertaken to determine the feasibility of supplying fiber optic internet service to unserved or underserved parts of rural Missouri. In many cases, the numbers just don't work because of extremely low population densities of three people per mile of line or less. Also, the presence of other internet providers already serving any area of higher density makes offsetting these low-density areas impossible.

Even if a Missouri electric cooperative can't provide the service, they are working behind the scenes to eliminate barriers that would prevent others from providing the service. For example, the passage of House Bill 1880 supported by the state's electric cooperatives removes uncertainty for those existing and new services.

The electric cooperatives are motivated by pleas for help like this one from a woman who lives less than a mile from where high-speed internet is available yet is denied service: "The only internet we can get is Century Link which only allows one device at a time. My husband has heart failure and is monitored every evening. My grandchild who is a college student could not use the slow service to connect for online college courses and had to move back to Kansas City to continue his schooling. I am starting an online business in the fall, high speed internet access is a must have to make a rural based company successful."

Existing federal programs have failed to solve the rural broadband problem. We need a new approach. The FCC relies on self-reported and unverified data to determine broadband availability across the nation. This data overestimates the level of service available in rural areas and should not be the sole point of reference to determine if an area is served or unserved. Bridging the digital divide requires an all-inclusive approach to solutions in unserved and underserved areas.

It is critical that these solutions recognize the need for broadband systems to remain viable for years into the future.

**Broadband Policy Recommendations: 4 Success Factors**

1. Additional financing support with a combination of grants and loans.
2. All capable providers with experience in serving rural infrastructure needs should have equal access to federal funding, regardless of technology.
3. Grants should prioritize projects in areas with the lowest population density given that is a prime cost driver for rural broadband deployment.
4. Broadband systems funded with federal money should meet the growing speed and data consumption needs of today and into the future. In today's 21<sup>st</sup> century economy, broadband systems built to 10/1 or slower speeds cannot support a modern household much less attract and retain new businesses.

Missouri's Electric co-ops are committed to improving the quality of life for rural citizens that we serve. We want the flexibility to pursue meaningful solutions for those who lack broadband access. We look forward to continuing the conversation and working together on technology and funding solutions that will enrich the lives of rural American families and businesses.

Sincerely,



Barry Hart  
Executive VP/CEO  
Association of Missouri Electric Cooperatives



## IMPROVING THE NATION'S DIGITAL INFRASTRUCTURE

Paul de Sa, Chief, FCC Office of Strategic Planning and Policy Analysis

### Introduction

This paper aims to contribute to the ongoing discussion about a national-infrastructure plan by highlighting three points relevant to communications, namely:

1. *Improving the nation's digital infrastructure should be a significant part of any national-infrastructure plan, as the economic upside for the country from accelerating investment in broadband is likely greater than from most other areas of infrastructure investment.*
2. *The primary goal of federal actions with respect to digital infrastructure should be to increase and accelerate profitable, incremental, private-sector investment to achieve at least 98% nationwide deployment of future-proofed, fixed broadband networks.*
3. *The policy measures that can be used to achieve this goal are: (i) direct funding support to reduce the cost of capital; (ii) changes to the tax code to increase the return on invested capital, and (iii) operations-related actions that enhance the productivity of capex. A national-infrastructure plan should include initiatives in some, or all, of these categories.*

Each of these points is considered in more detail below.

- 1. Improving the nation's digital-infrastructure should be a significant part of any national-infrastructure plan, as the economic upside for the country from accelerating investment in broadband is likely greater than from most other areas of infrastructure investment.**

Like other forms of infrastructure that were largely built out in the 20<sup>th</sup> century – such as transportation, energy, water and sewage – broadband is a foundation for economic activity across many sectors. But, unlike other potential infrastructure priorities, the public benefits of broadband could grow exponentially in the coming decades, as the nation is just beginning to realize the potential innovation and productivity gains from combining high-bandwidth, low-latency connectivity with massive sensor, computing, and storage capabilities in areas such as:

- *Industry verticals*, including transportation (e.g., autonomous vehicles including trucks, cars, drones), energy, healthcare, and manufacturing.
- *Consumer sectors*, including education and job training, disability access and empowerment, apps, entertainment, and augmented/virtual reality.

- *Government*, including efficient delivery of e-services, public safety, and smart cities.

Unlike most other types of infrastructure, the nation's digital infrastructure is largely corporate owned and generates revenues from paying subscribers. However, the private carriers who invest in broadband capex do not, in general, capture the full benefits of those investments (e.g., the positive externalities of the internet economy and the multipliers from increasing innovation and efficiency in adjacent sectors), so their investment levels are lower and slower than would be optimal for the country.<sup>1</sup> The public-policy challenge, therefore, is to increase largely *private* capital flows to levels consistent with the potential *public* benefits of abundant, ubiquitous broadband without crowding out existing private-sector investment.<sup>2</sup>

**2. The primary goal of federal actions with respect to digital infrastructure should be to increase and accelerate profitable, incremental private-sector investment to achieve at least 98% nationwide deployment of future-proofed, fixed broadband networks.**

As of December 2015, approximately 14% of the ~160m U.S. residential and small-and-medium business locations lack access to 25x3 Mbps-capable fiber-to-the-premise (FTTP) and/or cable service.<sup>3</sup> Achieving ubiquitous fixed-broadband deployment by providing incentives for companies to build out in these areas will have spillover benefits for U.S. leadership in 5G mobile broadband – e.g., because many of the same facilities can be used for high-capacity backhaul, particularly in rural areas that would otherwise lack widely-deployed fiber – as well as for stimulating the economy-wide innovation and productivity gains described above.

We estimate that the total upfront capex required to deploy FTTP to the 14% of locations lacking access would be ~\$80b but, because of the shape of the cost curve, ~98% coverage could be attained for ~\$40b (see *Figure 1*). Unlike the last 2%, moreover, we do not expect these first 12% of locations will require material ongoing support once the network has been built, as subscriber revenues should be sufficient to pay for ongoing network costs.<sup>4</sup>

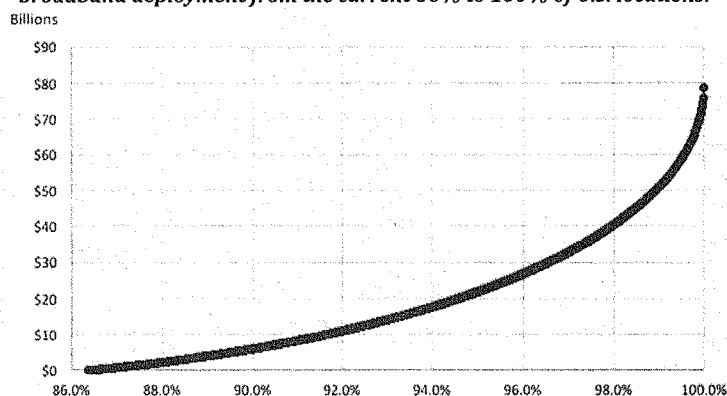
<sup>1</sup> As the focus of this paper is on infrastructure deployment (i.e., supply), it does not directly address competition, pricing, or adoption, which are critical components of a national broadband agenda.

<sup>2</sup> Though states and localities should be free to raise money for government-owned last-mile networks if they so choose (e.g., via general obligation bonds, revenue bonds, and/or tax increases) there are few examples of such initiatives being successful, and no evidence that such efforts will scale-up nationally in the face of the current industry structure in which almost all broadband infrastructure is privately designed, deployed, operated, and owned.

<sup>3</sup> Locations that currently have 25x3 Mbps-capable FTTP or cable likely have a commercial upgrade path to low-latency, gigabit (or faster) service, e.g., as DOCSIS 3.1 is rolled out.

<sup>4</sup> Taking the revenue and cost assumptions used in the Connect America Fund cost models (\$52.50 average monthly revenue per location passed – equivalent to a 70% take rate of a \$75 average-revenue package – and ongoing annual replacement/maintenance capex ≈ 3% of the initial investment). For the locations between 98% and 100%, however, there is not enough addressable revenue to cover ongoing costs, so – in addition to the initial capex – an annual subsidy of ~\$2b would be required to keep the networks operating.

**Figure 1: Estimated cumulative investment required to increase fixed broadband deployment from the current 86% to 100% of U.S. locations.**



Source: [www.fcc.gov/general/connect-america-fund-phase-ii-models](http://www.fcc.gov/general/connect-america-fund-phase-ii-models) (last visited January 16, 2017).

To stimulate infrastructure deployment to these unserved locations, public-policy measures should aim to increase the expected return on incremental investment in these areas relative to the cost of capital. Some potential ways to achieve this are discussed below.

3. The policy measures that can be used to achieve the goal of accelerating private-sector investment to achieve ubiquitous digital infrastructure for the nation are: (i) direct funding support to reduce the cost of capital; (ii) changes to the tax code to increase the return on invested capital, and (iii) operations-related actions to enhance the productivity of capex. A national-infrastructure plan should include initiatives in some, or all, of these categories.

There are three categories of policy measures that can increase and accelerate profitable, incremental private-sector investment in digital infrastructure by enhancing the expected return on incremental invested capital, namely:<sup>5</sup>

- i. Direct funding support to reduce the cost of capital, while avoiding the crowding out of private funding.

As cash is fungible from the recipient's perspective, in principle there is little inherent difference between alternative direct-funding structures (e.g., grants, loans, loan guarantees).<sup>6</sup> The ideal approach would be legislation providing broad funding authority

<sup>5</sup> Not all the initiatives in this section are in the purview of the FCC – some would require Congressional, other federal agency, state, and/or municipal actions.

<sup>6</sup> From the government's perspective it is likely more efficient to subsidize capex directly rather than provide opex support in the hope that it will lead to increased capex.

with the flexibility to choose the public-financing structure that would maximize the leverage from private sources given the capital-market environment at the time of allocation. This flexibility would be easier to institutionalize in some form of infrastructure bank<sup>7</sup> rather than in a dedicated program such as BTOP/BIP or USF.<sup>8</sup>

To avoid displacement of existing capex, recipients of public support could be required to both certify (subject to audit) that projects undertaken with government funding would not have been executed under existing business plans and also contribute matching funds (e.g.,  $\geq 20\%$  of total eligible project costs).

Once the direct funding structure has been decided the three main aspects of a digital infrastructure plan are:

- *Defining the objective of the effort:* For example, the primary objective could be to provide one-time funding for capex to build FTTP to currently unserved locations or for fiber deployment in areas where it will have the most effect in accelerating the roll out of small-cell coverage for mobile 5G.<sup>9</sup>
- *Allocating the funds:* Funding should be allocated as objectively as possible to qualified recipients, potentially via reverse auctions at a national/regional level to the eligible provider who is willing to meet the service requirements at the lowest cost.
- *Oversight of funding recipients:* To ensure that recipients are meeting their commitments on an ongoing basis, an independent third party with the requisite capabilities (e.g., an auditing/accounting firm) should be selected through an RFP and given oversight responsibility.

To help realize the benefits of the multiplier effect in other sectors from abundant, ubiquitous broadband, it could also make sense to set up separate financing pool(s) for deployment that explicitly enable communications-based innovation in industrial, consumer, and government applications. For example, a small percentage of existing government funding (e.g., DOT, FAA, and/or state/city) could be explicitly allocated to support infrastructure for 5G wireless connectivity along roads to facilitate autonomous vehicles;<sup>10</sup> for anchor institutions to enable education, government, and healthcare

<sup>7</sup> For a review of alternative infrastructure-bank structures based on proposals introduced in the 114<sup>th</sup> Congress see "How a National Infrastructure Bank Might Work," Congressional Research Service Insight (September 15, 2016) available at <https://fas.org/spp/crs/misc/IN10572.pdf> (last visited January 16, 2017).

<sup>8</sup> Note that many recipients of USF have significant amounts of debt and so effectively add leverage to the public funding, but likely not in the most efficient way given the pools of capital to which they have access (e.g., requiring high dividend yields).

<sup>9</sup> Estimates of the cost of ubiquitous 5G coverage under different supply and demand assumptions can be found, for example, at: [www.costquest.com/blog/news-and-events/post/the-5g-mobile-ubiquity-price-tag](http://www.costquest.com/blog/news-and-events/post/the-5g-mobile-ubiquity-price-tag) (last visited January 16, 2017).

<sup>10</sup> This should include sensors, as the resulting massive datasets generated on traffic flows – by being open for any third party to analyze (rather than being the proprietary property of the connectivity provider) – would create a virtuous circle for vehicle/application innovation.

applications; and for “Smart Cities,” expanding current initiatives<sup>11</sup> to help local communities tackle challenges such as reducing traffic congestion, fighting crime, fostering economic growth, and improving the delivery of city services. The expertise of the FCC and NTIA could be made available to assist with project selection and execution.

*ii. Tax-related initiatives to increase the return on invested capital.*

Changing the way in which digital infrastructure investments are treated under the tax code would increase potential returns and hence stimulate investment. Areas that should be considered include:

- *Clarifying and accelerating depreciation schedules for broadband-related capex, e.g., on fiber and fiber-related equipment.*
- *Targeting tax credits for broadband-related investments, e.g., by type of investment and/or geography.*
- *Ensuring that direct funding to stimulate capex is treated as a contribution to capital under Section 118 of the Internal Revenue Code rather than as taxable income.*

As recently suggested by Ross & Navarro,<sup>12</sup> the cost of tax credits to encourage infrastructure deployment could be offset against a repatriation tax on overseas retained earnings.

*iii. Operations-related initiatives to enhance the productivity of capex.*

Numerous initiatives could be taken to help remove barriers to the efficient deployment of digital infrastructure, including:

- *Streamlining siting approvals, e.g., for federal, municipal, and tribal properties. As an example, towers that already have at least one antenna could be deemed to have complied with NEPA/NHPA requirements for additional collocations.*
- *Reducing local pre-deployment barriers to reduce deployment costs and delays, e.g., with respect to rights-of-way, dig once, pole-attachment rates, and one-touch make ready.*
- *Promoting shared facilities, for example via municipal-driven incentives to share wireless equipment and fiber facilities.*
- *Improving access to information, e.g., about the location of fiber and rights-of-way access facilities and the procedures, timing, and point of contact for any required governmental reviews.*
- *Smart buying by government, e.g., facilitating commercial deployment in areas that can be served using network builds organized around public anchor institutions.*

<sup>11</sup> [www.whitehouse.gov/the-press-office/2015/09/14/fact-sheet-administration-announces-new-smart-cities-initiative-help](http://www.whitehouse.gov/the-press-office/2015/09/14/fact-sheet-administration-announces-new-smart-cities-initiative-help) (last visited January 16, 2017).

<sup>12</sup> See <http://peternavarro.com/sitebuildercontent/sitebuilderfiles/infrastructurereport.pdf> (last visited January 16, 2017).

- *Establishing more effective build-out conditions*, so that spectrum assets are put to productive use and redlining is prevented.
- *Improving inter-agency processes and cooperation* targeted at realizing benefits from incorporating broadband in other areas of the economy – industrial, consumer, government – for example via closer coordination between the FCC and DOT to accelerate the deployment of mobile coverage along roads.

The FCC can undertake many of these initiatives without any change in law – for example, the Commission’s Wireless Telecommunications Bureau recently sought comment on how federal law applies to local government review of wireless facility siting applications and local requirements for gaining access to rights of way.<sup>13</sup>

Congress may wish to consider additional initiatives to remove barriers to broadband deployment. The Appendix to this paper contains several areas for potential legislative action.

January 17, 2017

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<sup>13</sup> See *Comments Sought on Mobilitie, LLC Petition for Declaratory Ruling and Possible Ways to Streamline Deployment Of Small Cell Infrastructure*, Public Notice, DA 16-1427 (Wireline Tel. Bur. December 22, 2016), available at: [www.fcc.gov/document/fcc-seeks-comment-mobilitie-petition-small-cell-deployment](http://www.fcc.gov/document/fcc-seeks-comment-mobilitie-petition-small-cell-deployment) (last visited January 16, 2017).

**APPENDIX: POTENTIAL LEGISLATIVE PROPOSALS TO PROMOTE WIRELESS  
INFRASTRUCTURE**

**1. “Deemed Granted” Remedy for Local Reviews not Completed Within a Reasonable Period of Time.**

47 U.S.C. §332(c)(7)(B) requires State and local governments to act on wireless-infrastructure-deployment applications “within a reasonable period of time,” and the FCC has established that, as a general matter, the maximum “reasonable” amounts of time for action are 90 days for collocation applications and 150 days for applications involving facilities other than collocations.

In large part because the statute specifies a judicial remedy for anyone “adversely affected by any final action or failure to act by a State or local government,” the FCC has not adopted a “deemed granted” remedy for failure to act within a reasonable time. The siting proponent therefore has the burden of obtaining a judicial ruling. Shifting that burden to the tower opponent would promote certainty and expeditious resolutions.

***Proposed legislative approach:** Amend Section 332(c)(7)(B)(v) to remove the judicial remedy as the avenue for relief, replacing it with an express “deemed granted” remedy together with a provision allowing any party opposed to the “deemed granted” to seek judicial relief.*

**2. Touch Once Make-Ready/Climb Once/Dig Once.**

Broadband-infrastructure deployment projects often entail significant excavation and construction, and multiple parties may undertake construction in the same place at different times. One-touch make ready policies (sometimes referred to as “climb once” or “dig once”) try to avoid delay and redundancy by having all make-ready work (such as rearranging several existing attachments) performed at the same time by a single crew.

***Proposed legislative approach:** Support one-touch legislation that has previously been introduced.*

**3. Exempting Small Cell Deployments from Historic and Environmental Review.**

Small-cell and DAS antennas are much smaller and less obtrusive than traditional macro-cell deployments. For that reason, the FCC has already taken steps to streamline the historic and environmental review of such antennas, and to exclude some from review altogether, but is limited in what it can do without agreement from the Advisory Council on Historic Preservation.

***Proposed legislative approach:** Exclude from the historic and environmental review processes all collocations on existing structures that meet a size threshold, or are minimally visible from public spaces.*

**4. Municipally-Owned Poles.**

Section 224 of the Communications Act requires investor-owned utilities to provide telecom carriers and cable systems with access to poles, ducts, conduits, and rights of way, but municipally and coop-owned poles are not subject to those requirements.

