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None.	
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None.	
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None.	

CLOSING THE DIGITAL DIVIDE: CONNECTING RURAL AMERICANS TO RELIABLE INTERNET SERVICE

FRIDAY, OCTOBER 4, 2019

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SMALL BUSINESS,
Washington, DC.

The Committee met, pursuant to call, at 1:17 p.m., at Columbia Greene Community College, 4400 Route 23, Hudson, New York, 12534, Hon. Antonio Delgado presiding.

Present: Representative Delgado.

Chairman DELGADO. I want to, again, thank all of you for joining us this morning, and a special thanks to Geoffrey Starks, the FCC Commissioner, and the witnesses for being here today. I want to open with an observation.

As you will notice, there is no service in this auditorium. This is unfortunately the rule and not the exception here in the Twin Counties, and all across upstate, and New York's 19th Congressional District. Small businesses, families, schools, and healthcare providers in upstate suffer daily from a lack of consistent access to high-speed broadband services. This is due in large part to lack of investment in broadband infrastructure. Broadband services should not be treated as a luxury, but as a basic utility, and essential for all communities.

Rural communities like this one have been left behind because high cost and low subscription promises little profits. But small businesses and families in rural communities deserve equal access to affordable broadband services at comparable speeds. We all realize it is more difficult and expensive to build out broadband networks in these areas, but that is no excuse. We must take swift and deliberate action to close the digital divide between our urban and rural economies. Over 26 percent of Americans in rural America lack access to high-speed broadband compared to 1.7 percent in urban areas. Unequal access to high-speed broadband reduces economic opportunity for millions of Americans and small businesses.

Small businesses in rural America are already struggling to compete with their urban counterparts and falling further behind as technology rapidly advances. Now, I hear from businessowners through my small business advisory committee and time here at home that there are small businesses, which serve as the backbone of our economy, that can't complete simple payment transactions because their internet service goes down over 100 times a day. Others say that they are paying for enterprise-level, high-speed service

to get 100 megabits per second speeds, but are only getting 1 or 2 megabits-per-second speeds.

Standard broadband service has devasting impacts on small business. In fact, small firms that are digitally connected each earn twice as much revenue per employee, experience 4 times the revenue growth year over year, and are 3 times more likely to create jobs. These limitations harm rural small businesses and the communities that they serve. A startling 58 percent of rural Americans believe that lack of access to high-speed internet is a problem in their hometowns.

Congress must work to coordinate Federal resources and make commonsense investments in targeted infrastructure projects. That is why I joined the majority with Jim Clyburn on the House Rural Broadband Taskforce to ensure that investments in rural broadband are included in any comprehensive infrastructure package that passes through the House. For many years, the FCC and USDA's rural utility service have made strides to foster the development of broadband networks in rural communities through grants and loans, but this is just one of many steps we can take to address the lack of access to rural broadband, and much more must be done.

If you have heard me talk about broadband before, you will know I am deeply committed to addressing the flawed mapping process that undercounts our rural communities. The Federal government must have accurate data to ensure that funds and resources are being efficiently allocated to expand coverage to underserved areas. However, reports and widespread public outcry confirm that the FCC's maps are grossly overstated, and the National Telecommunications and Information Administration's outdated map was decommissioned. There is strong evidence that the percentage of Americans without broadband access is much higher than the FCC's numbers indicate, so we took action.

On the Small Business Committee, we held hearings on broadband mapping and rural broadband access, calling for the FCC to improve its Form 477 data collection and require carriers to submit more granular data. Last month, the FCC issued an order requiring a new data collection that will capture more accurate data and potentially phase out Form 477 altogether. The FCC also voted to open a rulemaking proceeding to establish a new fund, as the commissioner noted, offering $20.4 billion in funding over a 10-year period using data from the improved data collection.

I will be keeping a watchful eye on the FCC's progress on this improved data collection and implementation of its new fund. As a member of the House Committee On Agriculture and Democratic Rural Broadband Taskforce, I will continue to push legislation that delivers Federal funding for broadband infrastructure investments both at the FCC and the USDA.

I have also heard from small businesses, farmers, and students about the impact of slow download speeds and unreliable connections. Without access to reliable internet, small firms in rural areas miss opportunities to connect with new customers and can't take advantage of cost-saving tools, like digital payment processing and online distribution services. Schools and the healthcare providers are also impacted by a lack of access. Today, more than 70 percent

of teachers assign homework that requires access to broadband. The students that don't have access suffer from the cruelest part of the digital divide. Small rural healthcare facilities also need access to telehealth services to reach specialists at larger urban hospitals offering connected care to monitor chronic health problems and save lives. Without reliable access to high-speed internet services, the opportunities are missed, and loved ones are lost.

The small internet service providers that do operate and serve these communities need additional resources to get broadband infrastructure projects off the ground. Operators, like rural electrical co-ops, have made use of the valuable infrastructure to serve rural households and businesses, and small ISPs have made significant investments in fiber networks, but lack the access to Federal funding to expand their efforts. The FCC's matching partnership with the New York State Broadband Program Office has invested millions of dollars in funding and connected thousands of homes and small businesses, but we need to see more Federal and State government partnerships in order to close the divide in rural areas around the country, and ensure that all communities have access to reliable service.

It is painfully clear that private investment is not enough. We need connectivity now. High-speed broadband is not a luxury. It is essential to economic development of the communities and the survival of small businesses. However, these connections could only be realized with swift and deliberate action, Federal investment, and accurate maps. I hope that today's discussion will shed light on ways to improve connectivity in rural communities. I look forward to working with my colleagues and Congress to increase Federal investment in broadband infrastructure and bridge the digital divide. I thank each of the witnesses for joining us today. I look forward to your testimony.

Now I would like to just take a minute to explain the time and rules. Each witness will get 5 minutes to testify, and members—in this case, member—will get 5 minutes for questioning. There is a lighting system to assist you. Now, the green light, which typically would be the case if we were in Washington, we are not in Washington, so there are no green lights. But typically, there would be a green light, and with about 1 minute left, you see a yellow light. I am going to get a yellow light as well, and then there will be a red light, and I will get a red light. And when the red light pokes up, you will then have to stop, and I will politely ask you to conclude your testimony. That way we can keep the conversation going. And now I would like to introduce the witnesses for today's panel.

Our first witness is Tim Johnson, who hails from Edmeston, New York. Mr. Johnson is the CEO of Otsego Electric Cooperative. Mr. Johnson has been the chief executive office and general counsel of Otsego Electric Cooperative and the only connect fiber subsidiary since May 2016. Prior to that, Tim was a lawyer in private practice for 27 years from 1985 to 2012 with offices in Edmeston, Morris and Cooperstown. During this time, Tim represented Otsego Electric Cooperative, other rural electric cooperatives here in New York and numerous other non-profits, charities, and municipalities. He left private practice in 2012 to become assistant general counsel at

the National Rural Electric Cooperative Association in Arlington, Virginia. Tim studied at the University of Rochester in Rochester, New York where he received bachelor's and master's degrees. He obtained a law degree at Albany Law School of Union University. Tim is married, has 3 children, and resides in Edmeston. Welcome, Mr. Johnson.

Our second witness, Ms. Shannon Hayes. Ms. Hayes is the owner of Sap Bush Hollow Farm Store and Cafe in West Fulton, New York. Ms. Hayes grew up in the Sap Bush Hollow Farm in the heart of Schoharie County, which she now operates with her husband, parents, and her 2 daughters. In 2016, she added a community cafe to the farm's offerings and could be found in there cooking breakfast on Saturday mornings. When she isn't flipping eggs, she is homeschooling her 2 daughters, writing books, or just hanging out in the wilderness. Shannon holds a Ph.D. in sustainable agriculture and community development from Cornell University. Her work has been featured in numerous publications, including the New York Times, Brainchild magazine, U.S. News and World Report, Farm Quarterly, Elle magazine, and many other publications. Ms. Hayes' weekly essays about her attempts to live a balanced and sustainable life can be found on her blog, "The Radical Homemaker.net." Welcome, Ms. Hayes.

Our third witness is Mr. David Berman. Mr. Berman is Co-Chair of Columbia Connect in Denton, New York. A resident of Denton, Mr. Berman is a technology media consultant with a long career in those complementary fields. His career began in the world of closed-circuit television where he produced the broadcast of several of Mohammed Ali's biggest fights. I am a fan. This led to a 5-year stint at CBS Sports where he was managing director of the European operation based in London. He returned to New York as vice president of CBS Broadcast International in charge of production, operations, and administration for 11 years. That was followed by 7 years at the first global private satellite company, PanAmSat. Currently, he is a consultant to several Silicon Valley companies while serving as the Co-Chair of Connect Columbia, Chair of the Get Broadband Committee, on the Columbia County Broadband Committee. Every facet of his career, from the beginning to present day, has required more and more [Audio malfunction in hearing room]. Welcome, Mr. Berman.

Our fourth witness is Mr. Jason Miller. Mr. Miller is general manager of Delhi Telephone Company in Delhi, New York. Jason Miller is the vice president, treasurer, and general manager of Delhi Telephone Company and DTC Cable. Jason started with DTC in May of 2008 and has held various roles within the company over the past 11 years, becoming general manager in 2013. DTC currently maintains the following business lines: local telephone, long distance, internet, television, security, and I.T. consultant. DTC has over 35 employees and over 3,500 customers. DTC has partnered with Margaretville Telephone Company and Delaware County Electric Cooperative on the Delaware County Board Initiative—I am sorry—Initiative since 2015. Jason currently is Chairman of the NYSTA Government Affairs Committee, is a member of the NCAA Government Affairs Committee, is on the Board of Directors with the New York STA and the NTCA Rule Broadband

PAC, P-A-C. Jason has a bachelor's degree in accounting from Syracuse University and master's of business administration degree from Binghamton University. Jason currently resides in Delaware County in the Town of Masonville with his wife, Julie, and 4 children, Lilly, John, Ben, and AJ. Welcome, Mr. Miller.

We are getting there. Our fifth witness, Mr. Brian Dunn. Mr. Dunn is the superintendent of Middleburgh Central School District in Middleburgh, New York. In his 20 years of working the field, he has been an English teacher at Albany High School, assistant principal at Troy High School, and principal of Troy Middle School. He attended Christian Brothers Academy in Albany, New York and attended college at the College of St. Rose and SUNY Albany. He is a passionate mountain trail runner, fly fisher, and reader of history. He is a strong supporter of rural schools, the First Amendment, and World Peace. He lives in West Charlton, New York with his wife, 3 children, and cat named Twinkles.

Mr. DUNN. Thank you.

Chairman DELGADO. Welcome, Mr. Dunn.

Mr. DUNN. Thank you.

Chairman DELGADO. And our final witness, Dr. Cliff Belden. Dr. Belden is the chief medical officer of Columbia Memorial Health here in Hudson, New York. Dr. Belden is a neuroradiologist by training, and prior to coming to Columbia Memorial Hospital held leadership positions in both rural and urban environments, having served as the Chair of Radiology at Temple University in Philadelphia and the Chair of Radiology and chief clinical officer at Dartmouth in rural New Hampshire. Dr. Belden attended RPI for his undergraduate work in Albany Medical College where he graduated as a valedictorian. His radiology training was at the University of Florida and John Hopkins University. Dr. Belden served as a physician in the U.S. Army at Brooke Army Medical Center, San Antonio, Texas, from 1998 to 2002, where he achieved the rank of lieutenant colonel. He also received a master's in Healthcare Delivery Science from Dartmouth. Outside of his medical work, Dr. Belden and his wife, Marian, have a 100-acre farm in Hoosick, New York, which they actively farm, selling to local restaurants and at farmers markets. Welcome, Dr. Belden.

