AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

# BUILDING OPPORTUNITY IN RURAL AMERICA THROUGH AFFORDABLE, RELIABLE, AND HIGH-SPEED BROADBAND

## HEARING

BEFORE THE

SUBCOMMITTEE ON COMMODITY EXCHANGES, ENERGY, AND CREDIT

OF THE

COMMITTEE ON AGRICULTURE
HOUSE OF REPRESENTATIVES

ONE HUNDRED SIXTEENTH CONGRESS

FIRST SESSION

JULY 11, 2019

**Serial No. 116–15**

Printed for the use of the Committee on Agriculture
*agriculture.house.gov*

U.S. GOVERNMENT PUBLISHING OFFICE
37–193 PDF WASHINGTON : 2019

## COMMITTEE ON AGRICULTURE

COLLIN C. PETERSON, Minnesota, *Chairman*

DAVID SCOTT, Georgia
JIM COSTA, California
MARCIA L. FUDGE, Ohio
JAMES P. MCGOVERN, Massachusetts
FILEMON VELA, Texas
STACEY E. PLASKETT, Virgin Islands
ALMA S. ADAMS, North Carolina
*Vice Chair*
ABIGAIL DAVIS SPANBERGER, Virginia
JAHANA HAYES, Connecticut
ANTONIO DELGADO, New York
TJ COX, California
ANGIE CRAIG, Minnesota
ANTHONY BRINDISI, New York
JEFFERSON VAN DREW, New Jersey
JOSH HARDER, California
KIM SCHRIER, Washington
CHELLIE PINGREE, Maine
CHERI BUSTOS, Illinois
SEAN PATRICK MALONEY, New York
SALUD O. CARBAJAL, California
AL LAWSON, JR., Florida
TOM O'HALLERAN, Arizona
JIMMY PANETTA, California
ANN KIRKPATRICK, Arizona
CYNTHIA AXNE, Iowa

K. MICHAEL CONAWAY, Texas, *Ranking Minority Member*
GLENN THOMPSON, Pennsylvania
AUSTIN SCOTT, Georgia
ERIC A. "RICK" CRAWFORD, Arkansas
SCOTT DESJARLAIS, Tennessee
VICKY HARTZLER, Missouri
DOUG LAMALFA, California
RODNEY DAVIS, Illinois
TED S. YOHO, Florida
RICK W. ALLEN, Georgia
MIKE BOST, Illinois
DAVID ROUZER, North Carolina
RALPH LEE ABRAHAM, Louisiana
TRENT KELLY, Mississippi
JAMES COMER, Kentucky
ROGER W. MARSHALL, Kansas
DON BACON, Nebraska
NEAL P. DUNN, Florida
DUSTY JOHNSON, South Dakota
JAMES R. BAIRD, Indiana
JIM HAGEDORN, Minnesota

---

ANNE SIMMONS, *Staff Director*
MATTHEW S. SCHERTZ, *Minority Staff Director*

---

## SUBCOMMITTEE ON COMMODITY EXCHANGES, ENERGY, AND CREDIT

DAVID SCOTT, Georgia, *Chairman*

JEFFERSON VAN DREW, New Jersey
FILEMON VELA, Texas
STACEY E. PLASKETT, Virgin Islands
ABIGAIL DAVIS SPANBERGER, Virginia
ANTONIO DELGADO, New York
ANGIE CRAIG, Minnesota
SEAN PATRICK MALONEY, New York
ANN KIRKPATRICK, Arizona
CYNTHIA AXNE, Iowa

AUSTIN SCOTT, Georgia, *Ranking Minority Member*
ERIC A. "RICK" CRAWFORD, Arkansas
MIKE BOST, Illinois
DAVID ROUZER, North Carolina
ROGER W. MARSHALL, Kansas
NEAL P. DUNN, Florida
DUSTY JOHNSON, South Dakota
JAMES R. BAIRD, Indiana

ASHLEY SMITH, *Subcommittee Staff Director*

# CONTENTS


| | Page |
|---|---|
| Conaway, Hon. K. Michael, a Representative in Congress from Texas, opening statement | 5 |
| Kirkpatrick, Hon. Ann, a Representative in Congress from Arizona, submitted letter; on behalf of James D. Ogsbury, Executive Director, Western Governors' Association | 63 |
| Scott, Hon. Austin, a Representative in Congress from Georgia, opening statement | 3 |
| Scott, Hon. David, a Representative in Congress from Georgia, opening statement | 1 |
| Prepared statement | 3 |


WITNESSES


| | |
|---|---|
| Hengel, David, Executive Director, Greater Bemidji, Inc., Bemidji, MN | 8 |
| Prepared statement | 10 |
| Mollgaard, Neela, Executive Director, Red Wing Ignite, Red Wing, MN | 14 |
| Prepared statement | 16 |
| Submitted question | 70 |
| Hess, M.D., David C., Dean, Executive Vice President of Medical Affairs and Integration, Presidential Distinguished Chair, and Professor of Neurology, Medical College of Georgia, Augusta University, Augusta, GA | 19 |
| Prepared statement | 21 |
| Watahomigie-Corliss, Hon. Ophelia, Councilwoman, Havasupai Tribe, Supai, AZ | 27 |
| Prepared statement | 29 |
| Hurst, C. Blake, President, Missouri Farm Bureau Federation; Board Member, American Farm Bureau Federation, Tarkio, MO | 33 |
| Prepared statement | 34 |
| Submitted questions | 71 |

# BUILDING OPPORTUNITY IN RURAL AMERICA THROUGH AFFORDABLE, RELIABLE, AND HIGH-SPEED BROADBAND

**THURSDAY, JULY 11, 2019**

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON COMMODITY EXCHANGES, ENERGY, AND CREDIT,
COMMITTEE ON AGRICULTURE,
*Washington, D.C.*

The Subcommittee met, pursuant to call, at 10:00 a.m., in Room 1300 of the Longworth House Office Building, Hon. David Scott of Georgia [Chairman of the Subcommittee] presiding.

Members present: Representatives David Scott of Georgia, Van Drew, Vela, Spanberger, Delgado, Craig, Kirkpatrick, Axne, O'Halleran, Austin Scott of Georgia, Crawford, Rouzer, Marshall, Johnson, Baird, Hartzler, Allen, and Conaway (*ex officio*).

Staff present: Carlton Bridgeforth, Emily German, Matt MacKenzie, Isabel Rosa, Ashley Smith, Paul Balzano, Patricia Straughn, Dana Sandman, and Jennifer Yezak.

## OPENING STATEMENT OF HON. DAVID SCOTT, A REPRESENTATIVE IN CONGRESS FROM GEORGIA

The CHAIRMAN. This hearing of the Subcommittee on Commodity Exchanges, Energy, and Credit entitled, *Building Opportunities in Rural America through Affordable, Reliable, and High-Speed Broadband,* will come to order.

Good morning, and welcome to today's hearing on broadband Internet connectivity and the great opportunities it presents for our rural communities. This is an extraordinarily important and very timely and very necessary hearing, and this issue is an important one because it lets us shine light on those rural areas that have seen what broadband investment can do, and are thriving because of their access to broadband. Rural broadband is a prime example of how government investments, coupled with private innovation, can create a ripple of success and increase the quality of life for Americans in our rural communities.

We are going to hear today from a cross-section of very knowledgeable people who have worked hard to increase access to and success in healthcare, agriculture, local communities, education, and small businesses. We are going to hear from them on their successes in leveraging broadband connectivity to enhance the services they provide to our communities. And it is my hope that through these stories, their reports to us this morning, that we can have a

conversation, a meaningful, productive, beneficial conversation for our rural communities about those steps that we still need to take, because there are many, many rural communities that are crying out for our help and for broadband.

In my home State of Georgia, for instance, we have lost seven rural hospitals since 2010. I want to repeat that so you see it: 2010, just 9 years ago, and we have lost seven rural hospitals. And this is third most in our nation. There are so many of our states who are suffering an impact with the loss of hospitals and the absence of those hospitals and broadband access, in many cases, means this. It means the ability to access telehealth, which ¼ of rural adults say that they have used.

Let's go to the field of education. The gap between rural and urban adults with a college degree continues to widen. Broadband connectivity opens up a range of possibilities for online continuing education and degree completion at an increasing range of schools, including comprehensive state universities, and our land-grant colleges and universities, as well as regional schools with more specialized programs.

Our farmers, for example, continue to use broadband to expand their toolbox and their knowledge base to make the most of their precision agricultural applications. And small businesses, they can leverage broadband to access a world's worth of consumers outside their own communities. But, not if we do not make and expand this investment. Our Subcommittee Members here are committed to making sure that we expand this investment.

Now, I wanted to have this hearing so that we can see what is being done well. What of those successes can be done in other communities and also, what work remains for us to do? And I also know that the Federal Communications Commission Chairman Pai plans on releasing an order, very soon, for requiring increased reporting in an effort to improve the current failing broadband map system.

It is very important that rural America weigh in on these policy changes at the FCC, and here in the halls of Congress, as we continue to talk about proposals to rebuild our crumbling infrastructure. This is the key that will open the door when Congress moves and puts forward the rebuilding of our crumbling infrastructure program. And we can't wait for that to start.

I know that all of us on this Subcommittee agree, both Democrats and Republicans, that it is essential that rural broadband is an integral part of any infrastructure package, and we are going to make sure that rural broadband is a major centerpiece of our rebuilding of our infrastructure package.

I am eager, as all of us are, to hear from our witnesses and how they tackled the challenges in rural America to give communities the access and tools they need to thrive through our broadband technology. We have to work together to make sure that our policies encourage growth and success in our rural communities nationwide.

[The prepared statement of Mr. David Scott of Georgia follows:]

PREPARED STATEMENT OF HON. DAVID SCOTT, A REPRESENTATIVE IN CONGRESS FROM GEORGIA

Good morning, and welcome to today's hearing of the Subcommittee on Commodity Exchanges, Energy, and Credit on broadband Internet connectivity and the opportunities it presents for our rural communities.

This issue is an important and timely one because it lets us shine light on those rural areas that have seen what broadband investment can do and are thriving because of their access to broadband.

Rural broadband is a prime example of how government investments coupled with private innovation can create a ripple of success and increase the quality of life for Americans in rural communities.

We're going to hear today from a cross-section of people who have worked to increase access to and success in healthcare, agriculture, local communities, education, and small business, on their successes in leveraging broadband connectivity to enhance the services they provide to their communities.

And it's my hope that through those stories we can have a conversation about those steps we still need to take, because there are many.

In my home State of Georgia, we've lost seven rural hospitals since 2010, which is third most in the nation. In the absence of those hospitals, broadband access in many cases means the ability to access telehealth, which ¼ of rural adults say they've used.

Within the field of education, the gap between rural and urban adults with a college degree continues to widen. Broadband connectivity opens up a range of possibilities for online continuing education and degree completion at an increasing range of schools including comprehensive state universities and our land-grant colleges and universities, as well as regional schools with more specialized programs.

Our farmers continue to use broadband to expand their toolbox and knowledge base to make the most of their precision agriculture applications, and small businesses can leverage broadband to access a world's worth of consumers outside their own communities, but not if we do not make and expand this investment.

I wanted to have this hearing so that we can see what's being done well, what of those successes can be done in other communities and what work remains. I also know that Federal Communications Commission Chairman Pai plans on releasing an order very soon requiring increased reporting in an effort to improve the current failing broadband map system. It is very important that rural America weigh in on these policy changes at the FCC and here in the halls of Congress as we continue to talk about proposals to rebuild our crumbling infrastructure. I know that all of us on this Subcommittee agree, both Democrats and Republicans that it is essential that rural broadband is an integral part of any infrastructure package.

I am eager to hear from our witnesses and how they tackled challenges in rural America to give communities the access and tools they need to thrive through broadband technology. We have to work together to make sure our policies encourage growth and success in our rural communities nationwide.

Now I'd like to recognize the Ranking Member Austin Scott of Georgia for any opening comments he would like to make.

The CHAIRMAN. And now, in the consultation with our Ranking Member and pursuant to Rule XI(e), I want to make Members of the Subcommittee aware that other Members of the full Committee may join us today.

And now, it gives me great pleasure to recognize my distinguished Ranking Member, Mr. Austin Scott, whom I refer to affectionately as my cousin Scott, for his opening statement. Mr. Scott?

## OPENING STATEMENT OF HON. AUSTIN SCOTT, A REPRESENTATIVE IN CONGRESS FROM GEORGIA

Mr. AUSTIN SCOTT of Georgia. Thank you, Chairman Scott. We have been good friends for a long time, 23, 24 years, somewhere in there.

This is an important hearing on a subject that resonates with all Americans, specifically it resonates with me and my wife and my children. We live 15 miles north of high-speed Internet access, and we live 15 miles south of high-speed Internet access. And there are

many times in our life where the fastest access that we have is through connecting to our iPhone. It is extremely important to us and to the industries that try to operate in areas like those that I live in with my family.

I want to thank our distinguished witnesses that are here today to discuss how affordable, reliable, high-speed broadband can bring our communities into the 21st century.

For more than 24 million Americans who live in rural communities, as I do, that do not have broadband Internet access and lack the infrastructure for reliable and affordable connection, as we will hear from our witnesses today, having reliable, affordable broadband is not about having modern conveniences. That is certainly important for us, but for most Americans, broadband access is about access to information, options, choices, and quite honestly, it is virtually impossible to run a business without it today.

Whole conversations happen entirely online, and the only participants are those who have broadband access. Information of all forms is created, shared, and consumed entirely through a broadband Internet connection, and much of the machinery today is dependent upon these Internet connections to function. It enables new tools that can't be replicated in any other way, shape, or form. Big data and artificial intelligence, cloud storage and computing, the Internet of Things and data analytics, telemedicine—something else that is extremely important to those of us in the rural parts of the country—and other modern tools simply cannot be replicated without broadband access.

Broadband access has become a dividing line between those 24 million rural Americans and the modern broadband-dependent information services most urban and suburban Americans take for granted. It is not just rural Americans who suffer from this divide, though. Suburban and urban Americans are equally cut off from the voices and talents and ideas of their rural neighbors.

So, for me, all options are on the table when it comes to providing our rural communities with the technological resources they need to grow and thrive. This includes strengthening effective programs that are already in place at the USDA and FCC, advocating for robust broadband support in an infrastructure package, and even encouraging innovative technologies like TV white spaces.

This Committee did great work last Congress in the 2018 Farm Bill to ensure that the USDA has the tools it needs to bridge the digital divide in rural America. Included were two amendments which originated in our office that I am very happy to have the support of this Committee that addressed the accountability measures and expanded our U.S. loans and grants to the middle mile infrastructure projects.

Now, some might say quality broadband infrastructure investments will connect rural America to the rest of the world. I would suggest that it connects the rest of the world to the benefits of rural America. By bridging this digital divide, it will enable access to a wealth of economic opportunities for all parts of America, and it is in everybody's best interest.

With that, Mr. Chairman, I yield back.

The CHAIRMAN. Thank you very much, Mr. Scott.

And now, I recognize our distinguished Ranking Member of the full Committee, Mike Conaway, for any opening statements he would like to make.

**OPENING STATEMENT OF HON. K. MICHAEL CONAWAY, A REPRESENTATIVE IN CONGRESS FROM TEXAS**

Mr. CONAWAY. Well, thank you, Mr. Chairman. I appreciate your kindness and forbearance. Thank you for scheduling this hearing. It is an important topic, one that has been on the top of the minds of most Members for a long, long time. As the Ranking Member noted in his opening statement, broadband access is not about convenience. It is about being able to participate in modern life and the economy, which is rapidly moving onto the Internet.

For those who lack access, their lives are fundamentally different than those who do have access. As Ms. Mollgaard noted in her written testimony, broadband is a platform, a generic technology that is powerful because it enables the creation of other tools and technologies.

The importance of broadband is one of the many reasons that I am so proud of the farm bill we passed last December. We worked together across the aisle and across the Capitol to take the best ideas for how to build broadband infrastructure into our rural communities. We not only provided a new grant program to build broadband where it is needed, but also new requirements to build what is needed for the long haul. The forward-looking standards that we passed will make sure that new broadband projects provide high quality Internet service for long into the future.

Because of the 2018 Farm Bill, USDA has the ability to better target its limited resources to the rural communities most in need. By prioritizing projects, incentivizing investments in more rural territories, and requiring better assessments for proposed service territories, we will be able to help our most rural and least equipped communities while protecting taxpayers.

And finally, we also worked closely with the Energy and Commerce Committee to strengthen the cooperation between the USDA, FCC, and the Department of Commerce. One important product of this cooperation will be a comprehensive report on the long-term connectivity needs of rural communities, and the technology available to meet those needs.

The 2018 Farm Bill broadband provisions represent a real success story that the Members of this Committee should be rightly proud of, but that success will be for naught if our appropriators—folks with the money—don't actually appropriate the funds that we authorized under our bill. I am hopeful that before the ink is dry on the 2020 appropriations package that it includes robust funding for the programs we worked so hard on.

Let me also add my thanks to our witnesses for their diligence, preparation, and travel to be with us today. I look forward to your testimony.

Mr. Chairman, thank you for calling this hearing and building out a record of how important broadband is for our constituents. I look forward to working with you and Chairman Peterson, Ranking Member Scott, and the rest of the Committee in advancing this good work.

With that, I yield back.

The CHAIRMAN. Thank you, Ranking Member Conaway.

Now the chair would request that other Members submit their opening statements for the record so the witnesses may begin their testimony, and to ensure that there is ample time for questions.

Now, I know that Chairman Peterson wanted to introduce our first witness, but as he is stuck in the Veterans' Committee's markup, I am happy to introduce our first witness for him, and that would be Mr. David Hengel. Mr. Hengel is Executive Director of the Greater Bemidji an economic development organization in Bemidji, Minnesota. Good to have you, sir. Thank you for coming.

And now, I would like to turn to Ms. Craig? Is Ms. Craig here?

Ms. CRAIG. Yes, sir, Mr. Chairman.

The CHAIRMAN. Oh, I thought so.

Now I would like to recognize the gentlewoman from Minnesota, Ms. Craig, to make an introduction of our second witness.

Ms. CRAIG. Excellent. Thank you so much, Mr. Chairman.

It is my great pleasure to introduce Neela Mollgaard from Red Wing, Minnesota, here with us this morning. She is the Executive Director of Red Wing Ignite, which is an incubator for students, tech entrepreneurs, and local businesses.

As the Executive Director of Red Wing Ignite, Neela harnesses the power of broadband connectivity and new technologies to create educational opportunities and foster innovation in our region. Prior to joining Red Wing Ignite, Neela led and helped create Red Wing's Care Clinic, a free medical clinic serving uninsured and low-income residents of Goodhue County, Minnesota. Neela has a long track record of leadership, serving our community on numerous charitable organization boards and committees. She played a pivotal role in forming Minnesota's broadband infrastructure priorities as a member of the Governor's Broadband Task Force. She is a graduate of the University of West Virginia's School of Medicine where she received a Master of Science in Community Health, and the University of Wisconsin at Madison, where she received a Bachelor of Science in Consumer Affairs in Business.

Neela, it is an honor to have you here with us today.

The CHAIRMAN. Our third witness hails from my beloved State of Georgia, and now I recognize the gentleman from Georgia, Mr. Allen, for the introduction.

Mr. ALLEN. Thank you, Chairman Scott, for this opportunity to introduce Dr. David Hess here today. I congratulate this Committee on having this hearing, which is critical to survival, really, of rural America.

Dr. Hess serves as the Dean and Executive Vice President of Medical Affairs Integration as well as the Presidential Distinguished Chair of Neurology at the Medical College for Georgia at Augusta University, located in my hometown of Augusta, and the 12th District of Georgia.

A graduate of Johns Hopkins University and the University of Maryland School of Medicine, Dr. Hess is board-certified in internal medicine, neurology, and vascular neurology. Along with his passion for teaching, Dr. Hess's major area of interest is stroke and treatment for stroke and dementia. With over 185 reviewed publications, Dr. Hess has been involved in basic, pre-clinical, and clin-

ical stroke research. He played a major role in developing the REACH Telestroke Network at Augusta University, which you will hear more about in his testimony today. This well-recognized telemedicine service now serves over 30 hospitals in rural Georgia. Additionally, Dr. Hess cofounded a telestroke company known as the REACH Health Incorporated, and served as Chairman of the Board of Directors from 2008 to 2018. Throughout his career, Dr. Hess has won many distinguished teaching awards and has been named to America's Top Doctors and Best Doctors in America every year since 2000.

As my colleagues know, Augusta is well-known for his contribution to the great game of golf, and as you will see witnessed by the ties that Dr. Hess and I are wearing today, that we honor that tradition. But I will tell you this. Augusta is known through the efforts of Dr. Hess and his colleagues as the cutting-edge, high-tech medical center of this nation.

Dr. Hess, thank you for being here today to share your testimony with my colleagues and for all the work you do for Augusta University in Georgia and this nation.

And with that, sir, I yield back.

The CHAIRMAN. Thank you, Mr. Allen.

And now, I recognize the gentleman from Arizona, Mr. O'Halleran, to introduce our fourth witness.

Mr. O'HALLERAN. Thank you, Chairman Scott and Ranking Member Scott, for having this meeting today.

It is my great pleasure to introduce Councilwoman Ophelia Watahomigie-Corliss of the Havasupai Tribe.

Just a brief little thing, if you ever want to go someplace beautiful, go down to the Havasupai Tribe. You can't get down there by car. You have to take a helicopter or hike down, but it is one of the most beautiful places on Earth.

It is my honor to represent the Havasupai Tribe and to work in partnership with the Tribe to bring access to what I believe is the most remote community in the lower 48 states.

I have been working with the Tribe to improve Internet access by assisting the Tribe to obtain a permanent educational broadband service license from the FCC, which has improved access to the Internet. I look forward to hearing more about how Internet access has improved access to information for members of the Tribe.

I also want to follow up on Ranking Member Scott's comment about introducing the rest of the world to rural America. They better get introduced, because without rural America and the people in rural America that we have to have there, urban areas wouldn't exist.

I welcome the Councilwoman here today. Thank you.

The CHAIRMAN. Thank you very much, Mr. O'Halleran.

Next, I will recognize the gentlewoman from Missouri, Mrs. Hartzler.

Mrs. HARTZLER. Yes.

The CHAIRMAN. Sorry, excuse me. Please introduce our final witness, please.

Mrs. HARTZLER. Thank you, Chairman Scott and Ranking Member Scott, for holding this hearing and allowing me to be part of

this Subcommittee hearing today. I am not a part of this Subcommittee normally, but what an important topic. It is so important to Missouri, and I am so proud to introduce our next guest.

We have Mr. Blake Hurst that I have known for many years, but he is certainly a champion of agriculture in Missouri. He is President of the Missouri Farm Bureau, where he has been a leader for years, as well as other agricultural organizations in the state. But Blake knows what he speaks. He is a lifelong farmer. He and his family raise corn, soybeans, and they also have a greenhouse operation where they raise flowers.

Besides being involved in organizations, he is also a very talented and prolific writer, which takes the message of rural America to such publications as *The Wall Street Journal, Reader's Digest, Today's Farmer,* among others, and he has been very involved in leading efforts in Missouri, dealing with broadband development, as well as in the nation. He was part of a working group on a nationwide basis a few years ago, one of only two members from the American Farm Bureau representatives to help look at connectivity and data, and other issues that are important to precision farming.

We are very proud that you are here today, and have the opportunity to share your expertise with us, and we appreciate all that you do for agriculture and look forward to hearing your testimony. Welcome to our Subcommittee, and thank you, Mr. Chairman and Ranking Member, for allowing me the privilege of introducing such a fine individual to you today.

The CHAIRMAN. Well, thank you very much. And certainly, I want to say, Mr. Hurst, to please give this Committee's warmest regards to your President, Mr. Zippy Duvall. Please do that. He is a good friend of ours.

Thank you all for those introductions. We will now proceed to hearing from our witnesses. Each of you will have 5 minutes. When 1 minute is left, the light will turn yellow signaling time is close to expiring.

Mr. Hengel, please begin when you are ready.

**STATEMENT OF DAVID HENGEL, EXECUTIVE DIRECTOR, GREATER BEMIDJI, INC., BEMIDJI, MN**

Mr. HENGEL. Chairman Scott, Ranking Member Scott, and Subcommittee Members, it is a great honor to be testifying today. I am Dave Hengel, Executive Director of Greater Bemidji in Bemidji, Minnesota, a public-private partnership formed to drive development and promote prosperity in our region. We have three staff people and an operating budget of $300,000, a majority of which is provided by private businesses. I recently completed my 30th year in economic development.

Bemidji is a rural regional center located 200 miles north of Minneapolis. With 65,000 residents, it is one of Minnesota's fastest growing areas, but it is also one of Minnesota's poorest. Over the past 7 years, we have created 1,700 jobs and wages have grown 26 percent, yet one in five of our residents still live in poverty. Despite a historic low, our unemployment rate remains higher than the national average.

The economic development world has changed dramatically in recent years, the primary driver of which has been broadband.

Broadband can level the playing field between urban and rural as never before.

In the past, our nation has made bold decisions to ensure our rural areas are competitive: from ensuring access to telephone services, to building the interstate highway system. I believe broadband is the interstate highway system of our generation. Without strong broadband, rural communities will be left behind.

