BROADBAND MAPPING: SMALL CARRIER PERSPECTIVES ON A PATH FORWARD

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BROADBAND MAPPING: SMALL CARRIER PERSPECTIVES ON A PATH FORWARD

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TUESDAY, JUNE 25, 2019

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SMALL BUSINESS,
SUBCOMMITTEE ON CONTRACTING AND INFRASTRUCTURE,
Washington, DC.

The Subcommittee met, pursuant to call, at 10:00 a.m., in Room 2360, Rayburn House Office Building. Hon. Jared Golden [chairman of the Subcommittee] presiding.

Present: Representatives Golden, Finkenauer, Veasey, Balderson, Hagedorn, and Stauber.

Chairman GOLDEN. Good morning. The Committee will come to order. Thank you all for joining us this morning and a special thanks to the witnesses for being here today.

Reliable and affordable high-speed broadband connections are a vital aspect of doing business in this day and age. Sadly, at least 25 million Americans still lack access to high-speed internet, many of which live in remote parts of our country. We all realize it is more difficult and expensive to build out broadband networks in these areas, but that is no excuse to leave them behind.

To do so results in a divide between our urban and rural economies that reduces economic opportunity for millions of Americans and small businesses. In fact, more than 26 percent of Americans in rural America lack access to high-speed broadband compared to 1.7 percent in urban areas. And people that live in these towns across the country notice: 58 percent of rural Americans believe that lack of access to high-speed internet is a problem in their hometowns.

In my home district, at least 37,000 people don't have access to a wired, high-speed internet connection and 9,000 don't have a wired connection at all. As we will discover through this hearing, the problem is likely much worse as these numbers come from counts that overestimate both coverage and speeds available in rural communities.

To achieve parity across the country Congress must work to coordinate Federal resources and make commonsense investments in targeted infrastructure projects. To do this the Federal Government must have accurate data to ensure that funds and resources are efficiently allocated to expand coverage to unserved areas.

Effectively mapping our current broadband is a necessary and obvious step. However, the current state of broadband mapping is unacceptable at best, I would say. There is strong evidence that the percentage of Americans without broadband access is much higher

than the FCC's numbers indicate. Even the FCC Chairman is on record recognizing the lack of accurate and granular data.

The Chairman has stated he will introduce an order in August to address broadband mapping. In doing so, it is imperative that the FCC develop rules that require large carriers to submit reports with more granular data. For example, instead of using census blocks, carriers can submit coverage reports based on much smaller geographic or submit shapefiles instead of Form 477 data.

But great granularity is not a silver bullet. Robust and in-depth authentication of broadband coverage data needs to be conducted to assess whether communities are truly connected. In Maine, along with Minnesota, we are using publicly available data to develop more accurate maps on behalf of the Federal Government.

Members of this committee have heard from constituents across the country about slow download speeds and spotty connections. My home state of Maine has the second slowest broadband speeds in the country. 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.

Finally, children in rural areas also need access to high-speed broadband to utilize cutting-edge educational tools so we can usher in the next generation of tech-savvy entrepreneurs. This is something the Ranking Member, Congressman Stauber, and I talked about in a field hearing in Minnesota. And this has actually in his area and I am sure in mine, too, become a bit of a real estate issue. It is something that is critically important. People want to buy homes and live in areas with access to broadband internet.

We can no longer accept that rural means digitally disconnected. Private investment is not enough and inaccurate maps are a major barrier to the efficient expansion of broadband networks across the country.

I hope that today's discussion will shed light on ways to improve data and accountability in broadband mapping. I look forward to working with my colleagues in Congress toward developing accurate broadband maps and bridging the digital divide.

I thank each of the witnesses for joining us today and I look forward to your testimony.

I would now like to yield to the Ranking Member, Mr. Stauber, for his opening statement.

Mr. STAUBER. Thank you, Mr. Chair. Good morning and thank all of you for being with us today. I appreciate your time and your interest in our hearing.

As we all have witnessed in the last decade or so, modern communications technology has provided infinite opportunities for small businesses and particularly new and exciting ones to small firms located in rural America. The growth of the telecommunications industry and the advances in the way we communicate with each other in recent history has been nothing short of amazing.

Because of this rapid advancement we have seen a revolution of sorts for small businesses, as well. Small firms communicate with potential buyers around the world. Family farmers use wireless technologies to monitor and maximize their crop production. Entre-

preneurs can launch a website from just about anywhere and, with the use of the now commonplace smartphone, can accept payments from anywhere there is a wireless signal. Most importantly, these new technologies provide the gateway and opportunity for economic growth and job creation, especially in rural America.

Today, more than 24 million Americans lack access to high-speed internet, the vast majority of whom live in rural communities. In my home state of Minnesota specifically, over 400,000 people do not have access and those that are lucky enough to have access may only have one provider to choose from.

Just last month, Chairman Golden visited my district and held a field hearing with me, with my fellow committee members, and Minnesotans Jim Hagedorn and Angie Craig on the digital divide and how we can work to ensure better broadband access to rural areas. At that hearing we discussed that in a world where choice seems abundant, many Minnesotans are left optionless. When comparing urban and rural broadband deployment, 97.9 percent of urban American has access to both and mobile broadband while only 68.6 percent of rural citizens have that same access. We cannot continue to leave our constituents behind just because they choose to live in rural communities.

Since 2011, the National Broadband Map has been a tool for consumers, businesses, policymakers, and researchers by providing a searchable way to find out who is offering broadband, what types of broadband they are offering, and where they are offering it from.

But the mapping platform has become dated as has the coverage data. The current map has been widely criticized for overestimating how many people have access to high-speed internet. Because the FCC uses the map to determine where to devote billions of dollars in broadband investment, the issue has drawn intense scrutiny from people who say they are being overlooked.

At an oversight hearing earlier this month in the Senate, FCC Chairman Ajit Pai announced that in August he will circulate an order to update the method in which the FCC constructs the map to make it more accurate and be a better indicator of where we should invest.

Today our panel of telecom providers will help us understand what goes into creating the map and how we can make it more accurate to ensure we invest Federal dollars in the right place. Thank you all again.

And, Mr. Chair, I yield back.

Chairman GOLDEN. Thank you. The gentleman yields back. And if Committee members have opening statements, we would ask that they be submitted for the record.

I would like to take just a quick minute to explain the timing rules. Each witness will get 5 minutes to testify and members will get 5 minutes for questioning. There is a lighting system to assist you. The green light comes on when you begin, the yellow light means there is 1 minute remaining, don't panic when that happens, and the red light comes on when you are out of time. And we ask that you stay within that timeframe to the best of your ability. We won't shut you down immediately if you have a quick point that you need to wrap up, please feel free to do so.

And I would now like to introduce our witnesses for today's panel. Our first witness is Mr. Tim Donovan, the senior vice president of legislative affairs at the Competitive Carriers Association, the leading association representing competitive wireless telecommunications providers. Prior to joining CCA he served as the manager of government affairs for the Direct Marketing Association, where his primary responsibility was supporting the advocacy goals of the direct marketing community. Mr. Donovan holds a bachelor's degree from Providence College where he studied English and political science. Welcome, Mr. Donovan.

Our second witness hails from Postville, Iowa, and will be introduced by the gentlelady Ms. Finkenauer from Iowa, who is the Chairwoman on the Subcommittee on Rural Development, Agriculture, Trade, and Entrepreneurship. I would now like to yield to Ms. Finkenauer to introduce our second witness.

Ms. FINKENAUER. Well, thank you, Mr. Chair. And thank you for inviting me to be a part of your Subcommittee today. This is actually not one of the ones I sit on and so it means a lot to me to get to be here and introduce one of my constituents from Iowa's First Congressional District.

I am very proud to introduce Dan Stelpflug, who is on the front lines working to provide high-speed broadband service to families and small businesses in Iowa. Mr. Stelpflug is the director of operations, engineering, and technology at Allamakee Clayton Electric Cooperative. Mr. Stelpflug manages the AC Skyways Broadband Division, responsible for deployment of new technologies and the overall strategic vision of the department.

Unfortunately, many rural communities lack high-speed broadband because of the cost to carriers to provide in these areas. In turn, this hits small businesses that need high-speed broadband to identify new customers, sell their products, and create jobs in our communities, which are very important, especially in our rural areas.

Federal grant and loan programs are designed to deploy broadband to underserved areas. To target the assistance to where it is needed, though, we do need accurate maps that are drawn from granular data and vetted by robust processes. I look forward to hearing Mr. Stelpflug's perspective on this issue, which is so important, as I said, to our small businesses back home in Northeast Iowa.

Mr. Stelpflug, thank you for coming all this way to Washington and making sure that your voice is heard.

And I just want to also take the moment to say thank you to all of our witnesses here today. Having you guys on the record telling Washington why this matters, it means so much and helps us do our job in a better way. Thank you, guys.

And with that, I yield back.

Chairman GOLDEN. Thank you very much. And our third witness is Ms. Beth Osler, who hails from Unity, Maine, in my home district. It is Waldo County. Ms. Osler is the director of customer and industry relations at UniTel, which serves approximately 5,000 homes in rural Maine. She was born and raised in Bangor, Maine, and later attended Bates College. We are both alums of Bates College.

She was first employed as a cordboard operator for New England Telephone Company. Over the next 50 years she has held positions of increasing responsibility in operator services, customer service, regulatory affairs, and legislative affairs for both large and small telecommunications companies in Maine and in New Hampshire. Welcome, Ms. Osler. It is a pleasure to have you here.

And I now would like to yield to our Ranking Member, Mr. Stauber, to introduce our final witness.

Mr. STAUBER. Thank you very much, Mr. Chair. And our final witness today is Jason Hendricks, the chief regulatory officer for the Range Companies. He serves on the board of directors for WTA, Advocates for Rural Broadband, for which he is testifying on behalf of today, and the Colorado Telecommunications Association. He is also the past president of the Wyoming Telecommunications Association. And Jason has been in the telecommunications industry for 23 years. He began his career at the Illinois Commerce Commission, then consulted for JVNW Consulting before joining the Range Companies.

Jason has a master of arts degree in political studies from the University of Illinois Springfield, a master of science degree in economics from the University of Wyoming, and a bachelor of science degree in economics from Penn State. Thank you for being with us today.

Mr. Chair, I yield back.

Chairman GOLDEN. Thank you very much. We are now going to go ahead and move to opening testimony from our panel. We are going to go out of order very quickly because Congresswoman Finkenauer has to get over to a Transportation Committee hearing, but wants to hear the opening remarks for Mr. Stelpflug. So, sir, we will now recognize you for 5 minutes.

STATEMENTS OF DAN STELPFLUG, DIRECTOR, OPERATIONS, ENGINEERING & TECHNOLOGY, ALLAMAKEE CLAYTON ELECTRIC COOPERATIVE; TIM DONOVAN, SENIOR VICE PRESIDENT, LEGISLATIVE AFFAIRS, COMPETITIVE CARRIERS ASSOCIATION; BETH OSLER, DIRECTOR, CUSTOMER AND INDUSTRY RELATIONS, UNITEL, INC.; JASON HENDRICKS, CHIEF REGULATORY OFFICER,RANGE COMPANIES

STATEMENT OF DAN STELPFLUG

Mr. STELPFLUG. Thank you, Mr. Chairman, Ranking Member Stauber, and members of the Committee for opportunity to be here to share our small business perspective on the importance of more granular and accurate broadband mapping.

My name is Dan Stelpflug and I am the director of operations, engineering, and technology at Allamakee Clayton Electric Cooperative in Postville, Iowa. We provide electricity to less than 10,000 rural consumers across 8 Northeast Iowa counties near the Wisconsin and Minnesota border. The ACEC is part of a broader electric cooperative industry represented by the National Rural Electric Cooperative Association that serves 1 in 8 Americans and covers 56 percent of the U.S. landmass. 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 cooperatives, including my own, already are working toward meaningful and diverse solutions to bridge the digital divide and jumpstart local economies.

In addition to my operations and engineering responsibilities at ACEC, I oversee AC Skyways, the broadband division of our cooperative. We have been delivering broadband to Northeast Iowa residents since 2014 using a combination of fiber optic lines and fixed wireless technologies, a "fiber to the section, wireless to the home" business model. The primary impetus for ACEC's investment in its broadband network was and continues to be to serve members who lack affordable options to access internet with at least 25 megabit per second download speeds.

My cooperative's experience with shortcomings and inaccuracies of existing federally available broadband mapping data is from the perspective of a broadband provider seeking opportunities for Federal funding and as a provider working to meeting Federal Communications Commission's requirements as an FCC Rural Broadband Experiment grant recipient.

Our first experience with inaccurate data occurred while working to comply with Federal grant guidelines. In 2014, we received a grant from the FCC's RBE Program. The grant was awarded for us to reach 665 potential customers in 209 census blocks with broadband. The potential customer total was identified by FCC data that was assumed to be correct. While preparing progress reports required by the FCC, we discovered a discrepancy in the number of potential customers. Instead of 665 locations as indicated by FCC data, we counted 510 or 23 percent less than anticipated. My written testimony outlines the process we undertook and includes graphics demonstrating differences between FCC-provided data and what we discovered to be true on the ground in our service area.

In addition, it is important to address concerns with the FCC's Form 477. We believe the FCC's existing Form 477 data overstates the availability of broadband, particularly in rural America. The concept that a census block should be deemed served in terms of fixed broadband service if one location in a census block is served is just no longer viable.

Another frustrating aspect of the Form 477 data is the reporting requirement allowing carriers to report advertised maximum speeds in a census block even if they can only provide that high speed to one customer.

While the devil is always in the details, there are steps the FCC can take to vastly improve broadband data availability. First, more granular data is needed to eliminate the false positives in classifying census blocks as served or unserved. Second, the FCC needs a system of checks and balances to help ensure providers are reporting actual speeds that are reliably available to consumers. Lastly, Federal agencies must undertake increased data verification efforts, including the implementation of a challenge process.