I will now recognize each witness for 5 minutes to provide their testimony. Mr. Johnson, you are recognized for 5 minutes.

STATEMENT OF TIM JOHNSON, CEO, OTSEGO ELECTRIC COOPERATIVE, EDMESTON, NEW YORK; SHANNON HAYES, OWNER, SAP BUSH HOLLOW FARM STORE AND CAFE, WEST FULTON, NEW YORK; DAVID BERMAN, CO-CHAIR, COLUMBIA CONNECT, GHENT, NEW YORK; JASON MILLER, GENERAL MANAGER, DELHI TELEPHONE COMPANY, DELHI, NEW YORK; BRIAN DUNN, SUPERINTENDENT, MIDDLEBURGH, CENTRAL DISTRICT, MIDDLEBURGH, NEW YORK; AND CLIFF BELDEN, M.D., CHIEF MEDICAL OFFICER, COLUMBIA MEMORIAL HEALTH, HUDSON, NEW YORK

STATEMENT OF TIM JOHNSON

Mr. JOHNSON. Okay. Do I need a microphone?

Chairman DELGADO. That one, yeah.

Mr. JOHNSON. Is this on? Can everybody hear me? Thank you for this opportunity to testify about broadband and its importance to rural areas. I am Tim Johnson. I am sorry?

Chairman DELGADO. Talk into the mike.

Mr. JOHNSON. A little bit closer.

Chairman DELGADO. There you go.

Mr. JOHNSON. I speak into the mike, and I can't move my head then. All right. I am Tim Johnson, CEO at Otsego Electric Cooperative as I was introduced. We are located near Cooperstown. Our cooperative serves approximately 4,500 electric meter locations in the Otsego County area. Primarily, these are consumers that investor-owned utilities bypassed partially due to our sparse population.

In early 2017, Otsego Electric was awarded New York broadband grants of $14 million, including $4 million in CAF funds. We announced plans to begin offering high-speed, affordable broadband to help our consumer members fully participate in the 21st Century economy. Ultimately, OEC will make service available to all our consumer members with fiber speeds of up to 1 gigabit.

At this time, we actually already do that. The electric cooperative industry serves over 40 million Americans and covers 56 percent of the U.S. landmass. More than 100 electric cooperatives across the country are currently working toward meaningful solutions to bridge this digital divide. We believe electric co-ops are ideally suited for this task. However, we have several policy concerns that we believe you all can help with. First is the Federal Tax Code. Cooperatives desperately need your help fixing a 2017 Tax Cuts and Jobs Act mistake that happened in 2017, but we need it fixed by the end of this year.

OEC unexpectedly stands to lose as much as $3 million dollars of our broadband grants to taxation. This makes absolutely no sense. We bid under 2018 pre-tax law rules, so the train had already left the station, so to speak, when the new tax bill arrived. Most rural electric cooperatives are tax exempt under 501(c)(12), and no more than 15 percent of our income can come from nonmember sources in order to remain tax exempt. The Tax Act mistakenly made all public grants potentially taxable to cooperatives. This includes FEMA grants, a terrible mistake. If a Federal legislative fix is not passed by the end of this year, we will also lose our tax-exempt status. Fortunately, a bipartisan legislative solution has been introduced in the House and Senate, co-sponsored by our host, Congressman Delgado. This past April, the legislation will allow co-ops to accept grants without jeopardizing their tax status, but the bill has not been scheduled for a vote yet. We need your help and support on this bill.

Mapping. I would like to mention mapping. I suppose some of our other panelists will mention this, and it has already been mentioned, but a critical step for us in deploying rural broadband is to improve our maps. We need to do away with the one served, all served census block concept. We need to gather more granular standardized data on coverage and performance levels, and we should incorporate crowd sourcing as a way to fund projects. We need a better challenge process to flag issues with data and maps. We are encouraged by the FCC, and Congress are already working on these issues.

Public funding. As a nonprofit cooperative, we operate at cost, and our access to capital is limited by what our member consumers are willing to contribute through the rates they pay. The current Federal programs at the USDA and at the FCC, geared toward reducing the upfront capital investments, are necessary to achieve widespread expansion of high-speed broadband. The upcoming RDOF, or Rural Digital Opportunities Fund, will distribute $20 billion dollars by a reverse auction to help build service of at least 25 up and 3 down megabits-per-second to large segments of rural America. We believe added auction points should be given to gigabit expandable fiber to the home service projects where feasible. This is the gold standard we should all strive for everywhere.

Chairman DELGADO. One minute.

Mr. JOHNSON. Thank you. One quick comment on New York's broadband program. It has been a great program so far. However, it left many gaps due to mapping and funding problems. Over 70,000 locations in New York were relegated to satellite services, many of us know. We need funding for gigabit fiber in the home services to be fair to all. The bottom line is we need public money. There isn't enough rate of return for private investors to get involved in many of these projects.

In conclusion, Otsego Electric and electric cooperatives all over the country are ready and willing to take on this challenge. We did it 75 years ago with electric service, and we can do this project, as well. We look forward to working with you and everyone in expanding all the benefits broadband has to offer.

[The statement of Mr. Johnson follows:]

Chairman DELGADO. Thank you, Mr. Johnson. Ms. Hayes, you are now recognized for 5 minutes.

STATEMENT OF SHANNON HAYES

Ms. HAYES. Can everybody hear me okay? All right. Quick storytelling now. My name is Shannon, and I live up in the hills of Schoharie County up against a 2,000-acre State forest 5 miles from my family farm, and I am a child of the farm crisis. It forced youth out of my community like insects in the spray line of pesticides. It was whispered in the halls of my school that only the losers stayed around after graduation. Everybody else fled. So dutifully I went away to college, but I came home every other weekend because I love being a part of my family's farms, and I hated to be away from those dirt roads, and the farm-grown food, and the woodlands, and the neighbors, and the stone walls that define my world.

I eventually got a Ph.D., as you heard about, and my husband and I were qualified to take on careers in any of the land grant colleges around the country. But we weren't qualified to come back to our own beautiful, yet economically depressed, Schoharie County. We didn't go job hunting. We bought a cabin up in Middleburgh Telephone Company service area as opposed to my parent's farm a few miles down the road, which was in Verizon's area. And after graduation, I told my parents that I had come to only one certain conclusion, and that was that our family, our community and our farm could not afford this continued loss of the brains—the brains—the creativity and the energy of the next generation. And

the idea of commuting to a job someplace just filled us with abject misery.

So we stayed put and we lived cheap, and we worked with my parents to grow Sap Bush Hollow. And in a few years, Bob and I actually had an opportunity to cash in on our cabin in the woods and buy a farm next to mom and dad. But if we moved, we would be giving up our local provider and moving into a Verizon district, and at this point, I was the primary communications person for our business. Moving our home offices would put us on the service fringe of an urban phone company, and it was an area that had long suffered from telecommunication's neglect. But a few miles down the road, we had the benefit of being covered by a rural telecommunications company that specialized in people like us.

So at that moment we had to make a choice about the future of our farm: increase production or guarantee our telecommunications. Without good telecommunications, we would lose marketing opportunities and the ability to be in contact with our customers, to handle our finances efficiently without constant trips to town. Without the telecommunications, we would lose the ability to order supplies online, and we would have to take a day's work away from the farm just to drive into Albany. We would lose out on access to online veterinary diagnostic resources, the ability to network with other farmers about changes in the industry, and the ability to participate in online professional development opportunities, like seminars for improving grazing practices or learning more humane and ecologically responsible growing practices.

So we stayed put. Instead of buying the farmland, we made a radically different choice. We bought our community's post office building and former firehouse and moved our farm center of commerce off the farm and into our rural hamlet. Part of this decision was to give the community an economic jumpstart. Part of it thought that, hey, why not in the middle of Upstate New York? Who wouldn't love an espresso bar and farm-to-table cafe? You all come, please. Okay. And the final reason, the internet there was decent. Our industry is changing fast with online developments, and if we don't keep up, we are going to lose our farm for all of the reasons that I just mentioned.

Throughout this time now, we started a family and chose to homeschool our daughters. Our oldest, she practically taught herself to read, but the youngest would pick up books and hold them upside down. And she would bounce into things, bump into things. She confused people's names and faces, and we eventually learned she's legally blind in one eye, and she had reduced vision in the other, and she has a condition called cerebral visual impairment. She's smart, she's motivated, but she was severely academically learning disabled.

Our rural school, which you will hear from today, did its best to help us, but it did not have all the resources we needed, and we faced walking away from this whole family business just to get our daughter the education because the only schools that could help us were in Canada or Boston, and they were going to cost us about $40,000 dollars a year, far more than our annual income here in Upstate. But what if we could get our learning environment

equipped to accommodate her? If we could outfit our house with fast internet, I could make huge academic inroads with my kids.

[Disturbance in hearing room.]

Is that for me? Oh, no. Okay. If we could——

Chairman DELGADO. Maybe somebody is timing you out there. I don't know. You do have about 1 minute.

Ms. HAYES. Okay. If we could equip our proposed community cafe with good internet, then we could become a hub for all those other neighbors in the Verizon area. So we asked MIDTEL for help, and within a year's time, we came up with a solution, and we had better, faster internet than what you will find in downtown Albany. My oldest daughter enrolled in online classes. My youngest got enhanced visual access to any book or audio book in the world, and she became an avid fan of science podcasts. And she has gone from being a child that they did not think would read or write to this funny, articulate, and artistic preteen.

I encourage you to say hello to both of them today. And the cafe, hey, it is open Saturdays only. That is pretty good. Folks come for food and to socialize, and to check their email and download media. And since we worked out our arrangement, our family farm has experienced 100 percent growth, evidence of what you were talking about, Mr. Delgado, through our cafe, our farm store sales, our farm market, and our online sales. A small eco resort has now opened up in our hamlet, and the community has gained a farmstead cider tasting room, two local arts groups, and a yoga studio. Each of them are certain that they could move forward with rural businesses because they could be guaranteed high quality internet. There is talk that West Fulton, New York is pulling itself up by the bootstraps. We started an Airbnb above the café, and we now bring tourists from all over the world here to West Fulton where people want to experience our farm fresh food and our waterfalls.

Chairman DELGADO. Right. You are coming up on the end now.

Ms. HAYES. Okay. All right. So the long story is talk to my kids afterwards if you want to find out what their future holds. They are not thinking about running away like I had to. They are thinking about staying here in upstate New York because there are opportunities now. We are losing the rural brain drain, and I am appreciative of what broadband has done for us. Thank you.

[The statement of Ms. Hayes follows:]

Chairman DELGADO. Thank you. Thank you, Ms. Hayes. Mr. Berman, you are recognized for 5 minutes.

STATEMENT OF DAVID BERMAN

Mr. BERMAN. Thank you, Congressman. Can everyone hear me? Thank you, Congressman Delgado, for this opportunity. I am the Co-Chair of Connect Columbia, a citizen's action committee made up of elected officials and interested residents that have banded together to bring true broadband to the people of Columbia County. My Co-Chair, Patti Matheney is also here.

Let me define "true broadband" in 2019 terms: a minimum of symmetrical 100 megabits per second growing to a symmetrical 1 gigabit per second within 5 years. The FCC Commission's definition is considerably out of date and needs to be upgraded imme-

diately. Many of our international competitors are already at the gigabit level.