***Proposed legislative approach:*** Remove the exemption for municipal and coop-owned facilities.

**5. Pole-Attachment Fees.**

Having different statutory rate formulas for pole attachments by cable systems and telecom carriers has led to many issues over the years. The FCC has acted to harmonize the two formulas, but litigation on this matter is ongoing. Eliminating the disparity in the statute would eliminate any dispute over how to calculate attachment fees.

***Proposed legislative approach:*** Amend Section 224 to eliminate the telecom rate (Section 224(e)) and make the cable rate (Section 224(d)) applicable to all pole attachments.



*The Voice of America's Broadband Providers*

**Letter for the Record**

July 17, 2018

House Energy and Commerce Committee  
Subcommittee on Communications and Technology  
Hearing: "Realizing the Benefits of Rural Broadband: Challenges and Solutions."

Dear Chairman Blackburn, Ranking Member Doyle, and members of the Subcommittee:

Thank you for the opportunity to supplement the record of your hearing with our appreciation for the work the Subcommittee has done under the leadership of Chairman Blackburn to address the challenges we face in closing the digital divide.

ITTA member companies serve some of the most rural parts of our country.<sup>1</sup> Our members include price cap companies and rate of return companies operating under legacy mechanisms and those participating in the A-CAM program. Collectively, our member companies require a regulatory environment that promotes investment while guaranteeing certainty. We applaud the work this Subcommittee has done to help ensure that the appropriate regulatory environment is maintained.

As the Subcommittee continues to examine challenges to closing the digital divide, ITTA encourages it to focus on ensuring that the high-cost program of the federal Universal Service Fund ("USF") remains robust and able to adapt to meet the challenges of providing next-generation broadband services to consumers in rural America.

Thank you, Chairman Blackburn, for your continued work to ensure that all Tennessee consumers and the rest of rural America have access to broadband. ITTA looks forward to continuing to work with you and the members of the Subcommittee on this important issue.

Sincerely,

A handwritten signature in black ink, appearing to read "Paul Raak", with a stylized flourish at the end.

Paul Raak  
Vice President, Legislative Affairs  
ITTA – The Voice of America's Broadband Providers

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<sup>1</sup> The members of ITTA provide a broad range of high-quality broadband, wireline and wireless voice, video, and other communications services on a wholesale and retail basis to residential and business customers in predominantly rural areas across almost all 50 states.



Wireless  
Infrastructure  
Association

July 17, 2018

The Honorable Marsha Blackburn  
Chairman, Subcommittee on Communications and Technology  
Committee on Energy and Commerce  
United States House of Representatives  
Washington, D.C. 20515

Dear Chairman Blackburn:

On behalf of the Wireless Infrastructure Association (WIA), I would like to express strong support for your efforts to ensure that rural communities enjoy the benefits of wireless broadband. WIA is the principal organization representing the companies that build, design, own, and manage wireless facilities in the U.S. and throughout the world. Our mission is to expand wireless broadband everywhere.

Today's hearing, entitled, "Realizing the Benefits of Rural Broadband: Challenges and Solutions," will examine how to deliver broadband to all Americans. I am especially pleased that WIA member Deere & Company is testifying on the importance of rural broadband and the great work the company is doing to promote the use of technology to improve US agricultural production and efficiency.

The importance of expanding rural broadband cannot be overstated. Rural areas will benefit tremendously from broadband. As such, it is important for the public and private sector to work together to ensure that buildout can accelerate in these areas and that no community is left behind. WIA and its members stand ready and willing to work with Congress to ensure that no American community is left behind.

Thank you again for your efforts and the efforts of your Subcommittee in bring broadband to rural communities. WIA remains committed to delivering next generation wireless broadband to all communities and looks forward to working with this Subcommittee.

Sincerely,

A handwritten signature in black ink, appearing to read "Jonathan Adelstein".

Jonathan Adelstein  
President and CEO  
Wireless Infrastructure Association



800 10th Street, NW  
Two City Center, Suite 400  
Washington, DC 20001-4956  
(202) 638-1100 Phone  
www.aha.org

**Statement  
of the  
American Hospital Association  
for the  
Energy and Commerce Subcommittee on Communications and Technology  
of the  
U.S. House of Representatives**

**“Realizing the Benefits of Rural Broadband: Challenges and Solutions”**

**July 17, 2018**

On behalf of our nearly 5,000 member hospitals, health systems, and other health care organizations, and our clinician partners – including more than 270,000 affiliated physicians, 2 million nurses and other caregivers – and our 43,000 health care leaders who belong to our professional membership groups, the American Hospital Association (AHA) appreciates the opportunity to provide comments on the benefits of broadband and telehealth and actions Congress could take to increase access for communities across the country, especially in rural areas and vulnerable urban communities.

About 60 million Americans live in rural parts of the United States, and many of them have inadequate or reduced access to health care services. As detailed in AHA’s Task Force on Ensuring Access in Vulnerable Communities Report, lack of access makes it difficult for millions of rural Americans to get preventive health care services, leaving them and their communities susceptible to fragmented, episodic care and poorer health outcomes.<sup>1</sup> Broadband-enabled telehealth solutions can help bridge the rural health care access gap. This is also important for under-served and vulnerable urban communities.

Access to reliable, affordable, and high-bandwidth broadband is essential to the delivery of modern health care. Electronic health records, technology-based patient engagement strategies, health information sharing for coordinated care, and remote-monitoring technologies all require robust broadband connections. Such telehealth technologies can help overcome many of the



obstacles to health care delivery that particularly confront isolated rural communities and vulnerable urban communities. Telehealth offers enormous potential to improve access to certain services and improve patient outcomes through use of new technologies, such as remote patient monitoring (RPM) and access to specialty services, including mental health and addiction services.

We appreciate recent steps Congress has taken to strengthen access to broadband in rural areas, including additional funding for new pilot programs. However, according to the Federal Communications Commission (FCC), tens of millions of Americans still lack access to adequate broadband, and rural communities are more likely to be in need. Additional actions will further enable hospitals and health systems to meet the needs of their patients and communities through use of advanced communications technologies.

#### **IMPORTANCE OF FCC'S RURAL HEALTH CARE PROGRAM**

The Rural Health Care (RHC) Program is essential to providing affordable broadband access to rural health care providers and supporting telehealth services that improve health outcomes in rural communities.

The AHA was pleased that the FCC recently voted to increase the program's annual cap to \$571 million after the cap remained static at \$400 million for more than 20 years. The increase represents what the funding level would be today had the cap, which was established in 1997, included an inflation adjustment. Going forward, the cap will be adjusted annually for inflation and allow unused funds from prior years to be carried forward to future years. These changes will enable rural health care providers to expand broadband connections in their communities.

We would encourage the FCC to conduct a systematic review of future needs for funding, given the growing use of health IT across the health care landscape. There are several other modifications that are needed to streamline and greater incentivize program participation. Specifically, the AHA recommends:

- **Allowing remote patient monitoring to be included as an eligible expense.** Remote monitoring enables providers to better manage care for patients with chronic conditions by increasing provider oversight to ensure compliance with treatment plans, pre-empting acute episodes and, for recently-discharged patients, reducing the likelihood of disruption and unnecessary readmissions.
- **Continuing existing policies that encourage provider participation in health care consortia, including non-rural and for-profit hospitals.** Many participants in the Healthcare Connect Fund (HCF) are part of health care provider consortia that facilitate the process of program participation and contracting for broadband services. These consortia serve a valuable role as they connect rural members with specialists who are often located in urban areas and facilitate rural adoption of communications-based trends in health care delivery, such as the move towards electronic health records. The FCC has considered increasing the share of consortia members that must be rural, which risks

making them less effective. The AHA also recommends that Congress act to allow for-profit entities in rural areas to benefit from the program. At a minimum, the FCC also should allow for-profit entities to participate in consortia, even if they cannot receive funding.

- **Addressing concerns over program efficiency and integrity while ensuring that health care providers continue to receive support necessary to meet growing demands.** The AHA supports ensuring that health care providers have the ability and incentives to efficiently select services that meet their connectivity demands at affordable rates. Congress should ensure that the FCC takes steps to identify any unjustified increases in pricing that drive up program costs; however, the FCC's policy response cannot be to increase the out-of-pocket expenses for health care providers.

**Revising the definition of "rural" to be more inclusive.** The definition used by the FCC to determine whether health care providers are "rural" and, therefore, eligible for support, is quite restrictive. Other federal agencies, such as the Health Resources and Services Administration's Office of Rural Health Policy, have adopted alternative definitions of rural that may be more inclusive and equitable. The AHA recommends Congress urge the FCC to evaluate the current definition and whether an alternative approach would be more inclusive, equitable and consistent with program objectives. The goal of the program should be to support all health care providers that provide essential health care services to individuals who reside in rural areas, notwithstanding their status according to the census.

- **Streamlining administration of the RHC Program.** The AHA's members cite administrative burdens among the highest barriers to RHC Program participation. It is important to ensure integrity of the program, but, in doing so, the FCC must not impose unnecessarily onerous administrative burdens. A program that is too administratively burdensome will discourage health care providers from participating. Congress should urge the FCC to streamline and upgrade the RHC Program for those who participate so the available funds can be fully deployed in support of a broadband-connected rural health care system.

We also are pleased that the FCC is considering whether to establish a new \$100 million Connected Care Pilot Program to support telehealth for low-income Americans, especially those living in rural areas and veterans. We support creation of such a program, as long as it is separately funded, and does not compete with the Rural Health Care Program.

#### **BROADBAND-ENABLED TELEHEALTH SERVICES IMPROVE HEALTH OUTCOMES FOR UNDERSERVED RURAL AREAS**

It is increasingly vital for health care providers to have reliable and robust broadband connections to manage daily operations and critical telehealth applications. Telehealth connects patients to vital health care services through videoconferencing, remote monitoring, electronic consults and wireless communications. Electronic health records enable efficient exchange of patient and treatment information by allowing providers to access digital copies of patients'

information, improving the continuity of care and reducing redundancies in treatment.<sup>ii</sup> Remote patient monitoring uses electronic communication to collect and transmit personal and medical data to remote health care providers, allowing providers to monitor a patient's health in real time after the patient has left the health care facility. New and innovative mobile health applications enable better patient-provider communications, encourage better patient self-management and health literacy, and promote positive changes in health and lifestyle.<sup>iii</sup> Telemedicine and mHealth are rapidly emerging as cost-effective solutions to overcoming many of the obstacles to health care delivery faced in isolated communities.

### **Challenges Expanding Access to Telehealth and Recommended Solutions**

According to AHA survey data, more than three-fourths of U.S. hospitals are using or implementing solutions to connect with patients and consulting practitioners at a distance through video and other technology. However, there are many barriers to wide use of telehealth. Coverage for telehealth services by public and private payers varies significantly, and whether payers cover and adequately reimburse providers for telehealth services is a complex and evolving issue. Absent adequate reimbursement and revenue streams, providers may face obstacles to investing in these technologies, especially hospitals that serve vulnerable rural and urban communities – where the need for these services may be the greatest. The challenge of cross-state licensure also looms as a major issue.

For example, while recent legislation expanded Medicare coverage for telehealth services for stroke patients, and the Centers for Medicare & Medicaid Services has proposed incremental increases in coverage, Medicare still limits coverage and payment for many telehealth services, lagging behind other payers. Current statute restricts telehealth services to patients located in rural areas and in specific settings (such as a hospital or physician office), covers only a limited number of services, and allows only real-time, two-way video conference capabilities. The AHA urges Congress to remove Medicare's limitations on telehealth by:

- eliminating geographic and setting requirements so patients outside of rural areas can benefit from telehealth;
- expanding the types of technology that can be used, including remote monitoring;
- covering all services that are safe to provide, rather than a small list of approved services; and
- including telehealth in new payment models.

Many hospitals and health systems also find that the infrastructure costs for telehealth – such as video conferencing equipment, adequate and reliable connectivity to other providers and staff training – are significant. Congress has provided funding for rural telehealth programs, but greater support is necessary. Another barrier is the need for physicians to be separately licensed in each state where a patient is located, which can be costly and administratively burdensome if a telehealth program operates in multiple states. To address this challenge, 22 states have signed onto the Interstate Medical Licensure Compact, which expedites cross-licensure among participating states.

Research and experience under the Medicare program suggest that policymakers' concerns about increased access to telehealth leading to increased spending may be overstated, particularly when weighed against the potential benefits in quality, patient experience and efficiency. However, there are insufficient studies on the cost- versus benefits of telehealth outside of a limited number of services, such as telestroke. More and better research is needed for other conditions and newer technologies, such as remote monitoring of patients.

The health care field is quickly moving from fee-for-service to a value-based delivery system. Success in new payment models, such as bundling, accountable care organizations and new physician payment models, will require flexibility to deploy telehealth, particularly as part of care management programs. CMS has shown some willingness to provide waivers, and Congress has expanded the ability of some accountable care organizations to use telehealth, but only in limited circumstances.

## CONCLUSION

Ensuring vulnerable communities in rural and urban areas can take full advantage of the benefits of telehealth solutions requires access to reliable and affordable broadband connections. Telehealth is changing health care delivery. Through videoconferencing, remote monitoring, electronic consultations and wireless communications, telehealth expands patient access to care while improving patient outcomes and satisfaction. Telehealth offers a wide-range of benefits, such as immediate access to care, less expensive and more convenient care options and improved care outcomes. The AHA appreciates the Subcommittee's focus on the importance of expanding broadband connectivity and removing barriers to improved access to health care through technology and telehealth.

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<sup>1</sup> AHA, Task Force on Ensuring Access in Vulnerable Communities (Nov. 29, 2016), <https://www.aha.org/system/files/content/16/ensuring-access-taskforce-report.pdf> ("AHA Vulnerable Communities Report").

<sup>18</sup> The Office of the National Coordinator for Health IT reports that nearly five out of every six hospitals have adopted a basic electronic health records system.

<sup>19</sup> Frequently Asked Questions, HealthIT, <https://www.healthit.gov/providers-professionals/frequently-asked-questions/486#id155> (last accessed Jan. 25, 2018).



July 17, 2018

The Honorable Marsha Blackburn  
Chairman  
Subcommittee on Communications and  
Technology  
U.S. House of Representatives  
2125 Rayburn House Office Building  
Washington, DC 20515

The Honorable Mike Doyle  
Ranking Member  
Subcommittee on Communications and  
Technology  
U.S. House of Representatives  
2322A Rayburn House Office Building  
Washington, DC 20515

Dear Chairman Blackburn and Ranking Member Doyle:

Thank you for holding today's House Energy and Commerce Subcommittee on Communications and Technology hearing, "Realizing the Benefits of Rural Broadband: Challenges and Solutions." Broadband providers appreciate your continued focus on and commitment to the critical issue of broadband infrastructure deployment to expand opportunities for all Americans.

Addressing our nation's infrastructure needs, including our digital infrastructure, is a critical national priority. This subcommittee has played an important role leading the conversation by introducing legislation that prioritizes parity through technical neutrality and carefully tailored mechanisms that rightly focus federal attention on connecting the unserved areas in our country.

USTelecom and its members seek to ensure that any new federal infrastructure investment program supports broadband by maximizing consumer benefits, minimizing cost, producing results quickly, and ensuring accountability. This includes not only leveraging existing federal expertise in promoting and sustaining broadband access but also making available sufficient resources to meet the challenges of establishing and sustaining robust broadband in rural America.

As the committee continues its work on these issues, I encourage you to ensure sustainable and direct federal funding to support rural broadband deployment and responsibly reduce regulatory barriers, both of which will also incentivize more private investment. USTelecom and its member companies look forward to working with you to help close the digital divide. As we continue the sprint toward the next generation of communications networks, your leadership in maintaining policy frameworks to spur continued investment, innovation and deployment will help expedite the realization of a fully connected future for all.

Sincerely,

Jonathan Spalter



July 17, 2018

The Honorable Marsha Blackburn  
Chairman  
House Energy and Commerce Committee  
Subcommittee on Communications and Technology  
2125 Rayburn House Office Building  
Washington DC, 20515

The Honorable Michael Doyle  
Ranking Member  
House Energy and Commerce Committee  
Subcommittee on Communications and Technology  
2322A Rayburn House Office Building  
Washington DC, 20515

Dear Chairman Blackburn and Ranking Member Doyle:

On behalf of the nearly 850 small, rural broadband network providers represented by NTCA—The Rural Broadband Association, thank you for your subcommittee's work on rural broadband issues during the 115<sup>th</sup> Congress.

As the members of this subcommittee know well, it is difficult, if not impossible, to make the business case for broadband network deployment and ongoing operations through much of rural America due to the challenges of distance, population density, and the high costs of deploying, maintaining, and upgrading networks—challenges that are often compounded by cumbersome and duplicative state and federal permitting requirements.

This subcommittee and its individual members have already made many significant efforts to help address these challenges through the introduction and consideration of numerous common-sense measures. As I mentioned in January while testifying before your subcommittee, reducing the costs and time associated with deployment would—together with additional resources to make the business case for investment—allow our small providers to get back to the business of building broadband across rural America. Through ideas generated by this subcommittee, even as more remains to be done to secure our nation's broadband future, Congress has already passed bipartisan policies that will benefit rural Americans by increasing access to world-class broadband and reducing the digital divide.

Thank you for your leadership. We look forward to continuing to work with you on these issues.

Sincerely,

Shirley Bloomfield  
Chief Executive Officer



July 17, 2018

The Honorable Marsha Blackburn  
 Chairman  
 Committee on Energy and Commerce  
 Subcommittee on Communications and Technology  
 U.S. House of Representatives  
 Washington, District of Columbia 20515

The Honorable Mike Doyle  
 Ranking Member  
 Committee on Energy and Commerce  
 Subcommittee on Communications and Technology  
 U.S. House of Representatives  
 Washington, District of Columbia 20515

Dear Chairman Blackburn and Ranking Member Doyle,

We commend you for holding today's hearing, "Realizing the Benefits of Rural Broadband: Challenges and Solutions." Representing more than 5,000 app developers and connected device companies in a \$950 billion industry that employs 4.7 million Americans, ACT | The App Association cares deeply about rural broadband deployment. We applaud the Subcommittee for driving attention to the added productivity and life-saving benefits broadband brings to rural communities and the paths to realize those benefits.