We appreciate members of Congress working to solve these issues through legislation such as the Broadband Data Improve-

ment Act of 2019 by Representatives O'Halleran, McMorris-Rodgers, Butterfield, Kuster, and McKinley.

Electric cooperatives know how challenging it is to build infrastructure throughout rural America to provide a service that is integral in the prosperity and future of our communities. More accurate mapping 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 and coverage, and harmonize the diverse solutions that will be required to help rural Americans keep pace with their urban counterparts. We look forward to a continuing partnership with Congress to work toward that goal.

Thank you again for the opportunity to testify here today. I am happy to answer any of your questions.

Chairman GOLDEN. Thank you, sir. We will now go back in order and recognize Mr. Donovan for 5 minutes. Thank you.

STATEMENT OF TIM DONOVAN

Mr. DONOVAN. Chairman Golden, Ranking Member Stauber, and members of the Subcommittee, thank you for the opportunity to testify about the need to produce more reliable coverage maps.

Mr. Chairman, you are correct when you recently noted that this is a gravely important issue that creates barriers that prevent rural small businesses from reaching their full potential. These maps have been called many things. Useful is not one of them. We must have reliable broadband coverage maps to meet the challenge of closing the digital divide.

CCA is the Nation's leading association for competitive wireless providers, representing nearly 100 carrier members as well as vendor and suppliers. Through the recent FCC Mobility Fund II challenge process, CCA members have firsthand experience and motivation to fix the mapping process and continue deploying mobile broadband services.

It is an exciting time in our industry as mobile connections power new technologies and improve the quality of life across the United States. 5G will supercharge these services and enable new services, some not yet even imagined. Current and future technologies depend on robust wireless networks, and without the right policies, rural America will be left behind.

Today's hearing is not only important, it is also timely. Chairman Pai recently announced that this August the FCC will vote on a report and order on updating broadband maps. I hope today's hearing can help inform that process. We cannot close the digital divide if we do not know the country's existing coverage gaps.

I am pleased to join the Committee to continue the discussion on how to produce reliable maps and to support the policies small businesses rely on. You know that the representation of coverage in the current maps in your districts is overstated and, in some cases, substantially so. The FCC and agencies across the government must work in coordination with industry to produce the most reliable coverage maps possible. The stakes are too high for anything less than our best efforts.

I would like to take a minute to talk about how we got here, as well as offer solutions for a path forward. Historically, the FCC's

Form 477 has served as its tool to determine the availability of services and to guide policymaking. However, current policies are not adequate to allocate USF support. As recently as December, the FCC used Form 477 data to report that "approximately 100 percent of the American population lives in geographical areas covered by mobile LTE." This is wrong. If this were accurate, we would not be having this hearing today.

Mobility Fund Phase II will provide $4.53 billion over the next 10 years to preserve and expand 4G services. The FCC decided to undertake a new, one-time data collection to determine areas initially eligible for this support, acknowledging that using the data to determine eligible areas would prolong any challenge process.

To the FCC's credit, this data collection included specific parameters. While taking steps to standardize the data should be commended, we now know that the parameters selected did not sufficiently improve the accuracy or credibility of the resulting coverage maps, which continue to dramatically overstate coverage, especially in rural areas. This is a significant problem as the challenge process proved to be overly burdensome, yet insufficient to correct flaws.

The problem is particularly acute for small entities that must marshal resources or reassign staff to conduct challenges rather than focus on deployment. The takeaways for this process for challenges were twofold: one, the process was so complicated and expensive that challengers large and small were never able to challenge all the areas they wanted to; and two, absent a successful challenge, too many unserved areas will remain ineligible for support.

Mr. Chairman, in Maine specifically, one CCA member collected millions of data points, but could not successfully challenge 55 percent of the area they would have challenged because of a lack of roads and resources. Your state was not alone.

Despite these problems, entities last year provided the FCC with over 20 million speed tests to challenge claimed coverage. After a preliminary review, the FCC launched an investigation into the data while suspending the next step of the challenge process.

The investigation's findings can help improve future data collections, but we already know that more robust standardization is necessary. Any model will have shortcomings, but to produce maps that are more reliable, the FCC must ask carriers to provide a detailed Radio Frequency Link Budget submission that includes the most relevant data, including signal strength standardization, increased cell edge probability, increased cell loading to more accurately reflect how mobile networks are used in rural areas, and additional clutter factors. Further standardizing these bottom line factors will produce substantially more reliable maps and reduce the need to expend additional resources to correct data collection flaws.

In conclusion, connectivity for millions of Americans living in rural areas and the small businesses that rely on those connections depend on policy decisions that are based on reliable, real-world data.

Thank you for your ongoing leadership on this critical issue and for holding today's important hearing. I welcome any questions you may have.

Chairman GOLDEN. Thank you, Mr. Donovan. Ms. Osler, it is your turn for 5 minutes.

STATEMENT OF BETH OSLER

Ms. OSLER. Thank you, Chairman Golden, Ranking Member Stauber, members of the Committee. My name is Beth Osler and I work for UniTel, Incorporated, a very small telecommunications company in Unity, Maine, somewhere between Freedom and Hope.

I am here today representing not only UniTel, but also NTCA, the rural broadband alliance of which we are a member, and they have over 850 members who are small companies throughout the United States. So I am very proud to be able to represent them today.

One of the good things we can say today is that there is no argument about whether there is a problem or not. And we all know that the problem exists, that it is particularly difficult in rural areas, and even from other remarks this morning we all know why it is happening. You cannot make a business case to invest in an area where there aren't enough potential customers for you ever to make a return on your investment. And so what we do is we fall back on the ability, hopefully, of finding private and public partnerships where we can all work together to come up with a business case that actually works. And that has happened several times in Maine and we want it to happen a lot more.

Funds are limited, so you have potentially funds at the local level, although I would say that is where they are most limited; at the state level, and we have been working hard to try to make those funds available through our agency Connect Maine; and, as you know, at the Federal level. And we all know, too, I believe, that even then, the amounts of money that could be used for this purpose do not completely make up the need.

So what happens with maps? Everybody I think tries to do their very best to provide accurate data, but because the data is at such a high level at the census block level, the ability to actually determine where there are unserved and underserved areas is often impossible. And what we do is we end up with false positives and false negatives where the FCC says there is service and we know there isn't service; where the FCC says there isn't service when we know there is service. And as you can imagine, that makes the distribution of funds pretty difficult.

So we need to make sure that these limited funds are used in the most efficient and effective way. So we have kind of three things we would like to share and I don't think they will probably be much different from any of the other witnesses.

One, we definitely need more granularity at the map level. We are perfectly interested and want to help to make that possible from our perspective.

There have to be reporting standards. If people don't know exactly how they are supposed to report or it is unclear and they misunderstand what they are supposed to do, that is going to add to your errors.

And obviously, there needs to be a challenge of validation process, which is not working now. So, for example, we had six census blocks where the FCC said there was broadband service. We said, no, there is not. But we were ineligible for any support because they claimed that they were and we couldn't challenge that.

So those three areas of consideration about mapping are probably where you will get the biggest bang for your buck, so to speak. So we look forward to working with you and anyone else that we can work with to make sure that happens. We want our customers to have good service.

Thank you for letting me testify today.

Chairman GOLDEN. Of course, ma'am. Thank you so much. And finally, Mr. Hendricks, you are recognized for 5 minutes.

STATEMENT OF JASON HENDRICKS

Mr. HENDRICKS. Good morning, Chairman Golden, Ranking Member Stauber, and members of the Committee. My name is Jason Hendricks. I am providing testimony today on behalf of the Range Companies and WTA. It is a pleasure and an honor to testify before you this morning.

The Range Companies are comprised of the parent company, Range Telephone Cooperative, and its subsidiaries, RT Communications, Dubois Telephone Exchange, and Advanced Communications Technology. The four companies provide broadband service in rural areas of Montana, Wyoming, Colorado, and South Dakota. Our combined serving area is approximately 30,000 square miles with a customer density of .54 customers per square mile.

Despite the low density and high cost challenges of our serving areas, we provide very high-speed internet service, including fiber-to-the-premise service, in many of our communities. But like most rural providers we have some areas that are cost-prohibitive to serve with speeds comparable to those found in more densely populated areas. It is these areas for which the accuracy of the broadband mapping is most important and for which the current FCC mapping mechanism is the least accurate. My testimony focuses on goals to improve broadband mapping without being overly burdensome to small providers with limited resources.

The current broadband map is derived from data reported by broadband providers twice a year on Form 477. Problems with the current broadband map include the use of advertised speeds rather than actual speeds; lack of granularity through the reliance on census block, which can be very large in rural areas; overstatement of availability when entire census blocks can be shown as served if only a subset of it is actually served; understatement of availability due to a delay from when information is provided to when it is shown on the map; the use of inaccurate customer location data; and regulatory burdens associated with data collection.

Between our four companies we are required to provide broadband data on over 7,000 census blocks. Yet census blocks can be upwards of hundreds of square miles in size and are often ill-fitted to population clusters. For example, we are required to provide data on a census block that is 366 square miles with 19 locations.

I will provide you with an example of the problems that can occur when census blocks are used to determine broadband availability. RT Communications serves the town of Hulett, Wyoming, which is near the Nation's first national monument, Devils Tower. RT provides 100 megabit service in town, but there are locations outside of town that we haven't been able to serve with speeds of 25 megabits per second or more due to the high construction costs. We have looked at pursuing grants to defray some of the construction cost to serve those locations. However, the large census block is considered served because it includes a small portion of a well-served town. Were a better mapping system used, the outlying locations could be properly identified as unserved so that the funding could be targeted to the locations in need. Similar examples can be found throughout our serving areas.

The Range Companies are supportive of efforts to achieve more granularity in broadband mapping to ensure that broadband funding goes to areas most in need. We offer four goals for a new broadband mapping system.

First, we request that the reporting requirements not be overly burdensome for small providers. Second, we request that the mapping methodology be used for all state and Federal funding decisions so that providers are not subjected to reporting requirements that differ across jurisdictions. Third, the process used to verify the accuracy of the data should be meaningful and minimally burdensome to small providers. Fourth, a streamlined challenge process should be used to ensure broadband availability is not overstated and that support goes to areas of need.

Two mapping proposals that are gaining traction involve the use of shapefiles and location fabrics. We believe these proposals need not be mutually exclusive and both can be adopted over time.

In the near term, we are supportive of the shapefile proposal. It can be easily accommodated with our existing mapping capabilities. It can also be more representative of network architecture, community boundaries, and the locations of outlying customers and rights-of-ways. And it can be overlaid on multiple types of premise location platforms.

We are cautiously optimistic about the location fabric proposal. We are fully aware of the errors contained in the current location databases and we are hopeful that a more accurate database can be developed.

We are looking forward to results of the pilot project on the proposal. We do believe, however, that the shapefile reporting process can be created and used prior to the development of a customer location fabric.

With respect to the FCC's order that is due in August, I will be working with WTA to provide comments to the FCC in advance of the order's release to be consistent with the positions I provided in my testimony today.

I thank you for the opportunity to speak with you.

Chairman GOLDEN. Thank you very much, Mr. Hendricks. Very quickly, before we move to questions from members, I would like to submit this letter from USTelecom, the broadband association, for the record. Without objection, so ordered.

At this point we are going to go ahead and move to member questions. And I am going to start by recognizing myself for 5 minutes.

Mr. Hendricks, I had some good follow-up for you, but I am going to hold off and maybe we will come back to you later because I know that we have got two members up here from Minnesota who I am sure will want to have some back-and-forth, including Mr. Stauber, who should be back very quickly.

First, Ms. Osler, I thought I would ask you it seems like you have spent a lot of time working or trying to work at the local, state, and Federal level and pulling different resources together. And I have seen that repeatedly across the state. So I wanted to ask you, you know that last year the FCC decommissioned the National Broadband Map and came out with the Fixed Broadband Deployment Map, which uses the FCC Form 477 submissions. It has been criticized as overstating coverage, as you have heard and I think agreed yourself.

Earlier this year, NTIA announced a pilot program among eight states to include Maine and Minnesota to collect broadband to update the National Broadband Map. What role do you think states can play in helping the Federal Government get more accurate data working at the local level and state level? And what kinds of barriers are there to doing it? Do you need resources or help?

Ms. OSLER. Thank you, Mr. Golden. I think the closer to the ground that you get, the more accurate your data will be. And so I think it can only be better if the local/state folks do their part to help make the Federal data accurate.

I think that it is likely that there will always be errors. We are human and everyone is, I hope, so there are always going to be errors. And that is why we should also have a consistent way of letting people know when the data is inaccurate and a way for it to be accepted and verified and made appropriate.

We all look forward in Maine to working with whoever can help solve this problem because it is affecting us and will continue to affect us more and more as we go forward.

Chairman GOLDEN. I appreciate that very much. I think it strikes both the Ranking Member and I that there are a lot of different programs that Congress has put forward, you know, whether it be through USDA or other areas, things are rather spread out. But you can create these great programs, but if you are creating barriers to accessing them in terms of these mapping requirements that hold people back, first you have got limited access to those resources and, secondly, this issue of being able to challenge that information with that local data that you are collecting seems to be a real significant problem and one that I hope we can work on.

It is upsetting to hear that there is not a robust back-and-forth where you can go to the Federal Government to feed the information that you are working hard to gather on behalf of your people.

Ms. OSLER. Yes, and the more inaccurate the maps are, the more frustrating it must have been for the FCC to try to come up with a way to fix it. I think they got overwhelmed probably. But there has got to be a better way to do it and I think that part of it is getting down into the data further, so that those kind of overriding errors don't—they spread essentially because if you have one

error that shows someone in a census block when they are not there, then not only is that location wrong, but everything in the whole census block is wrong.

Chairman GOLDEN. Thank you for that testimony. I appreciate it.