National policy has called for telecom services in rural areas to be comparable in both price and quality to urban areas. If rural America is to play a role in the global economy, it is essential that national commitment remain.

Bemidji has been blessed. Our rural telephone cooperative, Paul Bunyan Communications, took a visionary approach of laying one of the nation's largest all-fiber networks. As a result, nearly every home, every farm, and every business in our region has access to gigabyte broadband. Moreover, MidCo, a private regional provider serving the upper Midwest, also provides high-speed broadband services to the Bemidji area. With these two leading-edge companies serving our community, our broadband services rival any in the nation.

Drawing on my experience in economic development, I believe broadband's economic impact is especially significant in the following areas; first, in corporate recruitment efforts. For a majority of my career, when companies considered our region, they would focus on three things: access to cheap land, cheap capital, and cheap labor. Now they look to access talent, quality of life, and availability of high-speed broadband.

Delta Dental is our most recent example. They are constructing a new $15 million operation center in Bemidji, creating 165 very good paying jobs. They chose Bemidji in large part due to the broadband services offered by Paul Bunyan Communications. Their leadership shared: "The broadband services we can get in Bemidji are far superior to what we can get in our corporate headquarters in downtown Minneapolis" They are just one example of broadband playing a central role in our corporate recruitment and expansion efforts.

Second, high-speed broadband is essential to winning the race to talent. In today's labor market, companies are looking to locations that have a quality of life to entice the best employees. As baby boomers retire, companies are investing in locations that appeal to the younger generation, for which high-speed broadband is a must-have. They simply will not live in a community that does not allow them to be connected.

Finally, high-speed broadband is central to our efforts to support emerging entrepreneurs. Three years ago, Greater Bemidji opened the LaunchPad, a one-stop shop for entrepreneurs. We provide co-working space, business assistance, finance, training, peer-to-peer networking, and mentoring. The most important resource we provide our entrepreneurs is gigabit broadband, which allows them to be connected to the world. Our LaunchPad has successfully launched 51 new startups.

I am not an expert in broadband policy or deployment, but I can testify to the impact high-speed broadband can have on the economy. For rural communities to be competitive, they must have the

infrastructure to support the transforming economy. Historically, the infrastructure we focused on was great roads and highways, waters and sewer systems, and industrial parks. Those are equally important today, but they simply are not enough. High-speed broadband is now essential for rural America to compete.

Because of bold decisions made by broadband leaders in my region, my community has a gold standard of high-speed broadband services. The impact has been clear. Companies are choosing our area over other potential locations; young, talented people are moving to our region; and businesses are starting up at an unprecedented rate.

I encourage you to do all you can to help other parts of rural America reap the same benefits we have felt in Bemidji. Thank you.

[The prepared statement of Mr. Hengel follows:]

PREPARED STATEMENT OF DAVID HENGEL, EXECUTIVE DIRECTOR, GREATER BEMIDJI, INC., BEMIDJI, MN

**Introduction and Background**

Chairman Scott, Ranking Member Scott, and Members of the Subcommittee, thank you for this opportunity to testify today on the essential role of high-speed broadband in fostering rural economic development. I am David Hengel, Executive Director of Greater Bemidji in Bemidji, MN—a public-private partnership created to drive development and promote prosperity in the greater Bemidji region. Greater Bemidji has three staff and an annual operating budget of $300,000—a majority of which is provided by 70+ businesses in our region. I just completed my 30th year in economic development—first at a regional level at the Headwaters Regional Development Commission, and now as the Executive Director of Greater Bemidji.

Bemidji is the regional center for the lakes and pines country of north-central Minnesota. Surrounded by three Native American reservations, our economy is dominated by health care, retail sales and services, and tourism—with a very modest manufacturing base. With an area population of 65,000 residents, it is Minnesota's fifth fastest-growing community and yet also one of its poorest. Over the past 7 years, our population has increased by 2,000 people with over 1,700 new jobs, wage levels are up 26.5 percent, and overall economic activity has increased over 25 percent. Despite the growth, incomes typically range from 65–70 percent of the state and national averages and over 20 percent of Bemidji area residents live in poverty. Despite currently being at a historic low, our unemployment rates still exceed both the state and national averages.

Greater Bemidji's mission is to help drive the positive economic numbers even higher, and high-speed broadband is intricately woven into our economic initiatives. Greater Bemidji has earned a reputation in Minnesota as an innovator in economic development through the success of our industry-led training center—the Minnesota Innovation Initiative—that provides timely, relevant, cost-effective manufacturing training to job seekers. In only 4 years, the initiative has trained well over 1,000 job seekers, 80% of whom have been placed in good jobs in our region. Another successful economic development innovation was the creation of Greater Bemidji's LaunchPad. The LaunchPad is a one-stop-shop for entrepreneurs, providing the co-working space, technical support, financial support, business planning, peer-to-peer mentoring and one-on-one mentoring they need to start their businesses. In its 3 year existence, the LaunchPad has spun off 51 new companies.

**Broadband Has Been a Critical Component of Our Economic Development**

The world of economic development has changed dramatically in the last 5 years. Technology, and more specifically broadband, has been an essential part of our strategy and our success. Broadband has the potential to level the playing field between urban and rural as never before in history. One could even say that there are two kinds of rural regions in the U.S.—those that have the broadband infrastructure to compete in our new information and innovation economy, and those that do not.

In the past, our nation has made bold decisions to ensure our nation's rural areas are competitive—from ensuring everyone has access to telephone services to building the interstate highway system. Based on my experience, broadband is the "inter-

state highway system" of our generation. Without a strong, fiber backbone, rural communities will no doubt be left behind.

Thankfully, national policy calls for telecom service in rural areas to be reasonably comparable in quality and price to what is available in urban areas. Based upon this policy, the Federal Government has recognized that broadband is an essential service by providing support for the construction and ongoing operation of rural networks through programs overseen by the Federal Communications Commission (FCC) and the U.S. Department of Agriculture (USDA). If rural America is to have any hope of playing a role in the global economy, it will be essential to ensure that these programs are positioned for the future to provide predictable, reliable support to operators committed to providing high-speed broadband in sparsely populated areas where there is no business case for telecom service otherwise.

Moreover, Minnesota has a state broadband office called the Office of Broadband Development that is the envy of other states. The Minnesota Office of Broadband works in concert with the Federal programs to support robust broadband deployment in rural areas and develops reliable broadband availability maps to ensure that the government resources are distributed efficiently and with maximum effectiveness. Even with the available Federal and state resources, a rural area still needs a broadband provider that is committed to serving the area with reliable, robust broadband.

Bemidji has been blessed. Our rural telecommunications cooperative, Paul Bunyan Communications, took the bold and visionary approach of laying one of the nation's largest all-fiber broadband networks in the nation. As a result, nearly every home, farm or business in our region has access to gigabit upload and download broadband speeds. The broadband services we have in Bemidji and surrounding rural areas rival any in the nation, and they come at affordable prices. Why? Because Paul Bunyan Communications understands the impact broadband will have on the economic development of its region.

Paul Bunyan Communications is not alone in providing exceptional broadband services in our region. MidCo, a regional broadband provider, serves the upper Midwest and provides high-speed broadband services in parts of the Bemidji area. Having two leading-edge companies serving our rural community is certain not typical.

Drawing on my experience in rural economic development, I've observed that broadband's economic impact in rural areas is especially significant in the following three areas:

*Corporate Recruitment and Business Expansion*

Recruiting companies and corporate expansions to an area is an ongoing mission for any economic development office. For the first twenty years of my career, when a company was considering our region, they would focus on three things: access to cheap capital, cheap labor and cheap land. Today, when I'm recruiting companies to Bemidji, I'm asked different questions: (1) Can I find the talent I need?; (2) Is Bemidji a great community to live in?; and (3) Does the region provide the broadband infrastructure to support my company?

Delta Dental is our most recent success story. Delta Dental is currently developing a new, $15 million operations center in Bemidji that will employ 165 residents at wages significantly higher than the average wage in the region. Delta Dental chose Bemidji in large part due to the fiber broadband infrastructure offered by Paul Bunyan Communications. When announcing their decision to expand in Bemidji, Delta Dental's head of technology said, "the broadband services we can get in Bemidji are far superior to what we can get in our corporate headquarters in downtown Minneapolis." Delta Dental is not alone, as our area's broadband infrastructure has been central to several corporate recruitment and expansions in our region.

*Winning the Race for Talent*

Increasingly, economic development is a race for talent, not a race for companies. In a tightening labor market, companies are expanding in places that have the quality of life and amenities that provide them the ability to recruit the best employees. As we baby boomers look toward retirement, companies are investing in communities that appeal to the younger generations for whom high-speed broadband is a "must have"—they simply will not move to or stay in a community that does not allow them to be connected to the rest of the world.

Bemidji's recent growth is certainly due in part to our natural amenities, Bemidji State University, our vibrant downtown, and our expanding arts and cultural scene. But there can be no doubt that we would not have grown at the rate we have without our broadband infrastructure.

*Start-up Communities*

Finally, economic developers are increasingly focused on creating what we call "start-up communities." Great start-up communities focus on ensuring their area has the foundational resources to help entrepreneurs start and prosper. Typically, anywhere from 50–70 percent of new jobs are created by local entrepreneurs.

Greater Bemidji dove into start-up community work 3 years ago with the opening of our LaunchPad, a one-stop-shop for entrepreneurs that includes access to technical and business assistance, financial support, training and peer-to-peer networking. To date, 51 new companies have been supported by the LaunchPad. My personal favorite service at the LaunchPad is what we call "Office Hours", where retired CEOs from throughout the region provide free, one-on-one mentoring to aspiring entrepreneurs. The LaunchPad also provides co-working space, where at any one time 50 young businesses are operating their companies.

The single most important service the LaunchPad offers its entrepreneurs is access to gigabit broadband service. Every entrepreneur using the LaunchPad today—as well as the 51 companies that spun off from the LaunchPad—required access to robust broadband services. Unfortunately, during the start-up stage, that broadband can be financially out of reach. The LaunchPad connects our rural entrepreneurs to the world, but we can only do this because of the fiber infrastructure in our region provided by Paul Bunyan Communications.

NTCA—The Rural Broadband Association—the national trade association for small, rural broadband providers like Paul Bunyan Communications—has its own program designed to highlight innovation called *Smart Rural Communities* that recognizes broadband providers and communities that deploy and use robust fiber networks to jumpstart economic growth and improve access to first-rate education, healthcare, and government services. Paul Bunyan Communications received NTCA's *Smart Rural Community* Showcase award in 2015 for its work in Bemidji.

**Rural Economic Development Successes**

In rural areas, as discussed earlier, broadband connectivity presents a unique challenge due to geographical barriers—barriers that broadband can help break down and overcome. Indeed, in rural and urban areas alike, broadband availability and adoption strongly correlates with increased economic opportunity and prosperity. A 2016 government study found that just 41 percent of adults with household incomes less than $20,000 had home broadband access, while 90 percent of adults with household income higher than $100,000 had access.[1] Other studies reveal that the availability of broadband services, regardless of adoption, added as much as 1.4 percent to the U.S. employment growth rate.[2]

Investing in rural broadband has far-reaching effects for both urban and rural America, creating efficiencies in healthcare, education, agriculture, energy, and commerce, and enhancing the quality of life for citizens across the country. A report released in 2016 by the Hudson Institute in conjunction with the Foundation for Rural Service underscores the nationwide benefits that arise from rural broadband; this study found that investment by rural broadband companies contributed $24.2 billion to the economies of the states in which they operated in 2015.[3] Of this amount, $8.3 billion accrued to the benefit of rural areas, while nearly $16 billion accrued to the benefit of urban areas. In addition, better broadband access in rural America is helping to drive growth in online transactions—a recent survey found, for example, that rural consumers account for more than 10.8 billion Internet-driven transactions annually, representing approximately 15% of the national total.[4]

The benefits of rural broadband, however, go beyond sheer numbers—it is helpful as well to understand the productive uses of broadband and what they mean to those communities that get and stay connected. Rural America needs broadband not only to help farmers efficiently produce the crops that are sold around the world, but to help rural small businesses participate in the global economy and help all rural citizens experience the potentially life-changing healthcare, educational, and employment benefits of broadband.

---

[1] *Digital Inequality and Low-Income Households* (*https://www.huduser.gov/portal/periodicals/em/fall16/highlight2.html*), HUD Office of Policy Development and Research (2016).

[2] Galperin and Viecens, *Connected for Development? Theory and evidence about the impact of Internet technologies on poverty alleviation* (*https://annenberg.usc.edu/sites/default/files/2017/03/12/Galperin_et_al-2017-Development_Policy_Review.pdf*), Development Policy Review (2017).

[3] *The Economic Impact of Rural Broadband* (*https://s3.amazonaws.com/media.hudson.org/files/publications/20160419KuttnerTheEconomicImpactofRuralBroadband.pdf*), The Hudson Institute, Washington, D.C. (2016).

[4] *A Cyber Economy: The Transactional Value of the Internet in Rural America* (*https://www.frs.org/sites/default/files/documents/2018-03/A-Cyber-Economy_The-Transactional-Value-of-the-Internet-in-Rural-America.pdf*), White Paper, iGR (2018).

A major benefit of rural broadband, for example, comes in the form of distance learning. With a shortage of teachers in many areas of rural America, many schools must rely on high-speed connectivity to deliver interactive-video instruction for foreign language, science, and music classes. For example, one rural South Dakotan teaches Level 1 and 2 Spanish to over 100 students in over a dozen high schools from a small office located on her farm. Her broadband connection enables her to instruct hundreds of students who otherwise would not have the opportunity to learn Spanish. In Minnesota, Fergus Falls Public Schools use a high-capacity connection between the various school buildings located throughout the city. This broadband connection enables staff to access and share files seamlessly across the network, and supports iQ Academy Minnesota, an accredited public-school program offering Minnesota students in grades K–12 an innovative, high-quality alternative to the traditional learning experience.

Access to healthcare is a critical issue for rural areas, where the lack of physicians, specialists, and diagnostic tools normally found in urban medical centers creates challenges for both patients and medical staff. Telemedicine applications help bridge the divide in rural America, enabling real-time patient consultations and remote monitoring, as well as specialized services such as telepsychiatry. A small broadband provider in Georgia partnered with the county public school system to deploy telehealth equipment to connect the school nurses' offices with physicians at a regional hospital. Through this partnership, the hospital, the school system, and the rural broadband provider facilitate better healthcare for students who might not otherwise see a physician in an area where parents can ill afford to miss a half or full day of work for a doctor visit.

High-speed broadband helps first responders foster safer communities. The Perham Fire Department in Minnesota serves 164$^2$ miles and five townships. Relying on broadband and LTE, each volunteer firefighter's smartphone includes a mobile app that allows the firefighter to view reported fires, use GPS to find the fire's location, and confirm the availability of each team member. The app also identifies the location of nearby fire hydrants. And in Melrose, MN all police department vehicles are equipped with WiFi and GPS, providing officers immediate access to data and improving overall community safety. The broadband network provided by a small, rural carrier also assists local ambulance services with a traffic-signal-prioritization system to manipulate traffic signals for emergency vehicles in transit.

Finally—in part by improving access to quality healthcare, education, and public safety—fast, high-capacity broadband in rural areas also creates jobs. In Sioux Center, Iowa, a major window manufacturer built a 260,000$^{2'}$ plant to employ 200 people. The company considered more locations throughout the Midwest, but selected Sioux Center in part because the rural broadband provider enabled this plant to connect with its other locations throughout the U.S. Similarly, in Cloverdale, Indiana, a rural broadband provider met with developers and helped bring an industrial park to its service area. Powered by this provider's broadband, the facility created more than 800 jobs in the area. These stories are repeated throughout those rural areas with access to robust broadband.

**Conclusion**

The title of this hearing is "Building Opportunity in Rural America through Affordable, Reliable, High-Speed Broadband." I am not an expert in broadband policy or deployment, but I can testify to the impact high-speed broadband can have on our nation's economy, particularly in rural America.

For our nation's rural communities to be competitive, they must have the foundational infrastructure to support a transforming economy that is increasingly driven by technology. Historically, great roads and highways, water and sewer systems, and industrial parks were the foundational infrastructure for communities. Today, these are as necessary as ever before, but they are not sufficient. High-speed broadband is now required for rural America to compete.

As I said earlier, I have been blessed. Because of bold decisions made by broadband leaders in our community and surrounding rural areas several years ago, my community of Bemidji, Minnesota has the gold standard of high-speed broadband service. Since then, the impact has been clear and observable. Because Bemidji has gigabit broadband service, companies are choosing our area over other potential locations. Young, talented people are moving to our region in part due to the available high-speed broadband. Finally, we are churning our new business start-ups at an unprecedented rate due to the broadband-focused Greater Bemidji LaunchPad. I would encourage the Congress to do all it can to help other parts of rural America reap the benefits we have in Bemidji. Thank you.

ATTACHMENT

The CHAIRMAN. Thank you very much, Mr. Hengel.

Now, Ms. Mollgaard, we will now hear from you.

**STATEMENT OF NEELA MOLLGAARD, EXECUTIVE DIRECTOR, RED WING IGNITE, RED WING, MN**

Ms. MOLLGAARD. Chairman David Scott, Ranking Member Austin Scott, and Members of the Subcommittee, thank you for allowing me to testify today. I am Neela Mollgaard, the Executive Director of Red Wing Ignite, located in the small town of Red Wing, Minnesota, nestled along the bluffs of the Mississippi, only 50 miles south of St. Paul. We have a diverse economy of advanced manufacturing, agriculture, and tourism.

Red Wing Ignite is a hub and a facilitator of community innovation, advancing students, entrepreneurs, and businesses to compete in the 21st century economy. That entails a co-working space, startup support, maker space, and programs to prepare our youth for the future workforce.

We have cold winters, lots of eagles, people who work hard and want the best for their kids. And through Ignite, I get to help our community stay competitive.

The City of Red Wing formed a partnership with Hiawatha Broadband Communications to invest in broadband infrastructure with fiber. That investment has made it possible for the stories I will share with you today.

Red Wing Ignite launched in 2013, leveraging our gig network and our partnership with U.S. Ignite, initially supported by the White House and the National Science Foundation. We are the only rural city in U.S. Ignite's network of 28 smart gigabit communities, a program providing tools to build smart communities, driving new services, startups, and technologies.

For us, broadband is like electricity. We turn it on and it works. Yet, you need more than the gig to grow an economy. Rural communities require a different strategy, one that builds density of talent, expertise, and resources.

Ignite is both a physical and virtual hub for innovation. Broadband was the essential first step, but so is an organization like Ignite, bringing opportunity, exposure, and access to students, entrepreneurs, and businesses.

I would like to share stories highlighting our three focus areas. First, growing our talent pipeline. We plant the seeds to grow future innovators, the employers of tomorrow. We provide leadership to create STEM learning inside and outside the classroom, college tech internships, and worksite learning by convening schools and manufacturers.

Tony was a high school senior participating in a tech entrepreneur class where students solved problems using technology, culminating in the opportunity to pitch to investors. Tony said "I was exposed to people and curriculum that heightened my knowledge of coding and entrepreneurism. Now I am launching my own startup!"

Second, advancing entrepreneurs. With U.S. Ignite and regional partners, we convened a statewide Ag Tech Challenge to solve problems facing agriculture. The winner was Jack Kilian with Poultry Patrol, a robot for turkey farms. It collects data and may increase the weight, decrease mortality, and *Salmonella* rates amongst turkeys. Kilian said, "This opportunity gave me a reason to explore an idea. With Red Wing Ignite's help, I was quickly able to get in contact with investors, customers, and mentors. Now I feel confident I can make Poultry Patrol a reality."

Currently, though, finding turkey farms with broadband has been challenging. It is costly for farmers to implement this on their own.

Third, supporting rural innovation. People want to choose where they live and bring their careers with them. We have seen this locally with people leaving urban areas for the benefits of small-town living. In response, Ignite has created a co-working space, maker space, start-up support, and other resources. The strongest network we have, even in the world of fiber, is the human network.

How did we get here? I have one word, *collaboration.* Red Wing Ignite forges partnerships with government, academia, corporate partners, and individuals to grow our innovative ecosystem. As a

result of our work, we were recently one of nine communities nationwide selected by the Center on Rural Innovation to receive technical assistance funded by the Economic Development Administration to support our efforts to create an innovation-based economy.

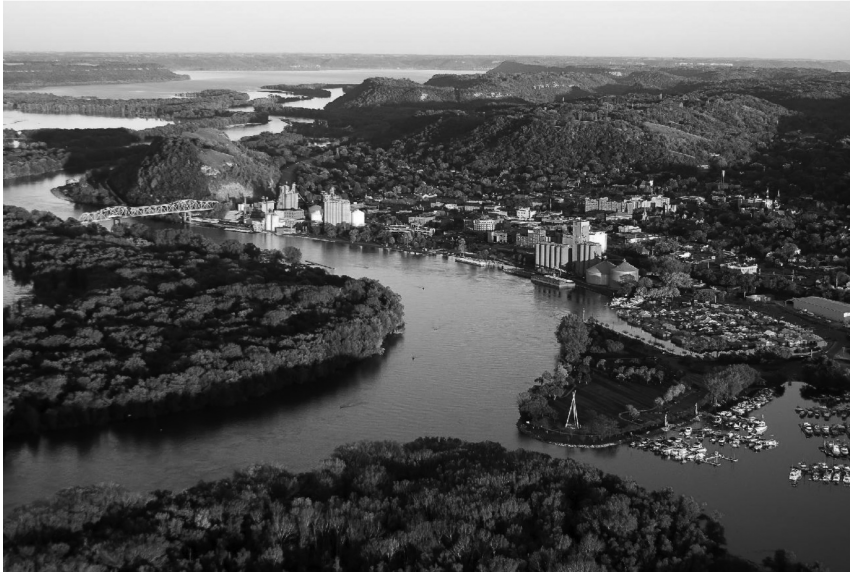
Through perseverance, we have learned these lessons. Communities without broadband are in jeopardy. Broadband access alone is not enough for economic vitality. Economic success should be evaluated by talent attraction, retention, and development, not only the number of new jobs. Public-private partnerships are critical for success and sustainability, and local champions are needed, because it doesn't happen quickly.

In closing, the African proverb says it best. "If you want to go fast, go alone, if you want to go far, go together." This work can't happen in isolation. We want to thank our local, state, and national partners.

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

[The prepared statement of Ms. Mollgaard follows:]

PREPARED STATEMENT OF NEELA MOLLGAARD, EXECUTIVE DIRECTOR, RED WING IGNITE, RED WING, MN



Chairman David Scott, Ranking Member Austin Scott, and Members of the Subcommittee, thank you for allowing me to testify today.

**Introduction**

I am Neela Mollgaard, the Executive Director of Red Wing Ignite, a hub and facilitator of community innovation located in the small town of Red Wing, Minnesota.

Red Wing is nestled along the Bluffs of the Mississippi River only 50 miles from Minneapolis/St. Paul. Red Wing supports a diverse economy of advanced manufacturing, agriculture and tourism. Downtown preservation efforts have resulted in Red Wing being identified as one of the top 25 historic towns to visit in the U.S.A.

We have cold winters, lots of eagles, people who work hard and want the best for their kids. Through Ignite, I get to help keep our community competitive.

We have built partnerships and initiatives with schools, government, businesses and nonprofits. We have more than 18 businesses and organizations at our co-working space. Last year, we hosted more than 150 community and business meetings enhanced with high-definition video conferencing facilities. We created and launched a Makerspace in partnership with Minnesota State College Southeast. We have also recruited and supported almost 40 startups in 2019 alone.

**Broadband Infrastructure**

The City of Red Wing was forward thinking and formed a partnership with a local provider, Hiawatha Broadband Communication (HBC) to invest in broadband infrastructure as an economic growth strategy. That investment has made it possible for the stories I will share today.

To leverage the gigabit network, and our partnership with U.S. Ignite (initially supported by the White House Office of Science and Technology Policy and National Science Foundation), Red Wing Ignite was launched in 2013. We are the only rural city in U.S. Ignite's network of 28 Smart Gigabit Communities. U.S. Ignite helps communities expedite adoption of services, develop innovative practices that stimulate job growth, the startup environment, and real estate investment.

Broadband is like electricity for us—*we turn it on and it works.* Unlike colleagues still struggling to secure broadband, we can spend time maximizing it.

But you need more than just the Gig to grow an economy. To be competitive in a global economy, rural communities require a different strategy—one that builds density of talent, people and resources to drive innovation.

Since then, the Red Wing area received two Minnesota Border to Border Grants, funds provided by the state legislature, to deploy better broadband. These grants are awarded on a competitive basis to unserved or under-served communities to help all of Minnesota reach the statutory speed goals of 100 Mbps down and 20 Mbps up by 2026. I served on the Governor's Task Force on Broadband at this time and had to compromise with speed goals, I feel they should have been faster.

Red Wing Ignite also received a grant from the Blandin Foundation to focus on broadband adoption. Blandin supports Red Wing with strategic consulting and seed money for broadband-fueled programs. The Blandin Foundation introduced us to the Intelligent Community Forum (ICF) model. The model measures community competitiveness in the broadband economy based on four indicators: ensuring broadband infrastructure, developing a knowledge-based workforce, supporting innovation, redressing the digital divide, and effectively using marketing and advocacy to tell the community's technology story.