With that out of the way, let me just take a moment to describe the current conditions in Columbia County. We were fortunate to receive over $30 million from Governor Cuomo's broadband initiative with the help of our assemblywoman, Didi Barrett, and Connect America funding. This has taken us to coverage for most of our residents, but still leaves huge gaps in our geography. Why? Because the economics require density of potential subscribers, which effectively penalizes rural areas.

The State and CAF money were used to fiber those areas where density made the economics work, and then a very confusing satellite overlay was applied to theoretically give everyone access, which it decidedly did not. As I am sure the commissioner is aware, the use of high-latency moderate-to-low through put satellite technology is merely a band-aid that cannot meet current demand, much less the exponential growing demand.

So how do we fill in the holes to give everyone access to true high-speed broadband that has scalable technology to meet growing speed and capacity requirements? Even though current Federal programs are constructed to fix the basic problem of access, their requirements effectively preclude those they are designed to help. An example is a recent program that required an area to have 90 percent of the population that lacks coverage. Sounds logical, doesn't it? So, consider a farming area with central village. The village population overwhelmingly exceeds the farming one and, therefore, 90 percent can't be achieved. The measurement is correct economically from a cost-per-person served basis, but fails miserably to provide access to rural areas where modern agriculture requires cutting-edge technology to effectively manage the process of growing our food supply, not to mention the children of farmers who need access to all the educational tools and resources that are now required.

The only solution to this issue is to base local, State, Federal programs on the goal of reaching every address in the United States. That means scrapping the use of census blocks to define coverage availability, financing, etc. Very simply, census blocks are both confusing and lead to some bizarre results. A perfect example is a street behind my house in Ghent, German Church Road. Like many streets, it bisects 2 census blocks so, under the State program. One of those blocks was granted money for broadband and the other wasn't. So, a provider doesn't get reimbursed for providing service to the other side of the street. Clearly every address that gets electricity should get broadband just like electricity which runs many devices essential to our lives, large-capacity communication capabilities are far more than the voice internet, email, and tweets. We are still in the early stages of what big connectivity can do beyond those mentioned with efficiencies in healthcare at the top of the list. It is no longer practical to separate access from voice and television since they all come over the same wire, fiber or frequency. Two out of 3 can't be ubiquitous while 1 remains unavailable. It is more important than ever in this economy to ensure every business and every person is connected to the content they want just as they can speak to anyone via traditional, what is

known as POTS in the telephone world. It is called plain old telephone service. The Commission as a regulatory body needs to expand its vision to encourage expansion of existing technologies and leave the door wide open for new ones that will enable even more ways to connect and ensure security.

Finally, Congress must act to rationalize the myriad number of competing programs that ostensibly are in place to facilitate the expansion of broadband, and then expedite the actual work being done, completed, and, importantly, measured so that suppliers meet the needs of consumers. And I apologize to my wife and children for not including them in my biography.

[The statement of Mr. Berman follows:]

Chairman DELGADO. But you ended within 5 minutes. How about that?

Mr. BERMAN. [Off audio.]

Chairman DELGADO. Thank you, Mr. Berman. I now would like to recognize Mr. Miller for 5 minutes.

STATEMENT OF JASON MILLER

Mr. MILLER. Am I close enough to the mic? No? All right. Congressman Delgado, thank you for the opportunity to testify in the importance of rural broadband and closing the digital divide. My name is Jason Miller. I am currently the vice president, and treasurer, and general manager of Delhi Telephone Company, DTC, which was founded in 1897. We also have DTC Cable and they are both headquartered in Delhi, New York. I started with DTC in May of 2008 and have held various roles over the last the last 11 years, becoming GM in 2013.

DTC currently provides our customers with local telephone, long distance, internet, television, security, and IT consulting. DTC has over 35 employees and 3,500 customers. In 2015, we partnered with Margaretville Telephone Company and Delaware County Electric Cooperative for the Delaware County Broadband Initiative. We call it DCBI. As part of this partnership, DTC has received $30 million dollars in projects. That is our portion, just DTC's portion, in New York State grant awards. DTC will be completing 1,200 miles of fiber optic builds, passing approximately 15,000 homes mostly outside of our regulated telephone franchise territory. With this build, DTC will be in 17 communities.

Deploying broadband takes time and includes many hurdles. Through our company's long experience in industry, combined with much-needed support from the Federal and State governments, we have been able to successfully deploy these networks in and around Delhi, New York for the rural residents of our community. Rural areas present unique issues to DTC, and more than 850 rural broadband providers represent by NTCA, the Rural Broadband Association that serves nearly 35 percent of the Nation's land mass, but less than 5 percent of the population.

Low population densities and significant distances are the root cause of why it is very difficult to build a business case to provide broadband in these high-cost areas left behind by large providers, and to then sustain these networks and services once deployed. In order to succeed in delivering reliable internet service, it takes support of the Federal, State, and/or local levels along with the afore-

mentioned commitment to the community. It is the public/private partnership model that has resulted in getting broadband to our customers and to serve as a model for reaching and then sustaining the delivery of broadband in the remaining unserved rural areas.

Rural broadband has far-reaching effects, creating efficiencies in healthcare, education, agriculture, energy, and commerce. A report released in 2019 by Purdue University, in conjunction with the Foundation for Rural Service—FRS—found that in 2017, small rural communication providers in the United States contributed to more than 77,000 jobs and supported more than $10 billion in economic activities across a wide range of industries. Additionally, a Cornell University study found that rural counties with the highest levels of broadband adoption had the highest levels of income and education and lower levels of unemployment and poverty.

Despite this great progress, many parts of rural America still need better connectivity, and even where broadband has been deployed, sustaining it in areas where consumers are scattered across great distances is itself a substantial and often underappreciated challenge. As policymakers consider potential initiatives for broadband infrastructure deployment, including USDA's Broadband Reconnect Program, the FCC's upcoming rural, digital opportunity fund, I believe, is essential to build upon was work to date. In doing so, there are several key principles that should guide next steps on infrastructure policy. These principles include providing Federal support to make the business case for investment in ongoing operation, leveraging existing experience and expertise, making long-term capital investments, targeting resources for new construction, coordination of efforts among many governmental programs, streamlining construction processes, and ensuring accountability for any recipients of scarce Federal resources

Accurate broadband mapping data is also critical to the ability to deliver and sustain service in rural America, and bad mapping data risk leaving rural consumers stranded without broadband. Even as there is a push to improve the standards in the granularity of how providers report, it is equally important not to forget the importance of making sure that there is some opportunity to double check the accuracy of the data being self-reported by providers.

Chairman DELGADO. One minute.

Mr. MILLER. The FCC has taken significant strides recently to move toward more granular and accurate broadband availability, data collections, and maps, but Congress has an important role here and can and should provide vital guidance and direction to the FCC on how to proceed next. Due in large part to the commitment of leaders, like Congressman Delgado and others on this Committee, small rural broadband providers, like DTC and others, and NTCA membership have made great strides in reducing the digital divide in rural America, but the job is far from done. Robust broadband must be available, affordable and sustainable for rural small businesses and underserved populations to realize the benefits that advanced connectivity offers.

On behalf of DTC and NTCA, the Rural Broadband Association, your commitment to identifying and solving these challenges is

greatly appreciated. Thank you for inviting me to be with you, and I look forward to your questions.

[The statement of Mr. Miller follows:]

Chairman DELGADO. Thank you, Mr. Miller. Mr. Dunn, you are now recognized for 5 minutes.

STATEMENT OF BRIAN DUNN

Mr. DUNN. Thank you, Congressman. Good afternoon, everyone. It is an honor to be part of this Committee and to have an opportunity to express my own meager experience and voice to this very complicated problem.

I am a superintendent in Middleburgh, and you can't talk about Middleburgh unless you go back to 2011, Hurricane Irene, which devasted our community. Literally, the school was flooded up to 4 feet into the basement, and so where we work and where we learn is undergoing another renewal. And when you talk about rural renewal, you have to talk about high-quality schooling. If you don't have high-quality schooling with innovative technology, with great teachers who care and are invested and who stay for the long haul, you are not going to experience a high-quality renewal that lasts and sustains itself over time.

My new friend, Ms. Hayes, to my right, you could hear the spirit in her voice, the hope in her voice when constituents are connected to information across the globe. It empowers our citizens, it empowers our youth, and it empowers our schools to join together to meet several wolves at the door. As a superintendent, the number one wolf at my door is safety and security. The second wolf at my door is never mentioned in any meeting, and that is the digital divide. So, I thank you for bringing it up.

But also deeper in the question of digital division is artificial intelligence and its impact on local economies and on schooling, and how we teach and learn. The working class jobs continue to morph and change and go away. What is going to happen when driverless trucks, and cars, and trains take over the market in the next 10 to 15 years? That is a reality that is coming, and so the best way to inoculate our students and our families and to impart them with the skills they need, we have to have excellent broadband, not only in the schools but most importantly, in all homes.

And I have to say there is a strong voice of optimism coming from Middleburgh and Schoharie County. Not only do we have fired-up residents like Ms. Hayes organizing, communicating, planning, working together, but we have a very strong infrastructure project that is 90 percent underway, led by our partner, MIDTEL, where 90 percent of our families are connected with fiber. Now, that will make all the difference for us in Middleburgh because in hopefully this year, we are going to get a $1 million Smart Schools grant after waiting for 3 years. It is coming, and I am grateful for it, but we are going to have to make great use of that in the school.

But like was mentioned earlier, homework is going to be on a laptop computer that we are going to send home, and all the families have to be connected with something they can afford that is high quality because our kids, as you all know, are competing globally. I always remember Thomas Friedman's book, The World Is Flat. It is truly getting flatter. So with that, I just want to remind

everyone it is a complicated issue. We in Schoharie County and Middleburgh, in particular, we are grateful we are moving forward, but we always remember that good is the enemy of great. And if you expect American, New York's Schoharie kids to compete on a global stage, our technology cannot be a one-shot deal. We have to continue to get quality funding, quality support from local, State, Federal levels, and we will work with you.

So with that, I hope my testimony meant something. I appreciate the opportunity to speak. Thank you.

[The statement of Mr. Dunn follows:]

Chairman DELGADO. Thank you. Thank you very much, Mr. Dunn. Dr. Belden, you are recognized for 5 minutes.

STATEMENT OF CLIFF BELDEN, M.D.

Dr. BELDEN. Thank you. Thank you for the opportunity to provide some comments today on this important topic. My testimony today is going to be focused on the impact that broadband internet access and the lack thereof has on healthcare and delivery of healthcare in rural areas.

So there are three broad areas where broadband impacts the delivery of healthcare: the patient, the location of services that you are able to get at any facility or the types of services in that facility, as well as it has an important impact on our workforce. So, first, the patient. The patient is the center of why organizations like Columbia Memorial Health exist in rural counties.

Twenty-five percent of the population of the United States lives in rural counties, but only 10 percent of the positions are in those same rural areas, creating a significant mismatch between the need and the availability of physicians and other healthcare providers. This mismatch is even greater in sub-specialties, particularly in those where there is a nationwide shortage such as obstetrics, dermatology and child psychiatry. Telemedicine has been championed as a tool to improve care and help bring the input and expertise of specialties and specialists to rural communities and their patients.