Real quickly, I will throw this one over to you, Mr. Donovan, and anyone can jump in. We only have a minute, though. But this issue of advertisement speeds and just one person being able to get a speed and all of a sudden you can advertise. You know, you have got this wonderful coverage. It reminds of truth in advertising type issues. Do you think there is any work that needs to be done to try and make sure that companies are advertising accurately what you can expect?

Mr. DONOVAN. Sure, I think it is both what you can expect as well as where you can expect it, especially when you are talking about mobile service. People expect your cellphone to work for you. That is why you buy a mobile device. And so getting into some of this fundamental data, as my colleagues on the panel were talking about, as a starting point is necessary before you can layer anything else on top of that.

Chairman GOLDEN. Thank you. I am just about out of time, but I would say quickly we heard this in our field hearing in Minnesota, and we are doing another one up in Maine in the fall, but, I mean, a big manufacturing company talking about how the speed advertised would be sufficient for his business and perhaps the speeds are there when there is low usage late at night, but when it is time to do business and people are at work the speeds just aren't there as advertised so it is a significant problem.

And I did want to point out before I cut myself off and hand it over to the Ranking Member, for those of you that are in the crowd, in the audience, or listening in back home, Ms. Osler from Maine, if you are looking for a wonderful place, you heard her talking about Waldo County, Maine, with such friendly town names as places like Freedom, Hope, Unity, and Friendship. It is actually Waldo and Knox County, but just an amazing, wonderful part of the country and the names of the towns speak to it.

So with that, I am out of time. Thank you, ma'am, for joining us. And I will now recognize the Ranking Member.

Mr. STAUBER. Thank you, Mr. Chair. Waldo County sounds like the entire state of Minnesota, thank you.

So, Chairman Golden, I want to just publicly thank you for coming to our state, my state of Minnesota to have that hearing. That generated a lot of interest. And as you know, one of the questions I asked to the business owners is had he known when he started the business would he locate in that same spot with the lack of internet access? He said absolutely not, and that is rural Minnesota.

And I think the four of you, I want to thank the four of you here because you understand that rural America matters. And that is a district that I am fortunate to represent and your testimony is congruent to that thinking. And so the expansion of broadband, the deployment in rural America, we bring our businesses. And I feel it is a choice of quality of life and just the opportunity to be able to

have that small business anywhere in this country you want is so important.

So my first question will be to Mr. Donovan. You know, couldn't we get better maps by leveraging government to help collect more and better data? For instance, there are Federal employees that roam all over the country, probably all of whom carry a mobile phone. Could an app or a program run an automated coverage scan while carrying out their regular duties? And would that help gather a deeper understanding of what coverage looks like in rural America?

Mr. DONOVAN. Thank you for the question. So, yes, you know, Federal employees could collect this data and that would be particularly useful in verifying where coverage does and doesn't exist.

To the question before on, you know, the speeds available, too, that also speaks to one factor that is measured in this called the loading factor, where if people are using the network heavily, you are not going to get the same speeds. And so, as we are building these maps it is important that the FCC sets that right loading factor to actually reflect how people are using these networks in rural areas.

While it is useful for verifying based on the employee's usage, I still think we need to start with more granular data coming in from the carriers. You can then push some of the burden. You know, part of the problem in the challenge process was the burden was all put on small entities, on state and local governments. If you start with better data, you can verify it through programs like what you discussed with Federal employees and shift that burden away from state and local government or private entities to prove the negative where they know that there isn't service.

Mr. STAUBER. Thank you very much. Ms. Osler, our Committee consistently hears from small entities that the Federal Government should not adopt a "one size fits all" data collection to mapping purposes. Can improving the broadband map be done in such a way that the smaller telecommunications have an easier time of it when compared to the larger ones?

Ms. OSLER. I think it is perfectly fine if there are different ways of gathering the data. My company has 25 employees. We know where every single building is in our property. We would love to just be able to tell people that and I think a lot of small companies could do that, too.

The issue to me, though, is that over and over again when there is an error, it would be so easy to fix. And so the validation, the ability to challenge what seems like more of a negative word, but the opportunity to work together to make sure it is correct is——

Mr. STAUBER. And I like that word, "the opportunity"——

Ms. OSLER. Right.

Mr. STAUBER.—to be able to, you know, fix or bring data that challenges what you have been given or what you have shown by the bigger telecommunications company.

So to the four witnesses, this is a map of Minnesota that says that a great part of Minnesota is covered. This map to me is not accurate. There are places that say it is covered, I know, I have been there, it is not covered. And so I think the accuracy is so important.

And that is why you bring from your business experience, that rural mentality, you bring part of the equation and part of the answer, and I think a big part of the answer. Because we know that—I am not concerned so much in the metro or urban areas in the big places of Minneapolis or St. Paul or Rochester maybe or even in the center of Duluth, which is the biggest city in District Eight of Minnesota. The concern is you have the ability to help augment the map when it is wrong and bring some solutions to us.

And before my time runs out, I just want to tell you how much I appreciate you being here and that it matters. Your experience, you have just as much knowledge and experience as some of the bigger companies and we need that. And our goal is to invite you into that process. As you said, Ms. Osler, the accuracy matters.

And my time is running out. I have run over. Thank you, Mr. Chair, and I yield back.

Chairman GOLDEN. The gentleman yields back. And we will now recognize Representative Abby Finkenauer, the Chairwoman of the Subcommittee on Rural Development, Agriculture, Trade, and Entrepreneurship.

Ms. FINKENAUER. Well, hello there. Thank you again, Mr. Chairman, for letting me to sit in on this Subcommittee today and thanks again for everybody being here.

Mr. Stelpflug, thank you again for traveling all the way from Iowa's First District. And, you know, I know in your testimony you compare the digital divide to the struggle that rural America faced nearly 80 years ago when the U.S. began deploying electricity. As a person with many years of experience in the electric industry, what were your experiences in developing networks in remote areas? And what are some of the lessons that we can learn from that process you want to make sure we hear loud and clear?

Mr. STELPFLUG. Some of the areas, when we started building our broadband network, you know, I am from an REC and we built the electric network that covers 56 percent of the landmass of the United States. We used a lot of community development folks to help us out to get things started. We have groups of people that come together that say if you can get broadband to our area, we will serve you or we will provide the customers. So, you know, they are giving us some solutions to some problems when we question how many customers we can actually get.

So we are taking a similar approach to the way the broadband is expanded out. And it is an expensive venture and we have to do it in a prudent manner; sometimes we just can't afford to do it. So we rely on a lot of these communities to help us out with that kind of thing.

Ms. FINKENAUER. Yeah.

Mr. STELPFLUG. Everyone is kind of coming together as a group to work toward a common goal.

We have a small town in Allamakee County that is a county seat that doesn't have adequate service and, you know, it is a town of 3,000 people. The city contacted us, their economic development people, asking if we could expand service to their area and they volunteered to send out surveys and that type of thing to find out what coverage would be to see if it would be a viable option for us.

So that is kind of an example of the way the communities are asking us to help them out.

Ms. FINKENAUER. Great.

Mr. STELPFLUG. We are taking that same approach as we did with the electric alliance years ago.

Ms. FINKENAUER. Okay, thank you. And wondering, too, if you could make sure, again, that Washington here has, you know, a little bit different perspective. I always take every opportunity I get to remind this Committee that our farmers are also small businesses. And as much as, obviously, we need broadband and rural broadband to attract small businesses to our Main Streets in rural Iowa and rural areas across the country, our farmers also rely on this because of PrecisionAg and how technologies are changing.

So I am wondering if you would be able to touch on that, too, given the rural nature of Allamakee and also Clayton County and how important that might be.

Mr. STELPFLUG. Yes, it is very important to the agricultural community. Everything from the dairy farmers to the crop farmers that are looking at real-time markets and are making plans as far as their budgets are concerned, and they need to have good internet access to do it. We have a lot of areas that it is just not available. They are in some pockets that are really not very populated and it is hard to justify extending to some of these areas. But these farmers are really dependent on the internet and they are kind of falling behind just because they don't have access to these markets.

We hear of people that go to local libraries to do work on some of this stuff to figure out what they are going to to. You know, they are in a tough spot and to stay competitive with everyone else in the country they need access to broadband.

Ms. FINKENAUER. Absolutely. Thank you, Mr. Stelpflug.

And I have just a minute left here, so this is just to the whole panel. Obviously, have increasingly seen how small firms benefit from broadband access. And it is actually hard to imagine how any small business would survive without the internet, including our farmers.

To the panel, you know, how can we encourage more businesses to adopt the technology and take advantage of the innovations brought by faster broadband? If anybody want to touch on that. Ms. Osler?

Ms. OSLER. Yes, thank you.

Ms. FINKENAUER. Yeah.

Ms. OSLER. I think one of the things people don't talk bout a lot, and I know we are talking about mapping right now, but is that there are a great many small businesses who don't understand what the use of the internet could do for them. We did a survey a few years ago in our territory and 40 percent of the small businesses, a lot of them at-home businesses, did not even have a website.

Ms. FINKENAUER. Oh, my goodness. Wow.

Ms. OSLER. So I think there is a wonderful opportunity and we at UniTel have actually been doing this of providing digital literacy training, not only what you want for service, but how to use it. I mean, we had people in those classes that we had to teach how to turn on the computer and then we had other people who wanted

to learn how to use QuickBooks so that they could run their business from home. This is a wonderful opportunity that we are looking forward to taking advantage of.

Ms. FINKENAUER. Well, thank you so much, Ms. Osler. And I know my time is about to expire, so I just want to say thank you again to all the folks here.

And thank you, Mr. Chair, again for letting me sit in on this meeting.

Chairman GOLDEN. Happy to have you join. Thanks for coming.

We now recognize Representative Jim Hagedorn from Minnesota One.

Mr. HAGEDORN. Mr. Chairman, thank you for holding this hearing. I appreciate that you and Ranking Republican Stauber made it up to Minnesota. That was a good hearing. And I think these continued hearings on the subject can be very important and I pledge my support to all of you.

I think everybody in the room is on the same team. We want this to work. We want to help out the folks in rural America and make sure that the people that happen to live outside of big cities have the same opportunities, as Congressman Stauber said, as the folks in the big cities. And it is a basic infrastructure issue.

I mean, let us face it, I agree with my colleague from Iowa, this is a lot like the REAs and delivering that last mile or two of electricity to the farms out there to make sure everybody was up to speed on that, roads and bridges, sewers, water, whatever it is. And now it is broadband and this is just a quality of life issue and it is something that we have to keep pushing and make sure it gets done as it is very critically important for our folks out there in our counties.

So, you know, when we were at that hearing up in Minnesota, Congressman Stauber's constituent, a small business guy, and he is talking about he is right, you know, if you had to look back and do it all over again, he would probably wouldn't have even tried. And there is a lot of opportunity costs out there that we are missing. But there are businesses in rural communities right now that would like to expand and they are like, eh, you know, what is the cost of labor? What is the cost of this? Do I even have broadband service to the point where I could expand my operations?

There are probably bigger sized businesses that would like to move into parts of Southern Minnesota and they are like, you know, not going to fiddle with it. We are just going to go where it is taken care of. So whatever we can do to move this along, like I said, you have my support.

I agree with Pete, looking at this map of the First District of Minnesota, and it says here 98 percent is covered. But then you look at what real speeds are, maybe only a third, and you can't do business that way.

And then when you get down and you are looking in the future and you have a lot of folks in rural areas, veterans, others, elderly people, and they want to do telemedicine, so maybe they don't have to travel 50 or 100 miles or they can get care right away. It could be also people with mental health care and things of that nature. Doctors need to be able to see the charts, you need to be passing

things back and forth, you need to make sure that it all makes sense.

And for our farmers, you know, a lot of livestock out there fed every day with mechanizations all run by the internet. That goes haywire, it doesn't work, that is rough on the animals, rough on the operations. And so we got to get it right.

Mr. Hendricks, I liked what you said about making sure that whatever they do in the future that we don't have onerous regulations and things that the burden would be borne too much by small business, by the smaller telecommunications companies, and others that are delivering this. Do you think it is pretty important that when we have businesses in these areas that they are the ones that can do the service, that they are the ones that are going to be in those communities long term? Or what are your thoughts in general on making sure that we protect the small businesses that are doing this work?

Mr. HENDRICKS. Thank you for the question, Congressman. And just a clarification that your question on small businesses is the small providers that are doing the work in the areas? Is that correct?

Mr. HAGEDORN. Yeah.

Mr. HENDRICKS. Yes, I think that is very important. I mean, we care about the communities we serve. We live in the communities. You know, it is not just a profit maximization thing. It is a serving the community thing.

And for us, if we can have a methodology to provide broadband mapping that fits in with our current systems, which I think the shapefile proposal does, I think that that makes sense. I think that you will end up solving a lot of the issues that you guys have been talking about as far as knowing individual areas.

You will be able to put a shapefile, for example, around a town, that area is well served. Maybe a community outside of town you put a shapefile over that, or a polygon I should say, and maybe that is at a lower speed. And then the more remote areas, they can be signified with lines and dots. And I think that fits in well with capabilities that we have for a small business.

Mr. HAGEDORN. Might know the area and customers better. Might have more of an interest in making sure that it gets done right and that the people are serviced long into the future because they are probably going to be doing business there for a long time.

Mr. Donovan, real quick, when they figure out these speeds and they say potentially 25, 3, whatever, is that just per person or is that per every 100 users or how do they do it?

Mr. DONOVAN. So for wireless service it is based on a model. You put in these different factors and then this is the minimum speeds you get. And the factors that you use make a real-world difference.

So as a quick data point on that, if you will allow me a few more moments, in the Mobility Fund data collection they required wireless carriers to report where 80 percent of the cell edge. So where the distance is where you have an 80 percent likelihood of getting the speeds. We now know that that is too low. So carriers build to at least 90 percent cell edge, public safety is 95 percent. That 10 percent difference turns out into a 27 percent difference in the cir-

cumference of the cell service and a 60 percent difference of the area covered. So that 10 percent ends up being a huge area that claims that there is service where it actually is not up to those minimum speeds.