The benefits of rural broadband deployment are especially pronounced in the healthcare context. The University of Mississippi Medical Center (UMMC)—a steering committee member of the App Association's Connected Health Initiative—has used its telehealth and remote patient monitoring programs to produce substantial healthcare savings and improved patient outcomes. However, UMMC continues to encounter the frustrating obstacle of inconsistent broadband service in Mississippi. UMMC serves a variety of remote patients with serious chronic conditions, but many report their inability to download or upload even small amounts of data unless they go to a local McDonald's, or in some cases, a nearby hilltop. Incidentally, many of these rural and semi-rural patients experience much higher rates of chronic illness than their urban counterparts, and they could substantially benefit from in-time notices and real-time data uploads for their physician to review. This means that broadband at *home* is especially important and offers greater opportunities for this community.

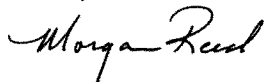
As Chairman Blackburn noted, the Subcommittee has set its sights on reauthorizing the National Telecommunications and Information Administration (NTIA), and this hearing offers a timely opportunity to explore how NTIA can help bridge the digital divide. We believe NTIA is poised to contribute to broadband mapping to better understand the

extent of broadband access across the country. In fact, NTIA recently opened a request for comment (RFC) seeking feedback in several areas including the location of existing broadband datasets, how best to ensure uniformity across the data NTIA reports, and how to validate collected data.

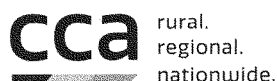
As NTIA moves forward with its proceeding, it is important to note that the Federal Communications Commission (FCC) is also taking positive steps to improve broadband deployment data collection, including suggesting adjustments to its Form 477 filings. For example, the FCC asks whether it should require internet service providers (ISPs) to indicate whether they have subscribers in a given census block and whether additional subscribers could be added within a standard interval. The NTIA notes, "the United States is divided into over 11 million blocks, 95 percent of which do not exceed 1 square mile in land area . . ." suggesting that reporting at the census block level provides a high level of geographic granularity. We agree that Census Block level reporting is geographically granular. However, we support the FCC's proposed update to better indicate where subscribers currently exist and could be added quickly. Such an update would be an improvement over the current data collected, which indicates in which Census Blocks ISPs make broadband "available." We are also supportive of efforts at NTIA and the FCC to collect and report on broadband deployment data that show more visually—such as with shapefiles or rasters—where subscribers exist, where they are not, and where they could quickly be connected. We have found this kind of data to be more useful from a data visualization perspective.

We applaud this Subcommittee for continuing to explore the benefits of rural broadband and the challenges to its deployment. The near-trillion-dollar app economy depends on broadband to run, and Americans across the country rely on reliable access to reap the benefits of telehealth, remote services, and the full complement of innovations our members create. Accurate broadband mapping is crucial to successfully implementing Connect America Fund-supported and industry-led efforts to deliver broadband to rural and unserved parts of the country, using a mix of last-mile technologies from wireline to licensed and unlicensed wireless deployment. We must understand where those communities are and what their needs may be, which can only be done with the implementation of comprehensive, granular, and accurate broadband coverage maps. We look forward to serving as a resource for this Subcommittee on this endeavor going forward.

Sincerely,



Morgan Reed  
President  
ACT | The App Association



July 17, 2018

The Honorable Marsha Blackburn  
Chairman  
Subcommittee on Communications and Technology  
Committee on Energy and Commerce  
U.S. House of Representatives  
2125 Rayburn House Office Building  
Washington, D.C. 20515

The Honorable Mike Doyle  
Ranking Member  
Subcommittee on Communications and Technology  
Committee on Energy and Commerce  
U.S. House of Representatives  
2322A Rayburn House Office Building  
Washington, D.C. 20515

Dear Chairman Blackburn and Ranking Member Doyle:

Competitive Carriers Association (CCA)<sup>1</sup> commends the House Committee on Energy and Commerce Subcommittee on Communications and Technology ("Subcommittee") for holding today's important hearing on "Realizing the Benefits of Rural Broadband: Challenges and Solutions," and its continued focus on policies that support preserving and expanding mobile broadband services in rural America. As I have testified before this Subcommittee, mobile broadband is a powerful economic driver and critical for full participation in today's connected world, fueling benefits for rural consumers, schools, health care facilities, public safety, precision agriculture, and businesses of all sizes. Consumers in North America are already using 2.5 exabytes of mobile data each month, an amount that the recent Ericsson Mobility Report expects to skyrocket to a staggering 19 exabytes a month by 2023. To meet these exponentially growing demands for mobile data and realize the benefits of next generation networks, policymakers must remain focused on addressing broadband infrastructure deployment challenges and make certain that rural America is not left behind.

CCA thanks the Subcommittee for its bipartisan leadership to address several broadband deployment issues, and applauds the many accomplishments reflected by legislative efforts this Congress that are now law. In particular, CCA appreciates several legislative proposals enacted into law as part of the Repack Airwaves Yielding Better Access to Users of Modern Services Act of 2018, or RAY BAUM'S Act. The Rural Wireless Access Act will take steps to standardize mobile coverage data for purposes of Universal Service Fund programs or similar programs. The Spectrum Auctions Deposits Act removed a barrier to conducting critical spectrum auctions to keep up with consumer demand for mobile broadband services. The Viewer Protection Act will provide certainty to broadcasters and carriers that the 600 MHz band repack will take place on or ahead of schedule and with sufficient resources to put this spectrum to use to serve consumers. The Rural Spectrum Accessibility Act will incentivize carriers to make otherwise unused spectrum available for service in rural areas. The SANDy Act will help keep Americans safe in times of disaster. These are all key policies, and consumers will benefit from the Subcommittee's work to enact them into law.

<sup>1</sup> CCA is the nation's leading association for competitive wireless providers and stakeholders across the United States. CCA's membership includes nearly 100 competitive wireless providers ranging from small, rural carriers serving fewer than 5,000 customers to regional and national providers serving millions of customers. CCA also represents associate members including vendors and suppliers that provide products and services throughout the mobile communications supply chain.

COMPETITIVE CARRIERS ASSOCIATION

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Despite these important steps, challenges to ubiquitous mobile broadband availability remain. CCA stands ready to work with the Subcommittee to continue progress to close the digital divide and provide all Americans with the latest mobile broadband services. That includes continued work on several bills currently pending before Congress, including:

- *H.R. 2903, the Rural Reasonable and Comparable Wireless Act of 2017;*
- *H.R. 6017, the Supplementing the Pipeline for Efficient Control of The Resources for Users Making New Opportunities for Wireless Act (SPECTRUM NOW Act);*
- *H.R. 4953, the Advancing Innovation and Reinvigorating Widespread Access to Viable Electromagnetic Spectrum Act (AIRWAVES Act); and,*
- *H.R. 1546, the Streamlining Permitting to Enable Efficient Deployment of Broadband Infrastructure Act of 2017 (SPEED Act).*

CCA urges the Subcommittee to build on legislative successes this year and continue to take concrete steps to provide all Americans, particularly those in rural America, with the benefits mobile broadband connectivity brings. To help close the digital divide, all carriers require sufficient access to spectrum, the invisible infrastructure that powers our industry, certainty and commonsense policies regarding broadband infrastructure deployment, and sufficient Universal Service Fund support based on reliable data. CCA commends the Subcommittee for its leadership on these issues, and looks forward to continued collaboration with the Subcommittee, Congress, the FCC, and the Administration to realize the benefits of rural broadband.

Please do not hesitate to contact CCA with any questions.

Sincerely,



Steven K. Berry  
President & CEO  
Competitive Carriers Association

CC: Chairman Greg Walden, House Committee on Energy and Commerce  
Ranking Member Frank Pallone, House Committee on Energy and Commerce



July 17, 2018

The Honorable Marsha Blackburn  
Chairman, Subcommittee on Communications and Technology  
House Energy and Commerce Committee  
2125 Rayburn House Office Building  
Washington, DC 20515

The Honorable Mike Doyle  
Ranking Member, Subcommittee on Communications and Technology  
House Energy and Commerce Committee  
2322A Rayburn House Office Building  
Washington, DC 20515

**Re: Hearing on "Realizing the Benefits of Rural Broadband: Challenges and Solutions" – Statement on State & Local Roles in Bolstering Connectivity**

Dear Chairman Blackburn and Ranking Member Doyle,

The Advanced Communications Law & Policy Institute (ACLP) at New York Law School respectfully submits the following comments regarding issues implicated by the Subcommittee's hearing on "Realizing the Benefits of Rural Broadband: Challenges and Solutions." We respectfully request that these comments be accepted into the record.

The Subcommittee is to be commended for its leadership in exploring the myriad issues impacting broadband connectivity in the United States. Under Chairman Blackburn's guidance, the Subcommittee has addressed a number of these issues, helping to bolster the availability and adoption of broadband across the country.

Should you have any questions, please do not hesitate to contact us.

Respectfully submitted,

/s/ Charles M. Davidson  
CHARLES M. DAVIDSON, DIRECTOR

/s/ Michael J. Santorelli  
MICHAEL J. SANTORELLI, DIRECTOR

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**To:** The Honorable Chairman Blackburn and the Honorable Ranking Member Doyle,  
Communications & Technology Subcommittee, U.S. House of Representatives

**From:** Charles M. Davidson & Michael J. Santorelli, ACLP at New York Law School

**Re:** Hearing on “Realizing the Benefits of Rural Broadband: Challenges and  
Solutions” – Statement on State & Local Roles in Bolstering Connectivity

**Date:** July 17, 2018

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The House Communications & Technology Subcommittee is to be commended for its leadership in exploring the array of issues impacting the deployment and use of broadband technology in the United States. Today’s hearing on “Realizing the Benefits of Rural Broadband: Challenges and Solutions” shines a light on a critical set of issues in the ongoing campaign to bring high-speed internet access to every corner of the country. **Section 1** below highlights the substantial progress made to date: as the FCC recently reported, 98.1% of the country has access to either fixed broadband service at 25 Mbps/3 Mbps or mobile service at 10 Mbps/3 Mbps.<sup>1</sup> However, in rural areas, that figure drops to 89.7%.<sup>2</sup>

There are myriad reasons why this urban-rural broadband gap exists. As Chairman Blackburn has rightly noted, numerous regulatory and policy barriers impede the ability of service providers to efficiently deploy broadband services to rural parts of the country, driving up the already high costs associated with building out infrastructure to less densely populated areas.<sup>3</sup> Indeed, the economics of rural broadband deployment are challenging,<sup>4</sup> necessitating an “all of the above” strategy that leverages targeted federal subsidies, well-designed state grant programs, and local leadership to streamline the build-out process.<sup>5</sup>

Municipal broadband is often among the menu of options discussed by policymakers for bolstering broadband connectivity. As discussed in **Section 2**, government-owned

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<sup>1</sup> See *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, 2018 Broadband Deployment Report, at Table 3d, GN Docket No. 17-199 (Feb. 2, 2018), <https://docs.fcc.gov/public/attachments/FCC-18-10A1.pdf> (“2018 Broadband Deployment Report”).

<sup>2</sup> *Id.*

<sup>3</sup> See, e.g., Michael Collins, *Congress Prepares to Knock Down Barriers to Broadband Expansion in Rural America*, Jan. 11, 2018, USA Today, <https://www.usatoday.com/story/news/politics/2018/01/11/congress-prepares-knock-down-barriers-broadband-expansion-rural-america/1020426001/>.

<sup>4</sup> For a recent analysis, see Steve G. Parsons and James Stegeman, *Rural Broadband Economics: A Review of Rural Subsidies*, CostQuest Associates (July 2018), <https://www.ustelecom.org/sites/default/files/documents/Rural%20Broadband%20Economics%20-%20A%20Review%20of%20Rural%20Subsidies.pdf>.

<sup>5</sup> See, e.g., Charles M. Davidson & Michael J. Santorelli, *Understanding the Debate over Government-Owned Broadband Networks: Context, Lessons Learned, and a Way Forward for Policy Makers*, at p. 109-138, ACLP at New York Law School (June 2014), <http://www.nyls.edu/advanced-communications-law-and-policy-institute/wp-content/uploads/sites/169/2013/08/ACLP-Government-Owned-Broadband-Networks-FINAL-June-2014.pdf> (“Understanding the Debate”).

broadband networks (GONs) are incredibly expensive and risky endeavors that have yet to demonstrate a track-record of financial viability or competitive sustainability. Moreover, from the perspective of improving broadband availability, a GON is rarely a panacea. A number of previously touted networks have failed spectacularly, leaving taxpayers in states across the country with enormous debts to pay down. Other systems have struggled mightily to compete with nimbler private providers, forcing cities to prop up their networks by dipping into general tax revenues. In some instances, local efforts to deploy a GON can tilt the playing field in favor of the new, publicly financed system. Consumers are often left worse off, as the energy and resources expended in the pursuit of a GON could likely have been put to more productive uses both within the broadband context and elsewhere in the local economy.<sup>6</sup>

In recognition of these dynamics, and in an effort to protect taxpayers, some 20 states have implemented legislative frameworks to guide the decision-making of their municipal subdivisions vis-à-vis GONs. Chairman Blackburn has been a staunch defender of the rights of states to act in this manner.<sup>7</sup> As discussed in **Section 3**, it is critical that states continue to play an active role in overseeing responsible broadband policy within their borders. But such action by states in the broadband context need not be limited to GONs. As discussed in **Section 4**, there are numerous roles for states to play in improving broadband connectivity. Similarly, in lieu of a GON, there are many impactful ways in which local officials can influence the build-out of next-generation broadband networks.

As an overview, the discussion below is structured as follows:

1. Brief overview of U.S. broadband deployment dynamics (p. 3);
2. GON models, examples, and risks (p. 5);
3. States' interests in overseeing the responsible deployment of broadband within their borders (p. 14); and
4. Effective broadband planning and policymaking at the state and local levels (p. 16).

\* \* \* \* \*

<sup>6</sup> Such opportunity costs are especially relevant in the context of other infrastructure projects – repairing roads, building schools, etc. – that might benefit from funds used for a GON. *See Understanding the Debate*.

<sup>7</sup> See, e.g., Press Release, *Blackburn, Tillis Introduce Bill to Stop FCC From Trampling on States' Rights*, Feb. 26, 2015, Office of Rep. Marsha Blackburn, <https://blackburn.house.gov/news/documentsingle.aspx?DocumentID=397689>.

# 1. CONTEXT: U.S. BROADBAND DEPLOYMENT DYNAMICS

The broadband success story in the United States is due in large part to the careful development and effective implementation of a *bipartisan, minimalist, national regulatory framework*, an approach that has encouraged the investment of significant sums of risk capital in network infrastructure by private firms. At the core of this framework is Congress's simple mandate to keep the Internet "unfettered by Federal or State regulation."<sup>8</sup> For much of the past two decades, adherence to this ethos has facilitated an enormous amount of investment – **in excess of \$1.6 trillion** – in broadband network infrastructure.<sup>9</sup> These investments and the competition that has attended the development of the U.S. broadband market has yielded impressive results:

- Over 92% of the U.S. population has access to a fixed broadband connection of at least 25/3 Mbps, up from 81% in 2012.<sup>10</sup>
- Mobile broadband deployment continues to be robust, with 99% of the U.S. population, including 98% of those living in rural areas, able to access a mobile connection of at least 5/1 Mbps.<sup>11</sup> Those numbers drop to 87.3% and 70%, respectively, for mobile connections of at least 10/3 Mbps.<sup>12</sup>
- An urban-rural broadband gap remains, with only 69% of the rural population having access to a fixed 25/3 Mbps connection.<sup>13</sup> But significant progress has been made in closing this gap: the number of available 25/3 Mbps connections in rural areas has grown by nearly 58% since 2012.<sup>14</sup>
- The market for broadband services is characterized by intense intermodal competition among a range of providers: cable, fiber, telco, fixed wireless, and satellite. The latter two categories of providers are particularly important in the context of rural areas. For example, satellite connections of at least 25/3 Mbps are available to 81% of rural residents.<sup>15</sup> Improvements in these offerings promise to help make available reliable and affordable broadband connections to millions of additional Americans in the near future.<sup>16</sup>

<sup>8</sup> 47 U.S.C. § 230(b)(2).

<sup>9</sup> See USTelecom, Broadband Investment, <https://www.ustelecom.org/broadband-industry/broadband-industry-stats/investment>.

<sup>10</sup> 2018 Broadband Deployment Report at Table 1.

<sup>11</sup> *Id.* at Table 2a.

<sup>12</sup> *Id.* at Table 2b.

<sup>13</sup> *Id.* at Table 1.

<sup>14</sup> *Id.*

<sup>15</sup> *Id.* at ¶ 51.

<sup>16</sup> See, e.g., *The BWA Industry Report: 2017*, WISPA (Sept. 2017), [http://www.wispa.org/Portals/37/Docs/Press%20Releases/2017/TCG's\\_2017\\_BWA\\_FINAL\\_REPORT.pdf](http://www.wispa.org/Portals/37/Docs/Press%20Releases/2017/TCG's_2017_BWA_FINAL_REPORT.pdf)

Implicit in the above is that government action at any level can either help or harm the market for broadband services. The most impactful actions by government tend to be those that narrowly target specific issues left unaddressed by the market. For example, efforts to improve rural broadband availability by using subsidies to make unserved areas more “economic” to serve by private providers offer a good example of where carefully tailored government action can be impactful. These efforts have been greatly improved thanks to the unstinting efforts of Chairman Blackburn to highlight and help correct the kinds of waste, fraud, and abuse that long plagued federal subsidy programs.<sup>17</sup>

Unnecessary government interventions can harm the market. At the federal level, for example, the former FCC’s reclassification of broadband as a “common carrier” service and the concomitant imposition of stifling net neutrality rules on ISPs dampened broadband investment by introducing significant regulatory uncertainty into a market that long thrived in its absence.<sup>18</sup> Chairman Blackburn’s advocacy in support of a return to the historically bipartisan, minimalist, and successful regulatory framework that prevailed for decades helped build momentum around a rollback of these rules in 2017.<sup>19</sup>

As a general matter, the rote application of legacy rules and processes to new broadband network technologies can slow network deployment.<sup>20</sup> Federal and state-level efforts to remove outdated rules and otherwise streamline these processes are helping to hasten the construction of these critical next-generation systems.<sup>21</sup>

As discussed in the next section, the deployment of a GON by a municipality – on its own, via a government agency (*e.g.*, a municipal utility), or in “partnership” with a private entity – can have similarly harmful impacts on the competitive provision of broadband services. It

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(providing an overview of advancements in fixed wireless technology and observations regarding its importance in bringing broadband to rural areas).