Telemedicine has many different forms and I will touch on two of them today: remote patient visits and remote telemonitoring of patients. Face-to-face teleconferencing between patients and a provider at their home or a medical facility allows a patient, who is referred to a specialist or perhaps needs follow-ups from one of their physicians, to see that provider without traveling for an appointment. Generally it is done over a secure videoconferencing platform. This results in improved access to specialists, and the patients get that benefit of not having to travel, particularly, during inclement weather, as we all know what the winters can be like around here.

At Columbia Memorial Health, we have a pilot project with a local nursing home and our cardiology and pulmonary physicians where they can evaluate patients without needing to transport the patient to the hospital after they have been discharged. We know there is over 50 percent more use of telemedicine visits when a rural county has a high penetrance of broadband, and it is such an important tool.

Remote patient monitoring is a second tool that involves providing patients with certain medical conditions devices such as scales, blood oxygen level monitors and heart rate monitors in order to get that data back to their providers to get early warning of any changes in their condition. Remote monitoring with these medical conditions can have a dramatic impact for the patients. For patients with congestive heart failure, remote telemonitoring decreases hospital admissions and readmissions up to 50 percent, and also has an impact on mortality and quality of life. Similarly, treatment costs are lower, and readmissions are lower for patients with chronic obstructive pulmonary disease when you use remote patient monitoring.

At Columbia Memorial Health, we have begun to use these remote telemonitoring devices for some of our patients. However, there are some challenges. Without broadband access, the monitoring equipment requires a dedicated cellphone and cellular service plan to be provided along with that. To offer this service, we provide that cellphone, we provide the data plan, and the expense exceeds what the government now reimburses for the services, as well as limits our ability when we apply for grants to start these programs. It is also impossible to deploy in areas that don't have a cellular signal.

Chairman DELGADO. One minute.

Dr. BELDEN. The second thing I would like to talk about is how the location of medical facilities is impacted by broadband. We have a lot of different types of medical facilities, all of which require highly reliable connected internet service. We have 2 outside clinics that still use microwave transmission for their broadband access and one that has a lower speed non-commercial grade access. That limits what they can see and how quickly they access patient records.

Finally, I would just like to say for the healthcare, the health provider, where you live matters, and if you are a radiologist, orthopedic surgeon, many of the specialists, or even primary care provider, you need high-grade internet access in order to perform your job. Increasingly we are required to make decisions quickly at home with the data that is sent to us via the internet.

So in summary, our request is simple. People who choose to live in a rural community should have the same access to tools that improve their health as those who live elsewhere, and I appreciate the efforts that you are making on that behalf.

[The statement of Dr. Belden follows:]

Chairman DELGADO. Thank you, Dr. Belden. I appreciate the testimony from everyone, really informative, and really appreciate the time that you put into the testimony. I will now recognize myself to ask some questions.

First, I want to begin with Ms. Hayes. Your testimony was very illuminating, and, as you know, we have a lot of farmers in our district. As I alluded to earlier, we are a very rural district. I think something like 5,000 farmers, about 8,000 farm operations or operators, and there is no doubt that farmers want to be able to earn a livable income from their business. Now, you have had to seek alternative business opportunities to keep your farm operating. Could you please share—I know you got a little bit into this in your

testimony—how access to affordable high-speed broadband can help farmers and other small business owners expand their business? What were the ways for you that it allowed the expansion of business?

Ms. HAYES. Okay. First, I do want to underscore in the case of my farm, we could go out to coffee and talk about the farm bill, and the Nation's chief food policy, and the commodity production but——

Chairman DELGADO. Happy to do that.

Ms. HAYES. Yeah, okay. So anyhow, I want to underscore, though, that diversification in the case of my farm is a choice. Diversification is ecologically beneficial and enables us to serve local markets and the community more effectively, and it has helped us here to become an anchor business and an economic driver in our community. So one of the ways that it has helped us, you know, you have already heard about the way the business is diversified with providing local food, and providing online services, and in terms of online shopping and things like that.

We have to teach constantly. Basically, in our Nation's agricultural history and food history, every generation since World War II has forgotten how to cook. It is very true, your people today, your constituents are time strapped. They are economically strapped, and processed foods, every generation gets a new processed food. But processed foods are what they turn to and the next, and they are not teaching the next generation. I am a farmer and I need people to buy real food. I have to constantly educate, and this is where the broadband is extremely important to me.

The next thing is it does create this multiplier effect, as I mentioned. People are coming into the area to see Sap Bush Hollow. They are staying, for example, in our vacation lodging, and then they are putting that money in all the different businesses in the area because they want to see what we are talking about on the internet. They want to see the beautiful waterfalls that we show. They want to taste the food that we are telling them how to cook. So we constantly have to educate to keep our heads above the water, and we are bringing people in and getting them to experience the rest of the businesses.

Chairman DELGADO. Thank you, and I think the multiplier effect pieces is critically important, and not just teach folks, you know, where good food is, but also to connect the folks who are providing it, right? And to the extent that we can have connectivity and set up localized distribution centers, food hubs, farm hubs, we can't do that in the absence of broadband access, so I really appreciate that.

Mr. Dunn, yes, Mr. Dunn, as the superintendent of Middleburgh Central School District, can you discuss, and I know you have talked a bit about this, but, in more detail, how improved broadband has impacted students in your classrooms?

Mr. DUNN. Well, in the context of the flood, our school system took a dive, and I have only been there a short while, under 2 years, but I took over an organization with an 82 percent graduation rate. And that is 18 percent of your kids not getting a diploma, and that is, that is very significant. And you also have to look at advanced regents diploma acquisition as college ready.

So, a lot of our economic indicators were down, so that is a whole complicated turnaround discussion. But how technology influences turnaround locally in its schools, it provides resources for people to research, to dialogue, and access best practices to improve their pedagogy. And so, what you have is a more highly-trained teaching force, you have more highly trained and motivated administrators, and you have opportunity and resources curricular-wise for kids to engage in project-based learning, to improve their reading, to improve their networking.

Don't forget distance learning. We have a lot of distance learning, and one of the things we are working on right now I am really proud of, you know, how do you engage in diversity and inclusivity discussions in a school system that is 99 percent white? Well, we have distance learning. Well, who are we distance learning with? We did a research project on it, and it is mostly other white constituencies in schools. So now we are investigating with a couple of partners. Well, how can we get access to urban distance learning to mix it up a bit because that is the world. That is the State university system. Those are the big cities, and that is a big part of the Every Student Succeeds Act, you know, creating equity and inclusion for all. So technology and high-quality technology is a great lever in a tool for progress and change.

Chairman DELGADO. Excellent. Thank you for that. And, Dr. Belden, you kind of alluded to this, but I want you to unpack it a little bit more, and it is kind of buried in everybody's testimony is the power of the draw of broadband access and recruitment of, you know, staff, caretakers, physicians, you know, if you want folks to come. And we know how urgent the need is for care in our rural communities. Can you speak a bit about what the impact would be to recruit physicians and specialists to the region with broadband access, and also the cost piece? You mentioned the cost element that the hospital has to bear. If you can get into more specifics about what that cost really feels like for you?

Dr. BELDEN. Sure. So I can use my own self as an example. When I moved to rural Hoosick Falls, the first thing we asked our realtors was is there internet access? Where can we get reliable service? Because as a radiologist, I know I am going to need to look at images after hours. The farm we bought in 2003 happened to be the last house on the road that had internet service. The only reason it had internet service was a previous owner was a soccer coach of a team from Vermont, and the head of the cable company wanted his son on the soccer team. So the deal was struck that his son would travel overseas with the team if cable came to my house. My neighbors down the road, 16 years later, still don't have high-speed cable broadband.

So that is the draw whether you are a physician or a physician's assistant, or a transcriptionist. Our transcriptionist—we had to switch our providers during a recent upgrade of our system. The transcriptionist that we had lived in an area where their internet wasn't reliable enough to do the transcription work. We had to outsource it outside of Columbia County for a period of time until the other system came back on, so that is really important.

You asked about cost, and cost in healthcare is always really sticky, because whose cost is it? If we, Columbia Memorial Health,

do telemonitoring, I know we can decrease the number of readmissions and improve the health of patients. That is the business we are in. That is what we want. We can absorb that cost, but it would be nice if the reimbursed amount, (we now have some codes where we can reimburse), at least covered that cost for us. The people—that is, the entities—that save dollars, real dollars when you don't readmit a patient or you don't admit them at all, that is the insurance company or Medicare or Medicaid. Again, good to save money.

I don't want to think we don't want to save money, we do. We spend for the remote monitoring, but someone else financially gets the benefit. Thankfully, the patients get the health benefit, which is why we are exploring these telemedicine projects, doing what can we do for patients with the budget and the funding that is available.

Chairman DELGADO. Thank you. That is very helpful. Mr. Johnson, as the CEO of Electrical Cooperative, and as someone who has had to figure out how to disburse and implement the grant funding from the State, could you just speak a little bit to some of the limitations that you have encountered when trying to ensure that you are best equipped to do the work that you are asked to do for your members and the community at large?

Mr. JOHNSON. Some of the limitations?

Chairman DELGADO. Yes, in terms of, specifically, you know, if there are communities that you are being asked to implement broadband, how that choice is being made and how are other actors in this space, other cable providers, for example, decisions being made that might affect where you are able to go and to what extent.

Mr. JOHNSON. Well, according to the terms of the New York Rural Broadband grant, we agreed to provide service in specified census blocks. So we didn't have much choice as during the past 2 years.

Chairman DELGADO. Uh-huh.

Mr. JOHNSON. After these 2 years, we will have some opportunity, but the limitations are that, and the incentives are to go toward density, the most dense area instead of the most sparse area without public funding.

Chairman DELGADO. Right.

Mr. JOHNSON. So that is the critical limitation. One of the other limitations, we know and can control the construction cost. We don't know when we go into a particular project what exactly the make-ready costs are going to be to get on poles outside of Otsego Electric's network. That is an unknown and a severe limitation without public funding to proceed down the road——

Chairman DELGADO. Uh-huh.

Mr. JOHNSON.—where, you know, it could be tens of thousands of dollars to go the next mile for construction. But the make-ready, it could double that perhaps.

Chairman DELGADO. Right.

Mr. JOHNSON. And sometimes it doesn't, and, you know, a hallelujah moment. But when it does, you are in a world of hurt if you are trying to make it happen.

Chairman DELGADO. Right. Could you speak a little bit to the tax law issue that you flagged and how it has, you know, negatively affected OEC?

Mr. JOHNSON. Right. The tax law change happened after we made our bids, put our application materials together, did our feasibility studies. And we suddenly were confronted with the fact that we might have a 21 percent loss of our grants Federally, and 9 percent State. So obviously, that is on our scale project, the $10 million project that is a 30 percent adjustment in what we thought we were going to be able to do. We were bound contractually, so we have gone out and borrowed the additional money. And by December 15th, we will be sending an estimated tax deposit based on these public grants that we received in 2019, and in 2020, we will receive more.

Probably this year we will receive about $4 million, so we are confronted about $1 million loss, and then next year we are confronted with, on a $6 million grant, perhaps another $1.8 million loss. That goes directly to our bottom line. We go directly to a borrower and, you know, ask them for the ability to borrow. We believe we will get it, but in the meantime, we would like to be able to go another mile, another 2 miles to the next people who are down the road and we can't. For the short term, we have to pay that debt, and just the interest alone, you know, you can imagine about $1 million, about $50,000 a year, maybe a little less at today's rates, severely curtails our ability to reach out to those people who are relegated to satellite service.