Mr. HAGEDORN. So they should upgrade some of those standards?

Mr. DONOVAN. Yes, sir.

Mr. HAGEDORN. Thank you.

Chairman GOLDEN. Thank you very much. We now recognize Representative Marc Veasey from Texas.

Mr. VEASEY. Thank you very much, Mr. Chairman. Good morning. I would like to thank the witnesses for being here today to discuss the need for better and more comprehensive mapping of the current availability of broadband across the USA. And as someone that has heard a lot about this issue, and, as a matter of fact, I signed onto a letter led by my colleagues on another Committee that I serve on that question the data relied upon by the FCC to determine where and how extensive broadband deployment is across the U.S.

Coming from the state of Texas, where there is more rural area than urban area, it is important to ensure that rural residents are able to participate in and benefit from our increasingly technology-reliant society. And I represent all urban Texas, but, again, in order for our state to continue to grow and prosper this is a hugely important issue.

I am old enough to remember going to my cousin's grandparents' house, out in what we call the country, out in Palestine, Texas, and where they still didn't even have indoor plumbing back in the late 1970s and 1980s. And people don't realize how long it takes for rural America to oftentimes get connected to the rest of what is going on in the world and this is very important.

Mr. Donovan, in your testimony you spoke about the FCC allowing a load factor of 30 percent, which failed to accurately reflect mobile broadband in rural areas. Given the increased reliance on mobile devices in many rural communities do you believe that tightening the FCC's parameters as mentioned in your testimony will have the effect of helping close the digital divide between rural and urban areas?

Mr. DONOVAN. Yes, sir, and thank you for the question. So if you have that load factor set too low, at 30 percent, then people aren't actually going to be getting the speeds when the network is actually in use. And this isn't only a small carrier issue. Even Verizon in the record noted how nearby to your state in the panhandle of Oklahoma that load is consistently above the 30 percent; it is only there about a third of the time. And that is because people are reliant on their mobile devices to connect to the internet as well as the fact that rural sites are more likely to be served using low band spectrum.

Low band spectrum is great because it travels long distances. You need fewer towers to build out and so in areas with low population density it is what you want to use. The tradeoff of that is lower capacity. So to make up for the way that those sites are engineered, you need to have a loading factor that is at least 50 percent, if not higher.

Mr. VEASEY. Would these tightened parameters create an incentive for more funding to be invested to increase mobile broadband development in rural areas?

Mr. DONOVAN. Yes, so they would help make the correct areas eligible for support as well as help give you a more reliable picture of what the need is. Until we have a reliable map, you know, we support all the discussions of making additional funding available for building out broadband and mobile services in rural areas. But until you know the size of those coverage gaps, it is really hard to determine what amount of support is necessary to close that.

Mr. VEASEY. We know that reliable broadband allows for friends, families, and businesses to stay connected, as has been articulated here today. Can you talk a little about how affordable high-speed internet improves the lives of people living in rural America and making these towns a more attractive place to live, work, and raise a family?

As you know, one of the things that you hear about rural America, at least all around Texas and I am sure around the country, is that they actually have a hard time keeping a lot of their talent there. Kids go off to college, get educated, and then they don't want to come back to these towns because there is not a lot of opportunity. Can you talk a little bit about how bringing broadband out to rural areas may sort of help them economically and then even be able to retain some of their local talent?

Mr. DONOVAN. Sure. So, you know, at one of our recent trade show conferences. the CTO from one of our rural providers was asked the question what do rural Americans want out of 5G? And the answer is simple: It is the same thing as everyone else.

We have heard talk today about telemedicine and, you know, a fifth of the population lives in rural areas, but with only about 10 percent of the physicians. If you want to get them the care they need, you need to make sure that you have broadband access.

Ranking Member Stauber mentioned payments. Just last weekend I was in Western Maryland, an area that looks like it is served on the map, turns out it is not. I am standing at a table for a local foundation and the gentleman in front of me in line said do you accept cash or credit? And they said "accept credit if it is going to work." You know, that is not reliable enough for somebody to conduct a business. And for somebody who is used to having connectivity, it is not a viable place for them to go and then to locate and try and, you know, start a business or raise a family.

Mr. VEASEY. Well, thank you. Yeah, that is fascinating.

I yield back the balance of my time.

Chairman GOLDEN. Thank you, sir. And we will now go ahead and recognize Congressman Troy Balderson. He is the Ranking Member of the Subcommittee on Innovation and Workforce Development.

Mr. BALDERSON. Thank you, Mr. Chairman. Good morning, everyone, and thank you for being here this morning.

My first question is for Ms. Osler. In your testimony you mentioned how the rural nature of service territories can cause unique difficulties in providing service. During my time in the Ohio State Legislature, I would hear how something as simple as a ravine or

a forest line could prevent accurate maps from being constructed, greatly reducing broadband service capabilities.

How can government work better with the private sector to ensure the most accurate map is created? That is the first question. A follow-up to that would be and what can the FCC do to engineer the most granular maps?

Ms. OSLER. Thank you very much, sir. I think we have kind of touched on that and that is that we have to use a deeper level of data. And I think, for example, shapefiles might be one of the ways to do that. I know we already use shapefiles to get data to the state as to where we provide service.

Just a quick story. One of the state senators in Maine called us and said I have a business that wants to locate here, but they said they can't because there is no internet service where they are. There was fiber running right in front of the building.

So there are all kinds of problems with not having accurate mapping. She was able to explain to him that he could get whatever he wanted.

In my community, we have fiber to the home. How did we do that? We got help from the state to leverage the investment, so they gave us several hundred thousand dollars and we invested 1.2 million more, and we were able to run over 200 miles of fiber. These are the kind of things that after you do that, as a businessperson, if it doesn't show up on the map, it is kind of annoying and it is very frustrating for customers.

So the map—everything comes back initially to the maps. From there, if you have accurate maps, from there you can do all kinds of things. Without that accuracy, you get people off on tangents and making decisions based on inadequate or erroneous information.

Mr. BALDERSON. I promise I won't have a tangent, but the Ranking Member also showed and Representative Hagedorn, I mean, these are very, very misleading and very, very inaccurate, so, hopefully, we can address that issue. Thank you very much for your answer, though.

My next question is for Mr. Hendricks. In your testimony you talk about the inability for Americans to challenge the speed being advertised to them and the speed that is being delivered. How can we enable Americans to voice their concerns without creating additional burdens for smaller telecom providers?

Mr. HENDRICKS. Thank you for the question. With respect to being able to look at it, I think there are two parts. There is a proposal called crowdsourcing, which would allow people to do speed tests and then report it as their own verification. And I think that is an important thing to allow and to consider.

I did caution in my written statement about overreliance on that because there can be some inaccuracies whenever you are talking about customer devices within a home on networks that we don't control. It can result in an understatement of what the speed availability is. But if there are a bunch of data points showing consistent things, then, yeah, I think that should be considered.

As far as the second part, which would be a challenge process, we are fully in support of a challenge process to allow any entity to challenge that broadband is available in a certain area or not

available. So, before any funding decisions are made, there should be an opportunity to allow people to challenge the accuracy of the map, particularly providers who may be impacted by the funding decisions.

Mr. BALDERSON. Okay, thank you very much. Mr. Chairman, I apologize, I yield back my remaining time.

Chairman GOLDEN. Thank you very much for that. Do you have any interest in asking any more questions?

All right. You all set?

All right, I am going to go ahead and go into additional round and we will let Mr. Stauber start.

Mr. STAUBER. Thank you, Mr. Chair. I just want to reiterate what I said. You know, one of the statements here is, "This new map will be borne out of the collective efforts of small telecos, large telecos, and the FCC." You folks matter. You need to be at the table and I want to assure you that the Chairman and I will make sure you are at the table to represent rural America. You have experience. You understand, as Ms. Osler said, you know where it is at and where it is not at from being in the community.

And I just can't reiterate enough to you, please work with us, give us your suggestions, because the Chairman and I want to make sure that your rural experience is brought into this mapping process to make it better.

Thank you, Mr. Chair.

Chairman GOLDEN. Well, with that, I think we have covered pretty much all of it, looking through your testimony and the back-and-forth of the questions. And we could keep going, but, as Ms. Osler just indicated, you know, I think often we end up coming back to the same responses here and there is good reason for that, because your testimony has been excellent and we appreciate it very much.

Jeez, I can't help but, you know, say that just last week I was having a bit of an issue with government and talking about how important accurate information is. In this case it was back home in Maine having to do with lobstermen. It is no different here with the FCC. We need to expect that the government is going to have the most accurate data and information available in order to make decisions. We owe that to the people of the country.

It is maybe perhaps out of fashion to legislate in great detail, but then when we hand things off to Federal agencies to implement the intent and will of Congress it requires a lot of oversight. That is what we are doing here.

We appreciate you coming in and we will continue to push to try and get the FCC to work more closely with you because you are like boots on the ground, the little force multipliers that they should be working with to get more accurate information and data rather than kind of butting heads with, so to speak.

We could go on and on and on, everyone up here and all of you and probably a lot of other people, about all the stories about how broadband access just isn't cutting it in rural America, so I am not going to go off on a tangent. I would love to, but probably could pull 10 stories out of my pocket right now, but this is an important issue. I want to thank everyone for working together on it building

up to this hearing, but also going forward because there is a lot of work to be done, and we look forward to working with all of you.

I want to thank the Committee staff, as well, for all the work that is going into this. And it is not just the work that went into the Committee, but following this issue closely and helping make sure that we are in a good place to make some real progress. Not enough to pass a new grant program. We got to make sure that it is effective and implemented in an effective way, so that it is actually benefiting our small businesses, our families, and communities back home.

We know how important this is. It is a major issue to unlocking opportunity in rural areas in the remainder of this century and going into the future. Accurate maps, we can't spend money on investing in infrastructure if we don't have accurate data. Like you said, Ms. Osler, the limited resources require that we spend it most wisely.

So thank you all very much for being a part of this. I would ask that we have unanimous consent that members 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 11:14 a.m., the subcommittee was adjourned.]

APPENDIX

Written Testimony of Dan Stelpflug

Director of Operations, Engineering & Technology

Allamakee Clayton Electric Cooperative

House Small Business Subcommittee on Contracting and Infrastructure

"Broadband Mapping: Small Carrier Perspectives on a Path Forward."

June 25, 2019 10:00 a.m.

Thank you Chairman Golden, Ranking Member Stauber and members of the committee for the opportunity to be here to share our small business perspective on the importance of more granular and accurate broadband mapping.

My name is Dan Stelpflug and I am the director of Operations, Engineering and Technology at Allamakee Clayton Electric Cooperative (ACEC), headquartered in Postville, Iowa. ACEC provides electricity to rural communities that investor-owned utilities bypassed, in part due to our sparse population. We serve less than 10,000 electric consumer-members, 95% of whom are farmers and rural residential customers. We serve these members on 2,508 miles of lines across eight northeastern Iowa counties near the Wisconsin and Minnesota border.

ACEC is part of a broader electric cooperative industry, represented by the National Rural Electric Cooperative Association that serves one in eight Americans and covers 56% of the U.S. landmass. Electric cooperatives are owned by the members they serve and they are uniquely suited to best understand and serve their members' 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 ACEC 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. 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.

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, already are 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. Whether this estimate is accurate is an important question, and I thank the committee for its attention to this important issue.

In addition to my operations and engineering responsibilities at ACEC, I oversee AC Skyways, the broadband division of our cooperative. The cooperative has been delivering broadband to Northeast Iowa residents since 2014. Our wireless broadband service is available in Allamakee and Fayette counties, with plans for expansion in 2019 and beyond. ACEC commissioned an engineering study as the first step in evaluating its broadband technology options. While we recognize that fiber may be the preferred broadband technology, the estimated cost of system-wide deployment of fiber-to-the-home (roughly $80 million) produced by the analysis exceeded the total value of the electric side of our business (around $60 million) and thus was not a realistic option. That is the case for many electric co-ops because of the rural nature of their service areas.

Our cooperative delivers broadband service using a combination of fiber optic lines and fixed wireless technology—a "fiber to the section, wireless to the home" business model. The fiber connection is established on high elevation structures and the wireless signal is transmitted from that point to where it can be picked up by a small antenna located at a residence or business.

Our cooperative has invested approximately $1.3 million to date in its fiber backbone, including one-third of that amount funded by a grant from the Federal Communications Commission's Connect

America Fund (CAF) under the Rural Broadband Experiments (RBE) Program. The grant is being disbursed to ACEC over 10 years. Annual operating cost of the fiber-wireless hybrid system in 2019 is budgeted at $836,000 with same-year budgeted revenues estimated at $530,000. Payback of the investment is expected to take an additional five to seven years or longer. The cooperative's wireless broadband division, AC Skyways, serves 525 subscribers. In recognition of the relatively long time to recoup its investment, AC Skyways has slowed network buildout as it grows its subscriber base.

The primary impetus for ACEC's investment in its broadband network was, and continues to be, to serve members who lack affordable options to access the internet with at least 25 Megabits per second (Mbps) download speed. The project is the cornerstone of our community development efforts. We heard from economic development professionals and employers that rural broadband access is critical to creating jobs, attracting workers, retaining our youth and young professionals, maintaining a competitive agricultural community, and supporting our seniors through services like telemedicine and telepharmacies. Conversely, the absence of high-speed internet discourages businesses from investing in our communities, which hinders economic development and threatens the viability of anchor institutions like schools and healthcare facilities that require robust connectivity to best serve our community.

Small business challenges ACEC has encountered with inaccurate data

Some the challenges we have encountered as a small business include difficulty finding staff time to identify and apply for grants, insufficient staff to meet reporting requirements, and inaccurate data in federal broadband maps subsequently impacting existing federal grant funding and eligible areas for future grant funding.