<sup>17</sup> See, *e.g.*, Mike O’Rielly and Rep. Marsha Blackburn, *FCC’s Lifeline Program Ripe for Fraud, Abuse*, July 12, 2015, Politico, <https://www.politico.com/magazine/story/2015/07/fccs-lifeline-program-expansion-without-reform-120008>.

<sup>18</sup> See, *e.g.*, *In the Matter of Restoring Internet Freedom*, Declaratory Ruling, Report and Order, and Order, WC Docket No. 17-108, 33 FCC Rcd. 311, at ¶¶ 89-102, FCC (rel. Jan. 4, 2018), <https://docs.fcc.gov/public/attachments/FCC-17-166A1.pdf>.

<sup>19</sup> See, *e.g.*, Amir Nasr, *Blackburn Outlines Path to Net Neutrality Reversal, Comms Act Rewrite*, Dec. 7, 2017, Morning Consult, <https://morningconsult.com/2016/12/07/blackburn-outlines-path-net-neutrality-reversal-comms-act-rewrite/>.

<sup>20</sup> See, *e.g.*, *Report of the Removing State and Local Barriers to Broadband Deployment Working Group*, FCC Broadband Deployment Advisory Committee (Jan. 10, 2018), <https://www.fcc.gov/sites/default/files/bdac-regulatorybarriers-report-012018.pdf>.

<sup>21</sup> See, *e.g.*, Hon. Greg Walden & Hon. Marsha Blackburn, *Building America’s 21<sup>st</sup> Century Broadband Infrastructure: It’s Time We All Got Connected*, Jan. 16, 2018, Medium, <https://medium.com/@HouseCommerce/building-americas-21st-century-broadband-infrastructure-it-s-time-we-all-got-connected-59a8934377ff> (“The reality is, it’s expensive, complicated, and time-consuming for broadband companies to reach the communities that need it. Our job in Congress is to expand access to high-speed broadband by making it easier, not harder, to get broadband connectivity to all Americans.”).

is essential that policymakers at every level be mindful of these dangers as they develop strategies for responsible and sustainable broadband deployment.

## **2. EXAMINING THE RISKS INHERENT IN GOVERNMENT-OWNED BROADBAND NETWORKS**

The history of GONs in the United States is characterized by dozens of notable failures and the continued existence of numerous struggling systems.<sup>22</sup> Notwithstanding this poor track record, those who push for widespread pursuit of GONs have been largely undeterred in their efforts to frame municipal broadband as a salve for any number of local issues. Indeed, advocacy in support of government intervention into local broadband markets is notable for its ability to constantly “rebrand” in the face of failed municipal systems.<sup>23</sup>

Many notable GON systems have struggled or failed after being cited as “models” that might be adapted in other cities. Some have achieved a measure of success but have done so under unique circumstances that cannot readily be replicated. Taken together, these examples make clear that, in the vast majority of instances, GONs are inherently risky endeavors that imperil resources, put taxpayers at risk, and do little to bolster the sustainable provision of competitive broadband services.

### **2.1 GONs Framed as “Model” Systems Rarely Thrive, and Those That Succeed are Unique Outliers**

The following includes capsule summaries of GONs that have been cited at one point as a “model” that local officials might seek to adapt for use when developing their own municipal broadband strategy.<sup>24</sup> For the reasons cited below, none of these systems should be viewed as viable or replicable “models.”

#### **2.1.1 Chattanooga (TN) [status: unique outlier; not replicable]**

The GON in Chattanooga, which is operated by the city’s muni electric utility (EPB), is often promoted as a successful muni broadband project. While the system has been able to attract a significant number of customers, it is best viewed as a unique outlier rather than an easily replicable model.

<sup>22</sup> For an extended discussion, see *Understanding the Debate* at p. 10-18.

<sup>23</sup> An example of this dynamic can be seen in recent efforts to position GONs as a vehicle for cities to provide more stringent net neutrality and privacy protections for consumers. See, e.g., *The Public Internet Option*, ACLU (March 2018), [https://www.aclu.org/sites/default/files/field\\_document/aclu\\_municipal\\_broadband\\_report.pdf](https://www.aclu.org/sites/default/files/field_document/aclu_municipal_broadband_report.pdf). As noted above, the restrictive set of net neutrality rules that some cities seek to voluntarily adopt via a GON negatively impacted broadband investment, a fact that could eventually undermine the financial stability of a muni system. Similarly, choosing to abide by rules that restrict business model experimentation could artificially limit consumer choices and thereby make a muni offering less attractive to potential subscribers.

<sup>24</sup> For the sake of brevity, the examples in section 2 have been condensed from existing ACLP research. Additional information and analysis regarding each of the GONs discussed herein is available upon request.

- *Market Share.* As of early 2018, the GON's penetration rate was about 50%.<sup>25</sup> But of its 90,000+ customers, only about 1/10<sup>th</sup> subscribe to its signature gig offering.<sup>26</sup>
- *Financing.* The GON benefited from a one-time, non-replicable stimulus grant of \$111M.<sup>27</sup> The funds, ostensibly earmarked for smart grid purposes, allowed the city to significantly expedite construction of the underlying fiber network, putting it on a quicker path to viability.<sup>28</sup>
- *Lingering Questions.* Although explicit cross-subsidies between EPB's Electric and Fiber divisions are illegal under Tennessee state law, the two divisions have a uniquely close relationship. Indeed, questions have been raised about whether and to what extent EPB might be attributing certain fiber-related costs to the smart grid rather than the broadband system, which would allow it to seek cost-recovery from among its captive rate-payers.<sup>29</sup>
- *Questionable Economic Impacts.* Many attribute the city's economic resurgence to the GON. Indeed, the GON's signature gig offering is central to the city's new identity as a tech hub. But little hard data exists in support of these claims. Indeed, the total number of jobs in the tech sector decreased after the GON launched. With regard to the city's high-tech sector generally, while start-ups are somewhat prevalent, overall job growth in the sectors where broadband is a critical input has been stagnant since the launch of the municipal network. The following table highlights these trends.

	Chattanooga	Knoxville	Memphis	Nashville	Tennessee
<b>Unemployment Rate (Dec. 2017)</b>	3.4%	2.9%	3.7%	2.4%	3.2%
<b>Info Sector Job Growth (Jan. 2010-Dec. 2017)</b>	-16%	-3.6%	-11%	17.1%	1.8%
<b>New Business Growth (Q4 2014 - Q3 2017) (by county)</b>	59.1%	67.2%	91%	75%	30%

Sources: Bureau of Labor Statistics; Tennessee Secretary of State

<sup>25</sup> See 2017 Annual Report, at p. 30, EPB, [https://static.epb.com/annual-reports/2017//media/EPB 2017 Annual Report.pdf](https://static.epb.com/annual-reports/2017//media/EPB%2017%20Annual%20Report.pdf).

<sup>26</sup> *Id.* at p. 6.

<sup>27</sup> See Charles M. Davison & Michael J. Santorelli, *Updated Case Study of Government-Owned Broadband Network in Chattanooga, TN*, ACLP at New York Law School (Oct. 2015), <http://www.nyls.edu/advanced-communications-law-and-policy-institute/wp-content/uploads/sites/169/2013/08/ACLP-Chattanooga-Case-Study-updated-October-2015.pdf>.

<sup>28</sup> *Id.*

<sup>29</sup> *Id.*

- *Replicability.* Several other cities in Tennessee are pursuing GONs using the Chattanooga muni utility GON framework as a model. For example, a similar system has been proposed in Johnson City,<sup>30</sup> and a muni utility-led fiber deployment is getting underway in Newport.<sup>31</sup> Neither project has benefitted from grant dollars, but both are seeking to leverage their fiber networks for smart grid purposes, raising the possibility of implicit cross-subsidies (it should be noted that, in Johnson City, the GON is seen as a means of helping the utility offset sagging electric sales).<sup>32</sup> Each system faces challenges: previous GON attempts in Johnson City have not panned out,<sup>33</sup> and the system in Newport has already suffered some delays.<sup>34</sup>

### 2.1.2 Bristol (TN) [status: failed]

This failed GON is notable because it was held out by both the Obama White House and FCC as a model system that other cities might emulate.<sup>35</sup> The muni network ultimately failed due to profound financial struggles and corruption at the parent utility.<sup>36</sup>

- *Overview.* This FTTH system, which evolved from a fiber network initially deployed by the local utility, was eventually deployed across Bristol and into surrounding

<sup>30</sup> See Nathan Baker, *BrightRidge Aiming for High Speeds in Low-Density Areas*, March 22, 2018, Johnson City Press, <https://www.johnsoncitypress.com/Business/2018/03/22/BrightRidge-aiming-for-high-speeds-in-low-density-places>.

<sup>31</sup> See Cliff Hightower, *Newport Utilities to Invest \$24.7 million in Fiber Project*, Sept. 5, 2017, Citizen Tribune, [https://www.citizentribune.com/news/local/newport-utilities-to-invest-million-in-fiber-project/article\\_fc6ad720-9252-11e7-9787-1bbc013f664c.html](https://www.citizentribune.com/news/local/newport-utilities-to-invest-million-in-fiber-project/article_fc6ad720-9252-11e7-9787-1bbc013f664c.html).

<sup>32</sup> See *BrightRidge Board Votes to Seek Regulatory Approval for High Speed Broadband Project*, Jan. 24, 2018, The Business Journal, <http://bjournal.com/brightridge-board-votes-to-seek-regulatory-approval-for-high-speed-broadband-project/>.

<sup>33</sup> In 2011, for example, the city engaged a consultant to conduct a formal GON feasibility study of a citywide FTTH network. The consultant endorsed a partnership model (*i.e.*, the city would build the network but rely on a third-party to operate it and offer service) but “the cost analysis [did not] yield the numbers the system targeted.” See Nathan Baker, *Power Board Exploring Wireless Internet Technology*, May 3, 2015, Johnson City Press, <http://www.johnsoncitypress.com/Local/2015/05/03/Power-Board-exploring-wireless-Internet-technology.html?ci=content&lp=4&p=1>.

<sup>34</sup> See Seth Butler, *NU Connect Rollout Continues*, March 30, 2018, The Newport Plain Talk, [http://www.newportplaintalk.com/news/article\\_041b44fd-c357-5ace-82ca-3afbdc50855.html](http://www.newportplaintalk.com/news/article_041b44fd-c357-5ace-82ca-3afbdc50855.html).

<sup>35</sup> See *Connecting America: The National Broadband Plan*, at p. 153, FCC (2010), <http://download.broadband.gov/plan/nationalbroadband-plan.pdf>; See *Community-Based Broadband Solutions: The Benefits of Competition and Choice for Community Development High-Speed Internet Access*, at p. 30, Executive Office of the President (Jan. 2015), <https://obamawhitehouse.archives.gov/sites/default/files/docs/community-based-broadband-report-by-executive-office-of-the-president.pdf>.

<sup>36</sup> See Charles M. Davidson & Michael J. Santorelli, *Updated Case Study of Government-Owned Broadband Network in Bristol, VA*, ACLP at New York Law School (Dec. 2016), <http://www.nyls.edu/advanced-communications-law-and-policy-institute/wp-content/uploads/sites/169/2013/08/ACLP-Bristol-Case-Study-Update-December-2016.pdf>.

areas at a total cost of over \$130 million, a substantial portion of which came via state and federal grants.<sup>37</sup>

- *Outcome.* After several years of seeming financial viability, the network began to struggle financially. Compounded by corruption at the parent utility, the network eventually failed and was sold off at an \$80+ million loss to a private company.<sup>38</sup> Unwinding the GON and parsing through its many debts and debtors proved to be a significant challenge, delaying the sale by many months.

### 2.1.3 Burlington (VT) [status: failed]

The muni fiber system deployed in Burlington was cited as a successful model GON soon after its launch in 2005.<sup>39</sup> But the GON struggled to gain its financial footing and was eventually sold to a private entity.

- *Overview.* Despite seemingly positive attributes (e.g., a healthy number of subscribers), the system was unable to cover its debts.<sup>40</sup> City officials were left to prop up the system; at one point, the mayor illegally dipped into general revenues for this purpose.<sup>41</sup> The system was such a burden on the city that its credit rating was downgraded.<sup>42</sup>
- *Outcome.* After settling a contentious lawsuit with a major creditor, the city began exploring a sale of the GON in 2016.<sup>43</sup> After more than a year, the city voted to sell the system to a private entity in November 2017.<sup>44</sup> At its nadir, the GON in

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<sup>37</sup> *Id.*

<sup>38</sup> *Id.*

<sup>39</sup> See, e.g., Christopher Mitchell, *Burlington Telecom Profits from Fiber*, Broadband Properties (Oct. 2007), <http://www.broadbandproperties.com/2007issues/october07/Burlington.pdf>; Christopher Mitchell, *Burlington Telecom Case Study*, Institute for Local Self-Reliance (Aug. 2007), <http://www.ilsr.org/wp-content/uploads/files/bt.pdf>.

<sup>40</sup> *Understanding the Debate* at p. 18.

<sup>41</sup> *Id.*

<sup>42</sup> *Id.*

<sup>43</sup> See Press Release, *Weinberger Announces Completion of Settlement Agreement in Burlington Telecom Lawsuit*, Jan. 3, 2015, Vermont Biz, <https://vermontbiz.com/news/january/weinberger-announces-completion-settlement-agreement-burlington-telecom-lawsuit>.

<sup>44</sup> See Jess Aloe, *Burlington City Council Chooses Last Minute Bid from Schurz Communications to Buy BT*, Nov. 27, 2017, Burlington Free Press, <https://www.burlingtonfreepress.com/story/news/2017/11/27/could-end-tonight-city-councilors-plan-vote-final-bt-buyer/858853001/> (“Burlington City Council Chooses”).

Burlington was over \$50 million in debt;<sup>45</sup> the sale price of the system was a little more than \$30 million, representing a steep loss to the city.<sup>46</sup>

#### 2.1.4 UTOPIA (UT) [status: failed]

In the early 2000s, 16 cities in Utah joined together to build a multi-city open access fiber GON. From the start, it was a financial disaster, spurred forward by unrealistic hopes and overly optimistic revenue projections. Despite these troubles, the system was cited as a successful example of a viable open-access approach to municipal broadband.<sup>47</sup>

- *Overview.* Throughout its long and tortured history, this ambitious project consistently under-performed. By 2016, the GON had a negative net value of \$100+ million and owed about \$500 million in interest payments through 2040.<sup>48</sup> It has yet to turn a profit.
- *Outcome.* Efforts by private entities to intervene and save the network failed because the costs were too great and demand remained tepid.<sup>49</sup> Recently, the remaining member cities have begun experimenting with new deployment models as they attempt to keep the system afloat. Even so, the GON has failed to realize its original vision for becoming a leading model of a financially self-sustaining open access fiber system capable of connecting multiple, mostly rural cities.

#### 2.1.5 Westminster (MD) [status: unproven]

The municipal network being deployed in Westminster is an example of a “partnership” model that is increasingly being touted by GON consultants as less risky for cities.<sup>50</sup> A closer look at the details of this partnership, though, reveals that many risks remain for cities and their taxpayers.

<sup>45</sup> See Christopher Mitchell, *Learning from Burlington Telecom*, at p. 4, Institute for Local Self-Reliance (Aug. 2011), available at <http://www.muninetworks.org/sites/www.muninetworks.org/files/bt-lessons-learned.pdf>.

<sup>46</sup> *Burlington City Council Chooses*.

<sup>47</sup> See, e.g., Kane Loader, *UTOPIA Will Continue to Help Utah Lead in Broadband*, March 19, 2011, Salt Lake Tribune, <http://archive.slttrib.com/article.php?id=51349618&itype=CMSID>.

<sup>48</sup> *Understanding the Debate* at p. 75-79.

<sup>49</sup> *Id.*

<sup>50</sup> See, e.g., Joanne Hovis et al., *The Emerging World of Broadband Public-Private Partnerships: A Business Strategy and Legal Guide*, at p. 23-25, Benton Foundation (May 2017), <https://www.benton.org/sites/default/files/partnerships.pdf>; Patrick Lucey and Christopher Mitchell, *Successful Strategies for Broadband Public-Private Partnerships*, at p. 11-18, Institute for Local Self-Reliance (July 2016), <https://ilsr.org/wp-content/uploads/downloads/2016/08/PPP-Report-2016-1.pdf> (“*Successful Strategies*”).

- *Overview.* Westminster has invested in excess of \$20 million to deploy its GON. It has partnered with a private ISP, Ting, to operate the network and offer service to customers. Ting remits two payments to the city each month: a lease payment (\$6/month per home that the network passes; this fee is mandatory regardless of whether the home subscribes) and a customer fee (\$11/month per subscriber).<sup>51</sup> In theory, these payments will help the city pay down its GON debts.
- *Outcomes.* To date, deployment has been delayed several times and take-rates have been low.<sup>52</sup> The system operated at a loss in 2016<sup>53</sup> and missed its revenue target in 2017.<sup>54</sup> Given the low take-rate and the fact the Ting must compete with established ISPs like Comcast and Verizon, it is unlikely that the GON in Westminster will be self-sufficient for many years. Its struggles thus suggest that this “model” has yet to be validated.

## 2.2 Additional Examples of Failed & Struggling GONs

The following includes capsule summaries of GONs that have failed or that have struggled mightily since their launch. These are best seen as cautionary tales for local officials contemplating a GON and for state officials weighing whether and to what extent legislative safeguards might be appropriate to protect their subdivisions and taxpayers from the many risks associated with a municipal broadband foray.