Chairman DELGADO. All right. Thank you. Mr. Berman, I want you to speak. I know you have had been doing the work to access and expand coverage to the residents of Columbia County for some time, and I think you have alluded to obstacles that you have encountered, specifically in the county. Can you speak a bit more about what those challenges are and why it has been such a challenge from your advantage point?

Mr. BERMAN. Sure. It is a simple question that I think we all face here of density. Under New York Public Service Commission rules for a television franchise, you must provide service to homes where the density is 35 homes per linear mile. Most of the cable companies will give you something better, but when you look at the cost of modern fiber optic installation in a green-field, meaning virgin territory, we are talking about upwards of $40,000 a mile. So if there are 7 or 10 homes, those homes are going to have to be contracted to you for the next, oh, I don't know, 4,000 or 5,000 years before you will ever make money.

Then you hit the issue of pole permits, which is one of the big, nasty issues of, you know, just because you want to hang a wire on a pole, if you don't own the pole, you have to get a pole permit. And while the utilities are required to respond in a timely manner, the small ones do. The large ones couldn't care less. And so what we will find, a lot of the broadband program office money that has been granted, they are behind schedule because the larger utilities do not give them access to the pole to hang the wire. And then you add in things like commercial secrecy of nobody wants to tell you where they are going in fear of others.

And one of the drawbacks of the State program is that they sign various nondisclosure agreements with Spectrum, and so the public has a hard time figuring out where commercial service is available. The Chairman of the county broadband committee and the elected official went from a 2-megabit DSL line for 50 bucks a month, and happened to see a guy going down the street from one of the carriers, and asked if service was available. And they said, oh, yeah, we can bring fiber to your house tomorrow. And he went from 2-megabit DSL to a symmetrical gigabit at $71 a month, and had no way of knowing that it was available. So, you know, it is a problem of physically building it and then actually making the public aware that it might actually be available.

Chairman DELGADO. Right. And on that first point with regard to population density, you know, it is interesting to me because it is so important to recognize that while the market has a rational way to operate, and that way in which it operates is, you know, seeking out profit margins. So you don't have to make a normative judgment one way or the other whether or not the market is acting in the way it ought to make money, right? So the question then becomes, what is the counterweight, right? What becomes the way to make sure that while that market operates the way that it does, it doesn't result in communities being left behind? And this goes back, Mr. Miller, to your point about public/private partnerships. And to the extent that those things can be created via incentivization or subsidies or tax credits, whatever the case might be, I think we at the Federal level must take a hard look at forming those kinds of partnerships. And where they cannot be formed, obviously, taking this on in a more public works standpoint by investing our revenue more directly into these projects.

I do want to just with our last question here, mapping came up quite a bit over the course of the testimony. Census block mapping clearly is flawed. Again, to reiterate, this is a situation where you have one home covered in 1 block and the whole block is deemed covered. And that makes a lot of sense when you have people living on top of each other in densely populated areas. But when they are not living on top of each other, you might want to consider a different way to track who has coverage and who does not. So what might those other ways be? I mean, how important, for example, is it to incorporate usage, or subscription to access connectivity or household data? What are some of the ways we think that we can get to more nitty gritty data to help us understand who, in fact, has coverage and who doesn't?

Mr. MILLER. Well, you know, an important part of the self-reporting is important, and the audits are important. I think a lot of the small carriers would go from auditing of the data to make sure that it is accurate, but the subscription model is sometimes tough also because a customer can choose what speed they need for their particular house. So even if they take a 10-meg service now or a 25-meg service, that may not be a future proof network.

So part of the mapping really has to be what is the maximum speed allowed available in that technology, and I think part of the mapping solution shouldn't include future proofing the network. You know, it is very frustrating to me. I am a type of person that likes to build it once and build it right, and have it there 20 to 30

years. So by using fiber optic cable and dedicating a fiber to every single home, that house is future proof for the next 30 years.

I can change out electronics on either side and go from 100 meg, to 1 gig, to 10 gig, to 100 gig. The glass that is on the poles is there for the next 30 years. Sometimes we tend to limp along with improving the speeds of copper by shortening the distance, whether it is copper or coaxial, put in more cabinets, shorten the distance. I can increase a 5-meg service to 10-meg, and then I meet the Federal guidelines, so we are good for this round of funding. But in 5 years, we are going to have to do a whole new round of Federal funding, and it becomes that kind of vicious cycle of continuously funding, upgrading the infrastructure. So I think part of the mapping process should be identifying where there is technology that is future proof, and really making sure that is how we are spending our money in infrastructure.

Chairman DELGADO. So it sounds like what you are saying is an actual robust commitment to solving the problem and not just putting a band-aid over it bit by bit.

Mr. MILLER. Absolutely.

Chairman DELGADO. Yes. Well, I know we are running long on time. I want to just thank all the witnesses for sharing their time with us and their testimony today. It has really been a privilege. I just want to offer a closing statement before I gavel this out, and then as noted, you know, we will stick around and do some questions with the commissioner.

Connecting communities in rural upstate is of critical importance to me and members of the Small Business Committee for many years, but there have been too many Americans who do not have access to the high-speed broadband connections they need, and we have heard today what the implications are. Small electrical co-ops and other broadband service providers do not have the resources they need to build and sustain broadband networks with our few subscribers in high construction costs.

Building out broadband infrastructure in rural America requires accurate maps and targeted Federal funding, real, robust, targeted funding so that billions of dollars of infrastructure incentives can reach the towns and communities that need them the most. Access to broadband can mean the difference between businesses opening and closing, students failing or passing and succeeding, and lives being improved and saved. Closing the digital divide should be a top priority for members of Congress. It certainly is one of mine. Representing all districts, the FCC, and the USDA, we must continue to push for policies until every community is served.

I would ask unanimous consent that members here have 5 legislative days to submit statements and supporting materials for the record.

Without objection so ordered.

And if there is no further business to come before the Committee, we are adjourned. Thank you.

[Whereupon, at 2:27 p.m., the Committee was adjourned.]

APPENDIX

Written Testimony of **Tim Johnson**

Chief Executive Officer, Otsego Electric Cooperative and OEConnect

On behalf of the National Rural Electric Cooperative Association

U.S. House Small Business Committee Field Hearing

Closing the Digital Divide: Connecting Rural Americans to Reliable Internet Service

October 4, 2019, 1:00 p.m.

Thank you for this opportunity to testify about broadband and its importance to rural areas. I am Tim Johnson, Chief Executive Officer at Otsego Electric Cooperative (OEC), headquartered in Hartwick, New York (near Cooperstown). Otsego Electric Cooperative, Inc. is a member-owned and democratically controlled tax exempt non-profit organization under IRC Section 501(c)(12).

OEC, serving ~4,500 meter locations, provides electricity to rural consumers that investor-owned utilities bypassed, partially due to our sparse population. In early 2017, OEC announced its plans to begin offering high-speed, affordable broadband after being awarded grant dollars that helped make the business case to build critical infrastructure to enable our consumer members to fully participate in our 21st century economy. Ultimately, OEC plans to make service available to all of its consumer members[1] with fiber at speeds up to 1 Gbps of service with no data caps. By the end of this year, OEC will have service available to over 5,000 locations over an 800-mile fiber network. Everyone will be offered Fiber to the Home service. To date we have activated fiber to the home (FTTH) broadband service to over 365 consumer members with many more on our waiting list. While we are off to a great start, we have also faced some policy-related challenges and we believe public policymakers can continue to play an important role in helping to support broadband in rural areas.

OEC is part of a broader electric cooperative industry, represented by the National Rural Electric Cooperative Association (NRECA) that serves one in eight Americans and covers 56% of the

[1] Final plans include nearly 1,000 more locations than the original OEC footprint due to the way the program rules worked in the funding programs through which the cooperative has been awarded funding.

U.S. landmass. Electric cooperatives are owned by the members they serve and they are uniquely suited to best understand and serve their members' and rural residents' needs. Most electric cooperatives are small businesses; they don't have investors or access to significant capital to help defray the costs of building and maintaining their infrastructure. These costs are borne directly by the farmers, ranchers, small businesses and other residents of the nation's rural communities – including those in 93 percent of the nation's persistent poverty counties.

Electric cooperatives play a vital role in transforming communities.

While our first priority at OEC is to provide reliable, clean and affordable electricity to our members, our commitment to our communities extends well beyond that service. We also provide services that empower local communities to improve their quality of life. As mentioned, that includes participating in efforts to make sure they have access to a robust communications infrastructure including access to quality and affordable broadband that enables rural communities to thrive and compete in an increasingly connected, global marketplace. Economic development, the education of our students to compete with children from urban areas, agriculture, and healthcare all require robust broadband access in the 21st Century.

Many comparisons are drawn between the lack of access to robust broadband service today and the need for electrification in rural America 80 years ago - with the urban areas of the country well-served, and rural areas being left behind. In part because cooperatives are led by, and belong to, the communities they serve, there is an increasing number of electric cooperatives studying whether they should be part of the solution to close the digital divide. More than 100 electric co-ops, including my own, are currently working toward meaningful and diverse solutions to bridge the digital divide and jump-start local economies. This cooperative commitment is vital for the one-quarter of all rural Americans who still lack access to broadband, compared to less than 2 percent in urban areas.

Key Policy Principles for Broadband Infrastructure

Mapping:

More granular and accurate maps showing broadband availability are a key part of reaching all rural Americans with high-speed broadband service. This will enable us to clarify existing gaps

in coverage and harmonize the diverse solutions that will be required to help rural Americans keep pace with their urban counterparts. Several steps are critical to improving the nation's broadband maps:

- More granular data is needed to allow the maps to reflect actual coverage rather than classifying entire census blocks–which are often geographically large in rural areas–as served or unserved.
- Inclusion of broadband service performance characteristics such as latency and monthly usage limits would provide important insight to the quality of service which broadband consumers experience. This is an especially important point given the large number of rural New Yorkers at over 70,000 locations who only have access to satellite broadband. These people should have better service, in terms of speed, reliability and affordability, available to them.
- Data accuracy including standardization of data is critical to ensure all providers must adhere to specific guidelines when reporting what areas they can serve. This will allow for a true apples-to-apples comparison, instead of providers submitting the required information several different ways.
- Further data accuracy components should incorporate crowdsourcing and, perhaps most importantly, an easily accessible challenge process to flag issues and further verify the accuracy of maps.

Fortunately, the FCC has recently taken steps on some of these items and we believe that our Members of Congress have a role to play in providing further guidance.

In the immediate term, the FCC is moving forward with having providers submit polygon or "shape files" of where their service areas are. This will provide a clearer picture of where coverage is and isn't than the current method of identifying whole census blocks as served or unserved. While the FCC is continuing their proceeding on data collection, Congress has also been active in this space. In July the Senate Commerce Committee passed a broadband mapping bill through committee that includes several of the aforementioned components and is supported by electric cooperatives. Additionally, the House Energy & Commerce Subcommittee on

Communications & Technology held a legislative hearing in September to discuss potential legislative solutions to improve our nation's broadband maps. Several pieces of mapping-focused legislation have also been introduced in the House, including companion bills to the Senate's committee-passed bill. We encourage Congress to continue moving these pieces of legislation through the legislative process.

85/15 Income Rule to Maintain Federal Tax Exempt Status:

We desperately need help fixing our federal tax code before the end of 2019. As community-focused, member organizations, electric cooperatives must comply with the 85-15 income test. No more than 15% of gross income may come from non-member sources in order to remain tax-exempt under federal law. Due to an unintended consequence created by changes to the Internal Revenue Code in the 2017 Tax Cuts and Jobs Act, OEC and other cooperatives across the country are facing a crisis related to this required income ratio that puts our federal tax-exempt status in jeopardy. The 2017 law contains a provision that counts federal, state and local grants to co-ops as non-member income. Before the law change, grants were defined as a contribution to capital and did not count toward 85-15 calculations.