Two years ago, Blandin released a report on five Minnesota broadband success stories—including Red Wing and Goodhue County. They found that broadband had increased residents' economic benefit more than $32 million per year (Or $1,850 annual benefit per household with broadband.) Real Estate values had also increased by more than $100 million.

**Recent Accomplishments**

It has taken Red Wing Ignite more than 5 years to build the foundation needed for an innovative ecosystem working to advance students, entrepreneurs and our business community. Broadband is essential but so is an organization like Ignite—bringing opportunity, access and exposure to the skills required in the 21st Century economy.

*Growing the Talent Pipeline*

We plant the seed to grow future innovators—the employers of tomorrow. We provide:

- Leadership to create a K–12 career pathways on STEM learning with aligned curriculum and worksite learning to be prepared for future careers. The flight paths focus on four areas: advanced manufacturing, health sciences, business/entrepreneurship and human services.
- College tech internships, that matches college students from the region with businesses needed technology help to advance their business.
- A coder dōjō site, is a free, volunteer-led, community-based computer programming clubs for students.
- A collaboration with school districts, our college and manufacturers to provide work site learning and a certification through our local college.

Tony, a high school senior, participated in our tech entrepreneur class where students solve problems using technology culminating with the opportunity to pitch to

investors. Tony said, "It's cool Ignite has brought so many opportunities. I was exposed to people and curriculum that heightened my knowledge of coding and entrepreneurism. Now I'm actually launching my own startup!"

*Advancing Entrepreneurs*

With assistance from U.S. Ignite and regional partners, we convened a statewide Ag Tech Challenge seeking new hardware or software to improve agriculture. The winner was Jack Kilian, with the Poultry Patrol, a robot for turkey farms. The robot collects data and is projected to possibly increase weight, decrease mortality and *Salmonella* among turkeys.

Kilian received $15K in awards and said, "*This opportunity gave me a reason to explore an idea. With Red Wing Ignite's help, I was quickly able to get in contact with investors, customers, and mentors. Now I feel confident I can make Poultry Patrol a reality.*"

Jack Buendor a cofounder also shares, "*Poultry Patrol is focused on Giving farmers access to the data collection technologies will increase the efficiency of the U.S. agricultural industry and help make farming more reliable, sustainable and safe. Everything from watershed monitoring, yield estimation, crop health, row alignment, and livestock monitoring will need data analysis, and the best ways to reliably collect, process, and present that data require through stable broadband.*"

Currently, finding turkey farms with broadband has been challenging; it's costly for farmers to implement on their own.

*Supporting Rural Innovation*

Now and in the future individuals will choose where they want to live and bring their careers with them. We have seen this locally with people choosing to leave urban areas for the benefits of small town living. In response Ignite has created a co-working space, makerspace, business incubator and other resources to meet this need.

The strongest network we have—even in the world of fiber is that human network.

**How We Got Here**

People ask—how did we get here. I have one word, **collaboration.**

Red Wing Ignite forges partnerships with government, academia, corporate partners and individuals to grow our innovative ecosystem to advance entrepreneurs, businesses and students.

I'd like to highlight partners that believe in this work: U.S. Ignite, Blandin Foundation, City of Red Wing, Goodhue County, MN DEED, MN State College SE, Xcel Energy, Red Wing Shoes, Jones Family Foundation, and Southern MN Initiative Foundation.

As a result of our work, we were recently one of nine communities nationwide selected by the Center on Rural Innovation to participate in the Rural Innovation Initiative, an effort funded by the U.S. Economic Development Administration to provide technical assistance and support to rural communities working to create digital economy jobs and businesses.

Our strength as an organization is the ability to connect our students, entrepreneurs and/or businesses with the needed resources in Red Wing, Minnesota or national opportunities. We are continuously learning and bringing best practices back to the region, for a lasting and sustainable impact.

**Looking Forward**

We believe our model will catalyze a regional innovation cluster that will strengthen and elevate our region and Minnesota's global competitiveness by focusing on three key areas:

1. **Advance Innovators and Entrepreneurs** by creating a hybrid incubator using virtual and in-person education, mentoring with top talent, technical assistance funds, access to investors and individual coaching.
2. **Enhance Regional Connectivity** by convening ecosystem builders and stakeholders in southern MN to implement the Entrepreneur First (E1) Collaborative. Creating a concentration of talent, people and resources to directly benefit entrepreneurs and the organizations serving them by simplifying the way individuals navigate the entrepreneurial ecosystem.
3. **Cultivate the Workforce of the Future** by convening industry, education and workforce development to attract, retain, and develop the talent needed to meet employer demand. RWI will advance students through worksite learning and hybrid courses in high demand, high growth fields.

Broadband establishes a platform for success that communities must have to be able to provide opportunities, access and exposure of virtual and physical networks to advance future innovators, entrepreneurs and their business.

Through perseverance we have learned these lessons:

1. Communities without broadband are in jeopardy.
2. Broadband access alone is not enough for economic vitality. It is critical to grow a knowledgeable workforce, increase digital literacy, foster innovation and market the efforts.
3. Measurement of economic success should evaluate talent attraction, retention and development not number of new jobs.
4. Trusted partnerships with government, corporate, academic and community partners are critical for success and sustainability.
5. Cities and organizations need to look beyond their geopolitical boundaries and proprietary tendencies in support of collaborative, regional economies.
6. Perseverance by local champions because it doesn't happen quickly.

In closing, the African Proverbs say it best, "If you want to go fast, go alone, if you want to go far go together." This work can't happen in isolation, we thank our local, state and national partners.

Thank you for the opportunity to testify. I look forward to your questions.

The CHAIRMAN. Thank you very much.

Now, Dr. Hess, please begin your testimony.

**STATEMENT OF DAVID C. HESS, M.D., DEAN, EXECUTIVE VICE PRESIDENT OF MEDICAL AFFAIRS AND INTEGRATION, PRESIDENTIAL DISTINGUISHED CHAIR, AND PROFESSOR OF NEUROLOGY, MEDICAL COLLEGE OF GEORGIA, AUGUSTA UNIVERSITY, AUGUSTA, GA**

Dr. HESS. Thank you. Good morning. First, I would like to thank the Chairman, the Ranking Member, Congressman Rick Allen, and the Members of this Subcommittee for the opportunity to testify today. I am David C. Hess, Dean of the Medical College at Georgia. I am here to recount my experiences as a physician providing telestroke services in rural Georgia.

Back in 2004, the early days of telestroke, I was coaching a Little League baseball team and I was called about a 45 year old man with a stroke at Emmanuel County Hospital in Swainsboro, Georgia, a 25 bed hospital in Congressman Rick Allen's district. There were only two of us covering our telestroke network in those days. The baseball field was 25 minutes to my home, but only 5 minutes to Taco Bell. I handed the scorebook to another dad, jumped in my car, and sped to Taco Bell and used their hotspot. I logged in with my password, but the camera repeatedly froze when I zoomed in to watch the patient move their eyes. The consult was dropped twice, and I was starting to sweat, as every second counts in stroke. I was finally able to make the decision to administer the drug TPA, and fortunately, the patient did well. But it was stressful for me, even more stressful than coaching my last place Little League team.

Now, fast forward to April of 2019, where I delivered 12 telestroke consults in 24 hours to a number of rural hospitals in both Congressman Allen's and Congressman Austin Scott's district. The cameras never froze and there were no major technical issues.

Three things have changed in the last 15 years. First, the bandwidth and technology have vastly improved, and I no longer have to drive to Taco Bell, except to eat their tacos. Second, demand for

telestroke services has increased. Third, I don't take calls often, as there are nine others who share the call burden.

Georgia is situated in the Stroke Belt, and there is a slide in your handout, a region of high stroke incidents in the Southeast United States. In 1996, a drug called tissue plasminogen activator, or TPA, was approved for the treatment of ischemic stroke by the FDA. The drug works by breaking up blood clots that could cause stroke.

There are two types of stroke. The most common one is ischemic, caused by a blockage of blood flow to the brain. The other type, hemorrhagic, is caused by bleeding into the brain. TPA is effective for ischemic strokes, but can be harmful or fatal if given for hemorrhagic strokes. This caused many emergency medicine physicians to be very reluctant to use TPA, and they require neurologists like myself to assist them in the treatment decisions.

One of the problems is a lack of neurologists in smaller hospitals. During a stroke, 32,000 brain cells die every second, so every moment matters when administering TPA. To address this problem, back in 2002, we in the Department of Neurology at the Medical College of Georgia began to developed a web-based telestroke system to help treat stroke patients in rural hospitals. There was no system available, so we built our own. This involved three components: two-way audio video so we could see the patient. We could communicate with the family. We could read the CT scan, and we had decision support software that helped us make the correct treatment decision. It was a web-based system, so we didn't have to sit and wait for calls in a specific wired room in the hospital. We could be at home or anywhere that we could have access to the Internet. We called this program REACH. We have now performed over 13,000 acute stroke consultations in Georgia, and have treated more than 1,800 with TPA, many of whom have never been treated with TPA. Telestroke has now become the standard of care with the American Stroke Association endorsing its use. Studies show that telestroke has expanded and improved stroke care in rural and super rural areas.

When we first started REACH back in 2003, we had a lot of problems with Internet connections to our rural hospitals. The video would often freeze and the consults would be delayed, and occasionally dropped. Bandwidth in rural Georgia is certainly much better today than it was 10 to 15 years ago, but requirements of at least 1.2 megabits will usually be needed for seamless operation. We also have improved technologies that allow us to operate in low bandwidth environments. We still experience problems with the video freezing and downloading imaging files. This problem is related to the people and resources necessary to adequately manage the bandwidth within the hospital.

Even if rural hospitals have access to broadband, they do not have the technology or IT budget. Congressman Scott recounted all the rural hospitals closing in Georgia—to support the infrastructure inside a facility, much less support a full-time IT person. The common example is the hospital guest network being allowed to use the same Internet connection as the clinical applications. A better-informed professional IT manager can set up restrictions on network use to prioritize clinical applications.

Now, current connectivity in rural America is not adequate to provide telehealth consults to patients in homes and small clinics. Lack of access to physicians is a problem. There are eight Georgia counties without any physicians, 11 without family physicians, 75 without an OB/GYN, and 78 without a general surgeon. This is only likely to worsen as the shortage of physicians is getting worse in rural Georgia. Much of this monitoring will be done by nurses and advanced practice providers, such as nurse practitioners, using tablets, but bandwidth is still a limiting factor.

We have proved this model works with stroke, but telemedicine could be used to address many other health needs in rural Georgia.

Thank you very much.

[The prepared statement of Dr. Hess follows:]

PREPARED STATEMENT OF DAVID C. HESS, M.D., DEAN, EXECUTIVE VICE PRESIDENT OF MEDICAL AFFAIRS AND INTEGRATION, PRESIDENTIAL DISTINGUISHED CHAIR, AND PROFESSOR OF NEUROLOGY, MEDICAL COLLEGE OF GEORGIA, AUGUSTA UNIVERSITY, AUGUSTA, GA

Good morning. First, I would like to thank the Chairman, the Ranking Member, and all the Members of the Subcommittee for the opportunity to testify today. I am Dr. David C. Hess, Dean of the Medical College of Georgia and Presidential Distinguished Chair of Neurology at the Medical College of Georgia at Augusta University. I am here to recount my experiences as a physician providing telestroke services, a form of telemedicine, to stroke patients presenting at hospitals in the rural Southeastern United States.

Georgia is situated in the "Stroke Belt", a region of high stroke incidence in the southeastern U.S. I work at the Medical College of Georgia, the only public medical school in the state of Georgia. We are the Joint Commission certified Advanced Comprehensive Stroke Center that serves patients in rural southeastern Georgia and South Carolina, areas that are in the "buckle of the Stroke Belt". In 1996, a drug called tissue plasminogen activator (TPA) was approved for the treatment of ischemic stroke by the Federal Drug Administration (FDA).

For background, there are two types of stroke—ischemic stroke is caused by a blockage of blood flow to the brain and hemorrhagic stroke caused by bleeding into the brain. TPA is effective for ischemic strokes but can be harmful if given for hemorrhagic strokes. The only way for a physician to tell the difference is to perform and review a CT scan of the brain. While TPA is very effective for ischemic stroke, in about 3% of patients it can cause bleeding into the brain which can be fatal. This complication caused many Emergency Medicine physicians to be reluctant to use TPA and they required stroke specialists (Neurologists) to assist them in making the decision.

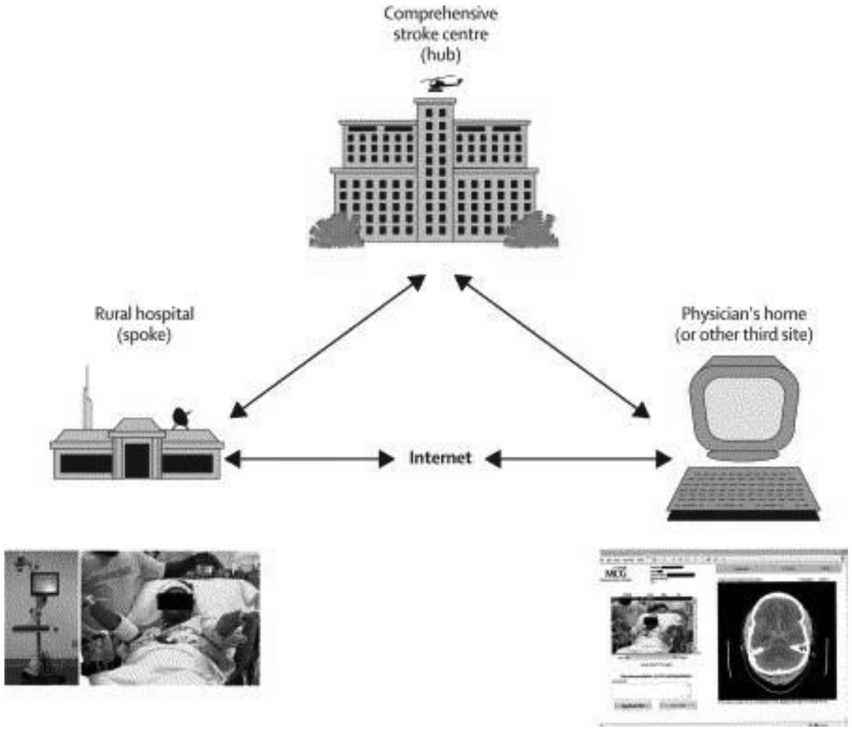
After TPA was approved by the FDA, only about 2% of stroke patients were receiving TPA. Nationwide, 64% of U.S. hospitals were not using TPA and most of them were small hospitals in the rural South.[1] There was a geographic penalty for stroke care—rural patients in small hospitals in the South that were not receiving TPA, the only drug that could reduce their chance of being disabled from a stroke.

One of the problems that led to low usage of TPA was the lack of neurologists and stroke specialists in the smaller hospitals to consult and help with the treatment decisions. Neurologists and stroke specialists tend to work in larger cities like Augusta and Atlanta and there were none in rural Georgia. Moreover, the time to treatment with TPA is a major determinant of how well the patient does; shorter time to treatment equates to better outcomes. Stroke is a "time sensitive disease" and it is estimated that during a stroke, 32,000 brain cells die per second so every second and minute delay matters when administering TPA. There is no time for the physician to get in their car and drive to a rural hospital. To make a decision to use TPA, the stroke specialist needs to see the patient and examine them and also review the CT scan of the brain. We would often get phone calls from our rural hospitals with questions about treating stroke patients with TPA. However, we could not see the patient or review their CT scan of the head, thus could not make safe decisions. The problem is that we had a very effective drug for stroke, but we did not have a healthcare system with the organization and tools to administer it.

To address this problem, back in 2002, we in the Department of Neurology at the Medical College of Georgia began to develop a web-based telestroke system to help

treat stroke patients at rural hospitals in Georgia. There was no system available, so we developed our own. This involved three components—two-way video (we can see the patient and the patient can see us), ability to read the CT scan of the brain, and decision-support software that helped us make the correct treatment decision and allowed us to complete a note to provide a consultation to the physicians at the site.[2–4] (*Fig. 1*) The other important feature was that the system was "site independent." We did not have to sit and wait for calls in a specific "wired" room in the hospital. We could be at home or anywhere that we had access to the Internet. We called this program REACH (**R**emote **E**valuation of **A**cute is**CH**emic stroke). After building a prototype and testing it within our own hospital, we began a pilot program in 2003 with McDuffie Regional Hospital in Thomson, Georgia and Emanuel County Hospital in Swainsboro, Georgia. Both these hospitals had administrators, nurses, and physicians supportive of the telestroke program. Internet connectivity was poor on both ends—the hospital and on our end. For example, if I was coaching a Little League game, I would have to drive to the Taco Bell and "use" their hotspot as that was closer than my home.

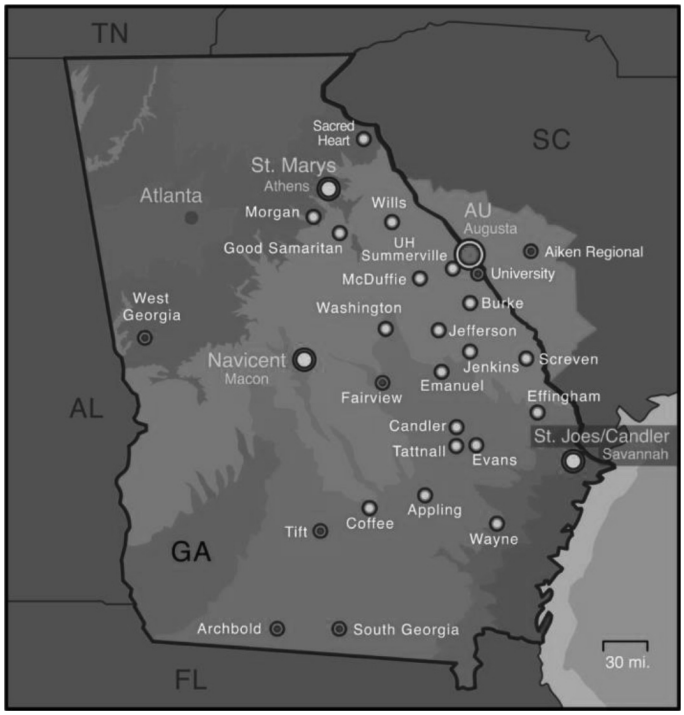
**Fig 1. REACH Telestroke System**




Patient presents in rural hospital (lower left) Consultation done at home by Stroke specialist (lower right) and patient transferred to Comprehensive Stroke Center (top) after TPA given or if complex care needed.

We demonstrated that that we could accurately examine the patient and measure the severity of the stroke and that we could safely and effectively guide treatment with TPA. Once we demonstrated (in the medical literature and to our peers) that we could do this, we expanded our network to nine rural hospitals over the next few years and now serve over 30 hospitals today throughout Georgia and one in South Carolina.[3–4] (*Fig. 2*) We have performed over 13,000 acute stroke consultations and have treated more than 1800 stroke patients with TPA. Most of these patients would have never been treated with TPA without a telestroke system.

**Fig 2. MCG–AU Health REACH Network**




Red dot is AU Health, Comprehensive Stroke Center. Small yellow dots are small rural hospitals (<50 beds); purple dots are hospitals >100 beds. Large yellow dots are larger hospitals >200 [] beds.

Telestroke is now used almost everywhere in the nation and almost every large health system has a telestroke program. Telestroke has become the "standard of care" with position statements written by expert panels from the American Stroke Association endorsing its use.[5–8] Telestroke became a disruptive technology that changed how we manage stroke patients. Studies show that telestroke has expanded and improved stroke care in rural and "super-rural" areas.[9]

We have expanded the use of telestroke to include acute teleneurology (other neurological conditions beyond stroke) and to triage and select stroke patients for mechanical thrombectomy (MT). MT uses catheters and clot retrieval devices to mechanically remove blood clots from vessels in the brain and this is a life-saving treatment for patients with large strokes (blockage of large arteries such as the middle cerebral artery.) We currently use telestroke to triage patients from all over Georgia and fly them by helicopter to the few Comprehensive Stroke Centers (there are four in Georgia) where this procedure can be performed.

In 2006, a group of us licensed the REACH technology through our University and in 2006 we founded a company called REACH Health in Augusta Georgia. The company later moved to Alpharetta, Georgia, and it provided telestroke services to over 150 hospitals in the United States, including hospitals in South Carolina, New York, Pennsylvania, Louisiana, Massachusetts and Alaska. I was Chairman of the Board from 2006 to 2018 when the company was sold to InTouch. REACH health is now a division of InTouch Health, the leading developer of telestroke systems in the U.S. and around the world.

When we first started REACH back in 2003 to 2004, we had a lot of problems with Internet connections to our rural hospitals. The video would often "freeze" and the consults would be delayed and occasionally dropped, and we would have to resort to using the telephone. Fortunately, this improved over the years. Access to bandwidth in rural Georgia is certainly much better than it was 10–15 years ago. There are also improved technologies that allow us to operate in a low bandwidth environment. This is stated in our Scientific Statement on "Telemedicine Quality

and Outcomes in Stroke" from the American Stroke Association and endorsed by the American Telemedicine Association[7] "The Scalable Video Coding extension of the H.264/MPEG–4 Advanced Video Coding standard (H.264/AVC) is the latest development for this successful specification, enabling high-resolution performance at the relatively low-bandwidth environments often available at more rural hospital sites. New communication (Web Real-Time Communication) and compression and decompression standards (VP8) are also emerging that promote the use of a Web browser as the primary audio/video platform while maintaining equal or better quality at half the bandwidth cost. Accordingly, technological advances on the horizon coupled with increasing access to high-speed bandwidth continue to accelerate the implementation of telemedicine services. Depending on the technology used, bandwidth requirements can range from as little as 64×103 bits per second to in excess of 1.2×106 bits per second. However, bandwidth >512×103 bits per second or closer to 1.2×106 bits per second will usually be needed for seamless operation. The quality of the connection is affected by many factors, including bandwidth (connection capacity and speed), distance (which introduces latency), network throttling (introduced by network configuration), and congestion (hospital systems will be 'saturated' at peak times, limiting the available bandwidth). The cell structure of mobile telecommunications may lead to low bandwidths during peak times of mobile Internet use. This becomes an issue in hospitals and busy emergency departments where competing for limited bandwidth leads to degradation of quality. Other variables affecting the conferencing experience include the number of participants in a videoconference, video resolution, and video size. Recently developed technologies, such as Scalable Video Coding1, provide better performance in low-bandwidth environments by making adjustments to frame rate, the area of the image to be refreshed, and video quality based on network environment."[7]

However, we do still experience problems with the video freezing and downloading imaging files. The problem is related to the people and resources necessary to adequately manage that bandwidth within the hospital. While most of these hospitals have access to broadband, they do not have the technology/IT budget to support much infrastructure inside the facility, much less support a full time IT person. The common example is the hospital guest network being allowed to use the same Internet connection (un-throttled) as the clinical applications. A better informed, professional IT manager can set-up restrictions on network use to prioritize clinical applications.

While Internet connectivity is adequate for most of the rural hospitals, it is not adequate to provide telehealth consults to patients in homes and at small clinic sites in rural areas. Telehealth is able to reinvent "doctor house calls" and is moving to monitoring and consulting with the patient in their home. In addition to physicians, much of this monitoring will be done by nurses and advanced practice providers. Lack of access to physicians is a problem in many parts of rural Georgia. According to the Georgia Board for Physician Workforce (*https://gbpw.georgia.gov/*), there are eight Georgia counties without any physicians, 11 counties without a Family Medicine Physician, 63 counties without a Pediatrician, 75 counties without an Obstetrician-Gynecologist and 78 counties without a general surgeon. Just as there are few stroke specialists in rural areas, there is a dearth of all types of medical specialists such as cardiologists, nephrologists, *etc.* This is likely to worsen as there is a looming shortage of physicians in the U.S. and major shortages in rural areas. One of the best ways to address these geographic disparities is through the use of telemedicine—to the patient's home and to health clinics.

There is also another need for stroke care where there is insufficient broadband—that is the poor connectivity to ambulances in rural areas. There is increasing interest in providing telestroke services in the ambulances transporting patients to the hospitals. This is presently not feasible in many rural areas.

Thank you again for the opportunity to testify before the Committee. I am available to answer any questions you may have.

**[Endnotes]**

1. Kleindorfer D., Xu Y., Moomaw C.J., Khatri P., Adeoye O., Hornung R. *US geographic distribution of rt-PA utilization by hospital for acute ischemic stroke.* STROKE 2009; 40: 3580–4.

2. Hess D.C., Wang S., Gross H., Nichols F.T., Hall C.E., Adams R.J. *Telestroke: extending stroke expertise into underserved areas.* LANCET NEUROL. 2006; 5: 275–8.

3. Wang S., Gross H., Lee S.B., *et al. Remote evaluation of acute ischemic stroke in rural community hospitals in Georgia.* STROKE 2004; 35: 1763–8.

4. Wang S., Lee S.B., Pardue C., *et al. Remote evaluation of acute ischemic stroke: reliability of National Institutes of Health Stroke Scale via telestroke.* STROKE 2003; 34: e188–91.

5. Schwamm L.H., Audebert H.J., Amarenco P., *et al. Recommendations for the implementation of telemedicine within stroke systems of care: a policy statement from the American Heart Association.* STROKE 2009; 40: 2635–60.