Four full-time equivalents staff the broadband unit and all are shared resources. Among these, two technicians split their time between broadband work and IT services, the customer service representative splits time with the cooperative's member services department, and the broadband department manager also is the co-op's operations manager. My co-op's experience with the shortcomings and inaccuracies of existing, federally available broadband mapping data is from the perspective of a broadband provider seeking opportunities for federal funding to deploy broadband service to more of our members and as a provider working to meet FCC requirements as an RBE grant recipient.

Our first experience with inaccurate data occurred while working to comply with federal grant guidelines. In 2014, the cooperative received a boost in the form of a $1.45 million grant from the FCC's Connect America Fund RBE program. The grant was awarded for us to reach 665 potential customers in 209 census blocks with broadband. The potential customer total was identified by, and based on, FCC data that was assumed to be correct. The bidding process required us to ask for a subsidy per subscriber per month. Our bid was based on the subscriber count provided by the FCC, and at the time, the cooperative had no process or procedure in place to verify that the FCC data was correct. Had we known that the subscriber count was inaccurate, our bid per subscriber would have been incrementally higher. While preparing progress reports required by the FCC, we discovered a discrepancy in the number of potential customers; instead of 665 locations as indicated by FCC data, we counted 510, or 23% less than anticipated. The FCC was asked to verify how their count was determined, and it would not verify the process; it would only provide the count.

ACEC then developed the following process to determine potential customer sites within the eligible census blocks:

1.   Fayette County provided aerial photography (2016) for the eligible census block area. We reviewed the photos to determine any residences and building sites.

2.   We looked at the 2010 census data as an indicator of the number of households in each census block. This was the starting point to determine the number of potential customers.

3.   In order to verify that no additional sites had been constructed since the 2016 aerial photo (or the 2010 census), we looked up each parcel within the eligible census block on the county assessor website. The assessor's office report on each parcel shows all buildings within the parcel and the value of those buildings. This was also an indicator of any structures that were torn down or in ill repair and thus not viable potential customers.

4.   We used cooperative data to verify ACEC electric members within the census blocks. If a location received electricity, we verified it was included in the customer count.

Included with my testimony are illustrations of what I've described, including census blocks where the FCC identified a certain number of potential RBE customers where we subsequently found the true count to be fewer than initially indicated. In a perfect world, we would have been able to identify this discrepancy earlier. But the realities of a small business, the timeline, and our initial trust in the accuracy of the FCC data didn't allow for that to happen. Even if we had been able to identify the location number

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discrepancy in advance of accepting the RBE grant, the FCC had no process in place at that time to resolve such an issue.

On September 26, 2018, we filed a petition with the FCC requesting to waive rules to allow the cooperative to meet requirements of the RBE program based on the actual number of potential customers. The lack of response from the FCC to this request has caused a budgetary hardship for our cooperative. We are reluctant to add new or upgrade equipment until we know the outcome of the ruling, considering we may have to pay back 23% of the grant. Had the FCC explained their methodology for determining the subscriber numbers and indicating that there was going to be some variability, we would have done additional subscriber research and changed the cost information included in our bid.

We hope the Congress will encourage the FCC to continue working with small carriers toward mutually agreeable resolutions to issues like ours that maintain program integrity, but recognize the challenges of small businesses and work constructively with us to improve our communities.

In addition to issues with data used to implement the RBE program, it is important to address concerns with the FCC's Form 477. As a broadband provider, we file the Form 477 with the FCC. And as a small business serving rural consumers, we have a vested interest in being able to consult Form 477 data to get a trustworthy view of where broadband is and isn't available in our service area.

We believe the FCC's existing Form 477 data overstates the availability of broadband, particularly in rural America. The concept that a census block should be deemed served in terms of fixed broadband service if one location in a census block is served is no longer viable. That model overstates broadband availability and does not provide a rational basis for policy determinations.

While recognition of its shortcomings has grown and various efforts are underway through congressional proposals and FCC proceedings to address them, electric cooperatives have firsthand experience with the existing maps wrongly excluding areas from eligibility in federal broadband programs.

Another frustrating aspect of the Form 477 data is the reporting requirement allowing carriers to report advertised maximum speeds in census blocks even if it can only provide that high speed to one customer. It isn't an accurate way of reporting and it leaves many residences with unacceptable bandwidth that cannot support everyday applications available in urban areas or simultaneous use of multiple applications or users at a single location. This is especially critical for telehealth, professionals working from home and students who require a robust, reliable internet connection. Grant money is

not available in these areas because the FCC assumes the census block is adequately covered with high-speed service.

What can be done to help address inadequate mapping information?

Recent federal policy changes at the FCC and USDA lay the groundwork for an improved approach to making robust broadband access a reality throughout rural America, but improved data mapping showing broadband availability is an essential element of such an approach.

The FCC's Form 477 is asking the wrong questions. While the devil is always in the details, there are steps FCC can take to vastly improve broadband availability data.

1. More granular data is needed to eliminate the "false positives" in classifying census blocks as served or unserved per the current Form 477 data.
2. FCC needs a system of checks and balances to help ensure providers are reporting actual speeds that are reliably available to consumers.
3. Federal agencies must undertake increased data verification efforts, including the implementation of a challenge process.

Data Granularity

Several proposals among industry, Congress and the FCC could improve the granularity of broadband data. As a small business, ACEC recognizes the need to balance the need for granular data with meaningful, yet simple filing requirements. While address-level data would be the most accurate, it is also potentially the most onerous. There are multiple government and industry lead pilot projects underway, including one to determine the feasibility of an address- level approach.

The FCC uses Form 477 census block data to develop the broadband map. However, many providers, including ACEC, create GIS maps of their service areas in shape files or other geolocated formats. Instead of requiring filers to complete the Form 477 spreadsheet, providers could be required to submit shape files or GIS maps of their service territory. This would improve accuracy and reduce the reporting burden on providers. There may be some carriers that do not create maps of their service territory and may lack the capability to do so at this time. In these cases, the FCC could provide technical assistance to such ISPs, especially in the initial years. The FCC could also issue an RFP for a contractor to create these types of maps or provide the technical assistance needed to ISPs lacking the requisite expertise.

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Data Accuracy: Broadband Service Characteristics and Verification

Collecting more granular data alone won't solve the problem. We must have information like speed and latency of the available broadband service and confidence in its accuracy. Advertised speed is just that – advertised and likely not illustrative of the consumer experience. Data should be collected showing actual speeds customers receive and the latency, or delay, that they experience. Fortunately, the FCC has adopted, but not yet implemented, a mandatory, uniform framework for measuring the speed and latency for the fixed broadband services. Recipients of various FCC high-cost support program—including the CAF II competitive auction winners, Rural Broadband Experiment grantees, rate-of-return of carriers, and price cap carriers accepting state-wide offers—will be required to implement one of three methodologies to determine their networks' fixed broadband service download and upload speeds and latencies.

The framework also prescribes the frequency of required testing over the course of a year and sets the time of day during which testing must be conducted. These parameters are important to ensure providers cannot cherrypick testing frequency and time of day to yield the most favorable results. As an RBE grant recipient, my cooperative will be subject to these requirements, as will many other NRECA members who were awarded bids in the CAF II auction. NRECA will continue working with the FCC toward implementation of the framework with an eye toward ensuring a final implementation plan is workable for small businesses. We will keep Congress apprised of these developments.

Further, some level of verification will be needed to ensure accuracy of broadband data filings. Verification could include a challenge process by which consumers have a remedy should they not receive the speeds reported by their provider. Such a process would enable various types of entities, including local governments, existing broadband providers and consumers, to provide public feedback with a determined resolution process. Acquisition of third-party commercial datasets on broadband availability and creation of a field verification process would be useful tools in resolving instances where provider-reported data, third-party data and consumer feedback conflict. Periodic discrepancies between data and actual coverage reported by an ISP will occur. However, penalties could be considered for flagrant and repeated misreporting of broadband coverage data by ISPs.

We appreciate members of Congress working to solve this issue through legislation such as the Broadband Data Improvement Act of 2019 by Reps. O'Halleran, McMorris Rodgers, Butterfield, Kuster, and McKinley. This bill would require more granular data to be reported and implement much-needed

validation processes, including the creation of a mechanism to collect and integrate public feedback. NRECA supports this proposal. Additionally, we look forward to the FCC's intent to circulate a Report and Order in the Form 477 proceeding this August.

Conclusion

Electric cooperatives know how challenging it is to build infrastructure throughout rural America to provide a service that is integral to the prosperity and future of our communities. Thanks to the dedication of the generation(s) before us and the strong working relationship among cooperatives, our communities and the federal government, we all have the privilege of saying, "We did it!" when it comes to electrifying the rural and remote parts our country.

Reaching all rural Americans with high-speed broadband service is a similar, but much more complex challenge. More accurate maps showing broadband availability are a key part of reaching that goal, enabling 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. We look forward to a continued partnership with Congress to work toward that goal.

Allamakee Clayton Rural Broadband Experiment Location Discrepancy Examples

The following figures include the number of locations the FCC said existed and depict ACEC's research and identification of the true number of potentially serviceable locations in those areas. ACEC identified locations are indicated with a yellow number. The result demonstrates why ACEC found fewer potential locations than the FCC's data said exist.

Figure 1 -

Census Block:	190650802001121
Location:	Westfield Twp, Sections 32 & 29
2010 Census Housing:	5
FCC Total Locations:	8
ACEC Locations:	5

Figure 2 -

Census Block:	190650803002011
Location:	Fremont Twp, Section 6
2010 Census Housing:	6
FCC Total Locations:	9
ACEC Locations:	5

Figure 3 -

Census Block:	190650807001093
Location:	Windsor Twp, Section 2, 3 & 4
2010 Census Housing:	9
FCC Total Locations:	14
ACEC Locations:	5 in Century Link Territory

4 in Hawkeye Territory (identified on the left side, but these are not in an eligible exchange territory under the RBE grant rules).

9 in total but only 5 are in RBE eligible areas.

Figure 4 -

Census Block: 190650807001141

Location: Windsor Twp, Section 13 & 14

2010 Census Housing: 6
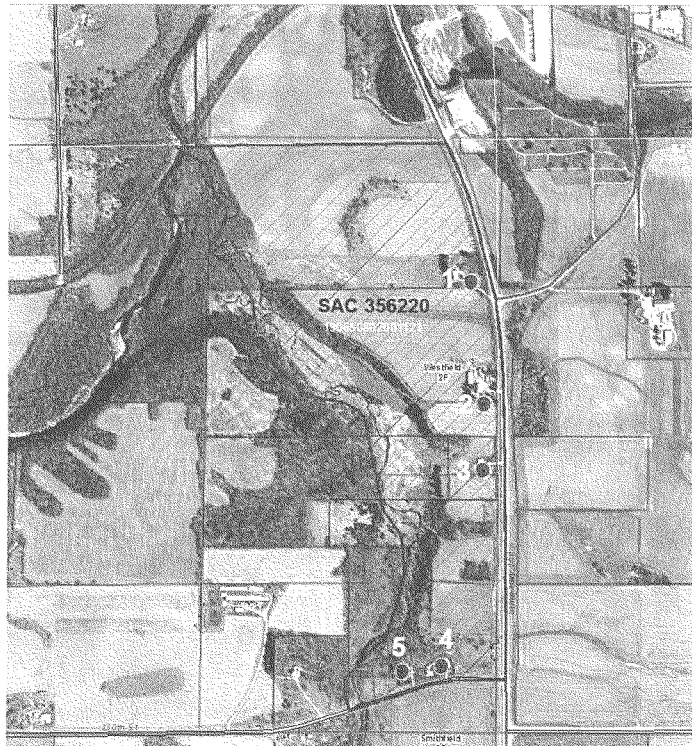
FCC Total Locations   10

ACEC Locations   5

Note: Old barns falling apart or torn down

Figure 5 -

Census Block:	190650807003085
Location:	Banks Twp, Section 15
2010 Census Housing:	3
FCC Total Locations:	6
ACEC Locations:	2

Note: Detail on the right shows the main part of the farm is in a different Census Block (Number 190650807003085) than the rest of the image below.

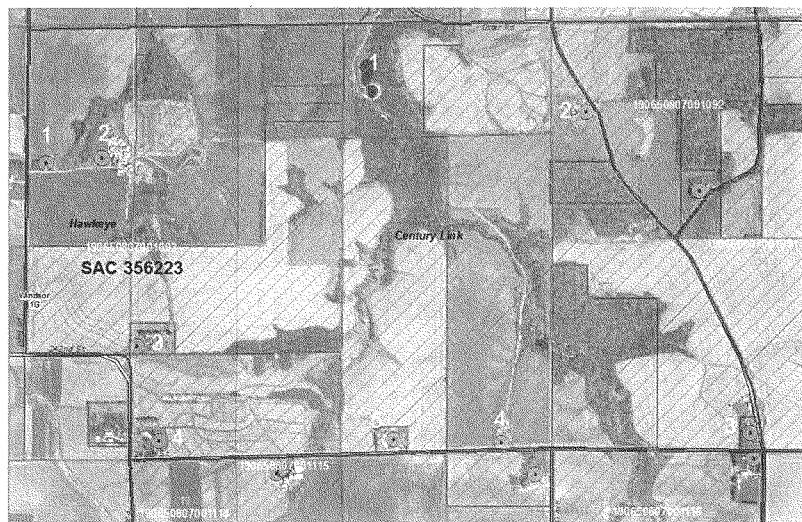**Figure 6 -**
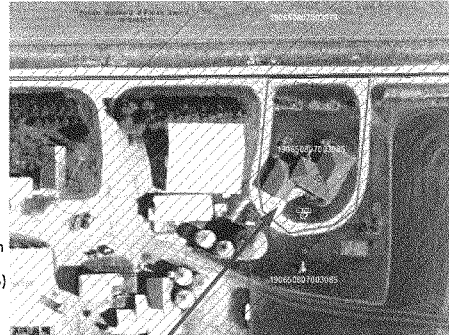
Census Block: 190650807002022

Location: Eden Twp, Section 19 & 20

2010 Census Housing: 3

FCC Total Locations: 7

ACEC Locations: 3

Note: Detail shows the main part of the farm

is in Census Block Number

190650807002023.