Historically, electric cooperatives have received grants from a variety of federal, state and local governments to assist in providing services to their members for purposes such as storm restoration (FEMA), renewable energy development, energy efficiency and conservation, economic development, or rural broadband initiatives. Now that grants are counted as income, several co-ops are facing difficulty in maintaining their tax-exempt status if they take government grants to restore power after a natural disaster, bring broadband service to rural residents, boost economic development in local communities or create energy efficiency programs.

OEC is choosing to use the state broadband grants we have been awarded but we are risking our tax-exempt status in the process. For OEC, the train had already left the station when the tax bill arrived. Prior to the enactment of the new law and the discovery of its unintended consequences on our tax-exempt status, our cooperative was awarded $10 million from New York's state broadband program plus nearly $4.3 million in federal funds over the next decade to extend broadband to well over two thousand rural homes and businesses. After finding out about the

threat to our tax-exempt status, our cooperative board made the decision to forge ahead on our planned broadband buildout to all co-op consumer members because we view access to reliable broadband as an essential basis for quality of life and economic development in our entire cooperative community.

However, we also have a contractual obligation with New York State to follow through on our broadband project as awarded. That promise has been made much more difficult to fulfill due to having these tax rules changed on us in the middle of the project; creating wide-reaching unintended consequences and needlessly driving up costs. To delay tripping the 85-15 test, OEC slowed down grant reimbursement requests for most of 2018. In 2019, due to increasing interest costs, we were forced to apply for and receive grant funds that far exceeded our 15% threshold. Slowing down reimbursements to a point where incoming grant dollars would never trip the 85-15 test isn't a valid option, so we will have to turn to additional loans to cover the unexpected taxes and any advisory, organizational, and accounting costs that the tax law change will cause for us.

If a federal legislative fix is not passed by the end of 2019, we will lose our tax-exempt status. What's more, as much as 21 percent of the grant money received could be lost to taxes. The combined penalties of paying income tax on grant funds and the loss of tax-exempt status will significantly reduce our ability to build broadband to as many locations as we originally projected, depriving many households of the intended and direct benefits of public grant funding for the broadband project. This is clearly not good public policy and the inadvertent mistake that has caused this situation must be fixed.

Fortunately, a bipartisan legislative solution to this issue has been introduced in the House and Senate. The Revitalizing Underdeveloped Rural Areas and Lands (RURAL) Act (S. 1032/H.R. 2147) was introduced by Senators Rob Portman and Tina Smith and Representatives Terry Sewell and Adrian Smith in April. The Senate bill has 28 cosponsors, while the House bill has 209 cosponsors with more signing on weekly. The legislation will allow co-ops to accept grants without jeopardizing their tax status, but the bill has not yet been scheduled for a vote in the House or Senate. OEC, along with the entire rural electric cooperative family and various rural

focused organizations such as Farm Bureau and the National Cooperative Business Association are urging Congress to pass this legislation.

Building Broadband Networks for the Future

Broadband is as needed in rural America as other infrastructure systems to support a healthy economy and community. Policymakers in Washington, D.C., have recognized the importance of rural broadband networks by including increased funding and new programs to promote rural broadband infrastructure.

One of the key objectives for consideration with respect to using the limited resources made available is that any broadband funding plans should include clear expectations for whomever receives federal or state support. Recipients should be required to construct networks capable of meeting growing consumer demand over the long-term. In other words, resources should be used to build networks which will be useful for decades. Spending federal or state dollars on broadband networks that will be obsolete in a few years doesn't make financial sense and will leave rural areas behind again. Any areas that are not currently being served, or being built out to, with robust, reliable broadband of at least 25/3 Mbps should be eligible for broadband funds in any state and federal broadband program. In addition, the highest speed and capacity solutions such as GPON gigabit speed Fiber to the Home projects should be given preference over other less robust technologies. Other considerations affecting the end-user experience, such as latency and data cap limits which lead to a higher cost and diminished ability to utilize the service, should also be considered in all broadband funding programs.

The Role of Public Investment in Reliable Rural Broadband Service

As a non-profit cooperative, we operate at cost and our access to capital is limited by what we ask our consumer member-owners to contribute through the rates they pay. Additionally, our rural nature lends itself to sparse population densities which means we have smaller groups of consumers to spread the costs of deploying service. Because OEC, similar to other electric cooperatives across the country, is a small non-profit that operates at cost, we entered this business with no extra cash to spend on the project. This means we financed our portion of the broadband infrastructure investment with borrowed funds. We had resources to invest - mostly

human, infrastructure, and equipment - but we would not have been able to proceed with the project without public funds. We also will not be able to extend our service area to reach additional rural Americans who don't yet have robust service without public funds. Therefore, continued government funding to reduce the upfront capital investment and help make the business case to deploy robust broadband is necessary to achieve wide-spread expansion of high-speed access throughout rural America.

There are currently federal funding programs geared toward this purpose at the United States Department of Agriculture's (USDA) Rural Utilities Service (RUS) and at the Federal Communications Commission. Programs at these agencies are complementary and equally important. Electric cooperatives have witnessed both success stories and challenges within these programs in pursuit of bridging the digital divide throughout rural America. When Congress reauthorized the Farm Bill in 2018, electric cooperatives participated in and appreciated the efforts taken to learn from some of those challenges by reshaping the USDA RUS Farm Bill Broadband Loan and Grant program. The updated program represents a bi-partisan, bi-cameral and industry compromise and we urge Congress to utilize this consensus approach by directing funding to the program soon.

There are several important Universal Service Fund programs at the FCC, one of which is the upcoming Rural Development Opportunity Fund (RDOF) which intends to distribute $20 billion dollars over a period of 10 years via reverse auction to provide broadband service of at least 25/3 Mbps to large swaths of rural America that don't currently have that level of service. The lack of density in the areas to be included in the RDOF makes the business model for service in these areas—sans direct public investment—infeasible. We believe a reverse auction is the most efficient way to go about this effort so the most efficient bidders will get the awards, but care must be taken to prioritize participants utilizing technologies that are most prepared to stand the test of time and keep pace with increased consumer demand for speed and quality including latency and potential data cap considerations. OEC believes priority should be given to those who are ready to provide at least 100/100 Mbps service in a GPON Fiber to the Home project.

Rural electric cooperatives, through NRECA, have filed initial comments[2] in the FCC's RDOF proceeding to provide detailed feedback on the FCC's proposal. In addition to the items noted above, particularly noteworthy comments this committee should be aware of include support for moving forward expeditiously with Phase I of the auction to known unserved locations and then proceed with Phase II once the FCC obtains more granular data on served and unserved locations within partially served census blocks. Electric cooperatives also support and underscore the importance of adopting a challenge process that applicants can utilize as eligible areas are determined and finalized. Lastly, several recommendations related to the proposed performance tiers and latency levels—that aim to bolster bids delivering faster speeds and fiber dense network builds—are made to further the FCC's goal to "make the necessary long-term investments to build robust future-proof networks" in rural areas.

Rural electric cooperatives are uniquely suited to partner with the government for these projects because of the existing infrastructure we have in place throughout our service areas. As member-owned, locally operated, and democratically controlled entities we feel we can best determine the needs of our local service areas because our consumer-members have a direct say in the services we provide, and we will continue serving these areas we call home long after other companies have reduced the quality of their service or ceased investment altogether. Rural electric cooperatives will continue to be active in the FCC proceeding to recommend how those investments should be made to have the most lasting impact.

CONCLUSION

As I have described, broadband is vital to the survival and growth of both the communities OEC serves and all of rural America. Much progress on broadband deployment has been made over the last few years and it's important that we address the public policy challenges I've shared to ensure that progress may continue. Electric cooperatives, in particular, are particularly well suited for this task and we are committed to deploying broadband in rural America and investing in these difficult to serve areas where other providers are not willing to serve.

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[2] NRECA Comments on Proposed Rules for the FCC Rural Digital Opportunity Fund; September 23, 2019; https://www.cooperative.com/programs-services/government-relations/regulatory-issues/Documents/Final%20NRECA%20RDOF%20Comments(02)%2009.20.2019.pdf

National and state broadband programs offer an opportunity to promote broadband development. As part of this effort, our cooperative is ready and willing to continue the conversation about broadband programs and we look forward to working with you to expand all the benefits broadband has to offer so rural New Yorkers will not be left behind.

Thank you for the opportunity to testify, and for your commitment to rural broadband. I look forward to working with you and answering any questions you may have.

Timothy R. Johnson, CEO
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My name is Shannon Hayes, and I live in the hills of Schoharie County, up against a 2000- acre state forest, five miles from my family farm. I am a child of the farm crisis. It forced youth out of my community like weeds in the spraylines of pesticides. It was whispered among the halls of my school that only the losers stayed after graduation. Everyone else fled.

Dutifully, I went away to college, but I came home every other weekend. I loved being on my family's farm, and I hated to be away from the dirt roads, farm-grown food, woodlands, neighbors, pastures and stone walls that defined my world.

I eventually earned a Ph.D. in sustainable agriculture & community development from Cornell. My husband and I were qualified to take on careers at any of the land grant colleges around the country. We weren't readily positioned to find employment in our beautiful, albeit economically depressed area.

But we didn't go job hunting. We bought a cabin up in Middleburgh Telephone Company's service area; as opposed to my parents' farm just a few miles down the road, which was serviced by Verizon. I told my parents after graduation that I had come to one certain conclusion:

Our family couldn't afford to lose us, and our community couldn't afford the continued loss of brains, creativity and energy of the next generation. And, the idea of commuting to an office filled us both with abject misery.

So we stayed put, lived cheap, and started working with my parents to grow Sap Bush Hollow Farm. A few years into our adventure, Bob and I had an opportunity to cash in on our cabin in the woods and buy a farm next to Mom and Dad.

But if we moved, we'd be giving up our local provider and moving into a Verizon district. By that point, I was the primary communications person for our business. Moving our home offices would put us on the service fringe of an urban phone company. That area had long suffered from telecommunications neglect. But a few miles down the road, Bob and I had the benefit of being covered by a company that specializes in rural telecommunications. I felt like we had a fighting chance going forward.

At that moment, we had to make a choice about the future of our farm: buy more land to increase production, or guarantee our telecommunications. Without good telecommunications, we would lose marketing opportunities. We would lose the ability to be in contact with our customers, to handle our financials efficiently without constant trips to town. Without the ability to order supplies online, we'd have to lose a days' work to drive to Albany. We would lose out on access to online veterinary diagnostic resources, the ability to network with other farmers about changes in the industry, and the ability to participate in online professional development opportunities, like seminars for improving our grazing practices, for learning more humane and ecologically responsible growing practices.

We chose to stay put. And instead of buying farmland, we made a radically different choice. We bought our community's post office building and former firehouse and moved our farm's center of commerce into the heart of our rural hamlet. Part of this decision was to give the community an economic jump-start. Part of it was because Bob and I had this cockamamie idea that we could open a farm-to-table cafe and espresso bar in the middle of nowhere and really rake in the farm profits. And the final reason? The internet there was decent. Our industry is changing fast with online developments, and if we don't keep up, we will lose our farm, for all the reasons I mentioned above

Throughout this time, we had started a family, and chose to homeschool our daughters. Our oldest daughter practically taught herself to read. She could absorb anything. But daughter number two, Ula,

would pick up books, and hold them the wrong way. She bumped into things. She confused people's names and faces. We eventually learned she was legally blind in one eye, the other eye was visually compromised, and she has a condition called Cerebral Visual Impairment. Though smart and motivated, Ula was severely academically learning disabled.