6. Schwamm L.H., Holloway R.G., Amarenco P., *et al. A review of the evidence for the use of telemedicine within stroke systems of care: a scientific statement from the American Heart Association/American Stroke Association.* STROKE 2009; 40: 2616–34.

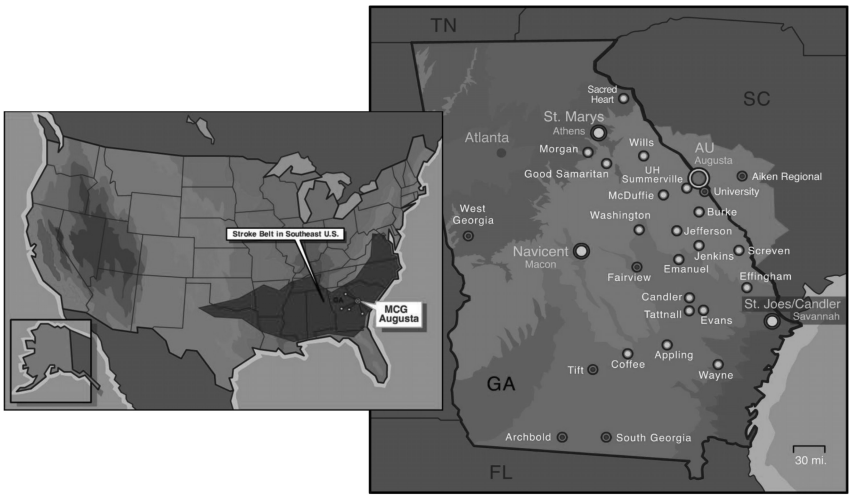
7. Wechsler L.R., Demaerschalk B.M., Schwamm L.H., *et al. Telemedicine Quality and Outcomes in Stroke: A Scientific Statement for Healthcare Professionals From the American Heart Association/American Stroke Association.* STROKE 2017; 48: e3–e25.

8. Wechsler L.R., Tsao J.W., Levine S.R., *et al. Teleneurology applications: Report of the Telemedicine Work Group of the American Academy of Neurology.* NEUROLOGY 2013; 80: 670–6.

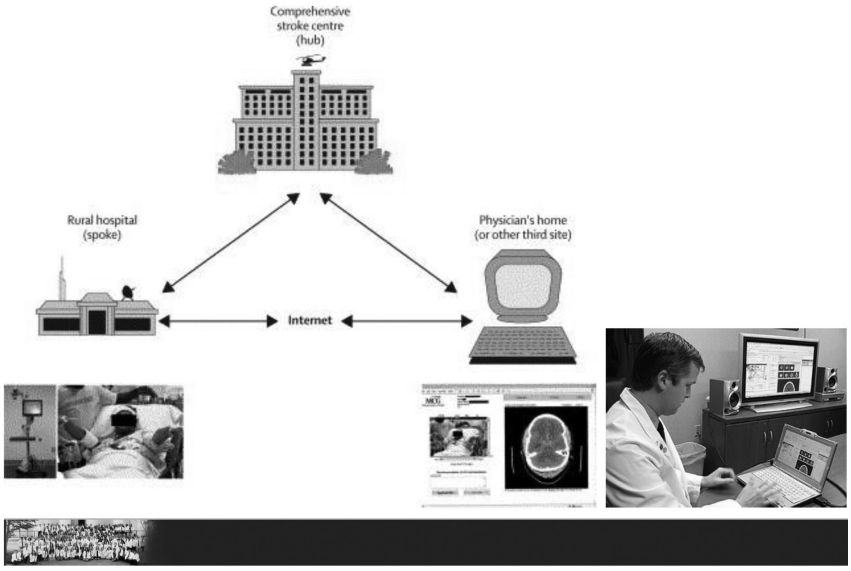
9. Zhang D., Wang G., Zhu W., *et al. Expansion Of Telestroke Services Improves Quality Of Care Provided In Super Rural Areas.* HEALTH AFF. (Millwood) 2018; 37: 2005–13.

ATTACHMENT

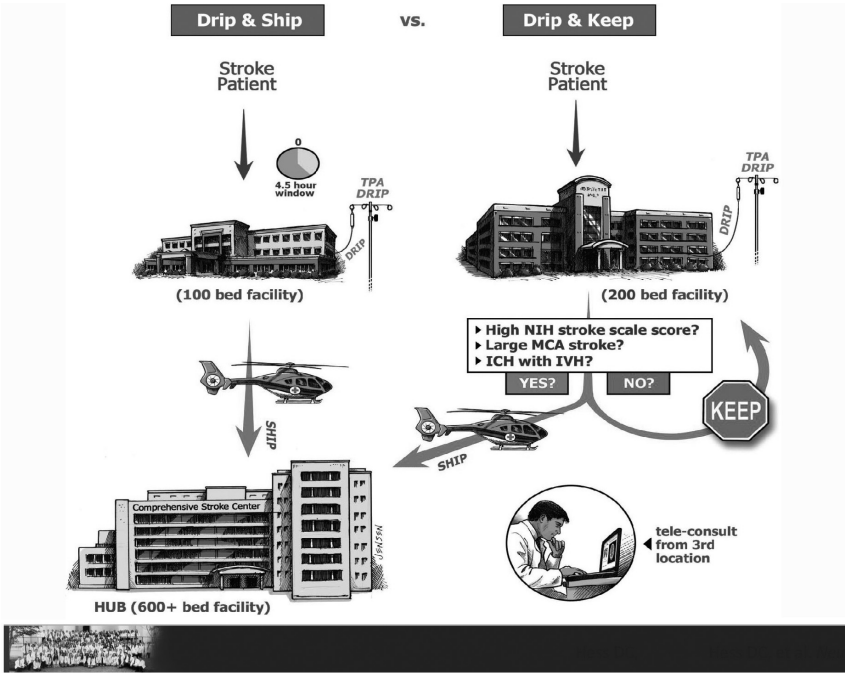
**REACH Network**



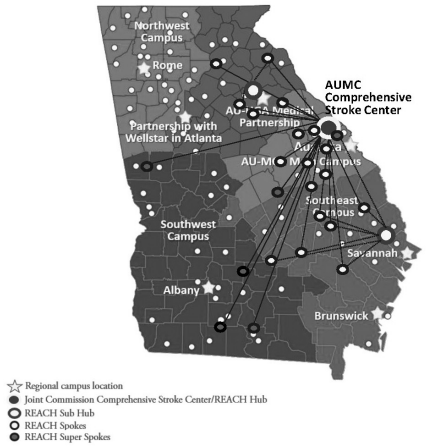
**REACH Hub & Spoke Telestroke Model**




Hess D.C., *et al.* LANCET NEUROL. 2006; 36: 5:275–8.



**The Two Georgias: Rural Health Care**






**Georgia**

**OVERALL RANK: 41**

**DETERMINANTS RANK: 42**

**OUTCOMES RANK: 37**

- 108 of Georgia's 159 counties are rural
- 101 rural counties have death rates above state average
- South Georgia is one of the sickest populations in U.S.
- Majority of rural/critical access hospitals are located in counties ranked in the bottom 50%
- Populations in these counties have more health challenges

The CHAIRMAN. Thank you, Dr. Hess.

And now we will hear from Councilwoman Watahomigie-Corliss. Please proceed.

## STATEMENT OF HON. OPHELIA WATAHOMIGIE-CORLISS, COUNCILWOMAN, HAVASUPAI TRIBE, SUPAI, AZ

Ms. WATAHOMIGIE-CORLISS. Good morning. Thank you, Chairman Scott and Ranking Member Scott, for the invitation to speak today. My name is Ophelia Watahomigie-Corliss. I am a member of the Havasupai Tribe. I am here in my official capacity as an elected leader. During my first term, I established a working relationship with MuralNet to help the community bridge the digital divide.

The Havasupai Reservation is the most isolated American Indian Tribe in the lower 48 states. The Village of Supai is located on the floor of the Grand Canyon, where the only way in or out is an 8 mile hike by foot, horse, or helicopter. Currently, the village receives Internet access by microwave point-to-point radio link providing 10 megabits for Tribal administration. Using an email browser and submitting grant reports have been the most successful use of that SM system. The current health clinic, run by the Indian Health Services, has obtained 1.5 megabits for its electronic medical records. Doctors lose the connection and file, refusing to use the electronic system, choosing paper charts instead.

In 2015, Coconino Community College partnered with the Tribe to establish the first GED program. The only available Internet was in the village center. Many of the students had jobs, and lacking home Internet access that year, the program had no graduates. To help bridge the homework gap the GED students experienced, the Council gave permission in 2017 to pursue high-speed Internet

through private LTE network. MuralNet and the Tribe filed a request with the Federal Communications Commission for a special temporary authorization permit to use educational broadband service spectrum over the Village of Supai under its educational burden of proof guidelines. Within 5 days of the license approval, we received customer premises equipment for homes and established our first high-speed Internet connection. Things changed with the newly approved STA permit. CPEs could connect to Internet at home. Our Head Start teachers came into compliance with new OHS standards, and teachers at our local Bureau of Indian Education School could lesson plan, research, and do continuing education from their homes.

In September 2018, our GED students signed onto their first live math class taught 168 miles away. This was a historical moment in 2018, because it marked the Tribe's first opportunities in online education.

While we have had successes, we have more needs. The Tribe's BIE school only goes to 8th grade. To receive a high school diploma, students must leave their families at 14 years old to attend a boarding school out of state. A percentage of these children are unable to adjust to leaving their families and return to the village, never going back to their studies. A Credit Recovery Program and online education school are needed.

Over the years, agencies have supplied us with failed telemedicine equipment. Telemedicine is important because of our isolation, and we are still living without this capability. Our community is suffering from a suicide cluster, and we are left with no in-person professional services for up to 3 weeks every month. The reservation sees 35,000 tourists a year. We need better emergency communications to the furthest gorge. Their safety is our responsibility. Navigating the canyon can sometimes be a life or death situation, and for these reasons, the Havasupai Tribe must move forward with upgrading this new pilot network. Seven homes in the village center with direct line of sight have broadband speeds. The planned network expansion will bring broadband coverage to the whole village. To make our network financially sustainable, Internet access can be sold to tourists in the campgrounds. The Tribe has decided its people deserve the opportunities afforded by broadband. The ruralness and population size of our community means there is no return-on-investment from outside Internet service providers or major telecoms to consider building the infrastructure. The benefits we have seen from this project are like none we have ever seen before. There is renewed hope in the community and among Tribal council that online education opportunities can become reality. Telemedicine can work to help improve the community's health.

These services ordinary Americans have been using for the past 20 years are still not a reality for my community. These disparities may be among the most extreme, but the disparities of the digital divide are felt across Indian Country. I support monies specifically allocated to rural American Indian Nations within the funds being negotiated. I can only speak to what my expertise is, which is my community, the most isolated and rural Tribe in the lower 48 states, which is the story of American Indian Country. If my story

and expertise can also expand into other parts of rural America to help your decision-making to support build-out for all rural America, then I am honored. Now you have the ability to help communities like us, and I know that you will.

I will be honored to address any questions the Committee might have of me. Thank you for your time.

[The prepared statement of Ms. Watahomigie-Corliss follows:]

PREPARED STATEMENT OF HON. OPHELIA WATAHOMIGIE-CORLISS, COUNCILWOMAN, HAVASUPAI TRIBE, SUPAI, AZ

Chairman Scott and Ranking Member Scott:

Good morning. It is very exciting to be asked to come speak about the topic of *Broadband Opportunity in Rural America through Affordable, Reliable, and High-Speed Broadband.* My name is Ophelia Watahomigie-Corliss, I am a member of the Havasupai Tribe, and I am currently serving my second term as a Tribal councilwoman. I am here in my official capacity as an elected leader of the sovereign Havasupai Nation. I also serve as the telecommunications lead among my Tribal Council colleagues. Within this testimony I will tell you about my Tribes' inability to participate in online education opportunities until 2018 and how our children must leave their families and canyon home in order to obtain a high school diploma at age fourteen. My community had been promised working telemedicine for the past fifteen years and yet agencies have failed every time to execute their promises. Finally, in partnership with MuralNet, we built our own Havasupai pilot network that was successful in bringing high-speed Internet to homes for students and teachers, which has pushed the Tribe to find ways to provide broadband to the rest of our community.

The Havasupai Reservation is the most isolated American Indian Tribe in the lower 48 states. The village of Supai is located on the floor of the Grand Canyon where it supports a population of 398 residents, and when the children return home from boarding school the number increases to 423. Our home is surrounded by mile high red rock cliffs and mesa tops that surround Supai Village. This scene is very similar to what you see at the Grand Canyon National Park, which was our ancestral home. Our village and canyon are important links to our traditional way of life. The only way in or out of our canyon home is an 8 mile hike by foot, by horse, or our public transportation via helicopter which runs two to four times a week, depending on what time of year it is. All packages sent through the United States Postal Service are still delivered by mule trail mail to area code 86435. Even after you make it up and out of the canyon, the nearest two towns are 67 miles away by car. My home, I am sure, qualifies under the definition of rural.

Within the first 100 days of my first elected term, I responded to a letter from Northern Arizona University, and soon established a working relationship with the nonprofit organization MuralNet. This was the first project I ever presented to Tribal Council and it was not easy. MuralNet had promised to help the community bridge the Digital Divide. My fellow colleagues were somewhat apprehensive and proceeded to inform me of the many agencies that had already promised to bring telemedicine into the community, and failed. I seemed enthusiastic enough that they were eventually willing to give the project a chance.

Initially, around 2008/2009, the village received Internet access from Niles Radio Communications by microwave point-to-point radio links producing 3 Mbps connection speeds at our access point in the village. In 2010 the access point was upgraded to receive up to 5 Mbps, and lastly upgraded in 2013 to receive a total of twenty Mbps. Using a Subscriber Module (SM) system the twenty Mbps were available and were split down the middle to provide 10 Mbps for Tribal administration, and 10 Mbps for a public network. The Tribe runs twenty-four departments year-round, which means at least thirty-two computers were signed onto a 10 Mbps system at all times, constantly competing for bandwidth. Our capabilities were far from high-speed usage. Using an email browser and submitting our grant reports online were the most successful use of our SM system but our Tribal departments were still unable to sign onto and interact with webinars, which were becoming the expected norm.

The 10 Mbps that are allocated for public use was available for portable devices such as phones and tablets. It catered to the community and the 35,000 tourists that come down to visit our world-famous waterfalls annually. The public network

was only available within a 30 yard radius from the computer room that housed our network equipment and access point.

The current health clinic in Havasupai is run by the Indian Health Service, which is a Federal agency who tried to establish their own Internet connection, but has only been successful thus far in obtaining 1.5 Mbps for the use of its electronic medical records system. I have reports from many contracted doctors who, after waiting forty-five minutes to get into a patient profile, will lose the connection and the file. They refuse to use the electronic system and many choose to stick with paper charts. There was not enough Internet speed to support an electronic medical records system, let alone have the ability to establish telemedicine in the canyon. Many organizations have donated telemedicine equipment, but the equipment is useless due to low Internet speeds.

Fast forward to 2015 when a local community college tried to partner with the Tribe to establish its first GED classes so that students could complete their work online and earn their diploma. The Tribe did not have the ability to get Internet to the homes of the GED students, so they would have to use the Internet in the village center. It was a very ambitious project, and many of the students already had jobs and wanted to work on their schooling at home, before or after work. The program had no graduates that year because it was nearly impossible to get their school work done in the allotted time when they had no access to the Internet at home.

MuralNet had promised to help the Tribe bridge the homework gap the GED students were experiencing. It was 2017 when the project was given permission with a Tribal resolution to move forward to bring in high-speed Internet via a private LTE network for the entire village. MuralNet and the Tribe filed a request with the Federal Communications Commission (FCC) for a special temporary authorization (STA) permit to use Educational Broadband Service (EBS) spectrum over the village of Supai under its educational burden of proof guidelines. We were ready to deploy the network by November of 2017, but it took the FCC until February 2018 to approve our request. Within 5 days of the license approval we received the plug-in customer premises equipment (CPEs) for homes and established our first end-to-end high-speed Internet connection in the village with thirty Mbps of backhaul. There was Internet signal throughout Supai and homes in the center of town with direct line-of-site to the antenna tower had broadband speeds.

During this time, the Tribe was working with its Early Head Start and Head Start programs to begin implementing new regulations that had been set by the Office of Head Start (OHS) in 2016. OHS was requiring all employees to have early childhood learning certificates, associate's, or bachelor's degrees depending on their job position, and our program had to prove their employees were enrolled in classes and on their way to receiving these certificates. This was proving troublesome for the Tribe. Although the OHS grants we had funded the classes, we did not have enough to pay for the employee's living expenses. The closest college to take the required classes would mean a hike, saddle ride, or helicopter ride out of the canyon and a 168 mile drive on top of that. If we sent them out of the canyon to attend school, we would also lose the employee at the Head Start. There are online classes, but the old network didn't have the capability to stream the videos, and the OHS deadline was getting close.

Within 10 days of receiving the STA from the FCC, I had developed a check out program for the MuralNet CPEs for online educational use. Anyone in the community could present to me a printed approval letter of any type of online educational classes they would be taking, and I would check them out a CPE to connect them to Internet at home. Immediately twelve CPEs were checkout out to Early Head Start and Head Start teachers who began enrolling in GED classes, and community college classes. By the summer semesters, students were able to enroll into classes towards their bachelor's degrees. This put both of our Head Start programs in compliance with new OHS standards! The teachers at our local Bureau of Indian Education (BIE) school were next on the list to be provided CPEs for use in their apartments. The teachers used the MuralNet CPEs for lesson planning, research for instructional activities, continuing education classes, news and email access. These first groups of students and teachers were able to confirm how our pilot LTE network enabled them to complete their tasks online. They no longer needed to stay at the office until 8 p.m. to use the Internet at the school to get their work done. They could now work from home.

The initial 6 month STA license was so successful that the FCC granted us an extension in May 2018. The second group to receive the CPEs were a group of seven students who were trying to complete the second round of GED courses provided by Coconino Community College located in Flagstaff, Arizona. The College had developed an interactive online class that students had to sign into twice a week and

complete forty hours of work through online courses in order to earn their diploma. Although the CPEs were distributed in the middle of their GED course year, we made every effort to accommodate these students so could take these classes at home. The first time a class of our students was able to sign into the live class was August/September 2018. Julie Baumgartner from Coconino Community College was teaching a math class in Flagstaff Arizona, 168 miles from the GED students. Once we successfully signed on, we could see Julie on our computer screens, we could hear her asking questions, and she even introduced her students in Flagstaff to us. Our Supai students watched her working out the problems on the board, and they could interact with the teacher. Some of the students were giving her answers to the solved problem on the board in real time. This was a historical moment for Supai because it was the first online, live, interactive class that had happened in the village.

While we have had successes, we also have more needs. The Tribe's current BIE school only goes to the 8th grade, and for our children to receive a high school diploma they are expected to up root from their families at fourteen years old and attend a boarding school out of state. A significant percentage of these children are unable to adjust to living life with a family of strangers or in a dorm, and return to the village, never going back to their studies. A credit recovery program needs to be initiated for these children and a type of online high school programming needs to be investigated and initiated to keep educational progress sustained.

There are also health and emergency service needs. For over fifteen years, the Tribe has been promised telemedicine services. This means over those years many agencies had supplied us with telemedicine equipment, all of which has been collecting dust because we lacked the high-speed Internet capabilities to run fluid programming. Telemedicine is so important because our community members have to stay out of the canyon and pay for hotel costs that can sometimes be over $1,000 a week when the helicopter only flies on Sunday and Friday in the winter. Our community is also suffering from a suicide cluster and sometimes we are left with no in person professional services for up to 3 weeks a month.

The Havasupai Reservation is also home to world famous waterfalls, and 35,000 tourists visit the Reservation each year. We do not have good emergency communication capabilities to the furthest gorge that tourists like to visit, and their safety is our responsibility. Navigating the canyon can sometimes be a life or death situation if someone gets lost. During July 2017 the Tribe had to evacuate around 200 people because of flash flooding, which kept the campground closed for months. These are some of the reasons the Havasupai Tribe must move forward with upgrading the network.

The Havasupai submitted an application for a permanent license of the EBS spectrum A channels in May 2018. However, the FCC had frozen all EBS spectrum permanent license applications since 1995. But now the FCC is rewriting the rules. After all our initial successes, Tribal Council fully supported the MuralNet pilot project and I was sent to Washington, D.C. to get the Havasupai Tribe the needed spectrum for our future network expansion. With Mariel Triggs, the CEO of MuralNet, I met with Members of Congress, their representatives and all of the FCC Commissioners' offices, advocating for the need of a permanent license for the Havasupai Tribe and for other Tribal nations to be able to claim unused and unlicensed EBS spectrum over their lands.

The success of our pilot project with MuralNet has motivated the Tribe to devote a part of its energy to upgrading the LTE Internet network. Currently only seven homes in the center of the village with direct line of site to the tower have had broadband speeds and homes on the outskirts have some connection issues. More and faster Internet connections means our network needs more bandwidth, equipment and backhaul. The initial investment for MuralNet to complete the pilot program was $15,000 in equipment costs and over $20,000 in lawyer fees, which is a very low cost to start a network. The planned network expansion would bring broadband coverage to the whole village, increase backhaul from fifty Mbps to 1 Gbps, provide emergency communications throughout the Canyon, connect an online charter high school, and allow for telemedicine in the new clinic, which will be beginning construction next year. To make our community network financially sustainable, high-speed Internet access can be sold to tourists in the campgrounds. The capital and network operator training costs are around $250,000–$300,000. These actions are being initiated because the Tribe has decided its people deserve the opportunities that are afforded by broadband. And we will have to do it for ourselves. The ruralness and population size of our community means there is no return on investment for outside Internet service providers or major telecoms to consider building the infrastructure.

The benefits we have seen from this project are benefits we have not been able to realize in the canyon before. There is renewed hope in the community and among Tribal Council that online educational opportunities can become a reality on the canyon floor. Community members can better their lives and their education through future broadband expansion in Supai Village. The telemedicine that has been promised to the community can finally work and begin to help the community's spiritual, mental, and physical health at the new clinic. These services that ordinary Americans have been using for the past 20 years are still not a reality for my entire community, but this is the first glimmer of hope we have seen for decades.

The disparities felt by my community may be of the most extreme examples felt by rural Tribal nations, but the disparities of the Digital Divide are being felt all across Indian country. It is extremely important to allocate funding to rural America, and Tribal rural America, to build reliable broadband. If my community has had its first opportunities to participate in online education in 2018, then there are other communities out there who don't have the capabilities. Extremely isolated areas are in desperate need of telemedicine services and we still don't have those capabilities. That is an opportunity with the monies you allocate to provide us that ability. The Havasupai would use the funds to establish the community's first charter school and credit recovery programs, which are desperately needed to increase the morale of families to earn a better living and give them the opportunity to live their best life.

I support monies allocated specifically to rural American Indian Nations within the funds being negotiated to support *Building opportunity in rural America through affordable, reliable and high-speed broadband.* I can only speak to what is my expertise and that is my community, the most isolated and rural Tribe in the lower 48 states, which is the story of American Indian Country. If my story and expertise can also expand into other parts of rural America and help your decision making to support building opportunity for all rural America, well then, I am also honored. I ask you to never to forget about us again, living at the bottom of the canyon, having had no access to online education or telemedicine services. We have felt left out and forgotten for decades. Now you have the ability to help communities like us, and I know that you will.

I will be honored to address any questions the Committee might have of me. Thank you for your time.

ATTACHMENT

June 25, 2018

Hon. OPHELIA WATAHOMIGIE-CORLISS,
Havasupai Tribal Council,
Supai, AZ

Dear Council Member Watahomigie-Corliss,

This letter serves as an assurance for the use of WiFi routers provided by the Havasupai Tribe. First, Havasupai Elementary School administration and staff thank the Tribe for the use of the WiFi routers located in some of the staff apartments. Second, school staff members, including teachers, are able to connect to the WiFi Internet for professional and personal access. Staff members use the Internet connectivity for the following:

- Lesson planning (*i.e.,* Persons, NWEA, NASIS, *etc.*)
- Research for instructional activities
- On-line classes for professional development
- Personal entertainment (*i.e.,* Netflix, Hulu, news, email, *etc.*)

We appreciate the Havasupai Tribe's support in helping make Internet access available to our staff. In addition, the access helps make living in teacher housing more enjoyable. If you have any questions or concerns, please do not hesitate to contact me.

Regards,

Dr. MAXINE ROANHORSE-DINEYAZHE,
*Acting Principal,*
Havasupai Elementary School.

The CHAIRMAN. Thank you very much.

Mr. Hurst, welcome. Please begin.

**STATEMENT OF C. BLAKE HURST, PRESIDENT, MISSOURI FARM BUREAU FEDERATION; BOARD MEMBER, AMERICAN FARM BUREAU FEDERATION, TARKIO, MO**

Mr. HURST. Good morning, Chairman Scott, Ranking Member Scott, and Members of the House Agriculture Subcommittee on Commodity Exchanges, Energy, and Credit. My name is Blake Hurst and I am from Atchison County, Missouri. I serve as President of the Missouri Farm Bureau and sit on the Board of Directors of American Farm Bureau Federation, whom I am representing here today.