Figure 7 -

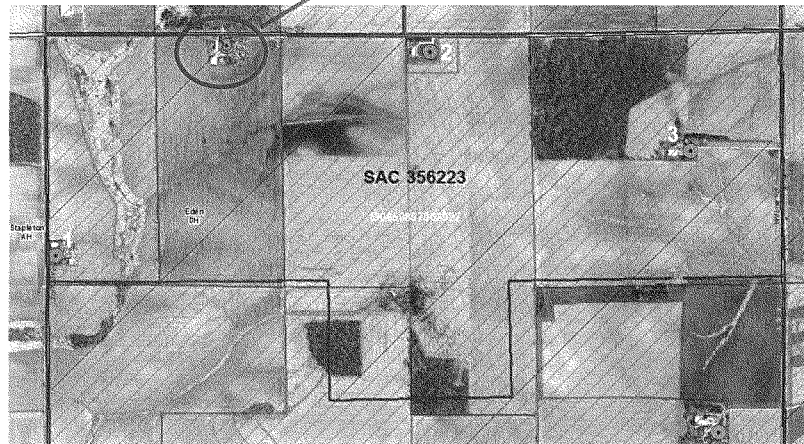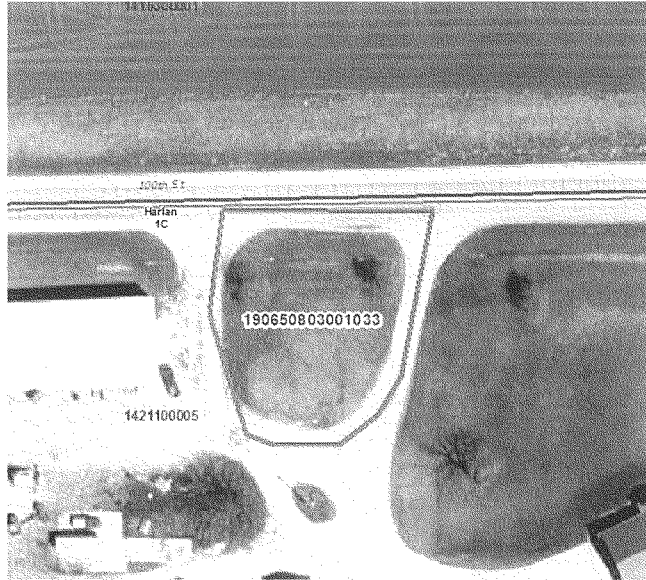Census Block: 190650803001033

FCC Total Locations: 2

ACEC Locations: 0

Broadband Mapping: Small Carrier Perspectives on a Path Forward

Testimony of Tim Donovan

SVP, Legislative Affairs

Competitive Carriers Association

Before the

United States House of Representatives

Committee on Small Business

Subcommittee on Contracting and Infrastructure

June 25, 2019

Chairman Golden, Ranking Member Stauber, and Members of the Subcommittee, thank you for the opportunity to testify about the need to update broadband coverage data to reliably reflect where service exists in rural America and to appropriately direct federal funds to rural carriers that serve the most remote parts of the country.

I am testifying on behalf of Competitive Carriers Association ("CCA"), the nation's leading association for competitive wireless providers. CCA represents wireless carrier members ranging from small, rural providers serving fewer than 5,000 customers to regional and nationwide providers serving millions of customers, as well as vendors and suppliers that provide products and services throughout the wireless communications ecosystem. The vast majority of CCA members are small businesses or work closely with small businesses. They invest in their hometowns by providing wireless service, and employing their neighbors, sponsoring local events and hometown teams, and hosting community service projects. Critically, they provide service where no other provider has the incentives to deploy.

Competitive carriers are highly motivated to provide data that demonstrates a real-world depiction of actual coverage to identify which areas in their communities do, and do not, have sufficient mobile broadband coverage. Where coverage is lacking, a small carrier hears the complaints from its neighbors. Importantly, this data also is used by regulators to determine where finite federal resources, such as Universal Service Fund support, will be dispersed to preserve and expand service. The parameters used to determine more reliable coverage must be standardized and collected from *all* service providers; otherwise overstated coverage will continue to leave entire areas on the wrong side of the digital divide.

Mobile connections already power new technologies that revolutionize entire industries and improve consumers' quality of life across the United States. Wireless technologies enable telemedicine services and remote patient monitoring, increasing patients' access to medical care, particularly in rural

areas. Precision agriculture enables farmers to increase yields while conserving resources. Distance learning brings the latest lessons and training programs to students, allowing them to access educational opportunities previously unimaginable. Today's wireless services also enhance public safety, economic growth, and opportunities for all Americans. Access to broadband even reduces unemployment, especially in rural America.

Closing the digital divide is a critical challenge, and it has a direct impact on our ability to power all of these innovations. As carriers begin to deploy the next-generation of wireless services, the time to act is now. 5G will supercharge existing services like telehealth and precision agriculture, and enable new services such as augmented and virtual reality, autonomous vehicles, and other innovations not yet invented. As these technologies develop, it is imperative to expand access to wireless services to rural and remote areas. Without smart action, areas without coverage today are unlikely to have these services in the near future, leaving communities behind.

We cannot close the digital divide if we do not know the size and location of our country's existing coverage gaps. Reliable data is necessary to determine where mobile broadband coverage does and does not exist. It also is important to understand that measuring fixed wireline broadband availability is a separate and distinct challenge from reliably measuring mobile coverage.

Members of Congress know from your constituents and travelling across your districts that the representation of coverage in the communities you serve is overstated - and, in some cases, substantially so. While significant efforts to update coverage maps will take place at the Federal Communications Commission ("FCC"), agencies across the government should work in coordination to produce the most reliable coverage maps possible. CCA and our members stand ready to work with Congress, the FCC, the Administration, and all stakeholders to create reliable coverage maps to appropriately guide policymakers as work continues to preserve and expand mobile broadband

coverage. With our nation on the precipice of a major technological change, the stakes are too high for anything less than our best efforts.

How We Got Here

Historically, the FCC's Form 477 has served as the principal tool to determine the availability of communications services and to guide the FCC's policymaking, and is intended to represent where consumers should expect to receive mobile broadband services at the minimum speeds advertised by providers. The FCC has an ongoing proceeding to update the Form 477 to improve the data and to eliminate unnecessary filing requirements. As recently as last December, the FCC used Form 477 data to report that "approximately 100% of the American population lives in geographical areas covered by mobile LTE with a minimum advertised speed of 5Mbps/1Mbps." This figure does not match Congress's or consumers' on-the-ground experience. Once work is complete to develop reliable maps to determine eligible areas for Mobility Fund Phase II ("MF II"), lessons learned from the MF II experience can guide ongoing updates to Form 477.

MF II proposes to disburse $4.53 billion over ten years to preserve and expand 4G LTE service in areas without an unsubsidized LTE provider. While acknowledging that using Form 477 to determine eligible areas would prolong a challenge process, the FCC decided to undertake a new, one-time data collection to identify areas initially eligible for MF II support. To the FCC's credit, this one-time data collection included specific parameters, namely requiring carriers to report where they provide 4G LTE service with download speeds of 5 Mbps with 80% cell edge probability and a 30% loading factor. But evidence supporting final determinations for areas eligible to receive MF II support must be clear, rigorous, and above all, reliable. While any steps to standardize the data should be commended, we now know that the parameters selected did not sufficiently improve the accuracy or credibility of the resulting coverage maps, which continue to dramatically overstate coverage in several states –

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especially in rural states. Areas where coverage was overstated, absent a successful challenge, would be ineligible for support to preserve and expand mobile broadband for a decade.

The MF II Challenge Process Is Overly Burdensome and Insufficient to Correct Flaws, Particularly for Providers Small Carriers

On February 27, 2018, the FCC released a 53-page public notice explaining how the MF II challenge map would be generated, the procedures for filing a challenge, and how the FCC would process challenges. With the benefit of hindsight, it is now apparent that the complicated process prevented the FCC from substantially improving its initial map of eligible areas. In fact, of the 106 entities that had access to the MF II challenge portal, only 21 entities submitted and certified valid challenges. Here are the basic steps a challenger was expected to undertake:

- Download mapping data from the FCC's portal;

- Compare the FCC's data to all available information about every carrier offering service in an area. If that research leads a challenger to conclude that the FCC's map is inaccurate because of other evidence, then it must conduct drive tests and submit the results to the FCC for consideration;

- A challenger may challenge the FCC's map, one square kilometer at a time. In other words, a challenger must demonstrate the absence of coverage in each one square kilometer block throughout an area. To provide some perspective, many rural areas that could be challenged have thousands of square kilometer blocks that must be separately analyzed to determine whether any carrier is providing service;

- For each individual square kilometer block, speed tests must be conducted no further than 800 meters apart from one another, and done between 6:00 AM and 12:00 AM local time;

- The tests must include all unsubsidized wireless companies claiming coverage inside that block;

- Only certain handsets, specified by and purchased from each operator claiming coverage in the area, may be used;

- A challenger must subscribe to rate plans and constantly monitor usage to ensure service is not throttled or subject to data caps, which could bias the tests and collect unusable test results;

- A challenger must purchase, mount and calibrate test equipment on one or more test vehicles, or hire a testing company to perform the tests;

- If a challenger does the testing, it must train up testing teams and take them away from their work building and maintaining a network for two or more months;

- GPS tracking equipment must be purchased so that the testers understand where the vehicle is in relation to the one square kilometer blocks eligible to be challenged, and so tests get conducted at the required locations inside the blocks, that is, at the minimum distance separation of 800 meters;

- Since the FCC's rules require a challenger to demonstrate lack of coverage in 75% of the grid being challenged, only grids with accessible roads that can be driven by a normal vehicle can be challenged. Vehicle-based drive testing must be done on drivable roads, which in rural areas can be far apart or otherwise inaccessible due to private or public restrictions, seasonal closures, or other factors. This is a significant limitation; indeed, some CCA members report that up to half of the rural blocks do not have enough drivable roads to meet the FCC's 75% benchmark. So, if a carrier claims coverage, there can be no challenge;

- For each test, a challenger was required to submit: (i) all speed test measurements collected during the relevant time frame, (ii) signal strength and latency, (iii) the service provider's identity, (iv) the make and model of the device used (which must be from that provider's list of pre-approved handsets), (v) the international mobile equipment identity (IMEI) of the tested device, (vi) the method of the test (i.e., hardware- or software-based drive test or non-drive test app-based test), (vii) if an app was used to conduct the measurement, the identity and version of the app, (viii) the identity and location of the server used for speed and latency testing;

- While challengers bear the burden of proof, challenged carriers do not need to provide drive tests to rebut. In lieu of drive testing, challenged carriers may submit data from transmitter monitoring software that could show geolocated, device-specific throughput measurements and other device-specific information, along with certifications from an engineer. Producing this level of rebuttal evidence is easier to do than drive testing.

To provide some perspective on how daunting this challenge process was for carriers of all sizes, one of CCA's small carrier members attempted to analyze 165,000 separate square kilometer blocks within its service area that it believed could possibly be incorrectly labeled as "covered." That company tested several thousand blocks, but lacked the resources needed to test a substantial portion of the blocks that appeared to be worth a challenge. One of our larger members spent over $2 million to hire a testing firm that completed tests in 20 states and challenged 37,000 one square kilometer blocks. Even with this resource allocation, the member completed testing in less than 5% of the carrier's overall rural footprint.

The critical takeaway from this process for challengers was that the process was so complicated and expensive that challengers large and small were never able to challenge all of the areas they wanted to. And the implications of these shortcomings were unfortunately significant: in any area where the

FCC *incorrectly* showed unsubsidized coverage, absent a successful challenge, there could be no investment of universal service support. Without eligibility for support, unserved people living in those areas could wait over a decade or more before having another opportunity to access mobile broadband services that are reasonably equivalent to services found in the nation's more densely-populated regions.

FCC Investigation

Despite these problems, entities provided the FCC with 20,809,503 speed tests to challenge claimed coverage. In December 2018, FCC Chairman Pai announced that a preliminary review of the data filed through the challenge process suggested that the preliminary maps were an inadequate basis to distribute MF II support, and launched an investigation into the data while suspending the next step of the challenge process. CCA appreciates the FCC's continued focus to ensure that it has reliable data before allocating limited support resources. The FCC should use the investigation to understand and rectify overstated coverage figures, and take steps to improve the next mobile coverage data collection. While the investigation may uncover additional concerns, various stakeholders confirm that the lack of a more robust standardization of parameters for the one-time data collection was a critical error that should be addressed.

What We Need to Do to Improve the Maps

Policymakers should apply a specific set of factors to standardize data collection, better understand carriers' broadband coverage, and produce more reliable maps. These smart policies will benefit small and large carriers alike and are critical for policymakers' ability to accurately and efficiently distribute federal support. It is important to understand that no model will perfectly reflect on-the-ground coverage. That said, steps should be taken to further standardize modeled coverage. At a minimum, a detailed Radio Frequency Link Budget submission should include the following:

- Signal Strength. Standardizing the Reference Signal Received Power ("RSRP") will base measurements on the same real-world measurements that wireless networks use to determine cell selection and handover, among other network functions. As current Form 477 filings show, these results can be subjective and vary by equipment vendor and network design. A weaker RSRP means that the coverage area is larger but that the actual coverage is less reliable at the cell edge. Also, a weaker RSRP threshold translates to more path loss allowed between the base station and the mobile. It is therefore imperative that all carriers report a standard RSRP level. In rural areas where sites are isolated, the coverage area doubles with a 5 dB increase in the Maximum Allowed Path Loss for a single site. For 4G LTE specifically, a -85 dBm RSRP level per 5 MHz channel would reflect excellent coverage, while a signal strength of no lower than -105 dBm per 5 MHz channel would reflect the type of reliable signal strength that consumers expect. In contrast, a -120 dBm level per 5 MHz channel could register that a consumers' device is connected to LTE service, but in reality, provide for a poor connection that fails to support many applications or functions.