### 2.2.1 Dunnellon (FL) [status: failed]

- *Overview.* In 2011, Dunnellon made a “big bet on the Internet worthy of a riverboat gambler.”<sup>55</sup> It took out loans totaling \$7.35 million to build its own broadband network in an effort to jumpstart economic development, provide services to some unserved residents, and otherwise attempt to make the city more attractive to businesses and residents.<sup>56</sup> By 2012, the city had deployed over “100 miles of fiber” and began offering Internet access, telephone, and video service to residents.<sup>57</sup> A

<sup>51</sup> *Successful Strategies* at p. 15.

<sup>52</sup> See, e.g., Press Release, *Westminster Fiber Network Advancing*, May 8, 2017, City of Westminster, <http://www.westminstermd.gov/DocumentCenter/View/2002/Fiber-Network-Advancing-05-09-17pdf> (noting take-rates).

<sup>53</sup> See *Comprehensive Annual Financial Report for the Fiscal Year Ended June 30, 2016*, at p. 38, City of Westminster, <https://www.westminstermd.gov/DocumentCenter/View/1551/FY2016-Comprehensive-Annual-Financial-Report-CAFR#page=44>.

<sup>54</sup> See *Fiscal Year 2018 Budget*, at p. 57, City of Westminster, <https://www.westminstermd.gov/DocumentCenter/View/2214/City-of-Westminster-FY2018-Budget#page=57>.

<sup>55</sup> See Bill Thompson, *Dunnellon Dreams of a Connected Future*, Oct. 15, 2011, Ocala Star Banner, <http://www.ocala.com/article/20111015/ARTICLES/111019789?p=all&tc=pgall>.

<sup>56</sup> *Id.*

<sup>57</sup> See Lisa Gonzalez, *Dunnellon, Florida's Fiber Dreams Now a Reality*, Aug. 8, 2012, MuniNetworks.org, <http://www.muninetworks.org/content/dunnellon-floridas-fiber-dreams-now-reality>.

year later, though, the system had proven to be a failure: it “only attracted 500 customers,” nowhere near what was needed for profitability.<sup>58</sup>

- *Outcome.* By 2013, the system had become financially unsustainable due to low take-rates. In October of that year, “the City Council voted to sell [the system] for \$1 million” to a private company, leaving the city to pay back “\$7 million in debt, a monumental task for a city of 1,700 people with an annual municipal operating budget this year of \$3.1 million.”<sup>59</sup>

### 2.2.2 Groton (CT) [status: failed]

- *Overview.* The local utility launched a cable network in an effort to offset sagging electric sales.<sup>60</sup> It justified the network in part by relying on a demand survey that found local residents appeared willing to take service from the GON.<sup>61</sup>
- *Outcome.* The network struggled from the start. It lost \$2 million a year; eventually the city’s credit rating was downgraded.<sup>62</sup> Groton eventually sold the failing network for \$550,000, leaving taxpayers to pay off \$28 million in debt.<sup>63</sup>

### 2.2.3 Monticello (MN) [status: struggling]

- *Overview.* After over-estimating subscriber demand and, once deployed, struggling to gain market share, the local government dipped into several tax funds to prop up its failing FTTH system.<sup>64</sup>
- *Outcome.* Eventually, the system defaulted on its debt obligations; the city settled with creditors for less than \$0.50 on the dollar.<sup>65</sup> By the end of 2015, after posting an operating loss in excess of \$300,000, it became apparent that the city needed to explore options for the GON.<sup>66</sup> Eventually, the city outsourced management of the

<sup>58</sup> See Editorial: *Dunnellon’s Disastrous Deal*, Oct. 29, 2013, Ocala Star Banner, <http://www.ocala.com/article/2013131029665>.

<sup>59</sup> *Id.*

<sup>60</sup> *Understanding the Debate* at p. 80-83.

<sup>61</sup> *Id.*

<sup>62</sup> *Id.*

<sup>63</sup> *Id.*

<sup>64</sup> *Id.* at p. 64-67.

<sup>65</sup> *Id.*

<sup>66</sup> See Tim Hennagir, *Monticello’s Broadband Utility Shows More Than \$322,000 Operating Loss in 2015*, Feb. 19, 2016, Monticello Times, [https://www.hometownsource.com/monticello-times/news/local/broadband-alliance-discussion-sets-stage-for-monticello-city-council-fireworks/article\\_c664deea-65a9-5c35-aac8-e804290d2bf8.html](https://www.hometownsource.com/monticello-times/news/local/broadband-alliance-discussion-sets-stage-for-monticello-city-council-fireworks/article_c664deea-65a9-5c35-aac8-e804290d2bf8.html).

struggling GON to a private provider; since then, the system's financial have improved somewhat.<sup>67</sup>

#### 2.2.4 Pitcairn (PA) [status: failed]

- *Overview.* A muni cable system was deployed and run by Pitcairn's municipal electric utility. At its height it had about 1,400 subscribers, but by 2013 fewer than 600 residents still subscribed.<sup>68</sup> The primary reason why the system struggled was the emergence of robust competition from private ISPs: the GON simply could not match the level of service or number of options made available by its private counterparts.<sup>69</sup>
- *Outcome.* By 2016, the network had become financially unsustainable. Citing "advances in technology and costs of maintenance as the culprits for ceasing operations," local officials shut the system down on July 31, 2016.<sup>70</sup> By "ridding itself of the responsibility of providing the service," local officials noted that they will now "be able to focus their time on other tasks around the community."<sup>71</sup>

#### 2.2.5 Provo (UT) [status: failed]

- *Overview.* This open access FTTH system was deployed by Provo at a cost of over \$60 million, most of which was financed with debt.<sup>72</sup> However, tepid demand resulted in slow revenue growth, which negatively impacted the ability of the system to cover its debts.<sup>73</sup>
- *Outcome.* On several occasions, the city used millions of dollars of taxpayer money to prop up the struggling system.<sup>74</sup> The city eventually sold off the system to Google for \$1, leaving it and its residents to pay off about \$40 million in debt.<sup>75</sup>

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<sup>67</sup> See *FiberNet on Pace to Hit Net Income Target, Stay Under Budget*, Nov. 10, 2017, Monticello Times, [https://www.hometownsource.com/monticello-times/news/local/fibernet-on-pace-to-hit-net-income-target-stay-under/article\\_08967350-c58a-11e7-bd44-8778cfe116c7.html](https://www.hometownsource.com/monticello-times/news/local/fibernet-on-pace-to-hit-net-income-target-stay-under/article_08967350-c58a-11e7-bd44-8778cfe116c7.html).

<sup>68</sup> See Jacqueline Dell and Kyle Lawson, *Pitcairn Officials Talk with Comcast to Take Over Cable Service*, Oct. 3, 2013, Trib Live, <https://triblive.com/neighborhoods/yourmonroeville/yourmonroevillemore/4297925-74/cable-pitcairn-service>.

<sup>69</sup> See Samson X. Horne, *Pitcairn's Cable, Internet Services' Last Day is July 31*, July 19, 2016, Trib Live, <https://triblive.com/news/neighborhoods/monroeville/10781733-74/borough-cable-internet>.

<sup>70</sup> *Id.*

<sup>71</sup> *Id.*

<sup>72</sup> *Understanding the Debate* at p. 83-87.

<sup>73</sup> *Id.*

<sup>74</sup> *Id.*

<sup>75</sup> *Id.*

### 2.2.6 Quincy (FL) [status: failed]

- *Overview.* In 2003, Quincy issued \$3.3 million in bonds to build a fiber-optic network known as NetQuincy.<sup>76</sup> The goal was for the city to use the network to "tak[e] charge of its [own] future."<sup>77</sup>
- *Outcome.* By 2005, the system had failed to generate revenues to become financially viable. The system soon went out of business, leaving the city and its taxpayers with millions in outstanding debt obligations.<sup>78</sup>

### 2.2.7 Salisbury (NC) [status: struggling]

- *Overview.* Salisbury deployed an ambitious FTTH gig system in 2010 in an effort to jumpstart economic development.<sup>79</sup> It admitted from the start that it would be difficult to compete with other ISPs in the local market, but it moved ahead confident that it could secure 30% of the market within three years.<sup>80</sup> After 8 years, the GON had failed to achieve its desired market share. As a result, it has struggled mightily, forcing the city to prop up the system to the tune of over \$20 million in subsidies drawn from general funds.<sup>81</sup> The city's credit rating has been downgraded.<sup>82</sup>
- *Outcome.* The city was recently granted permission to lease the underlying fiber network to a private company in an effort to offload some financial risk and help pay down its substantial debt.<sup>83</sup> However, numerous financial risks remain for the city and its taxpayers.<sup>84</sup>

<sup>76</sup> See *City of Quincy, Florida, Utility System Improvement and Refunding Revenue Bonds, Series 2003*, at p. 45, Electronic Municipal Market Access, Municipal Securities Rulemaking Board (Oct. 1, 2003), <http://emma.msrb.org/MS216479-MS191787-MD372435.pdf>.

<sup>77</sup> See *The Case for Municipal Broadband in Florida*, at p. 2, Florida Municipal Electric Association (2005), [http://www.baller.com/wp-content/uploads/finea\\_white\\_paper.pdf](http://www.baller.com/wp-content/uploads/finea_white_paper.pdf).

<sup>78</sup> See, e.g., Richard Swier, *Failing Government-Owned Networks Examined*, Dec. 3, 2013, Watchdog Wire, <http://watchdogwire.com/florida/2012/12/03/florida-failing-government-owned-networks-examined/>.

<sup>79</sup> See *Hard Lessons from Salisbury's Failing Foray into Muni Broadband*, Feb. 2, 2017, Broadband Expanded, <http://www.broadbandexpanded.com/2017/02/02/hard-lessons-from-salisburys-failing-foray-into-muni-broadband/> ("Hard Lessons from Salisbury's Failing Foray").

<sup>80</sup> See, e.g., Christopher Mitchell, *More Details Emerging About Fibrant in Salisbury*, Sept. 24, 2010, Community Networks, <https://muninetworks.org/content/more-details-emerging-about-fibrant-salisbury>.

<sup>81</sup> *Hard Lessons from Salisbury's Failing Foray*.

<sup>82</sup> *Id.*

<sup>83</sup> See City of Salisbury, *Fibrant Vote*, <http://salisburync.gov/Government/Administration/Fibrant-Vote>.

<sup>84</sup> See, e.g., Dan Way, *State Lets Salisbury Refinance Debt For Muni Broadband System* July 12, 2018, Carolina Journal, <https://www.carolinajournal.com/news-article/state-lets-salisbury-refinance-debt-for-muni-broadband-system/>.

### 3. STATES HAVE A COMPELLING INTEREST IN THE RESPONSIBLE DEPLOYMENT OF BROADBAND WITHIN THEIR BORDERS

GONs are exceedingly expensive and risky undertakings, costing anywhere from a few million dollars, as in the case of Groton (CT), to several hundreds of millions of dollars, as in Chattanooga (TN), to nearly half a billion dollars in UTOPIA (UT). In some cases where a network has faltered (*e.g.*, Monticello (MN), Salisbury (NC)), local government has stepped in with funding support to help steady the municipal system. Other failed and failing systems (*e.g.*, Burlington) have negatively impacted local credit ratings, which increase borrowing costs and strain local finances even more. As networks become more complex and ambitious, the costs associated with building and maintaining them rise inexorably. This, in turn, raises the risk of costly defaults by local government. Accordingly, states, which maintain ultimate responsibility for the financial health of cities and towns in their borders, have compelling interests in overseeing broadband policy in the state, including the parameters and processes by which GONs proposals are vetted and approved.<sup>85</sup>

#### 3.1 States' Legal Authority to Adopt GON-Related Protections

Well-established legal precedent supports such a close relationship between municipalities and their states. In 1907, the U.S. Supreme Court succinctly summarized this relationship when it ruled that municipalities are "political subdivisions of the state, created as convenient agencies for exercising such of the governmental powers of the state as may be intrusted [sic] to them...The number, nature, and duration of the powers conferred upon these corporations and the territory over which they shall be exercised rests in the absolute discretion of the state."<sup>86</sup> Over the last century, the contours of these relationships have been sharpened in some instances by the adoption of "home rule" statutes and other rules that, among other things, provide municipalities with a degree of autonomy to act on certain matters.<sup>87</sup> But even in "home rule" states, municipal action is continuously subjected to judicial scrutiny.<sup>88</sup>

In the GONs context, state legislatures have broad authority to adopt legislation pertaining to the extent to which a municipality can or cannot offer communications services.<sup>89</sup> The

<sup>85</sup> See, *e.g.*, Grant Gross, *States Threaten Lawsuit Against Obama's Municipal Broadband Plan*, Jan. 26, 2015, Network World, <https://www.networkworld.com/article/2875674/states-threaten-lawsuit-against-obamas-municipal-broadband-plan.html>.

<sup>86</sup> *Hunter v. City of Pittsburgh*, 207 U.S. 161, 178 (1907).

<sup>87</sup> For an historical overview of how these statutes evolved in the first half of the 20<sup>th</sup> century, see Kenneth E. Vanlandingham, *Municipal Home Rule in the United States*, 10 Wm. & Mary L. Rev. 269 (1968). For a more recent discussion, see National League of Cities, *Cities 101 - Delegations of Power*, <https://www.nlc.org/resource/cities-101-delegation-of-power>.

<sup>88</sup> See, *e.g.*, *City Rights in an Era of Preemption: A State-by-State Analysis*, at p. 5, National League of Cities (2018), <https://www.nlc.org/sites/default/files/2017-03/NLC-SML%20Preemption%20Report%202017-pages.pdf>.

<sup>89</sup> 47 U.S.C. § 253.

U.S. Supreme Court confirmed this power in 2004 when it upheld a Missouri law that prohibited municipalities from offering telecommunications services.<sup>90</sup> In 2016, a federal appeals court rebuked an extraordinary attempt by the Obama FCC to preempt laws in North Carolina and Tennessee that governed the ability of their political subdivisions to expand existing GON systems.<sup>91</sup>

To date, some 20 states have adopted laws impacting the ability of municipalities to deploy a GON. Only a few states (*e.g.*, Nebraska) have imposed outright bans. In most other instances, state legislatures have created a road map for municipalities to follow when evaluating a GONs proposal.<sup>92</sup> Many of these involve public participation of some sort – public hearings, referenda, or other activities meant to fully apprise citizens of their local government's intention to invest public resources in a GON. Numerous others require substantial economic and financial analyses to ensure that a particular municipal project does not become a burden on local residents or the state, or both. Some states, including Tennessee, require the approval of certain GON plans by a state agency.<sup>93</sup>

### 3.2 Ideas for Additional State & Local Level GON Protections

Despite their uneven record, their inherent complexity, and the significant financial risks that attend municipal broadband projects, GONs continue to be pursued in communities of every size.<sup>94</sup> Indeed, over the last few years, GON-related activities – *e.g.*, feasibility studies, resident surveys, citizen referenda, city council votes – have been evident in localities as diverse as San Francisco (CA),<sup>95</sup> Grand Junction (CO),<sup>96</sup> and Laketown (MI).<sup>97</sup> In studying these and other efforts in municipalities across the country, the ACLP developed a Check List (see attached) to help structure and inform decision-making processes by state and local policymakers vis-à-vis GONs. The issues covered in the Check List echo core concerns articulated in many of the state GONs laws noted above.

Given increased interest in GONs at the municipal level, state policymakers might consider updating their laws to reflect new complexities, models, risks, and other considerations

<sup>90</sup> *Nixon v. Mo. Mun. League*, 541 U.S. 125 (2004).

<sup>91</sup> *State of Tennessee v. FCC*, 832 F.3d 597 (6th Cir. 2016).

<sup>92</sup> See, *e.g.*, *Understanding the Debate* at p. 106-108 (profiling Florida's legislative approach).

<sup>93</sup> In Tennessee, these requirements apply to municipal electric systems seeking to enter the broadband business. See Tenn. Code Ann. § 7-52-602.

<sup>94</sup> See, *e.g.*, Masha Zager, *A Record Increase in Municipal Fiber Broadband*, Broadband Communities (Oct. 2017), [http://www.bbcmag.com/2017mags/Oct/BBC\\_Oct17\\_RecordIncrease.pdf](http://www.bbcmag.com/2017mags/Oct/BBC_Oct17_RecordIncrease.pdf).

<sup>95</sup> See, *e.g.*, Joshua Sabatini, *Funding Slashed for Farrell's Municipal Citywide Internet Initiative*, June 25, 2018, S.F. Examiner, <http://www.sfexaminer.com/funding-slashed-farrells-municipal-citywide-internet-initiative/>.

<sup>96</sup> See Carly Moore, *City Council Rejects Broadband Issue*, March 2, 2017, NBC 11, <http://www.nbc11news.com/content/news/City-council-debates-broadband-issue--415177053.html>.

<sup>97</sup> See Caleb Whitmer, *Laketown Township Voters Reject Township-Owned Internet Network*, May 3, 2016, Holland Sentinel, <http://www.hollandsentinel.com/news/20160503/laketown-township-voters-reject-township-owned-internet-network>.

implicated in recent municipal broadband inquiries. To that end, the following components might be of particular interest to state (and local) policymakers and decision-makers focused on assuring the responsible deployment of broadband within their borders:

- Codifying a rigorous evaluative process along the lines of the ACLP's Policymaker Checklist.
- Requirements to assure that evaluative consultants do not have a direct or indirect business interests in the outcome of a GON inquiry.
- Requiring that any business plan, pro forma, and related financial projections be subject to independent review by a disinterested firm, preferably a firm with significant accounting and financial modeling expertise.
- Requiring indemnification from key stakeholders involved in a GON project (*e.g.*, consultants, engineers) to enhance accountability and to mitigate against financial losses that might stem from a third-party's misrepresentation, failure to perform, etc. vis-à-vis a municipal broadband system.