Broadband is no longer a luxury; it is a necessity. Rural broadband is essential to modern agriculture, the farmers and ranchers who grow our food, and for the quality of life in rural America.

I am driving my combine and the phone rings. It is my 84 year old father who is driving another combine. The conversation goes like this. Dad says, "I just got a call from John Deere." I said, "Uh-huh." Dad says, "They said I was running out of DEF!", which is a fuel additive we use. I said, "Uh-huh." Days says, "They are watching us!"

Farming has changed. We used to think that we just grew corn and soybeans. Now we generate data, trillions of bits, all containing information that can make us more efficient, economical, and can reduce our environmental impact. On our farm, that data allows us to supply more fertilizer on our most productive land, cut fertilizer rates where yield potential is less, vary seed populations in real-time across the field, and yes, Dad, allows our equipment supplier to monitor our machinery, alerting us to potential problems.

After we collect this data, we must transfer it from our machines to the company who writes our prescriptions for fertilizer and seed, share it with our partners, who supply our seed, and eventually utilize it when making crop insurance and other business decisions. Transferring this data, which is essential to the future success of every farmer, requires access to fast and reliable and affordable broadband.

My friends in the livestock industry use broadband-based programs to monitor the development of each animal, analyze markets, make data-driven management decisions, and from monitoring feed usage and rations to scheduling delivery of animals, livestock farmers use broadband daily to improve the efficiency of their operations, and ensure the health of their herds.

While broadband connectivity is critical on croplands and ranchlands, rural communities also need broadband for healthcare, government services, and educational and business opportunities. We still have members who have to travel to the nearest fast food restaurant in order to use a hotspot so their children can finish their homework. That really is not acceptable.

Broadband is important to rural Americans because we deserve the ability to be a part of the larger society as well. Current and future generations of rural Americans will be left behind without adequate broadband service.

While most Americans take broadband for granted, 26 percent of rural Americans lack access to broadband, compared to only about two percent of urban Americans. And we have to use an asterisk with even these figures, because the current data and maps used to collect broadband coverage are inadequate.

The ability of the FCC and all other relevant agencies to utilize accurate coverage is the highest priority. With limited funding and an overabundance of need, more granular and accurate maps are critical to successfully target and distribute Federal broadband programs. That is why Farm Bureau supports the, bipartisan, H.R. 3162, the Broadband Data Improvement Act, that would improve the accuracy of broadband coverage maps and better direct Federal funds for broadband built-out. We say a special thanks to Representatives O'Halleran, Kirkpatrick, and Marshall for their support and sponsorship of this fine legislation.

Many of our state Farm Bureaus have engaged with their state legislators to improve rural broadband development. We helped organize the Missouri Broadband Initiative Working Group, which brought together providers, local, state, and Federal officials, and end-users of broadband. Many of the challenged we identified in Missouri are addressed by the changes made in the 2018 Farm Bill, including the high deployment costs, delivering technology that will be adequate for the future, accountability, mapping, and data collection, and meeting technology needs of agriculture.

Thank you for your leadership in making the necessary strides and providing the technology of the future, while safeguarding taxpayer dollars. Farm Bureau appreciates the Subcommittee's interest in rural broadband, and I am grateful for the opportunity to share our perspective with your today. We look forward to continuing to work with the Subcommittee in advancing the shared goals which I have highlighted here today, and I look forward to answering any questions you might have.

[The prepared statement of Mr. Hurst follows:]

PREPARED STATEMENT OF C. BLAKE HURST, PRESIDENT, MISSOURI FARM BUREAU FEDERATION; BOARD MEMBER, AMERICAN FARM BUREAU FEDERATION, TARKIO, MO

Good morning, Chairman Scott (D-Ga.), Ranking Member Scott (R-Ga.), and Members of the House Agriculture Subcommittee on Commodity Exchanges, Energy, and Credit. My name is Blake Hurst, and I am a corn, soybean, and greenhouse farmer from Atchison County, Missouri. I serve as President of Missouri Farm Bureau and sit on the Board of Directors for the American Farm Bureau Federation, whom I am representing here today. Farm Bureau appreciates the opportunity to provide input on the necessity of broadband technology on America's farms, ranches, and in our agribusinesses.

**A. Introduction**

The American Farm Bureau Federation (Farm Bureau) is the nation's largest general farm organization, with nearly six million-member families, representing agricultural producers of nearly every type of crop and livestock across all 50 states and Puerto Rico.

Broadband is no longer a luxury, it's a necessity. Rural broadband (fixed and mobile) is essential to modern agriculture, the farmers and ranchers who grow our food and the quality of life for rural Americans.

I'm driving my combine, and the phone rings. It's my 84 year old father, who is in our other combine. The conversation goes like this:

> DAD. "I just got a call from John Deere."
> ME. "Uh huh."
> DAD. "They said I was running out of DEF!" (A diesel fuel additive)

ME. "Uh huh."
DAD. "They're watching us!"

Farming has changed. We used to think that we just grew corn and soybeans. Now we also generate data. Trillions of bits, all containing information that can make us more efficient, economical and reduce our environmental impact. On our farm, that data allows us to apply more fertilizer on our most productive land, cut rates where yield potential is less, vary seed populations in real time as we travel across the field, and yes, allows our equipment supplier to monitor our machinery, alerting us to potential problems. After we collect this data, we must transfer it from our machines to the company who writes our "prescriptions," share it with our partners who supply our seed, and eventually utilize it when making crop insurance and other business decisions. Transferring this data, which is essential to the future success of every farmer, requires access to fast reliable and affordable broadband.

My friends in the livestock industry use broadband-based programs to monitor the development of each animal they raise, analyze markets, and make data-driven management decisions for their animals. From monitoring feed usage and rations to scheduling delivery of animals, livestock farmers use broadband daily to improve the efficiency of their operations and ensure the health of their herds. Many veterinarians communicate lab results through e-mail with livestock farmers to get them information on animal health as quickly as possible. All the data collected can be compiled into production reports which help farmers make more informed decisions about their farm and ranch.

While most Americans take broadband for granted, 26.4 percent of rural Americans lack access to broadband.[1] This is alarming, particularly when compared to the only 1.7 percent of urban Americans who lack such access.[2] However, an asterisk must be used alongside these figures because the current data and maps used to collect broadband coverage is flawed and fails to accurately determine broadband access. Farmers and ranchers, who already have seen a drastic 50 percent decline in net farm income in the last 4 years, must have access to fixed and mobile broadband to be more efficient, economical and responsive to environmental needs.

**B. Improvements to Rural Prosperity**

*Precision Agriculture and Farming Business*

Farmers and ranchers depend on broadband (fixed and mobile) just as they rely on highways, railways and waterways to ship food, fuel and fiber across the country and around the world. Many of the latest yield maximizing farming techniques require broadband connections for data collection and analysis performed both on the farm and in remote data centers. However, 29 percent of U.S. farms have no access to the Internet according to the USDA report, "Farm Computer Usage and Ownership, 2017."

America's farmers and ranchers embrace technology that allows their farming businesses to be more efficient, economical and environmentally sensitive. Today's farmers and ranchers are using precision agricultural techniques to make decisions that impact the amount of fertilizer a farmer needs to purchase and apply to the field, the amount of water needed to sustain the crop, and the amount and type of herbicides or pesticides the farmer may need to apply. These are only a few examples of the reasons farmers use broadband connectivity to achieve optimal yield, lower environmental impact and maximize profits.

According to USDA's "A Case for Rural Broadband," if access to broadband and adoption of digital agricultural technologies matched producer demand, U.S. agriculture would realize benefits amounting to nearly 18 percent of total U.S. market production, or $64.5 billion annually, based on 2017 levels. Farm Bureau's economic team analyzed the USDA report and wrote a Market Intel story, "Unleashing Broadband on Rural America Leads to Nearly $65 Billion in Economic Benefits Annually." The entire *Market Intel* story is attached as *Appendix A* to this testimony. Some highlights from this analysis include:

- *Row Crops*—The highest rate of adoption for precision technology used to improve yields and reduce costs is in the already highly mechanized row crop sector. USDA estimates connected technologies in row crops could result in a $13.1 billion gross benefit annually from next generation precision agriculture.
- *Livestock and Dairy*—According to the USDA's estimates, the livestock and dairy sectors are poised to benefit the most from next generation precision agri-

[1] FCC *Broadband Progress Report, https://docs.fcc.gov/public/attachments/FCC-19-44A1.pdf*, 2019.
[2] *Ibid.*

culture, with annual potential gross benefits totaling $20.6 billion. The majority of estimated benefits come from the production side and are focused on increased efficiency of animal care.

- *Specialty Crops*—Like row crop growers, specialty crop farmers could also see major gains with the adoption of new production and planning technology. Total annual benefits for next generation precision ag for specialty crops is estimated at $13.3 billion.

Broadband is important to our businesses in more prosaic ways. Farmers and ranchers rely on broadband access to manage and operate successful businesses, the same as small businesses do in urban and suburban America. Access to broadband is essential for farmers and ranchers to follow commodity markets, communicate with their customers, gain access to new markets around the world and, increasingly, for regulatory compliance. Additionally, our accounting program requires us to download the latest tax data to do payroll and prepare our taxes. We use broadband to place orders for our greenhouse business and can check availability and pricing in real time. We would not be in business without access to broadband, and we cannot compete with businesses in more urban areas if we don't have connectivity.

*Quality of Life*

Rural communities need access to health care, government services, and educational and business opportunities. For many rural communities, access can only be gained by using broadband services and sophisticated technologies that require high-speed connections. There are Farm Bureau members who need to take their kids to the parking lot of the nearest fast food restaurant to do research papers and complete their homework because their house does not have access to broadband. This is unacceptable. As more and more primary care physicians and specialists leave rural communities, telemedicine has become a necessity to provide critical healthcare to our parents and kids. I'm concerned for the well-being of my 84 year old father, who still is a full-time farmer.

I've listed business, health, and educational reasons for broadband's importance, but it's also important to rural Americans because we deserve the ability to be part of the larger society as well. Many families live across town, in another state or possibly another country and broadband allow families to connect, even when they are miles apart. Broadband allows grandparents to connect with their grandchildren through FaceTime and Skype. Streaming videos, using social media and participating in popular culture is important for social interactions. Rural Americans should have access to the same media as our urban neighbors.

Current and future generations of rural Americans will be left behind their fellow citizens if they are without affordable high-speed broadband service that enables them to tap into health care and education services, government agencies, and create new business opportunities.

**C. 2018 Farm Bill Modifications**

In the last few years, Farm Bureau members have elevated the priority of broadband access and affordability because of its impact on their daily lives. Farm Bureau has included rural broadband deployment as one of its strategic action issues for 2019 because many of our farm families are frustrated with the lack of services available in rural America.

Many of our state Farm Bureaus have engaged with their state legislatures to expand rural broadband deployment and have been conducting research on the impact of broadband deployment for rural communities. Let me walk you through some of the research that the Missouri Farm Bureau conducted concerning the deficits in current broadband programs provided at the state and Federal level. We helped organize the Missouri Broadband Initiative Working Group, which brought together broadband providers, local, state, and Federal officials, and end-users of broadband. Together, this group identified multiple opportunities and challenges to broadband deployment in our state and around the country. We now have a state broadband grant program and will soon roll out a comprehensive state broadband plan.

The recent changes in the 2018 Farm Bill made necessary strides in providing the technology of the future while safeguarding taxpayer dollars. Many of the challenges that we identified in Missouri are addressed by these changes, including:

- **High Deployment Costs:** Time and time again we have heard about the high cost of deploying broadband to rural areas. The 2018 Farm Bill increased the authorization for broadband deployment from $25 million to $350 million to help facilitate more broadband development nationwide. In addition, the farm bill established a grant program to help providers who are reaching the most

rural citizens. It is crucial that these programs are fully funded at the authorized level to help ensure that rural communities can benefit from broadband services.

- **Delivering Technology of the Future:** Prior to the passage of the 2018 Farm Bill, some rural broadband programs did not deliver service that is adequate and scalable into the future. The 2018 Farm Bill focused on "future-proof" technology and established benchmarks for broadband services. By giving USDA the authority to set minimum acceptable standards based on the life of the loan or grant awarded, we are ensuring that our tax dollars are not being spent on technology that will be outdated by the time projects are complete.
- **Accountability:** Ensuring judicious use of taxpayer dollars was a priority in the 2018 Farm Bill. Thanks to the work of the House and Senate Agriculture Committees, more safeguards are in place to make sure that the services promised are the services delivered by loan and grant recipients. Prior to this legislation, very few safeguards existed in this regard. It is vital that when Federal programs come into an area to address the lack of access that they do it right the first time.
- **Mapping and Data Collection:** Knowing where adequate broadband services do and do not exist is crucial to crafting sound public policies related to broadband deployment. The 2018 Farm Bill made significant progress in streamlining applicant processes and took steps to drill down to more granular data sets in determining where services are being provided. Missouri is fortunate to have been selected for a mapping pilot program, but more work remains on ensuring that the data collected nationwide is accurate and adequately reflects the current needs of our rural communities.
- **Meeting the Technology Needs of Agriculture:** In response to the growing needs of agriculture, the 2018 Farm Bill established the Precision Agriculture Connectivity Task Force. This legislation directs the FCC and U.S. Department of Agriculture to work together to identify gaps in mobile broadband coverage to farmland and ranchland. Then, policies will be recommended to fill 90 percent of those identified gaps by 2025. The legislation is an important step in changing the way the FCC and other agencies think about rural broadband as we strive to build the information infrastructure that modern production agriculture increasingly needs to be successful. Farm Bureau looks forward to participating in the nomination process.

**D. Importance of Broadband Mapping to Agriculture**

As efforts to improve access to broadband in rural areas continue, the ability of the FCC and all other relevant agencies to utilize accurate coverage maps is the highest priority. With limited funding to address an estimated $45–$65 billion issue and an overabundance of need, more granular and accurate maps are critical to successfully target and distribute Federal broadband programs. Currently, the FCC's National Broadband Map relies on Census block data to determine which areas are served, underserved, and unserved across the country. Census blocks are too large in rural and remote areas to accurately target broadband investments. If even one household in a given Census block is reported by a provider as being served, then the entire block is considered served and is therefore likely excluded from eligibility to receive Federal funds for rural broadband buildout. There are more than 3,200 Census blocks across the country that are larger than the District of Columbia, and five that are larger than the state of Connecticut. In fact, Census blocks larger than $2^2$ miles comprise more than 64 percent of the U.S. land area, which means that every rural area is impacted by this problem in some way.

Farm Bureau recommends that more granular data be used to determine areas of coverage. Gathering and, equally as important, verifying the data to accurately target and distribute the funding is critical to the success of broadband deployment for rural America. Adjustments in the data collection matrix to develop the mapping will assist in identifying areas in rural America where the digital divide is the greatest.

Farm Bureau supports H.R. 3162, the Broadband Data Improvement Act, that would improve the accuracy of broadband coverage maps and better direct Federal funds for broadband buildout. This bipartisan bill would require broadband providers to report data to create an improved National Broadband Map that is significantly more accurate and granular, an outcome that Farm Bureau policy supports. To improve accuracy and granularity, H.R. 3162 includes a three-pronged data validation process that focuses on: public feedback, third-party commercial datasets and on-the-ground field validation.

**E. Broadband Coverage for Croplands and Ranchlands**

We strongly advocate for the inclusion of cropland and ranchland as a metric of broadband access. Precision agricultural equipment requires reliable, high capacity fixed and mobile broadband connections for data collection and analysis performed both on the farm and in remote data centers. As more precision equipment becomes available, farmers cannot take full advantage of that equipment if they do not have access to reliable, high capacity broadband in the field or on the farm.

**F. Conclusion**

Farm Bureau appreciates the Subcommittee's interest in rural broadband and I am grateful for the opportunity to share our perspective with you today. Rural broadband (fixed and mobile) is essential to modern agriculture, the farmers and ranchers who grow our food and the quality of life for rural Americans. Broadband is no longer a luxury, it's a necessity.

We look forward to continuing to work with the Subcommittee in advancing the shared goals, which I have highlighted here today.

APPENDIX A

**Unleashing Broadband on Rural American Leads to Nearly $65 Billion in Economic Benefits Annually**

*https://www.fb.org/market-intel/unleashing-broadband-on-rural-america-leads-to-nearly-65-billion-in-econom*

MARKET INTEL
June 17, 2019
By: Megan Nelson, Economic Analyst

Credit: Mauricio Lima/CC BY 2.0.

**Editor's note:** the video is retained in Committee file; it can be accessed at: *https://youtu.be/6FDl-XjuDro*.

According to USDA's "*A Case for Rural Broadband,* (*https://www.usda.gov/sites/default/files/documents/case-for-rural-broadband.pdf*)" if access to broadband and adoption of digital agricultural technologies matched producer demand, U.S. agriculture would realize benefits amounting to nearly 18% of total U.S. market production, or $64.5 billion annually, based on 2017 levels. The report, published by the American Broadband Initiative, analyzes the possible economic benefits of bringing e-connectivity to the heartland and, more importantly, what needs to be done to make it happen.

From the way producers store and ship commodities to the way consumers purchase their food, the introduction and widespread usage of the household refrigerator has irrevocably changed the food supply chain system. A similar shift is upon us with the advent of digital technology and next generation precision agriculture, resulting in ever-increasing productivity with fewer inputs, better market access and healthier rural communities. Just as electricity allowed for refrigeration, to realize the benefits of this new digital technology, high-speed broadband service must be available everywhere.

**Figure 1. Annual Potential Gross Economic Benefit of Precision Agriculture Technologies Derived from Broadband**

| | Row Crops | Specialty Crops | Livestock | Total |
|---|---|---|---|---|
| Annual Value of the U.S. Market Studied * | $110.6 B | $30.1 B | $113 B | $254 B |
| Precision Ag in Planning | $4.2 B | $1.3 B | $2.4 B | $7.9 B |
| Precision Ag in Production | $6.7 B | $3.5 B | $15.8 | $25.9 B |
| Precision Ag in Market Coordination | $2.2 B | $8.5 B | $2.4 | $13.1 B |
| Next Generation Precision Ag Potential Gross Economic Benefits Annually, For the Market Studied | $13.1 B | $13.3 B | $20.6 | $46.9 B |
| Annual Value of Total U.S. Market Production * | $142.6 B | $45.3 B | $151.9 | $340 B |
| Next Generation Precision Ag Potential Gross Economic Benefits Annually, Extrapolated to Total Market | $16.8 B | $19.9 B | $27.7 | $64.5 B |
| Next Generation Precision Ag Potential Gross Economic Benefits as a Percent of Total U.S. Production | 12% | 44% | 18% | 18% |
| Average Percent of Next Generation Precision Ag Benefits that Depend on Broadband | 35% | 43% | 38% | 36% |
| Potential Gross Economic Benefits of Ubiquitous Broadband Infrastructure and Next Generation Precision Agriculture Adoption: | $4.6 *to* $5.9 B *or 4%* | $5.7 B *to* $8.6 B *or 19%* | $7.8 B *to* $10.5 B *or 7%* | $18 B *to* $23 B *or 7%* *of the total market* |

** Source: 2017 Production Values per 2019 reports of USDA National Agricultural Statistics Service and Animal and Plant Health Inspection Service.*

FARM BUREAU®

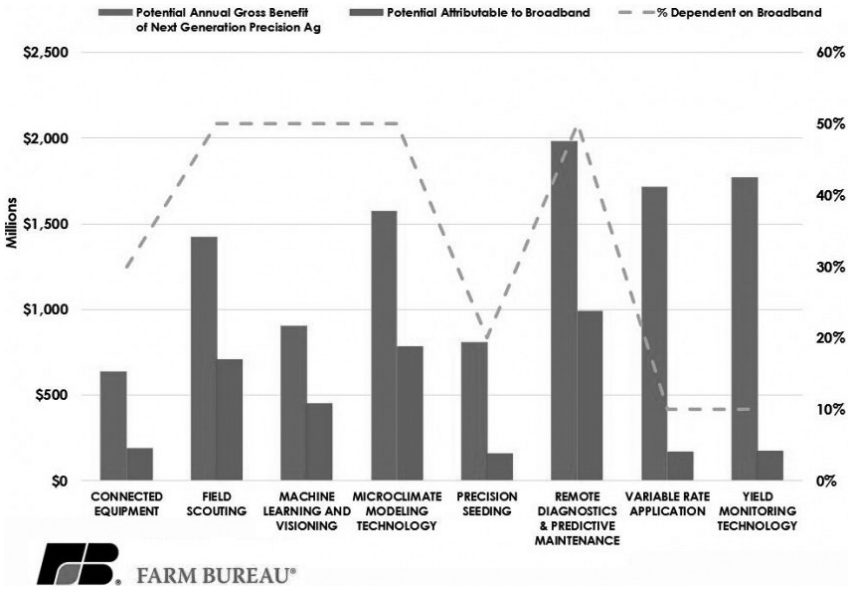
Source: USDA.

*Benefits*

Row Crops

The highest rate of adoption for precision technology used to improve yields and reduce costs is in the already highly mechanized row crop sector. USDA estimates connected technologies in row crops could result in a $13.1 billion gross benefit annually from next generation precision ag. Technology for improved planning, such as microclimate modeling, yield monitoring and precision seeding, is estimated to have a combined potential annual gross benefit of $4.2 billion, with $1.1 billion attributable to access to broadband services. On the production side of new technologies, the potential is even greater at $6.7 billion in possible benefits derived from precision agriculture, with $2.5 billion attributable to broadband. With an average dependence of 34% on broadband services to utilize these new technologies, the key to unlocking these significant gains is full deployment and adoption of broadband infrastructure. *Figure 1* outlines the potential benefits for row crop production and planning technology compared to the potential attributable to broadband with the percent of technology dependent on broadband.

**Figure 2. Potential Benefits for Row Crops By Digital Technology Type**

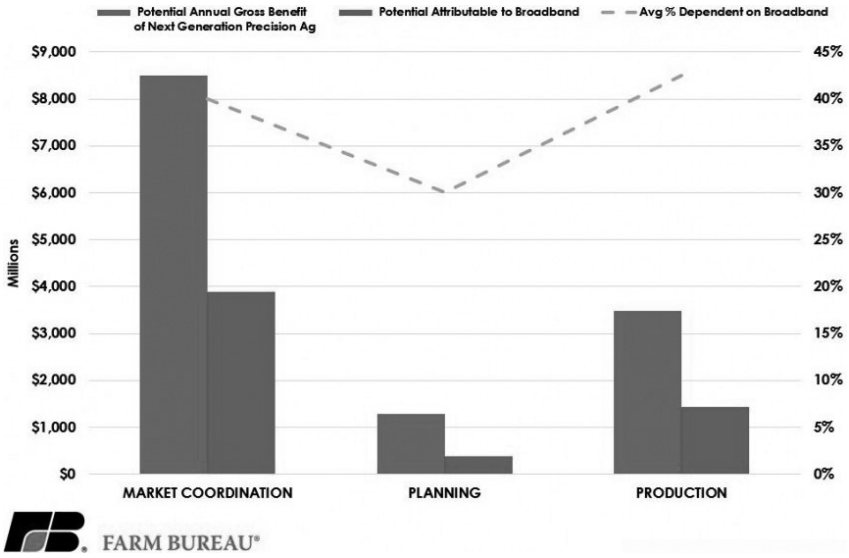



Source: USDA, Farm Bureau calculations.

Specialty Crops

Like row crop growers, specialty crop farmers could also see major gains with the adoption of new production and planning technology. Total annual benefits for next generation precision ag for specialty crops is estimated at $13.3 billion. With a possible increase of $8.5 billion, market coordination efforts will likely get the biggest boost from the adoption of digital technologies. Of the new opportunities in market coordination, direct-to-consumer sales are estimated to post a potential annual gross benefit of $6.4 billion, with $3.2 billion in potential attributable to broadband. Specialty crop producers can shorten the supply chain by utilizing digital platforms. USDA estimates a revenue increase of 50% per unit of apples, 649% per unit of salad mix and 183% per unit of blueberries. *Figure 2* illustrates the breakdown of potential financial benefits from next generation precision ag and the amount attributable to access to broadband services.

**Figure 3. Potential Benefits in Specialty Crops from Digital Technology By Business Function**

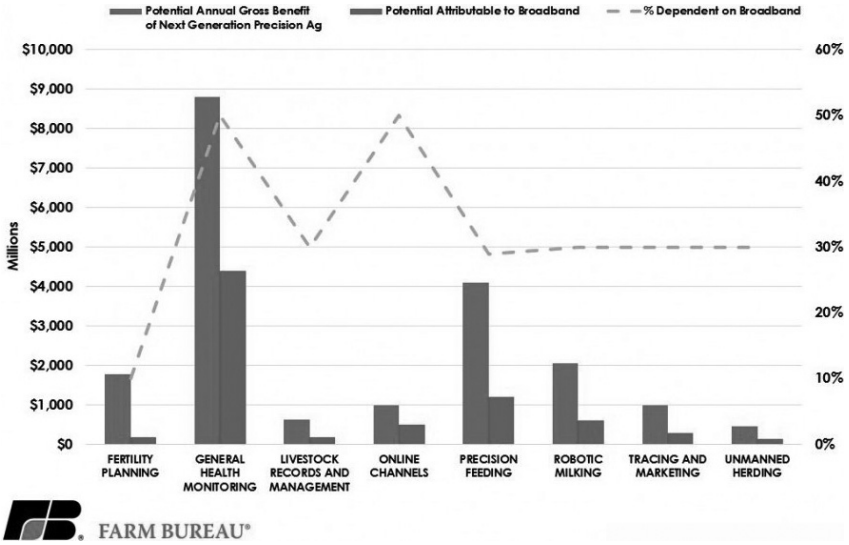



Source: USDA, Farm Bureau calculations.