- Cell Edge Probability. Cell edge probability determines the likelihood that the minimum speed will be possible at the furthest point from the base station. From data collected during the ongoing MF II process, it is evident that an 80 percent cell edge probability drastically overstates coverage capabilities. The FCC should revisit this parameter and adopt a cell edge probability of 90 percent or higher, as proposed by several industry stakeholders, including those representing the largest nationwide wireless carriers as well as those providing service across rural and regional areas of the United States. It is worth noting that the industry standard for commercial operators is to design their networks for at least 90% cell edge probability, and public safety typically designs to 95%. In a rural site, using 80%

extends the cell radius by about 27% and increases the "covered" area by about 60%. This additional 60% could represent hundreds of square kilometers of additional "coverage" per site that is mostly insufficient to support reliable service. Additionally, policymakers should consider requirement modeled coverage that includes upload consideration at the cell edge, instead of download alone.

- Cell Loading. Cell loading determines the extent to which available resources from a given base station may be used by consumers while providing minimum coverage speeds. In the MF II proceeding, the FCC directed reporting providers to evidence a 30% load factor, which failed to accurately reflect network use in rural areas. As Verizon has previously highlighted, network loading in at least one rural region in Oklahoma often exceeds 30 percent. In fact, because rural Americans are often more dependent on mobile broadband service for internet access than their urban counterparts, one CCA carrier member reports that its rural sites utilizing high-quality, low-band spectrum routinely experience average cell loading well in excess of 50 percent in the evening hours. In rural areas, coverage is typically provided by low-band spectrum, which has limited capacity compared to higher frequencies, and as a result, these sites are often prone to being heavily loaded. The FCC should revisit this parameter and adopt a cell loading factor of at least 50 percent on the downlink, or higher, to reflect the reality that consumers in rural areas are more likely to rely on their mobile connection for their primary or only internet connection.

- Clutter Factors. Clutter factors include environmental features such as structures, trees, vegetation, topography, or other objects that affect propagation of a signal from a base station. With varied geographic features across the country, clutter factors should match local environments but also must be appropriately standardized across reported coverage

areas. Submissions for clutter factors also should include clear indications of the precise loss values assigned to the clutter and feeder type.

A variety of factors inform a robust Link Budget; however, standardizing the initial factors listed above will produce substantially more reliable maps and reduce the need to expend additional resources to correct data collection flaws.

While there are several bills that address aspects of this issue pending before Congress, CCA specifically directs your attention the S. 1822, the Broadband Deployment Accuracy and Technological Availability (DATA) Act, introduced this month by Senators Wicker, Peters, Thune, and Klobuchar. This bipartisan bill would direct the FCC to collect more granular data, improve the parameters used for data collection, consider verification of the data collected and establish a process to challenge areas that where providers claim to have service. Ultimately, collecting better data will reduce the need to rely on a burdensome challenge process, allowing small carriers and those serving rural areas to use their resources to preserve and expand service instead of proving the negative where they know service does not exist. Altogether, this bill would produce more reliable maps, and CCA supports moving forward with its consideration.

Separately, at a recent Congressional hearing, FCC Chairman Pai announced that the FCC would vote on a Report & Order at its August Open Meeting "that would result in a more granular, and more accurate broadband map." We encourage Congress to stay engaged on this issue to make sure that this item creates a more reliable view of coverage in rural areas without overly burdening small providers.

All small businesses know the importance of basing decisions on reliable data. To close the digital divide, and provide connectivity for millions of Americans living in rural areas, policymakers must take actions to deliver coverage maps that are based on reliable, real-world coverage data. With

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improved parameters in place, a robust data collection will promote the inclusion of rural communities in today's digital economy.

Thank you for your leadership on this critical issue and for holding today's important hearing. I welcome any questions you may have.

Statement by

Beth Osler
Director of Customer and Industry Relations
UniTel, Inc.
Unity, ME

Before the

United States House
Committee on Small Business
Subcommittee on Contracting & Infrastructure

Broadband Mapping: Small Carrier Perspectives on a Path Forward

June 25, 2019

Testimony of Beth Osler
June 25, 2019
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INTRODUCTION

Chairman Golden, Ranking Member Stauber, and members of the Subcommittee, thank you for the opportunity to testify on the importance of rural broadband mapping.

My name is Beth Osler. I have worked in the telecommunications industry for over 50 years, and I am currently the Director of Customer and Industry Relations for UniTel, Inc. headquartered in Unity, Maine. UniTel, Inc. ("UniTel") is a local rural telecommunications provider serving portions of Central Maine. Founded in 1902, UniTel has delivered a wide variety of telecommunications services to sparsely populated rural areas spanning approximately 280 square miles and serving all or portions of 16 communities in parts of three counties for over 117 years. My remarks today are on behalf of UniTel, as well as NTCA–The Rural Broadband Association, which represents approximately 850 rural community-based carriers that offer advanced communications services throughout the most sparsely-populated areas of the nation. NTCA members and companies like them serve just under five percent of the U.S. population spread across approximately 35 percent of the U.S. landmass; in most of this vast expanse, they are the only fixed full-service networks available.

Today UniTel operates a digital network offering the latest services including high-speed broadband at speeds up to 1 Gigabit symmetrical. In 2015, UniTel made substantial investments in a fiber optic network within its footprint. In 2016, with support from ConnectME state grants, we extended the Fiber to The Home network further still. This fiber deployment allows us to offer some of the fastest broadband speeds in Maine and the U.S. – and to serve not only our citizens, but our local town offices, three volunteer fire departments, a community center, a rural health center, and businesses and non-profit organizations throughout our area. We do it all with fewer than 25 employees.

But the extremely rural nature of our service territory presents unique issues. Because the population density is so low, the ability to build a business case for investment in new or upgraded network additions is limited. While fiber offers the most promise now and into the future to give rural Maine the connections it needs to the rest of the world, the upfront costs of deployment and the ongoing costs of maintenance and operations are difficult to justify and then recover from small rural customer bases. Therefore, it takes support at the federal, state, and/or local levels along with entrepreneurial spirit and community commitment to realize our national vision of broadband in rural Maine and across rural America.

To be clear, getting broadband to and keeping broadband in rural areas truly requires the best kinds of public-private partnership. Much of the extensive network in Maine today is a result of private investment. UniTel has spent millions of dollars getting broadband to our customers. But for those places where densities are low and returns on infrastructure investments are measured in decades, government support is important to help make the business case.

This then brings us to the important question of broadband mapping. To be able to determine where limited resources for support should be spent, and to ensure that incentives exist for private investments where they can be justified, mapping of broadband availability and

identification of unserved areas are critical. Unfortunately, our maps have kept pace neither with consumer demand nor the evolution of the broadband marketplace, and now is the time to develop a process of mapping – and validating – the information that will help us to target resources better toward building and sustaining broadband networks.

UNITEL'S EXPERIENCE WITH BROADBAND MAPS

Broadband mapping is significant for consumers in rural areas and for companies like UniTel that need to leverage public-private partnerships to deploy networks and deliver services in such areas. Maine has attempts underway through its broadband agency, ConnectME, to more accurately identify unserved and underserved areas. But, as it stands today, the Federal Communications Commission ("FCC") maintains the most accurate maps available in most states. At the same time, like most – if not all – providers and other users of the maps produced by the FCC, we have found the results of these mapping efforts to be unreliable. In fact, we find it is not unusual for "conditions on the ground" to look very different from those depicted on national maps.

For instance, we do not use FCC maps to do any of our market analysis, and certainly not for our own internal planning or engineering. Instead we find ourselves using valuable work hours verifying and attempting to correct errors in order to identify both what is truly unserved and to identify also those areas where, with the help of government support, we are the only provider willing to serve there. To provide some basic understanding of how the current FCC maps miss the mark, they show an entire census block as served when even just one location in that block is served – meaning that a census block becomes ineligible for support funding. An additional concern is that no one is charged with thoroughly validating the data that are used to create the maps – providers submit it, and depending on the support program the FCC may not provide for any opportunity to correct that information before deciding support should be eliminated in an area that is in fact unserved by any other provider.

These sorts of "false positives" of coverage hit close to home and directly affect consumers who may never see broadband (or may lose access to broadband over time) as a result of such mistakes. As an example, there are six census blocks in one of the towns we serve that are identified by the FCC as served because another provider reported them as such. But, one of the advantages of the small size of our company is our deep knowledge of our service territory. We knew that the map was in error, and that no other provider was present there. But even with that local knowledge we are considered ineligible for support in those census blocks. And, more troublingly still, there is currently no process to correct or challenge the status of any census block – meaning UniTel loses support and the consumers there suffer as a result.

Conversely, there are "false negatives" as well – for example, our review of FCC maps of our area has shown gaps in coverage where we know we have active customers. Without the ability to identify and correct errors in the data we had supplied to the FCC, limited federal support dollars might have been used to duplicate an existing network.

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Accurate mapping data is therefore 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.

WHAT DRIVES INACCURATE BROADBAND MAPS?

The accuracy of broadband availability maps is often in question, as maps show services as available where consumers cannot get them at all, and in other places these maps show speeds available at levels that cannot consistently be delivered. The examples above illustrate these common problems. There are several reasons that these issues arise.

First, current broadband maps are based mostly, if not entirely, on information received from service providers themselves. While providers certify the accuracy of their reports, the processes used to verify the information can vary greatly at the state level and are all but nonexistent at the federal level. Therefore, the maps essentially say whatever the providers who populate them say. Moreover, the standards for reporting this data vary and make it very challenging to verify – there is, for example, no specific standard to ensure a wireless provider is reflecting the actual propagation of its spectrum capabilities in a given area, rather than just drawing a coverage circle around an antenna based upon the theoretical reach of that spectrum.

Second, as I mentioned earlier, a census block is reported as served on the Form 477 that feeds into the FCC's broadband map simply because one location in that block could *in theory* be served by a provider. In rural census blocks that can stretch large distances, this means that the delivery of service to just *one* customer in a census block can result in the denial of funding for voice and broadband to *another* customer *located miles away* in the same census block. This disparity results in many unserved homes and businesses looking served, especially in rural areas where census blocks can be large.

Third, the current standard for reporting an area as served depends upon advertised rather than actual speeds, and also allows an area to show as served if a provider believes it could deliver service there at some point soon, rather than having the actual capability to do so in the near term. In other words, there may be no service actually installed at all in a census block, or the speeds actually delivered in that block may not be equal to what is advertised – and, yet, a provider can claim that it serves that area and thus have them shown as served on the maps.

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Finally, the current map does not capture buildout in progress that is occurring pursuant to governmental initiatives like the FCC's USF or United States Department of Agriculture Rural Utilities Service (RUS) lending/grant programs. This means that there is the potential for multiple governmental programs to in effect "overbuild each other," allowing duplicative and competing networks to be built through two different programs.

WHAT IS THE SOLUTION?

My testimony above describes how the "rubber meets the road" in terms of what bad mapping data means when it affects the ability to serve specific rural areas. "False positives" – locations shown as served when they are not – can result in a denial of financing or funding needed for a small, local committed company like UniTel to deploy and operate a broadband network, especially in rural areas where the business case for doing so is so difficult. On the other hand, "false negatives" – locations appearing as unserved when they are already served or are in the process of having networks built to them – can result in a waste of financing and funding resources on duplicative networks.

The reality is that any map will practically be outdated by the time it is published. It is also the case that no one is going to validate independently each piece of data and claimed coverage submitted by a service provider the moment it is submitted. We recognize too that there is a balance to be struck in terms of obtaining more accurate and granular data while trying not to impose burdens that have providers spending more time reporting coverage than advancing coverage through network deployment. However, all this does not mean we should not strive to improve this process.

Many different proposals are being presented to the FCC, and each of them holds some promise to make the maps much better than they are today. These proposals warrant significant consideration, and they may provide a much-needed path forward toward better maps. But, at the end of the day, as long as any map is based upon self-reported data from providers and as long as that data is not vetted thoroughly by an independent source, there will be a need for a challenge process prior to relying upon the map to make decisions about where funding or support should either go or be withdrawn. A more granular map will certainly help identify more accurately where broadband is available, and getting more detailed information on a basis below the census block level is an important objective. At the same time, however, a meaningful and robust challenge process will remain critical to validate both fixed and mobile data prior to any map being used by the FCC or RUS (or any other governmental agency) to make final decisions on funding or financing. In other words, we need to aim to get both more granular *and* more accurate through upfront standards and back-end processes that will yield better, more useful maps.

We applaud the efforts of members on both sides of the aisle and both sides of Capitol Hill for their recent legislative efforts to address the broadband mapping problem. In the House, Representative McMorris Rodgers has introduced the Broadband Data Improvement Act (H.R. 3162); a companion bill has been introduced as well by Senator Capito (S. 1522). This bill would

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improve broadband data collection, mapping, and validation to support the effective deployment of broadband services to all areas of the United States. It would improve the accuracy of such maps by requiring broadband providers to report data in a way that more accurately reflects locations served, which is a change from current reporting requirements. It would seek to create a new National Broadband Map that is more accurate and granular – and, perhaps most importantly, be subject to an ongoing challenge, validation, and refinement process beyond taking providers' self-reported data as gospel. These are the core elements of an effective broadband mapping process.

Similarly, Senator Wicker has introduced the Broadband Data Act (S. 1822). This bill would require the FCC to collect granular service availability data from wired, fixed wireless, and satellite broadband providers, and set strong parameters for data collected from mobile broadband providers to ensure accuracy. It too captures many of the vital components of sound mapping strategy.