#### **4. EFFECTIVE BROADBAND PLANNING & POLICYMAKING AT THE STATE & LOCAL LEVELS**

Motivations for public action in the broadband space are clear: high-speed Internet connectivity is transforming every aspect of modern life and commerce. Attempting to harness this transformative technology for economic and social gain is thus a rational response by stewards of the public good, who increasingly understand that broadband connectivity is a vital ingredient to short-term economic revival and long-term prosperity. As such, state and local policymakers have critical roles to play in bolstering broadband connectivity across the United States.

The following offers (1) high-level principles to guide state and local processes around broadband planning and (2) ideas for using those principles to inform specific policymaking actions at the state and local levels.

##### **4.1 Guiding Principles**

The following guiding principles are offered to state and local policymakers as they consider the best route to improving broadband connectivity.

###### **4.1.1 Data is Essential**

Any inquiry into local broadband connectivity needs should be informed by accurate data regarding existing broadband assets and current take-rates for available services.

- Gathering data should be done in partnership with service providers and other stakeholders. Ideally, to assuage concerns about sharing proprietary data, a neutral third-party should be engaged for these purposes.

- Failure to gather and leverage data in this manner will yield incomplete “conclusions” about the true state of broadband availability and adoption. Such could foreclose viable options for addressing these issues in a cost-effective and timely manner.

#### **4.1.2 Technology Neutrality & Regulatory Parity are Critical**

The goal of any meaningful broadband planning effort should be to support continued competition amongst providers.

- *Technology neutrality* means that policies and practices do not explicitly or implicitly favor one type of broadband platform over another. Preserving technology neutrality in the planning process recognizes the dynamic nature of consumer demand.
- *Regulatory parity* ensures that all firms have the same opportunity to benefit from concessions or other privileges that a locality might grant to a provider. For example, revisions to service obligations or access to expedited review/approval processes should be accessible to all providers in order to assure a level playing field.

#### **4.1.3 Assure Independent Vetting**

Localities often hire outside consultants to assist in broadband planning. It is important that the work of these entities is specifically delineated and aligned with the goals of the city. In addition to potentially codifying additional protections at the state level (as detailed in section 3), municipalities should consider implementing procedures to protect their and taxpayers’ interests during broadband-related inquiries.

- Third-parties should be thoroughly vetted to ensure that they have a sufficiently robust, successful track-record vis-à-vis providing municipalities with sound, data-driven, and impactful advice.
- Evaluative consultants involved in inquiries implicating a possible municipal broadband network should not have any direct or indirect financial interest in the outcome of that work.
- Any inquiry conducted on behalf of a city (*e.g.*, a broadband survey or formal business plan) should be properly designed to assure maximum accuracy and vetted by an independent expert to verify methodologies, findings, and recommendations.

## 4.2 Operationalizing the Principles

The following details a range of actions that state and local policymakers might engage in as they push forward in their pursuit of more robust broadband connectivity. The processes surrounding these actions should be informed by the principles noted above.

- Using accurate, up-to-date data, *correctly identify the problem* to be addressed by state/local policy and carefully tailor responses to it.
- *Focus supply-side interventions on truly unserved areas.* Otherwise, scarce public resources (*e.g.*, subsidies) might be squandered if used to support unnecessary overbuild (in both the middle-mile and last-mile).
- Explore the feasibility of structuring *broadband grant programs* that leverage general tax revenues to support the expansion of existing broadband networks into unserved areas. Several states, including New York, have developed successful programs along these lines.
- *Let actual consumer demand rather than subjective speed benchmarks guide broadband planning.* Calls for achieving a subjective speed benchmark – like universal gigabit fiber connectivity – should be carefully evaluated in the context of actual consumer demand. Among the vast majority of households and businesses across the U.S., there is little actual demand for super-fast broadband connectivity. Indeed, most consumers don't think of broadband in terms of speed; rather, they think about it in terms of whether a connection allows them to do what they want to do online. The needs of anchor institutions (*e.g.*, schools, hospitals, libraries) and businesses are significantly different from those of households. Understanding these differences will assist in tailoring effective policies impacting broadband deployment and adoption.
- Engage in *holistic policy reforms* aimed at updating regulatory frameworks at the state and local levels so that they better reflect the contours of modern broadband systems. States and localities across the country are engaging in these actions daily as they work to facilitate the deployment of next-generation networks. To date, some 19 states have acted to streamline the review and approval processes necessary to support the timely construction of 5G networks.<sup>98</sup> A growing number of cities are collaborating with private providers to forge similarly forward-looking frameworks. Such efforts should also focus on wired networks, perhaps with an eye toward modernizing franchising rules to hasten more robust broadband deployment.

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<sup>98</sup> See NCSL, Mobile 5G and Small Cell Legislation (as of May 7, 2018), <http://www.ncsl.org/research/telecommunications-and-information-technology/mobile-5g-and-small-cell-legislation.aspx>.

- *Focus on the demand-side.* Effective broadband planning is incomplete unless it focuses on ensuring that residents and businesses are adopting and productively using available internet connections. State and local policymakers should work to ensure that any discussion about broadband deployment is balanced by an equally robust inquiry into the nature of local demand. Doing so will ensure that a more diverse group of stakeholders, especially those with expertise in providing digital literacy training and other such services, have ample opportunities play impactful roles.



## Policymaker Check List

The following check list of questions is offered to state and local policymakers as a resource for evaluating proposals for government-owned broadband networks (GONs). Because these networks typically require long-term commitments of limited public resources and entail the assumption of substantial risk, decision-making processes should be as informed and comprehensive as possible.

### Questions to Ask When Deciding Whether to Undertake a Government-Owned Broadband Network

When considering a GON, understanding the contours and mechanics of local broadband markets is essential. The following checklist of questions identifies key issues to examine on both the supply side and demand side.

	Questions To be Asked
<b>Assessing the Local Broadband Market</b>	
Have local officials comprehensively examined the local broadband market? Such examinations should encompass both the supply side and the demand side.	<input type="checkbox"/>
<b>On the supply side:</b> <ul style="list-style-type: none"> <li>• What is the nature of local broadband competition? How many total broadband options—wireline, wireless, satellite, etc.—do consumers have access to?</li> <li>• Are there barriers to further deployment by incumbent Internet Service Providers (ISPs)? New entrants?</li> <li>• Has the municipality analyzed how it could leverage its resources to facilitate additional network deployment by private ISPs? Examples include reevaluating existing rights-of-way administration, tower siting approvals, antiquated zoning laws, and franchising processes.</li> <li>• Has the municipality engaged ISPs in dialogues around meeting clear goals on the supply side?</li> <li>• Has the municipality clearly articulated its supply side goals for broadband via RFPs/RFIs and/or other such means of public communication?</li> <li>• Are there opportunities to use public-private partnerships (PPPs) to address supply side challenges? Pilot programs? Other experimental approaches?</li> </ul>	<input type="checkbox"/>
<b>On the demand side:</b> <ul style="list-style-type: none"> <li>• Are there data available on the nature of local broadband demand and use? Are there data regarding adoption rates across the municipality? Are there cost-effective ways of gathering such data (e.g., via existing survey tools, anchor institutions, etc.)?</li> <li>• Has the municipality engaged experts in the private and nonprofit sectors to identify barriers to more robust adoption and utilization? Has the municipality begun work to remove those barriers?</li> <li>• Has the municipality inventoried and examined existing resources on the demand side—e.g., training programs, anchor institutions, digital literacy initiatives?</li> <li>• Has the municipality attempted to work with and through local social infrastructures to address real demand side needs?</li> <li>• Has the municipality attempted to forge PPPs with partners in the private and nonprofit sectors? Have these partners attempted to leverage existing funding opportunities at the state and/or federal levels to support these efforts?</li> <li>• In unserved and underserved areas, have partners in the public, private, and nonprofit sectors engaged in sufficient demand aggregation activities to create favorable environments for new network deployment?</li> </ul>	<input type="checkbox"/>

Evaluating Related Municipal Factors	
Has the municipality evaluated basic infrastructure needs and weighed them against perceived and real broadband needs? These include developing plans to maintain roads, bridges, dams, electric grid components, water system elements, ports, and other basic public infrastructure for which state and local governments are responsible.	<input type="checkbox"/>
Has the municipality identified the full range of economic, social, and infrastructural opportunity costs associated with building a GON? Are there opportunities to achieve core public goals for broadband and new technologies generally without endeavoring to build a municipal network or otherwise interfere with organic market forces?	<input type="checkbox"/>
Does the municipality have a balanced budget? A surplus? A deficit? Is it financially solvent? Are there competing priorities for funding? Is the municipality assuming additional debt (e.g., under-funded pensions)?	<input type="checkbox"/>

### Questions to Ask When Reviewing a GONs Proposal

When evaluating whether to invest in or approve a proposal for a GON, an array of variables should guide decision-making. Numerous non-GONs options may be available to address broadband issues on both the supply and demand sides. As such, state and local policymakers should carefully consider the myriad costs, risks, and complexities associated with owning and operating a commercial broadband network. The following questions are offered as a guide for policymakers to use during these intricate undertakings.

Initial Review of GONs Proposals	
Have policymakers exhausted other options for bolstering broadband from both the supply side and demand side? (Discussed at length in <b>section 6</b> )	<input type="checkbox"/>
What is driving consideration of a GON in a particular municipality? Are there actual problems or issues that policymakers are seeking to address with a municipal network? Are policymakers looking to generate income? Spur the local economy? Make the local broadband market more competitive? Are they responding to unsolicited proposals?	<input type="checkbox"/>
Have policymakers and planners consulted and involved constituents in the process? Have policymakers created opportunities and a process for informative dialogue amongst citizens and stakeholders during review and planning stages?	<input type="checkbox"/>
<b>With regard to reviewing specific GONs proposals:</b> <ul style="list-style-type: none"> <li>Does the network plan consider and address the range of possible negative outcomes—e.g., low consumer demand, reaction by private ISPs, legal challenges, state preemption, etc.?</li> <li>Are performance and outcome expectations—among policymakers, the public, etc.—for the network grounded in solid data and analysis? Are assumptions and predictions about costs, take rates, and competitive impacts supported?</li> <li>Have policymakers and planners addressed the challenges associated with network construction and maintenance? Factors include population density, geographic considerations, and recurring network costs.</li> <li>Does the network plan have one or more “end games” or exit strategies?</li> <li>Does the plan adequately consider (and contain strategies regarding) the market strengths and possible responses of private sector providers?</li> <li>Does the plan create competitive or regulatory advantages for the proposed municipal provider compared to non-municipal providers?</li> </ul>	<input type="checkbox"/>

Cost, Financing & Business Model Review	
<b>With regard to costs:</b> <ul style="list-style-type: none"> <li>What is the estimated cost of the GON? Does this estimate encompass all aspects of maintenance, operation, and technology upgrades?</li> <li>What is the expected cost of hiring experienced management and expert staff—necessary inputs for operating a network in a competitive market?</li> <li>What is the expected cost for marketing and consumer outreach? Have these and other related costs been factored into cost projections?</li> <li>Have policymakers contemplated the costs associated with unwinding the network in the event of failure?</li> <li>Have policymakers considered the risk and additional costs of a negative credit action (e.g., a credit downgrade) against the locality or parent utility as a result of a GON's financial or operational difficulties?</li> </ul>	<input type="checkbox"/>
<b>With regard to financing:</b> <ul style="list-style-type: none"> <li>How will the network be financed? Will this entail the assumption of debt by the municipality or by a quasi-public entity (e.g., a public utility)?</li> <li>How much debt will planning, construction, operation, maintenance, and technology upgrades require upfront? Over the long term? How long will it take to repay these debts in the best case scenario? How long in the worst case scenario? Have policymakers quantified these scenarios?</li> <li>Who bears the financial risk of network failure? Bond default? Are taxpayers shielded from these obligations?</li> <li>Does the business model use alternative funding mechanisms that would limit taxpayer exposure to the costs of failure?</li> <li>To what extent does the financing plan revolve around government grants or other public assistance? Are these funds guaranteed? Provided in lump-sum upfront or an installment basis? Is this aid conditional (e.g., tied to certain performance metrics)?</li> <li>Has the municipality explored the feasibility of indemnification of public outlays if a network fails? This might be appropriate in instances where GONs proposals are offered unsolicited to municipalities.</li> </ul>	<input type="checkbox"/>
<b>With regard to proposed business models:</b> <ul style="list-style-type: none"> <li>Is the proposed business plan reasonable when measured against actual consumer demand for broadband services and when measured in light of competitive conditions in local markets?</li> <li>To what extent does the business model hinge on cross-subsidies (e.g., by a parent electric utility)? Are these cross-subsidies legal? Sustainable? Do they provide the municipal network with a competitive advantage over providers?</li> <li>Does the proposed business plan include contingency planning to address under-adoption, pricing adjustments by competitors, and/or outright failure?</li> <li>Does the business model allocate any potential profits to the local government (e.g., payments in lieu of taxes)?</li> <li>Does the business model factor in debt servicing generally? In the event that subscriber forecasts are off?</li> <li>To what extent does the business plan include supplemental borrowing or allocation of additional funds/resources by local government?</li> </ul>	<input type="checkbox"/>
Legal, Regulatory & Public Policy Considerations	
Are there state and/or local statutes to guide the GON review process?	<input type="checkbox"/>
Are there related utility laws that might impact core aspects of the proposal (e.g., prohibitions or limitations on utility cross-subsidies)?	<input type="checkbox"/>
Are there limitations on the extent to which municipalities can leverage public resources (e.g., rights-of-way) to provide a commercial service in direct competition with private providers?	<input type="checkbox"/>
Is the municipality empowered under state law to engage in activities that amount to industrial planning?	<input type="checkbox"/>
In the absence of formal state or local rules regarding GONs, has the municipality considered a public referendum or other means of public engagement?	<input type="checkbox"/>



Meredith Attwell Baker

July 17, 2018

The Honorable Marsha Blackburn  
Chairman, Communications and Technology Subcommittee  
United States House of Representatives  
2266 Rayburn House Office Building  
Washington, D.C. 20515

The Honorable Michael Doyle  
Ranking Member, Communications and Technology Subcommittee  
United States House of Representatives  
239 Cannon House Office Building  
Washington, D.C. 20515

Dear Chairman Blackburn and Ranking Member Doyle,

On behalf of the wireless industry, CTIA commends the bipartisan work your subcommittee has done to enabling spectrum auctions and modernizing the wireless siting process. RAYBAUMs Act, passed through your subcommittee, and ultimately enacted into law this year, contains a number of provisions that will help the United States win the global race to 5G which will require more spectrum and reforms to the current siting process.

CTIA supports the following bills enacted as part of the 2018 Omnibus Appropriations Act:

- Reps. Guthrie and Matsui introduced H.R. 4109, the Spectrum Auction Deposits Act, which cleared the way for the Federal Communications Commission to hold future spectrum auctions by allowing deposits to be placed in an account with the U.S. Treasury;
- Reps. Brooks and Matsui introduced H.R. 4847, the Broadband Deployment Streamlining Act, which requires certain Federal government agencies to process wireless siting applications within 270-days of receipt; and
- Rep. Walters introduced H.R. 4795, the Communications Facilities Deployment on Federal Property Act, which requires the development of common forms, applications, and master contracts among Federal agencies which will help speed deployment of wireless broadband across Federal lands.

Each of these provisions are key in streamlining wireless deployment and makes strides to get all Americans access to broadband. We appreciate your bipartisan work on these important issues.

Sincerely,

A handwritten signature in black ink, appearing to read "MABaker", with a long horizontal flourish extending to the right.

Meredith Attwell Baker  
President and CEO



## Reaching the Last Mile: Hearing on Rural Broadband Examines Solutions to Closing the Digital Divide

July, 17, 2018



Today, the U.S. House of Representatives holds an important hearing to discuss the challenges and benefits of rolling out broadband to rural regions across the country in order to reach communities that are currently affected by the digital divide. We applaud members of the Subcommittee on Communications and Technology for opening up a dialogue that brings to the table innovative broadband solutions and approaches to connect more Americans. As we have seen, high-speed and reliable connectivity is the key to improving a community's economic vitality, education, healthcare, and growth, and rural populations have benefitted tremendously from robust broadband networks that help to connect them to the rest of the world.

We are pleased that one of our member companies, Midco, which serves more than 385,000 customers throughout South Dakota, North Dakota, Minnesota, Kansas, and Wisconsin is testifying today and talking about their new fixed wireless solution. It's first important to note that nearly all of the communities that Midco serves have populations less than

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World Cup Coverage Sets New Records for Telemundo and FOX Sports (/whats-new/world-cup-coverage-sets-new-records-for-telemundo-and-fox-sports)

July 13, 2018

 50,000 people, but some have as few as 100. It's remarkable that despite serving one of the most difficult areas to deliver internet, Midco has still been able to make high-speed internet—including gigabit connectivity—available to more than 80 percent of its customers. Their investment in and commitment to serving rural America have turned around communities in major ways.

Midco's fixed wireless approach came about with a partnership with Invisimax, a fixed wireless provider, which allows the ISP to bring reliable and affordable internet service to those in its footprint who current don't have access to the network—whether that's due to the type of land that they live in, the miles and miles that separate farms and homes, or the high costs that come with building fiber in these areas. Unlike fiber connectivity, this solution makes it easier for Midco to deploy fixed wireless networks during harsh weather months, to reach remote areas that are as far as 50 miles away from its fiber network, as well as rough terrain and vast areas of farmland—ultimately helping farmers and increasing their productivity, but also allowing multiple people within the same household to run a home business, stream video, and keep up with news and entertainment.

America's ISPs have invested over \$275 billion in the last two decades to connecting all Americans through robust and high-speed broadband networks, and this has resulted in a reach of over 90 percent of U.S. homes that now have connectivity. But there are still regions out there that remain unserved. This hearing today is an important opportunity for those stakeholders representing rural America to make their voices heard in our quest to ensure that every American has the opportunity to take advantage of all that broadband connectivity has to offer.

For more information on how America's ISPs are bringing connectivity to rural populations, visit our page dedicated to rural broadband (<https://www.ncta.com/rural>).