Livestock and Dairy

According to the USDA's estimates, the livestock and dairy sectors are poised to benefit the most from next generation precision ag, with annual potential gross benefits totaling $20.6 billion. The majority of estimated benefits come from the production side and are focused on increased efficiency of animal care. Utilizing Bluetooth technology, animal wearables transmit general health data directly to the producer, resulting in a 15% reduction in medication per animal, as well as a shortening of the cattle finishing process by 4 to 6 weeks. Technological advances in general health monitoring alone are estimated to generate $8.8 billion in annual gross benefits. Unsurprisingly, as poised as producers in the livestock and dairy sectors are to reap enormous benefits from next generation precision ag, they are also the most dependent on reliable high-speed broadband to enable new technological advancements. *Figure 3* outlines the potential benefits for livestock and dairy compared to the potential attributable to broadband along with the percent of technology dependent on broadband.

**Figure 4. Potential Benefits for Livestock and Dairy By Digital Technology Type**




Source: USDA, Farm Bureau calculations.

*Strategies for Action*

As with electricity, the dawn of digital technology has brought an unimaginable amount of change to every aspect of our lives. Precision agriculture has led to 7.5% fewer people at risk of going hungry in developing countries and an up to 80% reduction in the application of crop protection tools. However, while new technology is able to inform and improve business decision making, without widespread adoption of next generation precision agriculture tools and access to broadband infrastructure, these benefits cannot be realized.

USDA has outlined key priorities for strategic action planning involving improved broadband deployment, incentivizing innovative technologies and creating environments for innovation, strategic funding and communication. To bring broadband services to even the most remote areas, public and private entities must work closely with communities to determine specific needs and challenges. Reducing barriers in Federal processes to access government assets is one of the cornerstones of the American Broadband Initiative and continues to be a focus at the Federal level. The task of actualizing broadband infrastructure relies on funding for deployment as well as for new innovations that can lead to long-term successes for the entire sector.

*Summary*

USDA's report puts the hypothesized potential benefits that broadband technology and infrastructure could bring to rural areas at $64.5 billion annually. Increasing the availability of broadband to all of rural America, coupled with increased precision agriculture adoption are estimated to increase the gross economic benefits to row crop agriculture by 4%, adding up to $5.9 billion, increasing 19% for specialty crops, or up to $8.6 billion, and 7%, or up to $23 billion, for livestock.

One limitation of the report is it does not incorporate the implementation costs, which will inevitably be incurred by rural residents, service providers and/or state and Federal Governments. As such, this report should be seen as a tool to illustrate the potential of broadband technology, rather than the only source for future investment-related decision-making.

USDA leaves us with this call to action—spread the word. For the full economic benefits of high-speed broadband to be realized throughout rural areas, adoption rates of precision agriculture tools and next generation technology must be much higher. All potential benefits are estimations based on rigorous research; however, producers must perform their own cost-benefit analysis to see where these emerging technologies fit in their operations.

**Contact:** MEGAN NELSON, *Economic Analyst,* (202) 406–3629, *megann@fb.org, twitter.com/@MeganRNelson1*

The CHAIRMAN. Thank you very much, and thank each of you for your testimonies. They were very informative and it gave us much, much information that some of us were not really aware of. And so, we thank you for that.

Now we go to questions for the Members. Members will be recognized for questioning in order of seniority for Members who were here at the start of the hearing. After that, Members will be recognized in order of arrival.

And I will start things off. I recognize myself for 5 minutes.

Dr. Hess, may I please start with you, because in your testimony, you talked about the Stroke Belt, and Georgia is right there in the heart of that.

Let me share with you some of the latest statistics. In Georgia, 3.5 percent of adults in Georgia had a stroke in 2018. In rural areas, the statistic for Georgia was 6.1, nearly twice that average. And it was 8.2 percent in 2017. This is one of the reasons I give a health fair every single year in my district for each of the 17 years we got here, and we address that dearly. We have the doctors and the physicians and all the great hospitals, as you may be aware. We have great recognition for this health fair, and that is what we address so much.

Can you explain the increases and decreases of these statistics, and also, can you tell us the answer to: are we doing something differently year to year, or are stroke numbers normally this varied?

Dr. HESS. Yes, Chairman Scott, those are very good points.

So, not only is Georgia in the Stroke Belt, but most of the coastal plain of the Southeast, so South Carolina, North Carolina, Mississippi, Alabama. And it is usually in the coastal plain, but it is. There are racial disparities, too. African American men have a very high rate compared to whites. African American men are the highest, and African American women, and then it drops down to white women and men.

The CHAIRMAN. Yes. What would be a rate racially on that? That is a very good point. What is the magnitude or the differentiation?

Dr. HESS. Well, it is a ratio of probably between 1.5 and 2 times as high, but you have to look at age. You have to adjust it for age, and the tragedy is, like the patient I talked about, 45 years old. In Georgia, in the Stroke Belt, we have strokes occurring a decade earlier than other parts of the country. Not only are there more strokes, but they are occurring in the prime of life. It is not unusual to see a 45 or a 50 year old person. It is not just elderly people who are having strokes.

And the other thing is the strokes were only the tip of the iceberg. I don't want to get too off broadband here, but there are a lot of silent strokes that occur that people don't even know about. For every stroke you have, there are five silent strokes, and that is a big contributor to dementia. A lot of this could be—I would rather actually focus on prevention than just treating the stroke would be better. It is treatment of hypertension is by far and away the biggest bang for your buck. We don't have as many programs as we used to have to treat hypertension, and a lot of rural pa-

tients don't have good access to healthcare, and so their blood pressure isn't as well treated.

African Americans have a higher prevalence of hypertension. They have more difficult to treat hypertension, and for any given level of blood pressure, they have more end organ damage like stroke. There are these definite racial differences and they tend to be accentuated in rural areas where there is less access to healthcare.

The CHAIRMAN. Right. Well, thank you very much for that.

Ms. Mollgaard, you gave a very interesting saying. You said—if I can remember correctly, you said "If you want to go fast, go alone, if you want to go far, go together." What did you mean by that? Give us an example of what you meant.

Ms. MOLLGAARD. Yes, it is an African proverb that I have heard and it really resonates with the work that we do on our local community level. To do the work that all of us here are doing, you need to forge these partnerships with a variety of sectors. You have to work with your government. You have to work with your schools. You have to work with your local businesses to really drive sustainable change in your community.

That quote I like because it might take more time. This work is heavy lifting, but when you bring the right people together and everyone is at the table, you can make a lasting impact for your communities, your regions, your states, and the nation.

The CHAIRMAN. Well, thank you very much. I hope you won't mind if I use that. I am going to be on television promoting my health fair, and I will use that. But I will give you credit. That is a great saying.

Ms. MOLLGAARD. It was not from me. I just resaid——

The CHAIRMAN. Oh, it is from Africa. Good.

I now recognize the gentleman from Georgia, Ranking Member Scott.

Mr. AUSTIN SCOTT of Georgia. Thank you, Mr. Chairman. I was waiting on the good doctor down there to give us a lecture about the fact that we go so far as to fry our vegetables, fried okra, fried tomatoes, we haven't figured out how to fry lettuce yet, but we pretty much fry everything before we eat it down there. Certainly, the way we eat, and it is good eating.

Dr. HESS. Yes.

Mr. AUSTIN SCOTT of Georgia. It has an impact on the strokes we have.

I want to focus first, Mr. Hurst, on you. I remember the old days of my granddad's 4430, and you pull a broadcast spreader, and when you turn the irrigation on, you put just as much water on the wet area as you did on the dry area.

Can you talk a little further—and you mentioned this briefly. Can you talk further about how you and your colleagues, and the ag industry as a whole, is able to utilize broadband on the farm to help reduce the inputs, fertilizer, pesticides, water, the way that they help production agriculture be more profitable and have less impact on the environment, while at the same time having greater yields?

Mr. HURST. Well, we keep pretty accurate yield maps as we go across the field, and basically we can check the yield for down to

a few square feet. And it is counterintuitive, but what you learn when you do that is to put a little more fertilizer on the parts that are green on the map that are of higher yields, a little less fertilizer where it is less productive. Before, we would use the same amount of fertilizer across the field, and it was wasted on places where the soil was thinner, was poor. We also do the same thing with seed, higher population where we have better capacity for yield. The less runoff obviously saves us money, but maybe more important for society, it saves the application of chemicals that can cause problems when they end up in the wrong place.

Mr. AUSTIN SCOTT of Georgia. I would add to the fact that the machinery today is much more complicated than it was in the past, and if you have a problem, my tractor's instruction manual is literally on my iPhone. But if I don't have access to the Internet, I can't get the information I need.

Mr. HURST. Yes, we absolutely use—just Google a problem, and if they can't fix it and we have to have a tech come out from our dealership, the first thing he does is hook up to the Internet to start tracing the codes.

Mr. AUSTIN SCOTT of Georgia. I beg to differ. The first thing he does is he starts that timer when he leaves the shop and they get a pretty penny, as my granddad would say.

Mr. HURST. Absolutely.

Mr. AUSTIN SCOTT of Georgia. Doctor, you have a relationship with Tift Regional Hospital where my father is a physician. I know I have talked with him many times in the past, him as an orthopedic surgeon and trauma surgeon. Just the ability in rural America for a physician to pull up an X-ray at their home instead of having to drive to the hospital to look at a patient to know if that is something that is an emergency, an emergency that requires an operation today, or if it is something that the patient is actually better off with a "wait and see" approach.

If you could expand a little further on how it is helping deliver healthcare into the rural parts of the country, I would appreciate that.

Dr. HESS. Yes. Well, almost any hospital to conduct any kind of business has to have broadband now, because you are sending images. Like you said, if your father wants to look at an image at home or if they are sending images to be read by these different teleradiology firms, which may be in Australia reading things.

Mr. AUSTIN SCOTT of Georgia. That is right.

Dr. HESS. And so you have to have that to function. The trouble is at peak times that bandwidth, there is a lot of competition for that bandwidth in a hospital, and that is the problem.

The problem is getting into patient homes, is the other problem, and getting into clinics. A lot of times they don't have broadband access.

Mr. AUSTIN SCOTT of Georgia. I was thinking the physician's home.

Dr. HESS. Yes. Well, the physician's office even can have trouble, you are right. I mean, you can have down times. Even we sometimes have trouble in Augusta. One of the worst things that ever happens is if my cable goes out from a lightning storm. Because I do telestroke, we all have backup systems; but, we have to have

wireless backup systems. You are right. Even for physicians trying to conduct business, it is very difficult in rural areas.

In Tifton, where you are, you already recounted the issues. And that is probably one of the better places we have seen in rural Georgia. I mean, some of the places we see, these 25 bed hospitals, they really struggle.

Mr. AUSTIN SCOTT of Georgia. Right.

Dr. HESS. They struggle. I don't know how they do it.

Mr. AUSTIN SCOTT of Georgia. My time is about to expire.

I want to say this. As someone who—from Tift County, we are very fortunate to have a quality medical community there. We also have I–75 and 319 and 82 that come through there, and as you know, we have a shortage of neurologists in the area. And when we have a neurological incident, if we are not able to have the telemedicine—even if you are able to have the telemedicine, one of the biggest questions is which way does the ambulance go? Does it go to Thomasville? Does it go to Macon, or does it head your way? Because in these areas where you have so few neurologists, even if the closest hospital—if that neurologist isn't there or if that neurologist is in a long procedure, the quickest help is sometimes further away.

Dr. HESS. Yes.

Mr. AUSTIN SCOTT of Georgia. And the access to immediately know where that patient needs to go in those situations it truly is the difference in life and death.

But thank you for being here.

Dr. HESS. Yes.

Mr. AUSTIN SCOTT of Georgia. Maybe we can have a second round of questions.

The CHAIRMAN. Yes. Thank you very much, Mr. Scott.

And now we will hear from the distinguished lady from Minnesota, Ms. Craig.

Ms. CRAIG. Thank you so much, Mr. Chairman, and thank you to the Ranking Member today for holding this hearing.

We all know that broadband is the gateway to rural schools, businesses, and healthcare providers. I am extremely pleased to have Red Wing, Minnesota's own Neela Mollgaard here to share the success story of Red Wing, one of the most incredible stories of how broadband can transform a community's economic future.

Neela, in your testimony, you mentioned that Red Wing Ignite has played a significant role in creating new educational opportunities for students in STEM, coding, and hands-on internships. How does broadband access expand the learning opportunities available to students outside of the classroom, and additionally, how does your organization collaborate with local school districts to improve those career pathways for students?

Ms. MOLLGAARD. I am happy to answer, once my microphone is on here. Yes. When we launched our nonprofit, we felt we should be focusing on our current innovators, the startup community. We learned quickly, though, we also need to help the future innovators. On our daily work with our manufacturers, with the startups we support, and the new next gen technology that we see in the nation, we know that there are new skills that are needed today, and those are in artificial intelligence and cyber security, in coding, in

automation, and so, our schools and schools all around might not have the capacity or the ability to teach those new skills that are needed.

We work with our partners in our school districts and our local college to try to provide those skills necessary for the students, whether that be inside or outside of the classroom.

A couple years ago, we started a STEAM team. We added A in there for the Arts. And what we did is we tried to provide more learning opportunities for these students with those skills that are so needed right now. What we learned, though, is we didn't want to do one and done programming. We wanted to do sustainable, impactful change. And so, we worked even closer with the schools to help provide some leadership to implement a new careers pathway at our K–12 system, which will be new curriculum and experiential learning for our schools.

I am pleased to say that out of the four pathways, two will focus on technology and science, and the other would be business and entrepreneurship.

Ms. CRAIG. Thank you for that. You really addressed my second question in your answer, because we were talking about that as well, because we are looking at how do we make sure that your program is aligning Red Wing with the jobs skills that are needed in greater Minnesota.

Can you talk a little bit about just—I know this Committee, and I am also on the Transportation and Infrastructure Committee—we often talk about how can we make sure that people can earn a good opportunity and living where they want to live? Please talk a little bit more about the entrepreneurship that has been unleashed. It is just stunning to me that you have been able to incorporate all of this here and in what is just a beautiful Mississippi River town that is growing by leaps and bounds.

Ms. MOLLGAARD. Yes. We have had some early successes with increasing the job market and keeping our community competitive. One program I could focus on is our Learn and Earn Program. It is one in five pilots in the State of Minnesota, working with high school students in high-demand, high-growth jobs. We have placed students in manufacturers around us, and they not only get a college certification, but work site learning. They can choose the path. Is it college or is it directly into career? And so, success rates right now, we have five students going to a technical college. We have four going to a university for engineering, and three got a job immediately out of high school for local employers.

With our startups, too, we are just providing the tools needed to be able to advance their business one step at a time with tools that they would not automatically have.

Ms. CRAIG. Thank you so much. I just want to add that this hearing is incredibly important. We are talking about broadband, but I hope we all see that through your testimony here today, Neela, it takes intentional leadership. It takes collaboration to make sure that we reap the full benefits and opportunities of the Federal dollars that we are investing in these programs.

Thank you for being here, and with that, I yield back.

The CHAIRMAN. Thank you, Ms. Craig.

Now, Mr. Baird, you are recognized for 5 minutes.

Mr. BAIRD. Thank you, Mr. Chairman, and Minority Member Scott as well. I appreciate the opportunity to have questions which deal with—my first one deals with telehealth.

Purdue University's Center for Regional Development has conducted numerous studies on a lack of rural broadband and social and economic benefits to Americans, and what can be gained from increasing that access. Many of you as witnesses mentioned those benefits here today.

In the Wabash Valley Heartland Innovation Network, it is a ten county area in my district that includes much of the area of about 97,500 people, and they don't have access to residential broadband. We have been interested in expanding the appropriations that would be involved in improving or funding distance learning and telemedicine, and to give better access to the equipment that would that.

Dr. Hess, I would ask you if you would care to elaborate on the types of healthcare services that can be—in addition to what you work with that might be provided to a patient in his or her home, and I am also looking at the kind of equipment that works best for that patient in order to receive that telehealth and telemedicine.

Dr. HESS. Yes. One of the biggest needs is telepsychiatry and telemental health. It is a huge need. Actually, if you look at requests that we get, it is often for telepsychiatry. There is a big movement now to develop different platforms, because that is a huge need.

Some of that would be done in clinics. Some of it could potentially be done in patient homes. Most of the things in patient homes would be more preventative care. In medicine, we are not very good at preventative care. We tend to be in a fee for service world where the more we do as physicians, we get paid. That is just how the reimbursement is set up. But we would like to go to a world where we are rewarded and reimbursed for preventing disease. But we are not there yet.

A lot of this can be done, as I mentioned—it doesn't have to be—there is such a shortage of physicians now in many areas that a lot of this can be done with nurses, nurse practitioners. They tend to be very, very good at this, developing relationships. You look at patients that have complex diseases, chronic diseases like diabetes and hypertension, and you focus on them. And a lot of that managing can be done by nurses in the home or pharmacists to review their medication.

The other big group is, at five percent, we call them the super users. Five percent of patients consume about 50 percent of the healthcare resources. They go to emergency rooms. They get admitted a lot. And that would be a group to focus on, and there has been some movement now to focus on those patients. It can't all be done through telehealth. You do need boots-on-the-ground. You need to touch people. You can't do everything by telehealth, but telehealth is a great adjunct, particularly in rural areas.

The other thing is we can provide—specialists tend not to be in rural areas, and telehealth is a great way to bring a specialist consultation, if not to a patient's home, to a community health clinic where they are going. I think it is a combination.

Most of the stuff in a patient home is monitoring for diseases you have, so you are monitoring the blood pressure. We are not very good at controlling blood pressure. And a lot of times, it is because we put people on so many medications, they can't keep track of them. I can't take three pills a day. I forget. How can we expect our patients to take ten pills a day? That is best done by nurses, nurse practitioners, and pharmacists. Doctors, we are not too good at that, honestly.

Mr. BAIRD. [audio malfunction in hearing room.]

Dr. HESS. Well, there are a lot of vendors. Our company that we sold was mostly focused on more in the hospital base, but there are more and more units you can use at the home. They are much simpler. They are often—you want to do something with an iPad or a computer. There are more and more things you can do with an iPad now, but you need the broadband connectivity. And on an iPad or a tablet, I should say, you can put a lot of patient education. Because, we are not very good also at educating our patients. We tend to rush through. We tell them we are going to get an echocardiogram. They don't know what that is. A lot of that information could be put on tablets that they could work with.

There are a number of systems. I don't want to go through all the commercials. There are a number of companies that do that; but, if you have the connectivity, you can always find a vendor to help you with the technology. The connectivity and the human factors are more important than the technology. I mean, the technology is almost a commodity. There are many good vendors for it.

Mr. BAIRD. Thank you very much, and I see I am out of time. I wish I had time to ask every one of the witnesses. I have questions.

But thank you, Mr. Chairman. I yield back.

The CHAIRMAN. Well, thank you very much.

Now we recognize the distinguished lady from Iowa, Mrs. Axne.

Mrs. AXNE. Thank you, Mr. Chairman and Ranking Member, for holding this important hearing.

Rural broadband, of course, is essential to modern agriculture, small businesses, and rural communities, as so many of you are talking about today. And as a Member of this Committee and a member of the Rural Broadband Task Force, getting our rural communities connected to the Internet so they can grow and thrive is definitely one of my highest priorities.

Iowa ranks among the top ten best states for education, opportunity, healthcare access, but it comes in 33rd for Internet connection. The FCC defines *rural broadband* as 25 megabits per second. As a reference, watching a movie on Netflix takes at least 5 megabits per second, and our rural communities and farmers, as several of you have pointed out, are not sitting around watching TV. Many of the latest farming technologies require broadband connections for data access and analysis of their fields. Farmers and businesses rely on broadband access to manage their inventory, communicate with customers, and grow online. Adequate broadband access is critical to the success of our rural communities, small business owners, and farmers.

According to the FCC, 26.4 percent of rural Americans lack access to adequate Internet speeds, and that is definitely true in my

district. We don't know how many Iowans are lacking broadband access because current FCC maps indicate a much higher connectivity rate than actual data from our local communications companies. There are large parts of my district—and I can tell you this from firsthand experience—where cell phone service isn't even available, much less Internet. And in the areas that do have Internet coverage, there can be huge differences.

For instance, in Red Oak, it is ranked 54th among all Iowa cities for Internet connection, but literally just 23 miles away in a town very similar in size, Shenandoah, it is ranked 430th. And even my largest city, Des Moines, has 37 percent slower Internet connectivity than the national average.

I think much of this comes from the disparity of the last mile, which is when Internet providers won't extend into the areas that they see as unprofitable, often stopping right at county lines or just outside the business district, leaving rural communities to either foot the bill or not be able to compete in a 21st century economy.

I want to highlight some folks in Montgomery County, Iowa, and the important work they are doing, led by Shawnna Silvius, the Director of Montgomery County Economic Development. Montgomery County is leveraging USDA's new Market Tax Credit Program to complete that final mile of connectivity, and when they are successful, they will literally be the first county in Iowa to have certified fiber optic to every home and business. The first in Iowa, and it is 2019.

When I spoke with Shawnna and Red Oak Mayor Bill Billings, Montgomery County supervisors Brian Amos, Mike Olson, and local business owners like Kevin Cabbage and Mickey Anderson about the economic development that high-speed Internet brings, they all shared that connecting our rural communities is critical to ensuring our rural communities survive.

From finding all the right avenues to funding, to navigating all the different agencies, the USDA, FCC, Department of Commerce, *et cetera,* our communities have very little guidance or assistance. I am really happy to have you all here today, because given your experience, you have been successful in navigating these broadband issues and helping connect your communities.

I would ask any one of you to comment and give me the advice that you have to help communities like mine who are either struggling to get started, having trouble finding enough funding, or who need to close that last mile gap. Thank you.

Mr. HENGEL. Thank you, Congresswoman. Great questions and great comments, by the way. I think your district is similar to mine, I would imagine, in what we deal with.

First off, I want to recognize the fact that there is bad data out there, and I think that is important that we gather some data.

We were lucky in my region because we had a cooperative that has decided to lay the fiber, because it is part of their mission. They believe deeply that economic development and community development is part of their mission as a rural cooperative. And so, that we are very lucky to do so.

With MidCo also having a personal interest and as a company—the success allowed them to make what would be decisions that are beyond what I would say would be business case analysis.

And so, I think that you have to use all the resources you can. You have to bring together both the business community as well as the education community, the healthcare community, and make the case. In Minnesota, we created the Office of Broadband, which has provided some leverage funds as well as Federal funds, to start reaching that extra mile, which is incredibly difficult to get to.

Mrs. AXNE. Thank you. Any other comments?

Mr. HURST. Yes, please. Thank you. I live about 20 miles south of Shenandoah, so I can certainly agree with the lack of broadband in that community.

Good help in Missouri from rural electric cooperatives and other cooperatives. Actually, our broadband comes from a small cooperative in southwest Iowa to our farm, and they reach across the state lines there. These are really outstanding efforts from the cooperatives, and we appreciate that very much.

Mrs. AXNE. Thank you.

The CHAIRMAN. Thank you very much.

The gentleman from South Dakota, Mr. Johnson, 5 minutes.

Mr. JOHNSON. Thank you very much, Mr. Chairman.

For 4 years, I was the Vice President of an engineering and consulting firm that worked in rural broadband, and we designed and put in place about 8,000 miles of fiber optic network a year, did a number of wireless builds as well. And I am not sure there was anything more rewarding than seeing the real joy, the satisfaction of these communities that were getting connected to real gigabit-type networks that they had not had access to previously.

And I was particularly struck when there were traditionally underserved communities or subcommunities. And we have talked a fair amount today about demographic differences in broadband availability.

I want to shift just a little bit to demographic differences in broadband adaptation, or to what extent people are actually using the speeds that they can get access to. And of course, we often talk about this with regard to age, and so, I was just curious for any of the panelists, if you want to share from your medical or Tribal or agricultural communities stories you may have about getting older Americans connected to these resources.

Dr. HESS. Well, I will just start with one anecdote. We were actually going to apply for a P–CORI (Patient-Centered Outcomes Research Institute) grant to look at post-stroke care, and most stroke patients are elderly. And so, before we did that and applied, we were going to use telehealth and actually connecting with iPads and smart phones to try to do follow up with nurses. We started. First, one of the nurses said, "Why don't you do a survey and see how many elderly Americans with stroke have a cell phone or know how to use a cell phone," and the numbers were disappointingly poor. Most of them didn't have access to a cell phone. They may have had a grandchild or a child with one, but they weren't necessarily in the house. And more than ½ of them didn't know how to use a cell phone or how to use a tablet. And they were intimidated by that technology. This was only 3 years ago.

In terms of the health field, when you get to elderly people who have a stroke who may already have cognitive problems, that can be a problem. You are going to need someone in the family maybe

to help them. Often the younger you are, the more technology adept you are.