Our rural school did its best to help us, but it didn't have all the resources we needed. We faced walking away from my family's business, shutting down the farm and relocating to Canada or Boston, where there were special schools that could help us to the tune of 40,000 dollars per year...Far more than our annual income.

But what if we could get our learning environment equipped to accommodate her? If we could outfit our house with fast internet, I could make huge academic inroads with my kids. If we could equip our proposed community cafe with good internet, we could become a hub for our other neighbors in the hills in the Verizon area who lacked adequate service.

I called Midtel and asked for help. A week later, I was sitting down face-to-face with Jason Becker. We joined forces to organize the community and find the resources to run fiber through West Fulton.

Within a year's time, our rural hamlet had better internet than downtown Albany.

My oldest daughter enrolled in online learning classes. My youngest daughter got enhanced visual access to any book or audiobook in the world. She became an avid fan of science podcasts. She has gone from being a child they didn't think would read and write, to an articulate, funny and artistic pre-teen.

And the cafe? We open on Saturdays only, and our parking lot is jammed. Folks come for food, to socialize, and to check their email and download media. Since we worked our arrangement, Sap Bush Hollow has experienced 100% growth through our cafe, farm store sales, farm market, and online sales. A small eco-resort opened in the area, and our community has gained a farmstead cider tasting room, two local arts groups, and a yoga studio, each of them certain they could move forward with rural businesses because they could be guaranteed high quality internet. There's talk around the county that West Fulton is pulling itself up by the bootstraps. We've started a new Air B&B above our cafe, coaxing tourists to our area to experience the waterfalls, farm fresh food, and the hiking trails (yet still have hi-speed internet). We've been booked all summer.

Best of all, I can say with confidence that with the help of the internet, Saoirse and Ula are getting an education that rivals that of any private school. And at the same time, they're working in a growing family business tied to the earth and our community.

If you ask them about their futures, they don't give a hoot about moving to cities and chasing jobs. They see opportunity right here, in their own backyard, not a thousand miles away.

They are growing into smart, confident and creative young women, devoted to their community and the land that sustains them.

The rural brain drain in our town is getting plugged. And I'm deeply thankful to our local provider for their willingness to invest in us, so that we could make it happen.

Statement to Congressman Delgado by David Berman, Co-Chair of Connect Columbia

Thank you Congressman Delgado for this opportunity. I am the Co-Chair of Connect Columbia, a citizen's action committee made up of elected officials and interested residents that have banded together to bring true broadband to the people of Columbia County. My Co-Chair, Patti Matheney is also here.

Let me define True Broadband in 2019 terms—a minimum of a symmetrical 100 Mbits/sec growing to a symmetrical 1 gigabit within five years. The Commissions definition is considerably out of date and needs to be upgraded immediately. Many of our international competitors are already at the gigabit level.

With that out of the way, let me take just a moment to describe the current conditions in Columbia County. We were fortunate to receive over $30 million from Governor Cuomo's broadband initiative and CAF funding. This has taken us to coverage for most of our residents but still leaving huge gaps in our geography. Why? Because the economics require density of potential subscribers which effectively penalizes rural areas. The State and CAF money were used to fiber those areas where density made the economics work and then a very confusing satellite overlay was applied to theoretically give everyone access which it decidedly did not. As I'm sure the Commissioner is aware the use of high latency, moderate to low throughput satellite technology is merely a band-aid that cannot meet current demand much less the exponentially growing demand.

So how do we fill in the holes to give everyone access to true high-speed broadband that has scalable technology to meet growing speed and capacity requirements?

Even though current Federal programs are constructed to fix the basic problem of access, their requirements effectively preclude those they are designed to help. An example is a recent program that required an area to have 90 percent of the population to lack coverage—sounds logical doesn't it? So, consider a farming area with a central village. The village population overwhelmingly exceeds the farming one and therefore 90% can't be achieved. The measurement is correct economically from a cost per person served basis but fails miserably to provide access to rural areas where modern agriculture requires cutting edge technology to effectively manage the process of growing our food supply not to mention the children of farmers who need access to all the educational tools and resources now available.

The only solution to this issue is to base local, state and federal programs on the goal of reaching every address in the United States. That means scrapping the use of census blocks to define coverage, availability, financing, etc. Very simply census blocks are both confusing and lead to some bizarre results. A perfect example is the street behind my house—German Church Road. Like many streets, it bisects two census blocks, one which was granted money for broadband and the other wasn't, so a provider doesn't get reimbursed for providing service to the other side of the street.

Clearly every address that gets electricity should get broadband. Just like electricity which runs many devices essential to our lives, large capacity communication capability is far more than voice, internet, email and tweets. We are still in the early stages of what big pipe connectivity can do beyond those mentioned with efficiencies in health care at the top of the list.

It is no longer practical to separate internet access from voice and television since they all come over the same wire, fiber or frequency. Two out of three can't be ubiquitous while one remains unavailable. It is more important than ever in this economy to ensure every business and every person is connected to the content they want just as they can speak to anyone via traditional POTS. The Commission as a regulatory body needs to expand its vision to encourage expansion of existing technologies and leave the door wide open for new ones that will enable even more ways to both connect and ensure security.

Finally, Congress must act to first rationalize the myriad number of competing programs that ostensibly are in place to facilitate the expansion of broadband and then expedite the actual work being done, completed and importantly measured so that suppliers meet the needs of consumers.

Thank you and I am happy to answer any questions you may have.

David P Berman

Co-Chair, Connect Columbia

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Statement by

Jason Miller
General Manager
Delhi Telephone Company
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Before the

United States House of Representatives
Committee on Small Business

Closing the Digital Divide: Connecting Rural Americans to Reliable Internet Service

October 4, 2019

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October 4, 2019
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INTRODUCTION

Congressman Delgado, thank you for the opportunity to testify on the importance of rural broadband and closing the digital divide.

My name is Jason Miller. I am currently the Vice President, Treasurer, and General Manager of Delhi Telephone Company (DTC – founded in 1897) and DTC Cable headquartered in Delhi, New York. I started with DTC in May 2008 and have held various roles within the company over the past 11 years, becoming GM in 2013. Delhi Telephone is a local rural telecommunications provider serving areas (or will be serving) in the Towns of Delhi, Bovina, Meredith, Kortright, Unadilla, Franklin, Hamden, Walton, Tompkins, Masonville, Afton, Bainbridge, Sidney, Oneonta, Davenport, Worchester, and Maryland.

DTC currently provides our customers with local telephone, long distance, internet, television, security, and IT consulting. DTC has over 35 employees and over 3,500 customers. In addition, we have partnered with Margaretville Telephone Company and the Delaware County Electric Cooperative on the Delaware County Broadband Initiative (DCBI) since 2015. As part of this partnership, DTC has a total of $30 million (DTC portion) in New York state grant awards. DTC will be completing 1,200 miles of fiber optic builds, passing approximately 15,000 homes, mostly outside of the telephone franchise service territory. DTC is also an Alternative Connect America Cost Model (ACAM) company, and DTC Cable has received $2.1 million in Connect America Fund (CAF) Phase II funding being provided in partnership with the New NY Broadband Program to deliver robust voice and broadband services outside of its historical incumbent serving area.

Deploying broadband takes time, and includes many hurdles – designing the network, make ready efforts (including pole attachments, easements, tree-trimming, franchise agreements, permits, etc.), construction, splicing, testing, marketing, and installations – all of which are very difficult and costly within a short time frame. We make our best efforts to accomplish these tasks in as cost effective and timely a way as possible so that our customers can enjoy the high-speed connections they need. Through our company's long experience in the industry, combined with much-needed support from the federal and state governments, we have been able to successfully deploy these networks in and around Delhi, New York for the rural residents of our community.

Our commitment to our customers is demonstrated by these investments and partnerships. Nonetheless, rural areas present unique issues to DTC and the more than 850 rural broadband providers represented by NTCA–The Rural Broadband Association that serve nearly 35% of the nation's landmass, but less than 5% of the population. Low population densities and significant distances are the root cause of why it is very difficult to build a business case to provide broadband in these high-cost areas left behind by larger providers, and to then sustain these networks and services once deployed. In order to succeed in delivering reliable internet service, it takes support at the federal, state, and/or local levels along with the aforementioned commitment to the community. It is this public-private partnership model that has resulted in getting broadband to our customers and should serve as the model for reaching and then sustaining the delivery of broadband in the remaining unserved rural areas.

Once built, our networks allow rural small businesses to communicate with suppliers and sell to new markets. They enable education of our children on par with opportunities in urban areas, and they make our communities attractive destinations for people and businesses to relocate. In rural America, that translates into economic development that produces jobs, not only in agriculture, energy, manufacturing, and other industries with a strong rural presence, but in the healthcare sector, and just about any other retail industry that requires broadband to operate.

BROADBAND IS ESSENTIAL RURAL INFRASTRUCTURE

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 2019 by Purdue University in conjunction with the Foundation for Rural Service (FRS) found that when evaluated as a snapshot in the year 2017, small, rural communications providers in the United States contributed to more than 77,000 jobs and supported more than $10 billion in economic activities across a wide range of industries just from the direct act of investing in and deploying broadband-capable networks.[1] These firms created and supported these 77,000 jobs across many different industries, and included direct, indirect, and induced jobs. For every job created by an NTCA member in the study group, almost two additional jobs (1.9) were created due to the interaction with other industries such as manufacturers of semiconductors, professional engineering firms, certified public accountants, and legal counsel.[2] Looking more broadly beyond the economic benefits associated specifically with network construction and deployment activities in rural areas, a recent study by the U.S. Chamber Technology Engagement Center (C_TEC) found that up to $47 billion a year could be added to the U.S. economy and more than 360,000 jobs would be created over the next three years if digital connectivity and adoption of online tools improved among rural businesses.[3]

Indeed, the broader socioeconomic benefits of broadband services for users and communities cannot be ignored. A Cornell University study, for example, found that rural counties with the highest levels of broadband adoption have the highest levels of income and education, and lower levels of unemployment and poverty.[4]

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 tele-psychiatry. One study found that doctors in rural emergency rooms are more likely to alter their diagnosis and their patient's course of treatment after consulting with a specialist via a live,

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[1] Job Creation From Rural Broadband Companies, Roberto Gallardo and Indraneel Kumar, Purdue University (August 2019).
[2] Ibid.
[3] U.S. Chamber Technology Engagement Center (2019).
[4] Broadband's Contribution to Economic Health in Rural Areas, Community & Regional Development Institute, Cornell University (February 2015).

interactive videoconference. Other benefits accrue in the form of distance learning. A shortage of teachers in parts of rural America means public school districts rely on high-speed connectivity to deliver interactive video instruction for foreign language, science, and music classes.

Despite this great progress, many parts of rural America still need better connectivity. Thirteen percent of NTCA member customers don't have access to even 10/1 Mbps broadband. And while the Federal Communications Commission (FCC) has indicated that 90 percent of Americans already have affordable access to 25/3 Mbps service and many urban consumers and businesses benefit from 100 Mbps or Gigabit speeds, broadband access in rural America lags behind urban areas despite the best efforts, innovation, and entrepreneurial spirit of NTCA's members. According to NTCA's 2018 Broadband/Internet Availability Survey Report, even as NTCA members have led the charge in deploying higher-speed broadband in rural areas, nearly 30 percent of NTCA member customers are still unable to receive speeds in excess of 25 Mbps downstream.[5] And even where broadband has been deployed, sustaining it in areas where consumers are scattered across great distances is itself a substantial and often underappreciated challenge.