(/whats-new/fast-internet-opens-doors-new-ways-of-educating-students)

Fast Internet Opens Doors to New Ways of Educating Students (/whats-new/fast-internet-opens-doors-new-ways-of-educating-students)  
July 10, 2018



(/whats-new/new-poll-shows-americans-satisfied-with-quantity-and-quality-of-cable-tv)

New Poll Shows Americans Satisfied with Quantity and Quality of Cable TV (/whats-new/new-poll-shows-americans-satisfied-with-quantity-and-quality-of-cable-tv)  
July 06, 2018

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**Congress of the United States**  
**Washington, DC 20515**

February 21, 2018

The Honorable Robert Aderholt  
 Chairman  
 Agriculture, Rural Development, Food and  
 Drug Administration, and Related Agencies  
 Subcommittee  
 House Appropriations Committee  
 2362-A Rayburn House Office Building  
 Washington, DC 20515

The Honorable John Culberson  
 Chairman  
 Commerce, Justice, Science, and Related  
 Agencies Subcommittee  
 House Appropriations Committee  
 H-310, the Capitol  
 Washington, DC 20515

The Honorable Tom Graves  
 Chairman  
 Financial Services and General Government  
 Subcommittee  
 House Appropriations Committee  
 2000 Rayburn House Office Building  
 Washington, DC 20515

The Honorable Sanford Bishop  
 Ranking Member  
 Agriculture, Rural Development, Food and  
 Drug Administration, and Related Agencies  
 Subcommittee  
 House Appropriations Committee  
 1016 Longworth House Office Building  
 Washington, DC 20515

The Honorable José Serrano  
 Ranking Member  
 Commerce, Justice, Science, and Related  
 Agencies Subcommittee  
 House Appropriations Committee  
 1016 Longworth House Office Building  
 Washington, DC 20515

The Honorable Mike Quigley  
 Ranking Member  
 Financial Services and General Government  
 Subcommittee  
 House Appropriations Committee  
 1016 Longworth House Office Building  
 Washington, DC 20515

Dear Chairmen Aderholt, Culberson, and Graves; and Ranking Members Bishop, Serrano, and Quigley:

As you begin deliberations on the Omnibus Appropriations Act for Fiscal Year 2018, we write to respectfully request that, of the \$20 billion included in the Bipartisan Budget Act for infrastructure projects, a substantial portion be targeted specifically toward building out broadband infrastructure in rural America.

This digital divide between urban and rural America is significant and demands a focused and aggressive response. Rural communities must have adequate broadband infrastructure to attract and retain businesses and human resources, close the homework gap for students and teachers, open innovative and convenient pathways to telemedicine for seniors and providers, and help farmers increase efficiencies in their barns and on their land. The success of America's rural communities depends on the build out of this essential technology.

We write to seek your support for ensuring significant resources from the Bipartisan Budget Act be set aside for rural broadband deployment in both fiscal years 2018 and 2019, distributed appropriately amongst the existing programs under the jurisdictions of your respective Subcommittees. Furthermore, we request all broadband funding allocations be coordinated with the National Telecommunications and Information Administration (NTIA) and provide for updating the National Broadband Map produced by the agency. We are committed to working with you to accomplish our goal.

We recognize the challenges of the current fiscal environment and thank you for your effort and dutiful consideration of this request. Your leadership on the Appropriations Committee is most appreciated. Should you have any questions or concerns, please do not hesitate to contact us.

Sincerely,



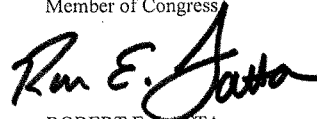
PETER WELCH  
Member of Congress



KEVIN CRAMER  
Member of Congress



MARK POCAN  
Member of Congress



ROBERT E. LATTA  
Member of Congress



DAVID LOEBSACK  
Member of Congress



ADAM KINZINGER  
Member of Congress







GREG WALDEN, OREGON  
CHAIRMAN

FRANK PALLONE, JR., NEW JERSEY  
RANKING MEMBER

ONE HUNDRED FIFTEENTH CONGRESS  
**Congress of the United States**  
**House of Representatives**  
COMMITTEE ON ENERGY AND COMMERCE  
2125 RAYBURN HOUSE OFFICE BUILDING  
WASHINGTON, DC 20515-6115  
Majority (202) 225-2927  
Minority (202) 225-3641

August 1, 2018

Mr. Tom Stroup  
President  
Satellite Industry Association  
1200 18th Street, N.W.; Suite 1001  
Washington, DC 20036

Dear Mr. Stroup:

Thank you for appearing before the Subcommittee on Communications and Technology on Tuesday, July 17, 2018, to testify at the hearing entitled "Realizing the Benefits of Rural Broadband: Challenges and Solutions."

Pursuant to the Rules of the Committee on Energy and Commerce, the hearing record remains open for ten business days to permit Members to submit additional questions for the record, which are attached. To facilitate the printing of the hearing record, please respond to these questions with a transmittal letter by the close of business on Wednesday, August 15, 2018. Your responses should be mailed to Evan Viau, Legislative Clerk, Committee on Energy and Commerce, 2125 Rayburn House Office Building, Washington, DC 20515 and e-mailed to [Evan.Viau@mail.house.gov](mailto:Evan.Viau@mail.house.gov).

Thank you again for your time and effort preparing and delivering testimony before the Subcommittee.

Sincerely,



Marsha Blackburn  
Chairman  
Subcommittee on Communications and Technology

cc: The Honorable Michael F. Doyle, Ranking Member, Subcommittee on Communications and Technology

Attachment



August 15, 2018

Evan Viau  
Legislative Clerk  
Committee on Energy and Commerce  
2125 Rayburn House Office Building  
Washington, DC 20515

Dear Evan,

Thank you for the opportunity to testify at the hearing entitled "Realizing the Benefits of Rural Broadband: Challenges and Solutions" on July 17, 2018. Please see the following Satellite Industry Association<sup>1</sup> responses to the questions of the Subcommittee on Communications and Technology.

Respectfully submitted,

/s/

SATELLITE INDUSTRY ASSOCIATION  
Tom Stroup, President  
1200 18th St., N.W., Suite 1001  
Washington, D.C. 20036

<sup>1</sup> SIA Executive Members include: AT&T Services, Inc.; The Boeing Company; EchoStar Corporation; Intelsat S.A.; Iridium Communications Inc.; Kratos Defense & Security Solutions; Ligado Networks; Lockheed Martin Corporation; Maxar Technologies; Northrop Grumman Corporation; OneWeb; SES Americom, Inc.; Space Exploration Technologies Corp.; Spire Global Inc.; and Viasat, Inc. SIA Associate Members include: ABS US Corp.; Analytical Graphics, Inc.; Artel, LLC; Blue Origin; DataPath Inc.; Eutelsat America Corp.; ExoAnalytic Solutions; Globecom; Glowlink Communications Technology, Inc.; HawkEye 360; Hughes; Inmarsat, Inc.; Kymeta Corporation; L3 Technologies; O3b Limited; Panasonic Avionics Corporation; Planet; Telesat Canada; TrustComm, Inc.; Ultisat, Inc.; and XTAR, LLC.



**"Realizing the Benefits of Rural Broadband: Challenges and Solutions"**

Additional Questions for the Record

Tom Stroup, President, Satellite Industry Association

Before the U.S. House of Representatives Committee on Energy and Commerce

Subcommittee on Communications and Technology

Jul 17, 2018

**The Honorable Yvette Clarke**

1. We hear a lot of talk around Washington that streamlining local siting ordinances *alone* can pave the way for high-speed broadband.
  - a. I have no doubt that such initiatives can help, but does anyone on the panel believe that streamlining alone will result in high-speed broadband being deployed across every part of the country?

Answer: While streamlining may be able to help with deployment in some areas of the country, other areas simply are too sparsely populated or difficult to reach economically by terrestrial service providers for streamlining to have any impact on terrestrial broadband deployment. The nature of satellite's wide coverage, however, ensures that all areas within the satellite's footprint receive the same quality of service, whether they are farms, remote cabins, small towns, or big cities. When incentives are provided on a technology neutral basis, a customer can obtain satellite broadband services by simply ordering and awaiting at-home installation. Accordingly, unlike with respect to terrestrial broadband, no long-term build out of terrestrial network infrastructure is required of satellite broadband nor is deployment hindered by local ordinances.

**The Honorable David Loebsack**

1. In the letter I've submitted for the record Chariton Valley Energy Cooperative brings up a major problem that I've emphasized time and time again—faulty broadband mapping data. Chariton was disqualified from the FCC's Connect America Fund auction—the auction intended to provide support for infrastructure build out to rural communities. The reason Chariton was disqualified is due to the FCC's data showing that 100 percent of residents in their new service area have access to basic internet access. Yet independent tests run in these counties show that is true only 17 percent of the time.



This is a huge discrepancy and has the potential to cut a huge swath of rural Iowa out of eligibility for these funds.

There's been so much criticism of these maps and their underlying data—from House to Senate, Democrats and Republicans—that it just seems unfair for the FCC to continue to make policy decisions on the basis of this information.

- a. Do you have other ideas for improving the reliability of this data, so that organizations like Chariton aren't left out in the cold when seeking grants to expand internet access to rural areas of the U.S.?

Answer: SIA agrees that it is important to understand where broadband is currently available. For this reason, it is important to have a clear and accurate map of broadband coverage in America. The Rural Wireless Access Act of 2017 addresses the need for accurate information about wireless service in rural America. Ensuring that all broadband platforms are included in broadband mapping will improve the accuracy of the data and help consumers, regardless of location, understand all the competitive options that are available in selecting a broadband provider. Even more, accurate data regarding broadband availability across the nation is important to inform future public policy aimed to address broadband gaps in unserved areas across the nation. For these reasons, SIA supports funding to improve broadband mapping and to continuously update the National Broadband Map. The nature of satellite's wide coverage ensures that all areas within the satellite's footprint receive the same quality of service, whether they are farms, remote cabins, small towns, or big cities. These services are available directly to the consumer today, covering all 50 states and delivering broadband offerings up to 100 megabits per second (Mbps). Approximately 2 million customers subscribe at reasonable rates to speeds that meet the FCC's definition of broadband service. Thus, SIA urges that the broadband maps reflect that satellite broadband service is available throughout the U.S.

GREG WALDEN, OREGON  
CHAIRMAN

FRANK PALLONE, JR., NEW JERSEY  
RANKING MEMBER

ONE HUNDRED FIFTEENTH CONGRESS  
**Congress of the United States**  
**House of Representatives**  
COMMITTEE ON ENERGY AND COMMERCE  
2125 RAYBURN HOUSE OFFICE BUILDING  
WASHINGTON, DC 20515-6115  
Majority (202) 225-2927  
Minority (202) 225-3641  
August 1, 2018

Mr. Justin Forde  
Senior Director of Government Relations  
Midco  
50 22nd Street East  
West Fargo, ND 58078

Dear Mr. Forde:

Thank you for appearing before the Subcommittee on Communications and Technology on Tuesday, July 17, 2018, to testify at the hearing entitled "Realizing the Benefits of Rural Broadband: Challenges and Solutions."

Pursuant to the Rules of the Committee on Energy and Commerce, the hearing record remains open for ten business days to permit Members to submit additional questions for the record, which are attached. To facilitate the printing of the hearing record, please respond to these questions with a transmittal letter by the close of business on Wednesday, August 15, 2018. Your responses should be mailed to Evan Viau, Legislative Clerk, Committee on Energy and Commerce, 2125 Rayburn House Office Building, Washington, DC 20515 and e-mailed to [Evan.Viau@mail.house.gov](mailto:Evan.Viau@mail.house.gov).

Thank you again for your time and effort preparing and delivering testimony before the Subcommittee.

Sincerely,



Marsha Blackburn  
Chairman  
Subcommittee on Communications and Technology

cc: The Honorable Michael F. Doyle, Ranking Member, Subcommittee on Communications and Technology

Attachment



August 15, 2018

Via First Class Mail and electronic mail (evan.viau@mail.house.gov)

Mr. Evan Viau  
Legislative Clerk  
Committee on Energy and Commerce  
2125 Rayburn House Office Building  
Washington, D.C. 20515

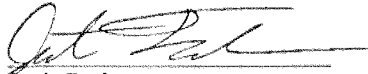
**Re: "Realizing the Benefits of Rural Broadband: Challenges and Solutions"  
Responses of Justin Ford to Questions for the Record**

Dear Mr. Viau:

Enclosed please find my written responses to the questions for the record regarding my testimony on Tuesday, July 17, 2018 before the Subcommittee on Communications and Technology at the hearing, "Realizing the Benefits of Rural Broadband: Challenges and Solutions" ("Hearing").

Thank you again for the opportunity to appear.

Sincerely,

  
Justin Forde  
Senior Director of Government Relations  
MidCo

Enclosure

U.S. House of Representatives  
Committee on Energy and Commerce  
Responses of Justin Ford to Additional Questions for the Record

**“Realizing the Benefits of Rural Broadband: Challenges and Solutions”  
Tuesday, July 17, 2018**

*[From Rep. Clarke]*

**Question 1: We hear a lot of talk around Washington that streamlining local siting ordinances *alone* can pave the way for high-speed broadband.**

- a. I have no doubt that such initiatives can help, but does anyone on the panel believe that streamlining alone will result in high-speed broadband being deployed across every part of the country?**

**Response:** Midco believes that streamlining local siting ordinances can be an important part of expanding broadband deployment in other areas, but reaching every part of the country with broadband is a complex problem requiring different solutions in different areas.

Midco has been fortunate to have great working relationships with the municipalities within its service areas and local siting rules have not been an impediment to broadband deployment. Nonetheless, we recognize that streamlining local siting rules in some instances may promote broadband deployment, particularly for broadband providers that have been subjected to long permitting delays, requests for additional franchise agreements for different services over the same network, or excessive fee demands.

Successful broadband deployment, however, requires more than streamlined siting rules. As federal lawmakers work to remove barriers to broadband deployment, they must continue to promote wired and wireless broadband, avoid exacerbating regulatory asymmetries that might otherwise be created among competing technology platforms, and continue to look for ways to provide all broadband providers – particularly small and rural providers – with access to more spectrum with limited interference to provide reliable service to all Americans.

I cannot speak for others on the panel.

*[From Rep. Loebsack]*

**Question 1: In the letter I’ve submitted for the record, Chariton Valley Electric Cooperative brings up a major problem that I’ve emphasized time and time again – faulty broadband mapping data. Chariton was disqualified from the FCC’s Connect America Fund Auction – the auction intended to provide support for infrastructure build-out to rural communities. The reason Chariton was disqualified is due to the FCC’s data showing that 100 percent of residents in their service area have access to basic internet access. Yet independent tests run in these counties show that is true only 17 percent of the time.**

**This is a huge discrepancy and has the potential to cut a huge swath of rural Iowa out of eligibility for these funds.**

**There's been so much criticism of these maps and their underlying data – from House to Senate, Democrats and Republicans – that it just seems unfair for the FCC to continue to make policy decisions on the basis of this information.**

- a. Do you have other ideas for improving the reliability of this data so that organizations like Chariton aren't left out in the cold when seeking grants expand internet access to rural areas of the U.S.?**

**Response:** Midco recognizes broadband availability data can always be improved and that there may be inaccuracies in the mapping data that has been collected. For this reason, we appreciate the challenge process that both the Federal Communications Commission ("FCC") and Rural Utility Service ("RUS") use when determining if an area is served or unserved, which allows broadband providers to correct the record if necessary. We also support efforts to further improve the reliability of data that the agencies making funding decisions rely on to ensure that funding is going to unserved areas and that the service provided is accurately portrayed. In fact, we have firsthand knowledge with respect to this issue. In 2013, Midco participated in a proceeding before the FCC, highlighting multiple census blocks where Midco provided broadband at speeds exceeding the FCC's requirements, yet the broadband availability data indicated that those census blocks were completely or partially unserved. In our case, we were concerned that data discrepancies such as those would contribute to overbuilding areas served by private risk capital and that federal funds earmarked for broadband expansion would be targeted at areas that were not truly unserved rural areas.

The FCC and NTIA currently have open proceedings regarding broadband availability data, and there appears to be common agreement on the importance of making funding and other regulatory decisions based on complete and accurate data. There is also a concern that requirements to submit data on broadband availability not become overwhelming, especially for mid-sized and smaller providers.

To improve the accuracy of this data without imposing unreasonable requirements, Midco suggests that the FCC and NTIA collaborate to find additional sources of data useful to augment existing broadband availability data, including state broadband availability data. It is also important that any database reflect information regarding locations where funding has been awarded for broadband deployment, to protect against duplication and ensure that scarce funds are put to the best possible use.

GREG WALDEN, OREGON  
CHAIRMAN

FRANK PALLONE, JR., NEW JERSEY  
RANKING MEMBER

ONE HUNDRED FIFTEENTH CONGRESS  
**Congress of the United States**  
**House of Representatives**  
COMMITTEE ON ENERGY AND COMMERCE  
2125 RAYBURN HOUSE OFFICE BUILDING  
WASHINGTON, DC 20515-6115  
Majority (202) 225-2927  
Minority (202) 225-3641  
August 1, 2018

Mr. Claude Aiken  
President and CEO  
Wireless Internet Service Providers Association  
4417 13th Street; #317  
Saint Cloud, FL 34769

Dear Mr. Aiken:

Thank you for appearing before the Subcommittee on Communications and Technology on Tuesday, July 17, 2018, to testify at the hearing entitled "Realizing the Benefits of Rural Broadband: Challenges and Solutions."

Pursuant to the Rules of the Committee on Energy and Commerce, the hearing record remains open for ten business days to permit Members to submit additional questions for the record, which are attached. To facilitate the printing of the hearing record, please respond to these questions with a transmittal letter by the close of business on Wednesday, August 15, 2018. Your responses should be mailed to Evan Viau, Legislative Clerk, Committee on Energy and Commerce, 2125 Rayburn House Office Building, Washington, DC 20515 and e-mailed to [Evan.Viau@mail.house.gov](mailto:Evan.Viau@mail.house.gov).

Thank you again for your time and effort preparing and delivering testimony before the Subcommittee.

Sincerely,



Marsha Blackburn  
Chairman  
Subcommittee on Communications and Technology

cc: The Honorable Michael F. Doyle, Ranking Member, Subcommittee on Communications and Technology

Attachment

## Aiken QFR Response

The Honorable Yvette Clarke

1. We hear a lot of talk around Washington that streamlining local siting ordinances alone can pave the way for high-speed broadband.
  - a. I have no doubt that such initiatives can help, but does anyone on the panel believe that streamlining alone will result in high-speed broadband being deployed across every part of the country?