It is an issue with some of our aged patients. That is just my anecdote.

Ms. MOLLGAARD. I would say also that it is about the adaptation, as you speak. It is when individuals can really change the way that they work, learn, and live, using this technology. They won't substitute it. I mean, why our youth are no longer going to go to communities that don't have broadband. That will be a requirement for the future, as our youth are looking for new homes.

Once we have the technology and everyone has technology, it should be like electricity. Everyone should expect it. It shouldn't be some have and have not. Then they can use this new technology, provide better healthcare, provide better educational outcomes. They will have that adoption rate. It will see the value to their day-to-day lives and how they care for their elderly parents or improve their own health. And then at that point, adoption will really be finalized.

Mr. JOHNSON. Maybe for you, Councilwoman, I mean, I would imagine dealing with Tribal elders sometimes it is hard for them to—when you talked about the increase in the quality of life of people using some of these new speeds. But I am sure Tribal elders lagged in that access.

Ms. WATAHOMIGIE-CORLISS. Mr. Johnson, you are correct. In the idea of public health, we are working on some crisis response protocols within the community, and we have set up kind of a public education guideline and system that we are about to deploy in regards to our state Medicaid. Even the community themselves don't know what questions to ask when they are flown out of the canyon to a regional medical center, and we are just now establishing a question card.

In the idea of a community, Native Americans usually do a public outreach and will have a community meeting where we will invite the public, and that is where we would start.

Mr. JOHNSON. And then for Mr. Hurst, all of my buddies in their 30s, 40s, and 50s who are ag producers are using technology a lot. My producer buddies who are in their 70s and 80s, less so. I am sure my experience isn't unique in that way?

Mr. HURST. I mentioned my father in the testimony. I kid him. He is the only guy, besides drug dealers, that depends on a burner phone from Wal-Mart; but, he pays attention to those maps, so we are making progress. But there is definitely a generational difference.

The CHAIRMAN. All right, thank you very much.

Mr. JOHNSON. Thank you, Mr. Chairman.

The CHAIRMAN. You are welcome. We will now recognize Mrs. Kirkpatrick, the lady from Arizona, 5 minutes.

Mrs. KIRKPATRICK. Thank you, Mr. Chairman. Thank you for having this really important hearing.

I have been working on expanding rural broadband since I was first elected to the legislature in Arizona in 2004. I grew up on the White Mountain Apache Nation in Arizona, very remote Tribe. When my cousin was principal of the elementary school there, she started a computer lab because she realized that practically none

of the households had computers in their homes. And yet, if these kids were not computer literate going on to higher education—and a lot of them went off the reservation to boarding schools—they would be at a lifelong disadvantage. But even that was restricted. They would spend maybe an hour or 2 a week in the computer lab, but at least they had some exposure.

I am very concerned about this for our rural areas that lack connectivity and that opportunity for our young people.

I just spent a week with my 2 year old and 4 year old grandsons who had their iPads with them the whole time. It is second nature to them to use their iPads. But that is not the case for a lot of rural students.

I have hiked down to Supai. It is a beautiful, beautiful area, but I just wondered, Ms. Watahomigie-Corliss, how many households in Supai have computers in their homes?

Ms. WATAHOMIGIE-CORLISS. With our old SM system, we did have a public network with 10 megabits, and we did try to deploy home modem use. And out of that old system, I would say that was around 2010, probably about 20 homes were able to receive the modems. But does that mean they have a laptop? It mostly means that they have a portable device, which would be a cell phone or an iPad.

Also, in regards to our GED programs that we have been trying to initiate, since 2015, that is also the same case. The students will ask the Tribe for a laptop because they don't have one. Last year, I was only able to get two laptops donated. In the same way that I was able to check out the CPEs for home Internet use, I also checked out the laptops and currently, we only have two.

I would have to say, Mrs. Kirkpatrick, I would guess of the 128 homes in the village of Supai, I would guess about maybe 28 of those homes may have a computer.

Mrs. KIRKPATRICK. Thank you.

I am going to switch gears a little bit. I have a Veteran's Advisory Council, and we just met when I was home last week. And we come from—they come from all over the district. I have a very rural county, Cochise County, and the veterans depend on telemedicine and the Internet to communicate with the VA hospitals in Arizona. And I would just like the panel's comments on what we can do to improve access for veterans in rural America in terms of telemedicine?

Dr. HESS. Yes, I will take the first stab.

The VA has actually been at the forefront of telemedicine. I mean, they have actually taken the initiative in a lot of areas. But, a lot of it depends what division you are in and where VA is doing it. I know there are some—it is not too widespread where I am in Georgia, but it sounds like your VA is pretty far ahead. And you are absolutely right. Veterans, there are just so many VA hospitals and they have tried to develop a lot more clinics; but again, there are wait times. There are access issues, just like there is everywhere else.

I remember the VA was talking about this in the early 2000s and late 1990s. They were ahead of the game. I don't know that I have a magic pill for that, but it is a very good question. And they have been at the forefront, compared to other healthcare systems.

Mrs. KIRKPATRICK. Yes, they really have been working at it. There are still some software problems that I am hearing about, but they have really taken the lead in that.

Any other comments from anyone else on the panel? I have about 30 seconds left. Okay, yes.

Ms. WATAHOMIGIE-CORLISS. Yes, I do have listed here available types of spectrum that maybe the VA would be—or consider either applying for a license or there are also unlicensed networks here. There is the Citizens' Broadband Radio Spectrum, which is called CBRS. That is a 3.5 gigahertz. It is lightly licensed and should be available late summer. There is the Educational Broadband Service Spectrum, but the FCC did just make their determination on that yesterday. There will be Tribal priority windows and then that will go up for auction. There is also unlicensed spectrum of 900 megahertz, 2.4 gigahertz, and 5.8 gigahertz, and there is also what is called TV white space, and it is currently unlicensed but it has a wide enough range of frequencies to be available in most areas.

Mrs. KIRKPATRICK. I would love to work with the Tribe on expanding that in any way I can.

Thank you, Mr. Chairman. I yield back.

The CHAIRMAN. Thank you very much, and now we will hear from the distinguished lady from Missouri, Mrs. Hartzler, for 5 minutes.

Mrs. HARTZLER. Thank you, Mr. Chairman, and thank you each for being here. What an impressive panel. I just think your communities and your states are very blessed to have you in leadership.

I want to start with Mr. Hurst. You have talked about, in your testimony, about the importance of broadband mapping to agriculture. Can you describe some of the problems that we are currently facing about—a little bit more about the legislation that you mentioned that would be helpful, but also about the FCC's National Broadband Map Initiative that is underway, and how you think that might be helpful?

Mr. HURST. The way it works now, as I understand it, if one person, one home in a Census block has access, then that means that that Census block is not eligible for any Federal programs. But it may be that it is just only one home, because in rural areas, because of the low population density, a Census block can be a lot of square miles. We need more granular data that gives us a better idea of how good that penetration is, how many people actually in the Census block are being served. That is why it is so very, very important that we work on these maps. It is one of our initiatives we are working on with our broadband group in Missouri. H.R. 3162 has that as its goal. There are also things written in the farm bill that would improve our mapping.

In order to fix the problem, we have to be able to measure it, and so far, we can't.

Mrs. HARTZLER. Right, and I am glad that we are focused on that because I think that is just something that hasn't been focused on as much, but it is critical that we get the maps right so that we can get the funding where it is needed and make sure that people are helped. Thank you for that.

Ms. Mollgaard, I really was inspired by hearing more about what is going in Red Wing, Minnesota, and your enthusiasm and just the

great things there. But I want to get more specific, because I want to do this more in my district.

You said that it is funded by the U.S. Economic Development Administration that provides technical assistance and support to rural communities. Is the support financially, or just technical assistance? What specific Federal programs—was it Reconnect funding? Was it the FCC's Connect America fund, or what did your community tap into, or is it just privately funded to help you expand and bring this broadband to your community?

Ms. MOLLGAARD. In my written testimony, I list many of our partners——

Mrs. HARTZLER. Push your mic—there you go. Thanks.

Ms. MOLLGAARD. In my written testimony, I list all of our wonderful partners and funders. It has been public-private partnership. Our City of Red Wing supports us. We have local foundations. We have had other grants, state and then with U.S. Ignite, that was funded by—they were initially funded by the White House, the National Science Foundation grant dollars. Currently as you were referring to with the EDA, we were selected by an organization called the Center on Rural Innovation to be part of their rural innovation initiative, and because we were one of nine communities in the nation, we were able to receive in-kind technical assistance to apply for the I–6 Challenge grant. We don't know the outcome of that. Now that I am here, maybe I need to go and see what the status of that grant application is.

But it will be a wonderful network of communities, nine communities throughout the nation that will now work together to try to improve our innovation-based economies. It is the EDA I–6 Challenge grant is what I was referring to with the help from the Center for Rural Innovation.

Mrs. HARTZLER. We have come a long ways in providing some funding, but the problem, and you referenced it in your comments, was sustainability. There is money to help put the broadband there initially, but then you have to be able to sustain that model. And so, I was curious about that.

But I wanted to talk about speeds just a little bit, and go back to Mr. Hurst.

As you know, Missouri has set out a new broadband plan, but the plan's goal is to achieve universal access to high-speed Internet with speeds of at least 100 megabits per second download and 20 megabits upload for all Missouri citizens by 2028, and I know there are similar goals elsewhere. Can you talk a little bit about how and why the states are adopting these broadband speeds that significantly outpace the Federal programs right now? And I was glad to offer the amendment in the farm bill that says now that USDA programs have to have at least 25 Mbps download and 3 Mbps upload speed, but that is still a far difference than Missouri's goals. Can you talk on that just a second?

Mr. HURST. Yes. We appreciate your help on the amendment, because before it was 10 Mbps to 1 Mbps, which is totally inadequate. Congresswoman Axne mentioned how much broadband it takes to watch Netflix, but the point is, in a rural home, you may have someone watching Netflix at the same time two or three children are trying to get on the Internet to do their homework, at the same

time that perhaps we are uploading the data that we generated that day on our combines. We need the faster service because we are finding more and more ways to use broadband.

I think Missouri's goal is ambitious, but it is necessary.

Mrs. HARTZLER. Thank you. Thank you, Mr. Chairman.

The CHAIRMAN. Thank you very much, and now we will hear from the very distinguished gentlelady from Virginia, Ms. Spanberger.

Ms. SPANBERGER. Thank you very much, Mr. Chairman, and thank you so much for being here today and for sharing your stories about how important broadband is to rural communities.

Coming from a district like mine in central Virginia where many of my constituents don't have access to broadband, your stories of the challenges your communities have had to overcome to get broadband and how it often took longer than you would have liked really do resonate with me, and they reflect the stories I have heard from my constituents.

One of my constituents, Roy, from Orange County, wrote to tell me that when he moved into his house 16 years ago, various Internet providers told him that he would have broadband very soon. You probably know where this story goes. It hasn't happened yet. He has a farm business, and the lack of high-speed Internet significantly impacts his outreach and his sales. And he has also seen the effect of the lack of broadband has had on the local high school students as they try to do their homework.

Another constituent, Crystal, from Henrico County in our district, works in healthcare, and many of her rural patients don't have easy access to the Internet, and she isn't able to give them the same follow up healthcare information online that she would like to and that she is able to with other patients.

As communities in our districts are looking to expand our access to broadband, I appreciate the opportunity to learn from your experiences. And I was particularly struck by some of the comments that you made, Councilwoman Watahomigie-Corliss and Dr. Hess, related to the ability to use broadband Internet as it relates to telemedicine, and recognizing the challenges that you all have seen in your different communities, the challenge of having insignificant speed for applications such as telemedicine, and sir, you recounted the story of your Taco Bell experience when trying to deal directly to a patient.

Knowing what you know now and what you have seen, I am wondering where you think other constituencies might be able to be a part of this conversation, be it medical professionals, be it veterans, as my colleague mentioned. Frequently, those of us who represent rural communities and those who live in rural communities are talking about this issue, but I also represent suburban communities where this issue isn't seen as prevalent. And so, I am wondering how, beyond this Committee room, we can continue to have this conversation so that people across the country understand the impact this has on our country.

And I will start with you both if you have any comments.

Ms. WATAHOMIGIE-CORLISS. Hi there. In regards to telemedicine services, I think public outreach and partnership are important. I don't know how many times I have come to D.C. and nobody knows

who the Havasupai even are. And in that regard, how are they supposed to know that I am from the most rural Native American Tribe in the lower 48 states?

Now, the ruralness of my community, as I mentioned, will not create return of investment for people to build the infrastructure, and that is the way it has been all the way up until this point. We have been able to partner with a nonprofit organization, MuralNet, whose mission was to bring broadband speeds and connect the homework gap in Native America, and we just happened to be their first partnership, and we were able to get an approved STA license through the FCC, only one of six since 1995.

Times have changed. The equipment, the cost of it is not as much as it used to be, and it costs us $35,000 in total for our first deployment.

Ms. SPANBERGER. And when we are looking at how we can help communities like yours, like the ones that I serve, do you have any suggestions—to other witnesses as well—about how we can bring additional voices to this conversation so it is not just the people who are always impacted who are kind of ringing the bell of how important this is from a healthcare perspective, from an educational perspective, or from an economic perspective? How we can really get additional advocates to recognize the value of ensuring that all of our communities are connected, and so it is not wholly dependent on people like the Councilwoman or people like Ms. Mollgaard to bring it to their communities and to do that outreach?

Ms. WATAHOMIGIE-CORLISS. I do have a short statement that combining government initiatives to help bridge the rural digital divide, so that we can work together in partnership to help build those networks.

Ms. SPANBERGER. Would anyone else—Dr. Hess?

Dr. HESS. Yes, it is a very good question, and a very hard question. I am trying to think how to answer you.

Charlottesville, where you are close to—I don't know if it is in that district—University of Virginia has a great telemedicine program, and we work with them. We work with them very, very closely.

I will tell a story. We once had a hospital that was reluctant to start telestroke. Some of the physicians didn't believe in it, and so I went and gave a talk in a Methodist church one Sunday night, and they asked me—I was talking about stroke. And they said, "Well, what about this drug TPA, Dr. Hess? If we go to the local hospital, can we get it?" And I said no, and I told them how they could, and they literally marched on the hospital. You get hospitals, you get churches, you get communities to realize what they are missing.

Now, the Internet connectivity is better to hospitals, but there is still—you have to get the public behind you.

In Georgia, we worked out of churches which were a strong voice, and working with the university—that is the world I know. Working with the universities, we have a lot of support groups, that is how we kind of have done it, working with other community health centers, federally-qualified health centers. Of course, I am biased to the telehealth point. You bring all those constituencies together, and I think that helps.

But it is a very good question, and I am not sure I answered it very well.

Ms. SPANBERGER. No, I appreciate that. I have a list of constituencies you mentioned, so I appreciate that input and I believe I am out of time, so I will yield back. Thank you. Thank you.

The CHAIRMAN. Thank you, and now we will hear from Mr. Van Drew, the gentleman from New Jersey.

Mr. VAN DREW. Thank you, Mr. Chairman. I want to thank you all for being here and sharing your experiences, your knowledge, and your insight for everyone that is here.

The testimony we have heard today is important, and it is important, believe it or not, in New Jersey. And I know everybody thinks what is this guy doing on the Agriculture Committee? What is he doing involved with agricultural issues? He is from New Jersey, the most densely populated state in the United States of America. But actually, I have the most rural part of the state, and my district makes up, geographically, 40 percent of the state, so I have almost ½ of the state. And we have some of these same issues.

I remember when I became, years ago, a new state senator, learning about those issues and being so surprised, surprised that people were really concerned and worried that the emergency services that they wanted to get or needed were not foolproof by any means, and sometimes it didn't work. Concerned that their kids were really having a difficult time doing their homework. Concerned that their businesses weren't doing as well as they nearly could, especially in the way business works today, because they weren't able to access the Internet properly. Concerned for their safety. Concerned for their economic security. Concerned for their farming, because again, farming has, as you all elaborated so well, farming has changed so much over the years and is going to change a lot more. And our world is going to change more. We are going to be short of doctors in the areas that you are speaking about, but we are going to be short of physicians almost everywhere. Maybe not in midtown Manhattan, but let me tell you, in major swaths of the country, we are going to have a physician shortage and a healthcare shortage that is very serious. Imagine how it is going to be in areas like this. I am from south Jersey, and my area of south Jersey, people who need care, even for developmentally disabled kids or need a host of other things aren't able to access them. It isn't only in the Midwest or in certain areas. It can be anywhere.

We have the lowest per capita income, the highest rate of obesity, the highest rate of teenage pregnancy. I can go through the list. And yet, just a few miles away will be some of the most beautiful homes on the shores and the beaches. It is a real dichotomy.

The work that you are doing is important, because you can't give people success—you can't—but you can give them opportunity to achieve success, and that is what you are all about, and that is what this is about. You can't expect people to do as well as they should when we have this kind of digital divide. And we still have it, even in places like south Jersey, as unbelievable as that is.

Along those lines of success, I just thought—anybody can answer it. Broadband obviously makes the economy better. Any particular ways that you believe it levels the playing field? And I think you know the answer between urban and rural and the job market.

Mr. HENGEL. Absolutely. Thank you, Congressman, for the comment.

Being in economic development for 30 years, I have seen great changes, and certainly, broadband has been the central focus of why those changes have occurred over the last 5 years. The increasingly economic development is about a race for talent, and I can't stress enough the importance of being able to provide a community that people want to live, and to want to be a part of. And that is—certainly broadband is a central part of that. That is simply going to be a must-have. People are not going to live, particularly young people, in communities where they cannot stay connected. And so, that is so important.

Also, I would add is there simply aren't any low-tech jobs anymore. There just aren't. There are no low-tech industries. In my neighborhood or my area of the state, logging, wood products manufacturing, sawmilling, all those are significant data users. I think it is critical that without the broadband, you simply are not going to be able to keep up with the global economy.

Mr. VAN DREW. And I think you are right, and the world has changed. Whether we like it, whether we don't like it, it is the reality, and those of us in government have a responsibility to make sure that everybody does have that opportunity.

And just alluding to what the Congresswoman was saying before, a lot of people don't know that. It is amazing. Even in my district, from the western part of the district, which is generally less affluent and doesn't have some of the access to the eastern part of my district where people do and are quite wealthy, they have no idea. If I was to tell them that, they would say, "No, not in New Jersey. That can't be." I think we have our work cut out for us, and it really is an important subject for the entire nation.

Thank you.

The CHAIRMAN. Well thank you, Mr. Van Drew, for your excellent remarks. I agree with you wholeheartedly.

Before we end, I would like to recognize our Ranking Member for any additional comments, closing, or questions you may have.

Mr. AUSTIN SCOTT of Georgia. Thank you, Mr. Chairman.

I want to comment on Mr. Hurst's answer to Mrs. Hartzler's question. The industry has the ability to provide shape file mapping today to the FCC, and if the FCC would begin to use that and they could use it virtually immediately. It would not take long at all to implement that. Then we would have those more accurate maps that you and Mrs. Hartzler were discussing.

Ma'am, I appreciate your testimony about the different capabilities and technologies that are out there. As someone who lives 15 miles north of—I would call it a city. Most people would call it a town. I recognize the technology that is going to work at my house might not be the same technology that is deployed in the city. I don't care what technology it is, as long as it works, and it seems that that is your approach, and I appreciate that very much. If there is anything that this Committee can do to help you with any licensure that you may need help with, I think that the Committee would be more than willing to help provide that support to the people that you represent in your Tribe.

Doctor, I appreciate you being here, and appreciate the others who testified as well. It seems to me that what we have, maybe it is the old question of the chicken and the egg. Do we build the biggest, fastest interstate we can, how do we get it there, I guess is my question, Mr. Chairman, and I am—I don't care what the technology is. I am not biased to any of them, but I do know this. We can do a better job, and we have to do a better job, because we are losing our population in rural America.

I represent 24 counties right now. I expect after the next Census, I will probably represent 26 or 27, and Congressman Bishop, just to my west, currently represents 28, and he will probably represent 31 or 32. And you guys in the Metro area are picking them up.

The CHAIRMAN. I represent seven right now, I used to represent 13.

Mr. AUSTIN SCOTT of Georgia. Yes, but there has been a huge population shift from the urban areas, the metropolitan areas, and this is one of—it is education, it is healthcare. But in the end, a lot of it revolves around technology and access to that, and we can play a big part in fixing that.

Thank you so much for the hearing. To those who were here to testify, thank you for your testimony. It was extremely important, and this is something that we can and will be working together to help resolve.

The CHAIRMAN. Thank you so much, Ranking Member. You touched on a number of very important parts. And to answer part of your question, going forward, we need to understand that the bottom line right now about this, it takes money. It takes money. It takes priority of funding. And so, with that in mind, I would like to make a suggestion. I would start with you, Mr. Hurst, with the American Farm Bureau. You all are well-placed. No national organization is more well-placed to get into this bargaining situation with rebuilding our infrastructure. Right now, we need our rural communities to have a seat at the table as we look at the budget, as we look at where this money needs to go.

I would like for you to give Zippy, my good friend Zippy Duvall—we worked together on many things—and of course, he comes right out of Georgia, so go back to my days in the Georgia State Senate. But here is what I am suggesting. There is some definitive, well-respected source that needs to submit to this Congress the kind of funding that our rural communities that we need to devote to accomplish everything that we have said here. And I hope that you all know that from the passion you heard from our Committee Members, that we in this Subcommittee on Commodity Exchanges, Energy, and Credit, we are this financial arm of the agriculture industry, and our whole approach—there is nobody better to be the champions for getting proper broadband and Internet access to our rural communities. But you and your organization is probably the premier organization that is well-placed to say to us, "This is how much money it is going to take for us to be a part."

Right now, the figure that keeps bouncing around—sometimes it is hard to get this one in the room, that one in the room at the same time. But we are going to get there. We have no choice but to move ahead. Our infrastructure is crumbling, we have to send this clarion callout that crumbling is not just taking place with

bricks, with mortar, with just roads, highways, trains, all of that. This crumbling has been taking place in our rural communities, and we have to lift up our rural communities and give them a premier prime seat at the table as we divide and determine the amount of money that we need.

And as I said right now, it is fluctuating between $2 and $2½ trillion. My estimate is when you look at what needs to be done in the rural communities for broadband, it is life-saving. I mean, it is more than just crumbling roads. Infrastructure is human beings. They are us. They are people. Not just roads, not just airports. We got to get that through. It is education. It is job training. It is healthcare. It is lifting up and making people not just want to live in rural areas, but will desire to live there. And we have to give that attention to it.

I would like for you to understand that that is why we had this. Austin Scott and I met early last year when we knew at the beginning of the year that we would be in charge of this. This is a strong, bipartisan, Democratic and Republican Committee. That is what it takes to get the job done. We are uniquely placed to do it, but we need you all to tell us as soon as possible how much money it is going to take. How it should be applied to make sure that our rural communities are the sparkling oases of life, of excitement, of productivity that they have been as the source of the foundation of our country. Our country wasn't founded on big cities. They were founded with people in small towns, and towns that grew into cities. But it is the rural communities that need to have our energy and our direction. And so, I want to make sure that you all take down this assignment, our Subcommittee here, and Ranking Member Scott and myself and our Members will be your champions to get this done. But the next step is we have to get the money appropriated to do it, and we need you all to let us know how much it is going to take so we can start selling it up here. All right?

Again, thank you all, and there is some homework I need to read here. Let me put my glasses on. Under the Rules of the Committee, the record of today's hearing will remain open for 10 calendar days to receive additional material and supplementary written responses from the witnesses to any questions posed by a Member.

This hearing of the Subcommittee on Commodity Exchanges, Energy, and Credit is adjourned.

[Whereupon, at 11:56 a.m., the Subcommittee was adjourned.]

[Material submitted for inclusion in the record follows:]

LETTER SUBMITTED BY HON. ANN KIRKPATRICK, A REPRESENTATIVE IN CONGRESS FROM ARIZONA; ON BEHALF OF JAMES D. OGSBURY, EXECUTIVE DIRECTOR, WESTERN GOVERNORS' ASSOCIATION

July 9, 2019

Hon. DAVID SCOTT,
*Chairman,*
Subcommittee on Commodity Exchanges, Energy, and Credit,
Committee on Agriculture,
U.S. House of Representatives,
Washington, D.C.;

Hon. AUSTIN SCOTT,
*Ranking Minority Member,*
Subcommittee on Commodity Exchanges, Energy, and Credit,
Committee on Agriculture,
U.S. House of Representatives,
Washington, D.C.

Dear Chairman David Scott and Ranking Member Austin Scott:

In advance of the Subcommittee's July 11 hearing on "Building Opportunity in Rural America through Affordable, Reliable and High-Speed Broadband," attached please find three Western Governors' Association (WGA) policy resolutions addressing broadband deployment:

- WGA Policy Resolution *2019–04* (*http://www.westgov.org/images/editor/WGA_PR_2019-04_Health_Care_in_Western_States.pdf*), Health Care in Western States;
- WGA Policy Resolution *2018–13* (*http://westgov.org/images/editor/WGA_PR_2018-13_Workforce_Development.pdf*), Workforce Development in the Western United States; and
- WGA Policy Resolution *2017–09* (*https://westgov.org/images/editor/2017-09_Western_Agriculture.pdf*), Western Agriculture.