The rural broadband industry has a great story of success, but we also have much more work to do – and this is where public policy plays such an important role in helping to build and sustain broadband in rural markets that would not otherwise justify such investments and ongoing operations.

KEY PRINCIPLES FOR BROADBAND DEPLOYMENT AND SUSTAINABILITY

As policymakers consider potential initiatives to promote broadband infrastructure deployment – including execution of USDA's ReConnect Broadband Program and implementation of the FCC's upcoming Rural Digital Opportunity Fund (RDOF) – we believe it is essential to build upon what has worked to date, leveraging successes, and taking account of lessons learned from prior efforts. In doing so, there are several key principles that should guide next steps on infrastructure policy. These principles include: providing federal support to make the business case for investment and ongoing operation; leveraging existing experience and expertise; making long-term capital investments; targeting resources for new construction; coordination of efforts among governmental programs; streamlining construction processes; and ensuring accountability for any recipients of scarce federal resources.

Robust broadband infrastructure is crucial to the current and future success of rural America. Small, rural telecom providers like DTC are deploying faster broadband throughout their service areas, but no carrier – regardless of size – can deliver high-speed, high-capacity broadband in rural America without the business case to justify and then recover the initial and ongoing costs of sustaining such infrastructure investment in high-cost areas.

Many federal efforts are now dedicated to the pursuit of universal service and broadband connectivity across rural America. Since December 2018, three significant federal measures have

[5] NTCA 2018 Broadband/Internet Availability Survey Report (2018).

advanced these efforts: (1) the most recent Farm Bill became law and added a grant component to the existing loan program with hundreds of millions of dollars authorized for USDA's Rural Utilities Service (RUS); (2) the ReConnect Broadband Program also launched at RUS with $1.15 billion in appropriated funds for loans, grants, and loan/grant combinations; and (3) the FCC announced the rollout of the RDOF, which will include $20.4 billion over the next ten years. While the rules of some of these programs are still to be written, all of them will hopefully aim for higher speeds in rural communities to be comparable with their urban and suburban counterparts. As these programs move forward, it is also important that policymakers strive to use limited resources to focus not only on speed, but to focus on lowering latency and improving service quality for customers so that they can truly participate in the digital economy. In addition, legislators have wisely included language in these programs to prevent overbuilding, with the prudent goal of preserving scarce federal resources and distributing them most effectively. It is no longer a debate within either policy circles or the federal government itself as to whether ubiquitous broadband is essential for all Americans – it is an accepted fact, with these many complementary efforts being dedicated to the pursuit of this goal.

THE IMPORTANCE OF MAPPING

Accurate broadband mapping data is also critical to the ability to deliver and sustain service in rural America – and bad mapping data risks leaving rural consumers stranded without broadband. Without any meaningful validation process or the ability to challenge the "FCC Form 477" reports submitted by providers that are translated into the FCC's maps, much-needed support through the FCC's Universal Service Fund (USF) program is being denied in areas where that support is in fact very much needed – which then translates into rural consumers not getting served. And that is perhaps the most important part of this problem. While improving the maps on the front end is undoubtedly important and is attracting much of the attention these days, without any ability to validate or correct on the back end the self-reported data that gets populated into these maps and is then used by agencies to decide where funding should go, the end user is ultimately the one who suffers. Thus, even as there is a push to improve the standards and granularity of how providers report, it is equally important not to forget the importance of making sure that there is some opportunity to "double-check" the accuracy of the data being self-reported by providers.

The FCC has taken significant strides recently to move toward more granular and accurate broadband availability data collections and maps – and it is seeking input now on how to implement these measures and possibly take additional steps to improve our nation's broadband maps. But Congress has an important role here still and can and should provide vital guidance and direction to the FCC on how to proceed next.

CONCLUSION

Due in large part to the commitment of leaders like Congressman Delgado and others on this committee, small, rural broadband providers like DTC and others in NTCA's membership have made great strides in reducing the digital divide in rural America. But the job is far from done. Adhering to the broadband principles I outlined, combined with better broadband maps, can play

a key role in making sure that we both build broadband where it is lacking and sustain broadband where it exists today.

Robust broadband must be available, affordable, and sustainable for rural small businesses and underserved populations to realize the economic, healthcare, education, and public safety benefits that advanced connectivity offers. As noted in this testimony, it takes an effective mix of entrepreneurial spirit, access to capital, commitment to community, and federal USF support to enable and sustain deployment of communications infrastructure in many parts of rural America.

On behalf of DTC and NTCA–The Rural Broadband Association, your commitment to identifying and solving these challenges is greatly appreciated. We look forward to the continued discussion and advancement of measures such as those being considered today. Thank you for inviting me to be with you, and I look forward to your questions.

MIDDLEBURGH CENTRAL SCHOOL DISTRICT
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October 2, 2019

As a Superintendent of a rural school district, I am sure it is not surprising that I am going to state that having affordable and reliable broadband access is important and critical in today's learning environment. As a Superintendent of a rural school district it is even more important and critical to close the achievement gap, break cycles of poverty and make sure that all students have equitable access to high quality learning opportunities with integrated technology.

As I am sure you know, classroom instruction now relies heavily on Internet and Broadband access. It is deeply integrated in every aspect teaching and learning in our schools. Yet, students in rural school districts are still having issues getting broadband into their homes and often have to travel to get to a usable (sometimes not even reliable) broadband source to complete their homework and research. They are at a disadvantage, not only with their own classmates but also with students in the more populated and well -resourced parts of the State and country.

We have been fortunate in the Middleburgh Central School District that MIDTEL has had DSL service and now Fiber to the Home service to nearly all of our students (in a district of 181 square miles). It has helped us begin to meet our goals of general academic improvement and state/federal accountability designations, but our work has just really begun. Our vision in Middleburgh-is to utilize our soon to be awarded 1 million dollars in Smart Schools aide to provide all of our students with access to university caliber technology and technology integration. All of our 7-12 students will have their own laptops to take home with them to continue their studies, research and projects. All of our homes need internet connectivity is to realize the promise of this initiative.

In closing, reliable and affordable broadband is critical to the success and advancement of students in rural school districts. Without it the digital divide will continue to widen and the viability of our rural school districts are in danger.

Thank you for inviting me to speak and allowing me to share my thoughts on rural broadband and its importance to rural school districts. I welcome any questions you may have.

Sincerely,

Brian P. Dunn
Superintendent of Schools

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October 1, 2019

Testimony to The Committee on Small Business, "Closing the Digital Divide: Connecting Rural Americans to Reliable Internet Service."

My name is Clifford Belden, and I am a physician and the Chief Medical Officer at Columbia Memorial Hospital, located in Hudson, NY. My testimony today will be focused on the impact that broadband internet access, or the lack thereof, has on the delivery of healthcare in rural areas.

There are 3 broad areas where the impact of broadband is felt in the delivery of health care – it impacts the patient, the location and types of services available in a facility and has a sometimes-unrecognized effect on our workforce.

First, the patient. The patient is the center of why organizations like Columbia Memorial Hospital exist in rural counties. Twenty five percent of the population of the United States lives in rural counties, yet only 10% of physicians live in the same rural counties, creating a significant mismatch between the need and availability of physicians. The mismatch is even greater in subspecialties, particularly for those in which there is a nationwide shortage, such as obstetrics, dermatology and child psychiatry.

Telemedicine has been championed to improve care and help bring the input and expertise of specialists to rural communities and their patients. Telemedicine has many different forms, including:

- Face-to-face teleconferencing between the patient and a provider at their home or a medical facility
- Consultation between physicians or other health care providers, either in real-time or asynchronously
- Remote monitoring of patients with certain medical conditions
- Tele rehabilitation for patients at home
- Education of patients at their home

A recent study (*JAMA Intern Med.* Published online July 29, 2019 doi:10.1001/jamainternmed. 2019.2234) looked at the use of telemedicine visits in rural counties and found over 50% more use of telemedicine visits when the rural county had high wired broadband availability. When broadband has a high penetrance in a community, its citizens learn to use and trust the technology, which leads to acceptance and adoption of these new tools and technologies. In communities with low broadband penetrance, there are fewer potential users of the technology, and those end-users are slower to adopt the technology, resulting in a challenge for health care organizations to make large investments in developing patient facing programs centered around telemedicine.

Remote monitoring of patients with medical conditions such as congestive heart failure (CHF) and chronic respiratory illnesses (such as COPD and emphysema) can have a dramatic impact for a patient. For patients with CHF, remote telemonitoring decreased hospital admissions and readmissions, mortality, and improves overall quality of life. Similarly, treatment costs, readmissions and admissions are lower for patients with COPD when remote monitoring devices are employed. At Columbia Memorial Hospital, we have begun to use remote telemonitoring for some of our patients. Without broadband access, however, the monitoring equipment requires a dedicated cell phone to send the information to the remote monitoring systems. To offer the service, we provide a cell phone with a data plan to each patient that is remotely monitored, which makes the widescale spread of remote telemonitoring significantly more expensive than if it simply used an existing broadband wireless network, and impossible in areas that also lack cell phone signal.

Second, the location of medical facilities and types of services available in those facilities are dictated by the availability of broadband. Reliable broadband internet access is critical to the provision of medical services in 2019. Our organization has one office remaining that does not have reliable commercial broadband access, and simple tasks such as viewing an x-ray are challenging, and two do not have dedicated point-to-point connections, necessitating the use of a virtual private network (VPN), which is less efficient. Two of our outlying facilities rely on broadband using nearby microwave towers. Placement of an orthopedic office, urgent care center or facility that provides x-ray or ultrasound services is nearly impossible in a location that does not have commercial grade broadband access.

Ideally, broadband networks are redundant to ensure near 100% uptime for healthcare facilities. In areas with poor broadband penetration , redundancy is lacking. Typically, there is a single fiber backbone even if there is more than one broadband provider, which can lead to more frequent outages.

Finally, access to broadband at home is a requirement for many healthcare workers. Medical specialists, such as orthopedic surgeons, neurologists, neurosurgeons, radiologists, pulmonologists and urologists, need to review medical charts and images in a timely manner at all hours of the night. Columbia Memorial Hospital's stroke program has had the American Heart Association Stroke Gold Plus designation for the past 2 years, a program that is supported using tele neurology services from our local neurology group and teleradiology services from both a local and national group. A neurologist or radiologist that provides these services cannot buy a home in an area that does not have broadband. I am a radiologist, and the first question I asked when looking for a farm in rural upstate NY was what the internet connectivity status was. On my road, broadband cable access stopped at my house. Sixteen years later, cable still hasn't made it down the road to my neighbors.

Increasingly, it is not just specialists that need reliable broadband connectivity. It is not unusual for a primary care physician to spend 2 hours in the evening completing documentation, reviewing notes and answering questions that patients may have. Transcriptionists commonly work off-hours remotely and require broadband access. The lack of reliable high-speed internet access impacts where health care professionals can live in very tangible ways, creating regions that benefit from added potential homeowners and those that do not.

In summary, reliable internet access is a requirement for the efficient delivery of health care in the rural environment. The lack of broadband access has a negative impact on patients, their communities and the people who provide care.

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