Congresswoman, you are correct that streamlining regulations alone will not solve every problem. However, streamlining of infrastructure processes would make a significant difference for small businesses that are trying to deploy broadband in rural areas. Whether it is a \$5000 permitting fee just to put a basketball-sized radio on an existing tower; or worse, having to tear down a tower because your permit was revoked; streamlining can make a significant difference for small, unsubsidized providers offering affordable, low-margin service in rural areas.

But what will truly make a difference is streamlining small provider access to spectrum, which may be invisible but truly is critical infrastructure. If the government does not provide access to spectrum in a way that makes sense for small providers, Americans who lack robust broadband service will continue to be left out. There are hundreds of thousands of homes and businesses within range of WISPA members' towers today, but our members cannot serve them because there is insufficient spectrum available to do so. A 2017 report showed that capital expenditures for fixed wireless networks are about one-seventh the cost of fiber and one-fourth the cost of cable, calling into question the ability of those technologies to support a viable business case in rural areas. The most significant action Congress and the FCC can take to serve the unserved is auction more spectrum in small license areas; make more shared spectrum available; and unleash more unlicensed spectrum. These actions will do more than anything else to enable small companies to reach more people with high-speed broadband and reduce reliance on federal subsidies.

The Honorable David Loebsack

1. In the letter I've submitted for the record Chariton Valley Electric Cooperative brings up a major problem that I've emphasized time and time again—faulty broadband mapping data. Chariton was disqualified from the FCC's Connect America Fund auction—the auction intended to provide support for infrastructure build out to rural communities. The reason Chariton was disqualified is due to the FCC's data showing that 100 percent of residents in their service area have access to basic internet access. Yet independent tests run in these counties show that is true only 17 percent of the time.

This is a huge discrepancy and has the potential to cut a huge swath of rural Iowa out of eligibility for these funds.

There's been so much criticism of these maps and their underlying data—from House to Senate, Democrats and Republicans—that it just seems unfair for the FCC to continue to make policy decisions on the basis of this information.

a. Can you describe the implications of faulty FCC 477 data?

The implications are as you say, Congressman: we do not know where broadband truly is and truly is not available. This has broad impacts on cost-effective deployment of subsidies, something that WISPA is deeply concerned about. If faulty data is used to provide subsidies to a large corporation to deploy on top of an already existing small business deployment, the government will in essence be paying to put a small business (typically a local community member) out of business.

b. Do you have other ideas for improving the reliability of this data, so that organizations like Chariton aren't left out in the cold when seeking grants to expand internet access to rural areas of the U.S.?

We are strongly supportive of acquiring better data, but acquiring better data down the road should not come at the cost of deploying better broadband today. Let me explain.

Our members are predominantly small businesses, which are very sensitive to regulatory burdens. Granular mapping obligations imposed on fixed wireless broadband providers will require more resources expended on mapping (e.g., new software, data input) and less on deployment.

We do want to work with government to improve data collection. We have proposed allowing fixed wireless providers to submit service "polygons," which would allow the FCC to translate those polygons into more granular data. Unlike wireline technologies, fixed wireless coverage is often inexact and certainly cannot be mapped at census level or geopolitical borders. We are also committed to work with Congress, the Administration, NTIA, and the FCC to enhance the accuracy of broadband data. But we must be mindful of doing this in a way that produces accurate data without undue burdens on small providers.

GREG WALDEN, OREGON  
CHAIRMAN

FRANK PALLONE, JR., NEW JERSEY  
RANKING MEMBER

ONE HUNDRED FIFTEENTH CONGRESS  
**Congress of the United States**  
**House of Representatives**  
COMMITTEE ON ENERGY AND COMMERCE  
2125 RAYBURN HOUSE OFFICE BUILDING  
WASHINGTON, DC 20515-6115  
Majority (201) 225-2922  
Minority (202) 225-3641  
August 1, 2018

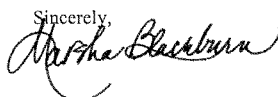
Mr. John C. May  
President, Ag Solutions and CIO  
Deere & Company  
1 John Deere Place  
Moline, IL 61265

Dear Mr. May:

Thank you for appearing before the Subcommittee on Communications and Technology on Tuesday, July 17, 2018, to testify at the hearing entitled "Realizing the Benefits of Rural Broadband: Challenges and Solutions."

Pursuant to the Rules of the Committee on Energy and Commerce, the hearing record remains open for ten business days to permit Members to submit additional questions for the record, which are attached. To facilitate the printing of the hearing record, please respond to these questions with a transmittal letter by the close of business on Wednesday, August 15, 2018. Your responses should be mailed to Evan Viau, Legislative Clerk, Committee on Energy and Commerce, 2125 Rayburn House Office Building, Washington, DC 20515 and e-mailed to [Evan.Viau@mail.house.gov](mailto:Evan.Viau@mail.house.gov).

Thank you again for your time and effort preparing and delivering testimony before the Subcommittee.

Sincerely,  


Marsha Blackburn  
Chairman  
Subcommittee on Communications and Technology

cc: The Honorable Michael F. Doyle, Ranking Member, Subcommittee on Communications and Technology

Attachment

**Responses to Additional Questions for the Record  
addressed to John C. May, Deere & Company  
Subcommittee of Communications and Technology  
Hearing of July 17, 2018**

**The Honorable Yvette Clarke**

Question 1. We hear a lot of talk around Washington that streamlining local siting ordinances *alone* can pave the way for high-speed broadband.

a. I have no doubt that such initiatives can help, but does anyone on the panel believe that streamlining alone will result in high-speed broadband being deployed across every part of the country?

***Response of John C. May:***

*In a word, no. There is much more to be done. We agree that streamlining local siting ordinances is an extremely important step to promote broadband deployment, but it is far from the only step that can or should be taken. Rural areas today do not enjoy access to high speed broadband -- either wireless and wired -- comparable to what is available in urban and suburban areas of the country, and rural businesses and consumers are missing out. There are many economic and other benefits to expanding broadband deployment to rural areas, including to areas with agricultural operations that are the economic backbone of rural America.*

*More so than siting policies, the most daunting challenge to narrowing the "digital divide" in rural areas is the steep cost of infrastructure, where there are fewer users to absorb the required investments. The costs of site acquisition, cell tower infrastructure, conduits, poles, fiber, and rights-of-way for backhaul and fiber distribution must by definition be spread among far fewer users in rural areas, including where agricultural operations occur. Many commercial providers simply cannot make the business case necessary to justify the investment needed to expand into low-density areas. The economics of delivering broadband to high-cost rural areas are such that continued public support of expanded rural infrastructure is essential. Streamlined siting decisions alone are not sufficient to expand deployment to high-cost rural areas.*

*Beyond streamlining processes and increased funding, specific policies are needed to drive improvements not just in rural capacity, but also in greater coverage of rural areas. The specific rules that define which rural areas are worthy of broadband support for infrastructure build-out should not be limited to serving rural residential locations only. The rules must also encourage broadband deployment in agricultural areas, such as active cropland, rangeland and forests. The consideration of other functional broadband needs (beyond people and households) in coverage decisions is necessary to maximize the economic benefits from expanded rural deployment and to fully engage rural communities in the nation's digital economy, on par with urban and suburban areas.*

Responses to Additional Questions for the Record  
addressed to John C. May  
Deere & Company

**The Honorable David Loebsack**

1. In the letter I've submitted for the record Chariton Valley Electric Cooperative brings up a major problem that I've emphasized time and time again-faulty broadband mapping data. Chariton was disqualified from the FCC's Connect America Fund auction-the auction intended to provide support for infrastructure build out to rural communities. The reason Chariton was disqualified is due to the FCC's data showing that 100 percent of residents in their service area have access to basic internet access. Yet independent tests run in these counties show that is true only 17 percent of the time. This is a huge discrepancy and has the potential to cut a huge swath of rural Iowa out of eligibility for these funds. There's been so much criticism of these maps and their underlying data-from House to Senate, Democrats and Republicans-that it just seems unfair for the FCC to continue to make policy decisions on the basis of this information.

- a. Do you have other ideas for improving the reliability of this data, so that organizations like Chariton aren't left out in the cold when seeking grants to expand internet access to rural areas of the U.S.?

**Response of John C. May:**

*We fully agree that the lack of reliable and complete data regarding nationwide broadband availability significantly hampers and distorts policymaking and investment decisions, and is itself a reason that rural areas continue to be left behind in the broadband economy.*

*Broadband data collection and analysis should recognize the important need for broadband on agricultural lands, including croplands and ranchlands. Agricultural operations are an important -- and often the most important -- economic driver in many rural areas and represent a significant portion of the national economy. Efforts to promote broadband deployment where people work, as well as live and travel, and to empower innovation in the nation's rural areas will fall short if assessments of broadband availability overlook these important agricultural areas.*

*Broadband data reporting should not be based solely on populations in a Census Block or households. Accurate and reliable mobile broadband deployment data is essential to policymakers and consumers, both business and residential. We agree that the current approach is inadequate, primarily because it overstates rural coverage, and fails to consider important economic functions and activities that are geographically distant from residential users or households. Current mapping processes overlook unserved and underserved agricultural areas that lack needed access to broadband services.*

*High-speed coverage is needed on active croplands and ranchlands to enable precision technologies and solutions that can greatly improve farm productivity and sustainability. Deere is concerned that Census Block and household data mapping skews coverage decisions and investment toward rural residential populations, without regard to other important areas such as*

Responses to Additional Questions for the Record  
addressed to John C. May  
Deere & Company

*the need for broadband coverage of rural agricultural lands, including croplands and ranchlands.*

*The information collected through the FCC's Form 477 broadband deployment report is currently the only source of data depicting nationwide broadband availability. Form 477 data, self-reported semi-annually to the FCC by voice and broadband telecommunications carriers, reports services provided to residential populations as measured by Census Blocks. In rural areas where population densities are low, Census Blocks can cover very large geographic areas compared to urban and suburban areas. Nonetheless, in the current reporting system, carriers reporting broadband service deployment in a limited and discrete area of a Census Block – say one small corner -- will report the entire block as being covered by broadband. In that unfortunate case, federal support for broadband deployment will likely be denied to the entire Census Block even though a significant portion of the Census Block area remains unserved. Given the very limited sources of broadband availability data, this reporting significantly distorts funding and other broadband deployment policies in a way that overlooks the needs of rural areas.*

*Similarly, reporting programs that measure adoption and usage of households also skews data to reflect deployment status of residential population centers. They ignore the important and growing demand for high-speed broadband by rural business and other users, large and small. Broadband availability data should be drawn from a wide range of sources including, but not limited to, carrier mobile coverage maps, private party users, machine modem connection statistics, information from other agencies (particularly the USDA), and state resources and private parties. Additionally, other similar land use or functional use data sources can be used to determine where broadband coverage is lacking, where it is not, and the quality of broadband services in those areas where it does exist.*

*“On the Ground” test data should be used to verify coverage. To verify coverage information and confirm granular, accurate broadband deployment data, Deere supports the adopting of “on the ground” test data (via app or drive tests) to verify broadband coverage. Test results will help ensure the accuracy of coverage data showing the actual consumer experience. If crowd-source data provides timely and accurate data, that data could be used as well. Given the importance of broadband coverage to modern farming and ranching techniques, broadband availability should include an assessment of coverage or the lack thereof on “cropland” and “ranchland” coverage.*

*Broadband data should specify technology; LTE coverage is essential. Broadband availability should be, wherever possible, specifically identified by technology (LTE mobile, fixed wireless, wireline, cable, satellite, etc.) and available speeds. Smart farming and precision agriculture techniques use a variety of technologies but availability of high-speed LTE wireless is a priority. Transmission through wireline, fixed wireless, satellite or low power radios can help to augment and address very specific situations but none of these technologies standing alone or in combinations, absent LTE mobile have the range, bandwidth, or lack of latency to meet the needs of modern agricultural operations.*

GREG WALDEN, OREGON  
CHAIRMAN

FRANK PALLONE, JR., NEW JERSEY  
RANKING MEMBER

ONE HUNDRED FIFTEENTH CONGRESS  
**Congress of the United States**  
**House of Representatives**  
COMMITTEE ON ENERGY AND COMMERCE  
2125 RAYBURN HOUSE OFFICE BUILDING  
WASHINGTON, DC 20515-6115  
Majority (202) 225-2927  
Minority (202) 225-3641

August 1, 2018

Ms. Jenni Word, RN  
Associate Administrator and Chief Nursing Officer  
Wallowa Memorial Hospital  
601 Medical Parkway  
Enterprise, OR 97828

Dear Ms. Word:

Thank you for appearing before the Subcommittee on Communications and Technology on Tuesday, July 17, 2018, to testify at the hearing entitled "Realizing the Benefits of Rural Broadband: Challenges and Solutions."

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Thank you again for your time and effort preparing and delivering testimony before the Subcommittee.

Sincerely,



Marsha Blackburn  
Chairman  
Subcommittee on Communications and Technology

cc: The Honorable Michael F. Doyle, Ranking Member, Subcommittee on Communications and Technology

Attachment

Attachment—Additional Questions for the Record

The Honorable Yvette Clarke

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  - a. I have no doubt that such initiatives can help, but does anyone on the panel believe that streamlining alone will result in high-speed broadband being deployed across every part of the country?

The Honorable David Loebsack

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- a. Do you have other ideas for improving the reliability of this data, so that organizations like Chariton aren't left out in the cold when seeking grants to expand internet access to rural areas of the U.S.?

GREG WALDEN, OREGON  
CHAIRMAN

FRANK PALLONE, JR., NEW JERSEY  
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Minority (202) 225-3641

August 1, 2018

Ms. Suzanne Coker Craig  
Managing Partner  
CuriosiTees of Pinetops  
P.O. Box 1073  
Pinetops, NC 27864

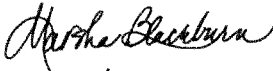
Dear Ms. Coker Craig:

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Sincerely,



Marsha Blackburn  
Chairman  
Subcommittee on Communications and Technology

cc: The Honorable Michael F. Doyle, Ranking Member, Subcommittee on Communications and Technology

Attachment

August 19, 2018

The Honorable Marsha Blackburn  
Chairman  
Subcommittee on Communications and Technology  
2125 Rayburn House Office Building  
Washington, DC 20515-6115

Dear Chairman Blackburn,

Thank you for the opportunity to provide further information for the record on the hearing "Realizing the Benefits of Rural Broadband: Challenges and Solutions." My responses to the additional questions appear below. Please feel free to contact me if there are any further questions.

Sincerely,

A handwritten signature in black ink that reads "Suzanne Coker Craig". The signature is written in a cursive, flowing style.

Suzanne Coker Craig  
Managing Partner, CuriosiTees of Pinetops LLC  
Former Commissioner, Town of Pinetops NC

**Responses of Suzanne Coker Craig  
Subcommittee on Communications and Technology Hearing  
“Realizing the Benefits of Rural Broadband: Challenges and Solutions.”**

**To The Honorable Yvette Clarke:**

1. Earlier this year, Congressman Issa and I launched the Congressional Caucus on Smart Cities to bring American communities into the 21st Century through innovation and technological change.

We believe that embracing smart technology will make our communities more sustainable, resilient, efficient, livable, and competitive in a world in which technology is constantly advancing.

- a. Ms. Coker Craig, in your experience, what has gigabit broadband access meant for the city government in Pinetops? Specifically, has it helped you deliver essential services?

**Response:** Access to modern broadband has been a tremendous asset to our small town. Our town government has benefitted similar to other businesses through faster download and upload speeds in daily computer tasks and in accepting online payments and credit card transactions. Our police department uses several cameras deployed in high crime areas and busy intersections, and the quality of that system is enhanced with the improved internet system. Their response time is enhanced and their ability to discern facts from quality video streaming has improved their service to the community. I have also heard from one of our local fire department chiefs (an all-volunteer department) who reported that he is now able to stream video training resources that were not available without access to modern broadband internet. Our town also partners with our county to provide a library branch in town and their access to fiber-based internet has greatly increased their capabilities to serve students and adults in the community.

2. We hear a lot of talk around Washington that streamlining local siting ordinances *alone* can pave the way for high-speed broadband.
  - a. I have no doubt that such initiatives can help, but does anyone on the panel believe that streamlining alone will result in high-speed broadband being deployed across every part of the country?

**Response:** I am not familiar with this concept, so am not comfortable attempting to answer this question directly. I will, though, repeat here my belief that there is no “one size fits all” solution to expanding broadband across rural areas. Local and regional government leaders need to be given the flexibility to work with

their available partners and resources to provide what is best for their communities.

**The Honorable David Loebsack**

1. In the letter I've submitted for the record Chariton Valley Electric Cooperative brings up a major problem that I've emphasized time and time again—faulty broadband mapping data. Chariton was disqualified from the FCC's Connect America Fund auction—the auction intended to provide support for infrastructure build out to rural communities. The reason Chariton was disqualified is due to the FCC's data showing that 100 percent of residents in in their service area have access to basic internet access. Yet independent tests run in these counties show that is true only 17 percent of the time.

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- a. Do you have other ideas for improving the reliability of this data, so that organizations like Chariton aren't left out in the cold when seeking grants to expand internet access to rural areas of the U.S.?

**Response:** Would it be possible and practical for the FCC to ask local governments to run basic speed tests in their areas? We witnessed “faulty data” about the internet speeds in our area given by a lobbyist for our area's large telecom provider during a state legislative committee hearing. The lobbyist told the committee that his company provided 100 mps internet service to our town and we had no reason to complain. In reality, even business customers within a block of their hub only received 10 mps download speed under ideal conditions, and that number decreased as customers were further from that hub. Upload speed was about 2 mps at best, with speed tests generally showing less than 1 mps upload. Unbiased speed tests are readily available and provide easily printable results in a matter of just a few minutes. From my experience, people who live in small towns and rural areas would be very willing to report their actual internet speeds if it would help them get improved speed and access.