I request that these documents be included in the permanent record of the hearing, as they articulate Western Governors' policy positions on this important issue.

Please contact me if you have any questions or require further information. In the meantime, with warm regards and best wishes, I am

Respectfully,

JAMES D. OGSBURY,
*Executive Director.*

ATTACHMENT 1

***Policy Resolution 2019–04***

**Health Care in Western States**

*A. Background*

1. Ensuring access to high-quality, affordable health care services is an important element of maintaining and enhancing the quality of life in western states for our growing populations. It is the basis for healthy communities and healthy economies.
2. Western states face unique challenges in health care, including growing rates of substance use disorder, provider shortages in underserved and rural areas, and limited access to broadband. Low population densities and the vast distances between population centers also make it difficult for providers to establish economically-sustainable health care systems in rural areas.
3. Distance and density also inhibit construction of the technology infrastructure that would provide or improve broadband connectivity in underserved and rural areas. Expanding broadband access provides numerous quality-of-life benefits for rural Americans, including economic development, social connectivity, education, public safety, and access to telehealth and telemedicine.
4. The health care sector faces severe personnel shortages in western states, despite efforts of Western Governors, such as the foundation of Western Governors University and other medical training programs in western states, to ensure adequate numbers of qualified medical personnel. This challenge is

particularly acute in the West's underserved and rural areas. Ensuring access to health care services requires an adequate number and distribution of physicians, nurses and other trained health care professionals. Population growth, aging residents, and challenges involving Tribal health care and services for veterans require a renewed focus on developing our nation's health care workforce.

5. Western states struggle with access to behavioral health services and higher-than average suicide rates. The ten states with the highest suicide rates in the nation are all located in the West.
6. Substance use disorder (SUD), including alcohol and drug misuse, is a major public health and safety crisis affecting nearly 21 million Americans. It is particularly prevalent in western states where individuals are more likely to have SUD during their lifetime. SUD crosses all social and economic lines and tragically takes the lives of tens of thousands of Americans every year. While state and Federal progress has been made to fight this epidemic, additional efforts are necessary to help bridge prevention and treatment gaps in western states.
7. In many cases, health disparities and barriers to accessing health care are particularly acute for certain populations in the West. A better understanding of the role that social determinants play in health outcomes can inform the development of effective health policy to increase access for these populations.
8. Western states have a unique body of experience, knowledge and perspective with respect to health care. The Western Governors' Association (WGA) is ideally situated to collect and disseminate information, including best practices, case studies and policy options, that states can use to improve the foundation for health care services and advocate for shared policy priorities on behalf of their citizens.

*B. Governors' Policy Statement*

1. Federal efforts to address health care workforce and access needs should reflect early, meaningful and substantive input from Governors, who are best positioned to assess the needs of their states and help develop solutions to meet these needs. State-Federal collaboration and coordination are integral to addressing these health care challenges. Wherever possible, and where appropriate, the Federal Government should respect state authority and maximize flexibility granted to states and Governors.
2. The Federal Government should work with states to facilitate the deployment of broadband to underserved and rural areas, recognizing that adequate broadband access has a direct correlation on rural populations' ability to access telehealth and telemedicine.
3. Despite efforts by Western Governors to address the shortage of qualified health care workers, significant challenges remain. Governors urge the Federal Government to examine and implement programs to ensure states have an adequate health care workforce—including in primary care and other in-demand specialties—that is prepared to serve diverse populations in urban, suburban, and rural communities. Governors also support efforts to increase the diversity of the health care workforce to improve health outcomes for all.
4. Western Governors support efforts to improve the quality and quantity of behavioral health services available to our residents, as these services are essential to reducing suicide rates and treating a range of behavioral health conditions, including substance use disorder.
5. The Federal Government should work toward treating addiction as a chronic illness and work with Western Governors to develop strategies for addressing substance use disorder that work in concert with state efforts and recognize regional variations in substance use disorder patterns.

*C. Governors' Management Directive*

1. The Governors direct WGA staff to work with Congressional committees of jurisdiction, the Executive Branch, and other entities, where appropriate, to achieve the objectives of this resolution.
2. Furthermore, the Governors direct WGA staff to consult with the Staff Advisory Council regarding its efforts to realize the objectives of this resolution and to keep the Governors apprised of its progress in this regard.

*Western Governors enact new policy resolutions and amend existing resolutions on a bi-annual basis. Please consult* ***westgov.org/resolutions*** *for the most current copy of a resolution and a list of all current WGA policy resolutions.*

ATTACHMENT 2

***Policy Resolution 2018–13***

**Workforce Development in the Western United States**

*A. Background*

1. Workforce development efforts contribute to the economic well-being of western states by enabling people to find fulfilling, well-paying jobs, fostering economic mobility, and ensuring that businesses have access to the skilled employees they need to thrive.
2. Western states had an average unemployment rate of just under 4.0 percent in March 2018.[1] Many businesses report that they cannot find qualified candidates for open positions. At the same time, many jobseekers are unable to find good jobs for which they are qualified.
3. Workforce development challenges are particularly acute in rural communities, which are commonly characterized by higher rates of unemployment, a lack of economic diversity, geographic isolation, and limited infrastructure, including access to broadband.
4. Economic equity continues to be a problem across states, with people of color and people with disabilities, regardless of career preparation and credential levels, seeing poorer rates of employment and earnings than majority populations.
5. There are 6.6 million unfilled jobs in the United States due in part to a shortage of workers with the skills and qualifications to fill those positions.[2] The largest gap is in middle skills jobs, which require more than a high school diploma but less than a 4 year degree.
6. Postsecondary education and training is critical in today's economy. Almost 80 percent of jobs in the United States require a postsecondary credential, including certificates, associate degrees, 4 year degrees, and licenses.[3]
7. On average, those holding a bachelor's degree earn more than those who have not attained that degree, but those who do not reach that level of education can still find good employment. There are 30 million jobs that don't require a 4 year degree and pay at least $35,000 per year with a median salary of $55,000.[4]
8. Education systems have not kept pace with economic realities. Student success is traditionally perceived, and measured, as moving directly from high school to a 4 year degree program. Today, only 20 percent of students successfully complete that traditional pathway to their career.[5] The rest are finding their own pathways to success, which may include entering the world of work or pursuing other types of credentials. Many, however, encounter obstacles.
9. On average, only about ⅓ of high schoolers are engaged in school, meaning that ⅔ are not actively involved in or enthusiastic about school.[6] Three million young adults ages 16–24 are not participating in either work or education.[7]
10. Additionally, many Americans start a college degree but do not complete it, leaving them with the burdensome costs of higher education but no wage benefit—35 million people over 25 have some college credits but no degree.[8]
11. As students increasingly pursue indirect routes to higher education, over 70 percent of students enrolled in postsecondary education are now "nontraditional students" who may be older, working full or part time, or caring for children.

---

[1] Bureau of Labor Statistics, *Local Area Unemployment Statistics,* May 18, 2018.

[2] Bureau of Labor Statistics, *Job Openings and Labor Turnover Summary,* May 8, 2018.

[3] National Skills Coalition, *United States Middle-Skill Fact Sheet* (*https://www.nationalskillscoalition.org/state-policy/fact-sheets*), February 2017

[4] Carnevale, A.P., Strohl, J., and Ridley, N., *Good Jobs that Pay Without a BA: A State-by-State Analysis* (*https://goodjobsdata.org/wp-content/uploads/Good-Jobs-States.pdf*). Georgetown University Center of Education and the Workforce, 2017.

[5] U.S. Department of Education, National Center for Education Statistics, *The Condition of Education 2017* (*https://nces.ed.gov/programs/coe/indicator_ctr.asp*), May 2018.

[6] *2016 Gallup Student Poll Snapshot Report* (*https://news.gallup.com/reports/210995/6.aspx*).

[7] Brookings, *Employment and disconnection among teens and young adults: The role of place, race, and education* (*https://www.brookings.edu/research/employment-and-disconnection-among-teens-and-young-adults-the-role-of-place-race-and-education/*), May 2016.

[8] U.S. Census Bureau, *Educational Attainment in the United States: 2017,* December 14, 2017.

12. Technology will continue to be a disruptive force in the labor market, driving potentially drastic changes in the labor demands of certain industries. It is expected that many jobs that will be in demand in 2030 do not yet exist. Workers will need to be able to acquire new skills over their careers to adapt to change. Up to ⅓ of U.S. workers in 2030 may need to learn new skills or move into a new occupation due to the impacts of automation.[9]
13. To address these issues, Western Governors have prioritized a variety of workforce development efforts, from better aligning education with labor market demands to expanding workforce services and training opportunities for the unemployed and underemployed to attracting more skilled workers.
14. Western states are also leading the way on expanding work-based learning opportunities for both students and adults. Work-based learning programs, including registered apprenticeships, allow people to acquire in-demand skills while earning a salary.
15. Employer leadership is critical to ensure that workforce development efforts are satisfying the needs of an ever-changing economy. Businesses in the West have taken an active role in working with educational institutions and workforce agencies but increasing industry participation will remain critical.

*B. Governors' Policy Statement*

1. Western Governors recognize that there are many pathways students can take to a successful career, including short-term education and skills training or work-based learning programs such as registered apprenticeships. Students and jobseekers should have access to understand their options and the potential outcomes of these programs.
2. Facilitating lifelong learning is essential to prepare for the impacts of technology on the labor market. Western Governors encourage Congress to increase student access to short-term education and skills training programs in reauthorization of the Higher Education Act, including through expanding the Pell Grant program to include high-quality short-term training programs leading to industry-recognized credentials. These flexible work-force oriented funds should be coupled with plans to adopt and report outcomes metrics tied to employment and earnings to maximize the success of this policy in equipping workers for high-opportunity jobs and careers.
3. Western Governors also support the expansion of work-based learning programs, including registered apprenticeships. Western Governors encourage Congress and Federal agencies to support and incentivize state-, local-, and industry-led partnerships to create and scale work-based learning and apprenticeship programs. New Federal investments in apprenticeships should align with existing efforts to foster a coherent system with minimal duplication at the Federal, state, and local level.
4. Career and technical education (CTE) helps expose students to their career options and develop skills they will need in the workforce. Western Governors call on Congress to reauthorize and fully fund the Carl D. Perkins Career and Technical Education Act. Reauthorization of the act should take into consideration the following principles:
   - Governors and states are in the best position to determine how to use Federal CTE funding to meet the unique needs of their economies.
   - High-quality CTE programs should lead to in-demand, high wage careers; include career and academic advising; include pathways to 4 year degrees, for example through articulation agreements or stackable credentials; and develop employability skills through integrated education and training, work-based learning or leadership opportunities.
5. Western Governors note that Federal funding for workforce development through the Workforce Innovation and Opportunity Act supports economic growth and job creation in the states. Western Governors request that the 15 percent reserve for statewide activities be maintained. This funding allows Governors to be flexible in addressing state needs and supports innovation.

---

[9] McKinsey Global Institute, *Jobs Lost, Jobs Gained: Workforce Transitions in a Time of Automation* (*https://www.mckinsey.com/~/media/McKinsey/Global%20Themes/Future%20of%20Organizations/What%20the%20future%20of%20work%20will%20mean%20for%20jobs%20skills%20and%20wages/MGI-Jobs-Lost-Jobs-Gained-Report-December-6-2017.ashx*), December 2017.

6. Western Governors encourage the Federal agencies, including the U.S. Department of Labor and U.S. Department of Education, to coordinate their efforts to better align Federal workforce development, career and technical education, and higher education programs.
7. Western Governors recognize the benefits of measuring and reporting outcomes by institution and program. Reporting completion rates, employment and earnings will provide useful information for students and their families and help promote the success of these programs to prepare students for in-demand jobs and careers in their regions. Western Governors encourage Congress to include the College Transparency Act in reauthorization of the Higher Education Act, to adopt and report on earnings, employment, and credential attainment metrics by education provider and individual program in a manner that protects student privacy and ensures data security.
8. Employers play an important role in state workforce development efforts. Western Governors support efforts to incentivize employers to play a more active role in talent development, through partnership with state workforce development agencies and educational institutions or investments in the skills and training of their employees.
9. Rural communities are at risk of falling further behind in skills necessary for the economy of the future due to a lack of broadband access. Western Governors encourage Federal agencies and Congress to continue to deploy resources to solve this urgent need.
10. Professional licensing requirements vary by state and can create a barrier to mobility for professionals in western states. Where possible, Western Governors should work together to minimize this barrier.

*C. Governors' Management Directive*

1. The Governors direct WGA staff to work with Congressional committees of jurisdiction, the Executive Branch, and other entities, where appropriate, to achieve the objectives of this resolution.
2. Furthermore, the Governors direct WGA staff to consult with the Staff Advisory Council regarding its efforts to realize the objectives of this resolution and to keep the Governors apprised of its progress in this regard.

*Western Governors enact new policy resolutions and amend existing resolutions on a bi-annual basis. Please consult* ***www.westgov.org/resolutions*** *for the most current copy of a resolution and a list of all current WGA policy resolutions.*

ATTACHMENT 3

***Policy Resolution 2017–09***

**Western Agriculture**

*A. Background*

1. Agriculture and forestry in the western states and territories are significantly different than in other regions of the country. We have greater variations in soil, climate, terrain, commodities and production practices, and water availability.
2. Farms, forests, and rangelands are important contributors to the economies and quality of life of western states. Among other important values, western agricultural and forest lands are primary sources of open space, wildlife habitat, water supplies, and diverse rural economic opportunities in the recreation, food, fiber, energy and biobased product industries.
3. Trade promotion plays an important role in ensuring that western agricultural products and food have an opportunity to compete with products produced and subsidized internationally.
4. Western states have seen some of the most significant increases in per-capita veteran populations since 2000, including surges in returning veterans under the age of 25. It is estimated that nearly 25 percent of all veterans live in rural areas. These veterans have slightly lower rates of employment compared to veterans living in urban areas and to their non-veteran rural colleagues.
5. Responsible management of Federal lands is a significant concern for Western Governors. Western states include more than 75 percent of our National Forest and rangeland ecosystems. These public lands serve as critical economic

drivers, and they provide numerous conservation benefits, water supply, and recreational opportunities for Western communities and the nation.

6. The West's network of land-grant universities and colleges, including Cooperative Extension Service programs, continue to provide national leadership in research to develop more resilient seeds and crops, manage soil health, advance technology deployment in the biobased economy and conduct on-farm research experiments that help farmers and ranchers be more effective and efficient.
7. Western Governors recognize that nutrition assistance programs can meet the needs of children and the most vulnerable, while creating economic opportunity across the agriculture supply-chain from the store where food is purchased, all the way back to the farm. Western Governors acknowledge recent efforts to reduce rates of nutrition program fraud and abuse, deliver programs under budget, and improve program effectiveness.
8. Many agricultural producers in the West rely on irrigation water delivery systems that are shared among multiple producers and operated by an irrigation district, canal company, or mutual ditch company.

*B. Governors' Policy Statement*

1. Western Governors support funding for the U.S. Department of Agriculture (USDA) Market Access and Foreign Market Development Programs to promote opportunities for western producers to increase export revenues and encourage trade agreements that maximize benefits for the West's farmers, ranchers and forest landowners.
2. Western Governors support adequate funding for the USDA Specialty Crop Block Grant Program (SCBGP) that provides critical research, education, and promotion tools to the fruit and vegetable producers.
3. Western States have experienced sharp declines in farm income and farm prices since 2013. Western Governors support a farm safety net that recognizes past deficit reduction contributions of the agricultural sector and maintains funding for other key commodity, conservation, crop insurance, research, energy, and export promotion programs. In particular, Western Governors note that the conservation title of the 2014 Farm Bill contributed to deficit reduction, saving taxpayers $6 billion by consolidating 23 programs into 13, streamlining and targeting delivery to farmers, ranchers, and foresters. Western Governors support farm bill funding levels based on need rather than baseline budget targets.
4. Western Governors encourage the expansion of programs that can meet the unique educational, training, technical and financial needs of new, beginning and veteran farmers and ranchers and other USDA programming that can help returning veterans develop and expand business opportunities in rural communities.
5. Western Governors continue to support collaborative, targeted and voluntary conservation to address locally identified natural resource issues for farm, range, and forest resource concerns on private and public lands, such as soil health, air and water quality, drought and wildfire resilience, wildlife habitat conservation and invasive species. Western Governors support the role of conservation title programs in providing voluntary solutions to threatened and endangered species, water quality impairments, groundwater recharge, and other regulatory concerns potentially facing producers.
6. Western Governors support an increase in the role that state and local governments have in managing public lands for multiple uses, including agriculture.
7. Western Governors continue to urge Congress to provide a comprehensive solution for the current approach to budgeting for wildland fire for the Departments of [the] Interior and Agriculture. Any fire budget solution must address the chronic problem of the rising costs of wildfire and the complicating problem of mid-season budget transfers when appropriated funding becomes insufficient. A comprehensive fix is needed to address capacity constraints and allow for a predictable program of work for agencies to fulfill their management responsibilities.
8. Western Governors acknowledge significant progress toward achieving forest restoration goals by using authorities granted in the 2014 Farm Bill. Western Governors support permanent authorization of the Insect and Disease designation provisions of section 602 of the 2014 Farm Bill and the elimination of project constraints from section 603 for condition class or fire regimes out-

side of the Wildland Urban Interface (WUI). Western Governors also support creating additional flexibility to Good Neighbor Authority to address conflicting language on road construction and reconstruction and the uses of program income. The lack of flexibility restricts opportunities for states to partner in shared stewardship work across boundaries.

9. Within the context of comprehensive wildland fire budget reform, existing law and forest plans, Western Governors support the use of new tools to streamline environmental analysis to increase the pace and scale of restoration activities. Specifically, Western Governors support creation of a new pilot program to prioritize landscape-scale environmental analysis for restoration projects envisioned over geographies greater than 100,000 acres. This pilot program should allow for predictable project-scale implementation and adaptive management. Western Governors believe Federal agencies should develop guidance to build consistency in environmental analysis and bring agency practice in conducting environmental assessments (EAs) more in line with the administrative policy intent of streamlined, summary documents. Western Governors affirm that Congress should resolve outstanding issues with potential requirements to reinitiate endangered species consultations following the adoption, amendment or revision of an appropriate management plan.
10. Western Governors support Congress establishing a restoration categorical exclusion (CE) based on a record of analysis from the past 5 years of projects where agency analysis and a decision recognized a finding of no significant environmental impact. Western Governors support allowing Federal agencies to analyze only the action and no-action alternatives when a project is collaboratively developed, unless a third alternative is proposed during scoping and meets the purpose and need of the project. Western Governors also support rewarding successful implementation of collaborative projects through funding, retained-receipt authority, or other capacity to pursue subsequent projects.
11. Western Governors support efforts to expand research funding to address drought, a changing climate and extreme weather risks facing western producers.
12. Western Governors encourage the effective use of extension and other partnerships to deliver practical tools, technologies and information to farmers, ranchers and forest landowners.
13. Nutrition assistance programs should continue to allow flexibility for states to respond to unique economic conditions, serve all eligible participants without drastically reducing benefits, and encourage continued pursuit of transparency and accountability in program administration.
14. Western Governors support changes to conservation title programs that remove existing contracting barriers for western producers, and make the farm bill's conservation title programs more accessible and relevant to western producers and their associations.
15. Western Governors support coordinated state and Federal action to expand markets for wood products that can achieve forest and rangeland restoration objectives and foster rural employment and income opportunities. Western Governors support coordinated financing and grant support from USDA Rural Development programs and the USDA Forest Service to advance wood product business development, infrastructure, and demonstration products in the areas of mass timber construction and biomass energy.
16. Western Governors support the USDA, Animal and Plant Health Inspection Service (APHIS) and Agricultur[al] Research Service (ARS). APHIS works in partnership with state departments of agriculture to monitor, prevent and control infestations of invasive pests and diseases and curtail or minimize wildlife conflicts, which can cause widespread environmental and economic damage and safety hazards. APHIS works in cooperation with other Federal agencies, states, territories, counties and private entities to implement management programs. ARS conducts research to develop and transfer solutions to agricultural problems of high national priority, and shares information to ensure high quality, safe food and other agricultural products. ARS research helps sustain a competitive economy; enhance the natural resource base and the environment; provide economic opportunities for rural communities and society as a whole, and; provide the necessary infrastructure to create and maintain a diverse workplace.
17. Western Governors support the continued efforts of the Rural Utilities Service to provide financial assistance for drinking water, wastewater facilities

and broadband connectivity in rural and remote areas, particularly in communities that have minimal or no such infrastructure. Expanding broadband access to rural America will allow citizens to compete in a global market and have access to IT health care, education and public safety resources.

18. Western Governors support the recommendations identified over the course of the WGA National Forest and Rangeland Management Initiative, and incorporate those recommendations related to the reauthorization of the Agricultural Act into this resolution by reference.

*C. Governors' Management Directive*

1. The Governors direct WGA staff to work with Congressional committees of jurisdiction, the Executive Branch, and other entities, where appropriate, to achieve the objectives of this resolution.
2. Furthermore, the Governors direct WGA staff to consult with the Staff Advisory Council regarding its efforts to realize the objectives of this resolution and to keep the Governors apprised of its progress in this regard.

*Western Governors enact new policy resolutions and amend existing resolutions on a bi-annual basis. Please consult* ***www.westgov.org/resolutions*** *for the most current copy of a resolution and a list of all current WGA policy resolutions.*

---

SUBMITTED QUESTIONS

**Questions Submitted by Hon. Stacey E. Plaskett, a Delegate in Congress from Virgin Islands**

*Response from Neela Mollgaard, Executive Director, Red Wing Ignite*

*Question.* Ensuring reliable broadband access is clearly a crucial component of encouraging economic growth. Broadband is a critical component of our economic development and I see that you have built partnerships and initiatives with schools, government, businesses and nonprofits.

How can we build public-private partnerships to support broadband infrastructure in the Virgin Islands?

*Answer.* Public-private partnerships were essential to the creation of Red Wing Ignite. Since its inception, Red Wing Ignite forged partnerships with government, academia, corporate partners, and individuals to grow our innovative ecosystem to advance entrepreneurs, businesses and students.

The launch of Red Wing Ignite was a collaboration between the City of Red Wing, the Red Wing Port Authority, U.S. Ignite, Hiawatha Broadband Communications, community leaders and funders. It took perseverance from local champions to make the idea a reality. Broadband infrastructure is essential, but so is an organization like Ignite—bringing opportunity, access and exposure to the skills required in the 21st Century economy.

In 2012, Red Wing was one of 25 cities to join U.S. Ignite's their national network. U.S. Ignite was initially funded by the White House Office of Science and Technology Policy and the National Science Foundation. They provided leadership and guidance on best practices to foster a culture to create new innovative technologies.

In 2015, we were designated as a Blandin Broadband Community by the Blandin Foundation. The Blandin Foundation introduced us to the Intelligent Community Forum model (see image). Both of these organizations emphasized the importance of partnerships across sectors, and we saw this to be true on the frontlines of our work locally.

It has been years of learning, setbacks, pivots and many wins to get where we are today. This format is challenging to provide an in-depth response to this involved question. I would encourage your local champions and constituents to reach out directly to learn more.

*Response from C. Blake Hurst, President, Missouri Farm Bureau Federation; Board Member, American Farm Bureau Federation*

*Question 1.* In the Virgin Islands, so many people still lack basic and reliable access to the Internet and our businesses cannot compete globally and we are unable to attract larger businesses to the Territory without increase broadband.

What assistance were you able to offer for Missouri residents that assisted your farmers in rural development?

*Answer.* A working group was created that consisted of the Director of the Missouri Department of Agriculture, the Director of Extension at the University of Missouri, the Deputy Director of the Missouri Department of Economic Development (DED) and Missouri Farm Bureau. The group met on a regular basis and planned a rural broadband conference open to representatives of providers, rural organizations, the public sector and academia. The conference created the momentum to seek a broadband coordinator position within DED and legislation to start a broadband grant program. A coordinator was hired, legislation was approved to create the broadband grant program and a $5 million appropriation was received this fiscal year. A second statewide broadband conference was held this summer and we expect regulations for the grant program to be released soon.

Missouri's progress can be traced back to a few very dedicated individuals who believe broadband is critical in both urban and rural areas. Support from local and statewide elected officials has also been instrumental in our success to date. Missouri residents have benefitted from increased coordination between the public- and private-sectors, greater awareness of the need for improved access to affordable broadband and an intense focus on funding opportunities at the state and Federal level.

*Question 2.* Your testimony provided a lot of insight into the specific impacts of broadband access and precision ag technology for farmers. Fixed wireless and mobile technologies have clearly played an important role in filling the broadband needs of farmers and rural communities.

Given the lower infrastructure requirements and cost of implementing those technologies, has further improvement and broader adoption of these technologies specifically affected the ability of smaller farms to adopt precision ag technology?

*Answer.* The decision to adopt precision agricultural technology is based on its return on investment. Fa[r]mers and ranchers wear many different hats, including owning a business and keeping the business profitable. If the technology will allow the farmer to be more efficient and have a positive return on investment, then there is a strong likelihood that the farmer will invest in that technology, regardless of farm size. The only certainty is the lack of broadband prevents many farmers from even considering precision agriculture technology because there is no reason to invest in a technology that won't work in your fields.

○