The primary goals in these pieces of legislation – and in any other initiatives related to mapping – include several essential elements. No matter what policy route is taken, these characteristics must be present in any broadband mapping effort.

First, there should be a movement toward more granular maps through shapefiles in the near-term with the objective of implementing location or address-based maps in the longer-run. Taking this step would help to minimize, if not eliminate, the errors that arise from census block-based reporting. Next, policy makers should develop standards for reporting by various platforms; this is particularly important in the case of spectrum-based offerings (such as fixed wireless services) in order to more realistically capture what they can and cannot do in coverage, rather than once again just drawing large circles around antennas and calling that entire area "served." Finally, there must be challenge and other data validation processes regardless of what mapping solution is adopted. Whether shapefiles or location-based reporting, someone needs to validate the data that providers self-report so that funding is directed to where it is needed and so that funding is not eliminated based upon false positives of "unsubsidized competition," – and consumers, other operators, and other entities familiar with local conditions (such as local governments) should be able to weigh in if and when they see errors in the self-reported data and coverage maps.

The three steps outlined above – moving to shapefiles "on the way to" even more granular service availability data; standardizing how providers can determine and report on asserted coverage; and adopting validation and challenge processes – will result in the best possible maps showing where services are available or not while recognizing that there is no singular magic "silver bullet" that will yield perfect results. These recommendations also strike a reasonable balance in terms of the work that providers will need to do in reporting more granular data while also minimizing the scope of challenge processes due to more granular reports than are available today.

In the past, agencies like the FCC and RUS have developed and used challenge processes that treat service coverage information like Form 477 data as *informative* but not *dispositive*.

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Unfortunately, however, such processes are not always employed, and even when used, they have not been consistently applied. Certainly, the recent experiences with the FCC's Mobility Fund show the value and wisdom of continuing to use a challenge process. Without such a process, the concerns that have been raised about overstated mobile coverage would never have been identified. At the same time then, it has been disappointing to see the FCC moving away from challenge processes in the fixed service context. Specifically, the FCC has refused recently to permit any challenge process at all in the context of ACAM support, and it is now proposing to eliminate the existing challenge process to validate Form 477 data in the context of other USF support – meaning that it would now instead default to treating the self-reported Form 477 data effectively as gospel.

If UniTel's own experience in rural Maine provides any lesson, it is that a meaningful challenge process is a necessity in determining where funding should go or where it should be denied. We therefore are hopeful that the FCC will reverse course on its suggestion to eliminate a challenge process in the context of distributing USF to support fixed networks, and that it will commit to a data-driven process that ensures rural consumers are not left on the wrong side of a digital divide due to inaccurate information. We hope that an evidence-based challenge process will be used in all contexts going forward to make sure that even improved maps are as accurate as possible prior to funding or financing decisions being made by agencies like the FCC or RUS.

CONCLUSION

UniTel continues to strive to provide great service to its customers in rural Maine. However, as long as broadband maps remain unreliable and riddled with erroneous, overly broad coverage claims, we will not be able to maximize our efforts to reach all unserved areas or to sustain services in areas where funding is needed to do so.

Developing more granular maps is an important prerequisite to driving better decision-making, and there are a number of proposals being developed that would do just this. At the same time, this is only one step among several that must be taken to get mapping right. In particular, we also need better standards for what providers can report on the front end to populate those maps, and then we need validation processes, including the ability to challenge data on the baseline map as inaccurate, to ensure these maps can effectively contribute to the ultimate goal of connecting every American and keeping every American connected.

Written Testimony of Jason Hendricks
Chief Regulatory Officer, Range Companies

U.S. House of Representatives Committee on Small Business
Subcommittee on Contracting and Infrastructure

Broadband Mapping: Small Carrier Perspectives on a Path Forward
June 25, 2019

Background
Good morning Chairman Golden, Ranking Member Stauber and members of this
Subcommittee. My name is Jason Hendricks, and I am the Chief Regulatory Officer of the Range
Companies and a Board member for WTA – Advocates for Rural Broadband. I am providing
testimony today on behalf of the Range Companies and WTA. It is a pleasure and honor to
testify before you this morning.

The Range Companies are comprised of the parent company – Range Telephone Cooperative –
and its subsidiaries – RT Communications, Dubois Telephone Exchange ("DTE"), and Advanced
Communications Technology. Together, the four companies provide telecommunications and
broadband service in rural areas in Montana, Wyoming, Colorado, and South Dakota. Our
combined incumbent carrier serving area is approximately 30,000 square miles, with a
customer density of 0.54 customers per square mile. The largest town we serve has a
population of about 5,500 and the smallest communities we serve have populations in low
double digits. Despite the low density and high-cost challenges of our serving areas, we provide
very high-speed, quality Internet services, including fiber-to-the-premise service, in many of the
communities we serve. But like most small, rural providers, we have very rural areas that are
cost prohibitive to serve with speeds comparable to those that are available in more densely
populated areas. It is these areas for which the accuracy of broadband mapping is most
important and for which the current Federal Communications Commission ("FCC") mapping
mechanism is the least accurate. My testimony focuses on goals to improve broadband
mapping without being overly burdensome to small providers with limited resources.

Problems with the Existing FCC Broadband Map and Location Assumptions
The FCC's current broadband map is derived from data reported by broadband providers twice
a year in FCC Form 477 (Local Telephone Competition and Broadband Reporting). There are
concerns that many observers have with the current broadband map and they derive from the
way in which the data is reported and mapped. These concerns include:

- <u>Use of advertised speeds rather than actual speeds</u> - Per FCC Form 477 formatting
  instructions, the speeds reported are often advertised speeds, which may not equate
  with speeds a customer can expect to receive, particularly in sparsely populated areas.

- Lack of granularity - Availability of service is determined on a census block basis and census blocks can be very large in rural areas.
- Overstatement of availability - An entire census block can be shown as having broadband available if service is offered to just one location in that census block, resulting in many premises appearing to have broadband available to them when they do not.
- Understatement of availability - There is typically a delay of more than a year between the time data is reported via Form 477 to the time a map is created showing the availability of service, resulting in possible understatements of broadband availability if providers have expanded their broadband services in the interim.
- Funding decisions based on inaccurate data - In some of its high cost universal service fund (USF) programs, the FCC uses Form 477 data to determine where to target USF support and if the underlying data is not accurate, limited USF support dollars may not go to places where it is needed or may go to places where broadband already exists.
- Regulatory burdens - Form 477 remains burdensome for providers to complete with the FCC estimating in its instructions that the annual reporting burdens for this collection of information is 387 hours per each of the two responses, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the required data and completing and reviewing the collection of information.

Between our four companies, we are required to provide broadband data on over 7,000 census blocks. Yet, census blocks can be upwards of hundreds of square miles in size and are often ill-fitted to population clusters and network boundaries. For example, we are required to report on a census block of 366 square miles with 19 locations.

I will provide you with an example of the problems that can occur when census blocks are used to determine broadband availability. RT Communications serves the town of Hulett, Wyoming (population 383), which is near the nation's first National Monument, Devil's Tower. It provides 100 Mbps service in town and has fiber south of town. But there are locations outside of town that we haven't been able to serve at speeds of 25 Mbps or more due to high construction costs. We have looked at pursuing state or federal grants to defray some of the construction costs to serve those locations. However, the large census block in which the locations exist is considered served because it includes a portion of the town in which we provide 100 Mbps service. Were an alternative mapping system used that was better tied to existing provider networks, the outlying locations could be properly identified as unserved so that universal service support or broadband grants could be targeted to the locations in need. Similar examples can be found throughout our serving areas.

Moreover, there can also be problems with the data the FCC uses to determine customer locations for purposes of distributing model-based universal service support. Recently, the FCC announced Alternative Connect America Fund (ACAM) offers to carriers not already receiving model-based support. Carriers have until July 17 to make decisions on whether to accept ACAM universal service support or continue to receive funding via the existing cost-based support methodology. In Wyoming, if we accept ACAM support, we would receive an annual

support amount in return for deploying broadband service to a specified number of locations. Like many companies reviewing the ACAM buildout obligations, we are finding many discrepancies between census data locations used by the model and the real-world locations of where people actually live. For example, in examining tribal buildout obligations in DTE's territory, we have discovered a census block for which the model assumes 10 locations exist. In reality, the census block is mostly hayfields and sagebrush grazing with only one customer location. In total for DTE, accepting ACAM may necessitate broadband deployment to 268 tribal locations when our analysis shows that there are 241 locations, at most, in the census blocks at issue. Similar examples of locations assumed in the model that don't exist in reality can be found throughout our serving areas.

The Range Companies strongly believe that improvements can be made to the FCC's broadband mapping system and customer location databases. I will first lay out some goals we have to achieve a higher level of granularity in broadband mapping to ensure that broadband support flows to areas most in need. Then I will talk about some of the solutions being considered in the industry and will comment on their workability from a small company perspective.

Proposed Goals for Broadband Mapping Changes
The Range Companies are supportive of efforts to achieve a higher level of granularity in broadband mapping to ensure that broadband support funds go to areas most in need. We offer four goals for consideration in the establishment of a new system.

First, we request that the reporting requirements for a new broadband mapping system not be overly burdensome for small providers. Specifically, the reporting requirements should be consistent with capabilities easily available to providers, match the network characteristics of providers, and allow for easy upload with minimal effort.

Second, we request that the methodology be used for all state and federal broadband support, loan, and grant decisions so that providers need not be subjected to reporting requirements that differ across jurisdictions. Currently, we provide broadband mapping data in Wyoming and Colorado, as well as to the FCC though 477 data submissions and High Cost Universal Broadband (HUBB) reporting via the Universal Service Administrative Corporation. Having one data submission for all jurisdictions and for all purposes would greatly reduce compliance burdens.

Third, the process used by regulators to verify the accuracy of data should be meaningful and minimally burdensome to small providers. For example, if broadband speed and latency tests are used to verify the accuracy of data, then these tests should be for those portions of the networks the provider controls, the data samples should reflect the size of the carrier and the demographics they serve, and the tests should be conducted in a manner unobtrusive to the customers receiving the service.

Fourth, a challenge process should be enacted to allow other providers, government entities, customers, and interested third parties to challenge the accuracy of data provided by a

provider. A challenge process will help ensure broadband availability is not overstated and that support is not precluded from going to areas that are unserved.

Broadband Mapping Proposals

I will now provide a summary of some of the main proposals submitted to the FCC to improve its broadband mapping system.

First, NCTA - The Internet and Television Association, has proposed that fixed broadband providers be required to submit polygon shapefiles in lieu of the census block availability data. According to NCTA, the use of shapefiles would increase the accuracy of the reported data because shapefiles are more closely tied to a provider's service area and the shapefiles could be generated based on a provider's footprint using a variety of sources, such as network maps or homes passed data. As further explained by Connected Nation, mapping programs like those it administers in Minnesota offer proven examples of where granular polygons, contained within shapefiles, have been created to depict service availability footprints and where the resulting map is used to guide the state's broadband grant program.

Second, with respect to customer location data, USTelecom, with the help of its vendor CostQuest, has developed a proposal to create a "Broadband Serviceable Location Fabric" ("BSLF") that would generate an individual latitude and longitude for buildings to where broadband is, or would be, deployed. Its proposal would create a consistent location fabric for which all serviceable locations would be located using a single methodology and thus provide a harmonized reference point for broadband reporting. To create the BSLF, multiple data sources would be required. USTelecom is conducting a pilot program in Virginia and Missouri to demonstrate the viability of its proposal and to validate its assumptions. CostQuest has estimated that if the FCC adopts the BSLF methodology it would take an additional 12 months to complete a nationwide fabric after the pilot closes. The coalition intends to provide a report on the pilot program to the FCC by the end of July.

In conjunction with their shapefile proposal, NCTA and others have also advocated for the use of crowdsourcing, in which the FCC would: 1) establish a verification process to allow consumers to report potential inaccuracies in the data, and 2) the FCC staff would forward any submissions to the relevant providers, who would make any necessary corrections in subsequent filings. According to NCTA, the primary goal of this process is to improve the accuracy of the map, not to generate enforcement activity.

Reactions to Broadband Mapping Proposals

The Range Companies believe that these proposals do not have to be mutually exclusive and both can be adopted over time. In the near-term, we are supportive of the NCTA shapefile proposal. First, it can be easily accommodated with our existing mapping capabilities. Two, it can be more representative of network architecture, community boundaries, and the locations of outlying customers and rights of way. Three, it can be overlaid on multiple types of premise location platforms.

I will provide you with an example of a typical exchange of ours and how we envision shapefile mapping would work. In one of our typical exchanges, there is a small town that is relatively concentrated and has high bandwidth availability with either fiber to the premise service or a fiber-copper combination with very short copper loop lengths. Outside of town, there are typically developments with larger lot sizes and with more distance between homes than what occurs in town but with more cluster characteristics than what occurs in more remote locations. In the more remote locations, there are often farms and ranches with customer premises separated by miles from one another and which are many miles from the town in which switches and network concentrators are located. With shapefiles for this typical town, we could have one polygon for the town where we are very confident that most customers can get high-speed broadband service. Then we could have multiple polygons for the clusters of premises located on the outskirts of town that would align with the network characteristics present in those clusters. Then we could use lines to represent bandwidth available along the roadways leading further away from town and along which there may be the occasional home or business. Lastly, we could use dots to represent bandwidth available for the individual locations in remote locations many miles from the town. With this type of mapping, one could clearly see the locations with the lowest broadband speeds, which should better inform policy decisions on how best to address the broadband needs of those that are unserved or underserved. In addition, shapefiles for other exchanges and from other companies could be consolidated into one master file that would more accurately display broadband availability by town, county, state, or country. Further, such files can be more easily updated as network characteristics improve and bandwidth increases than the exiting method that requires one to first match bandwidth availability to the census block for which locations may be less logically assigned.

However, policymakers should consider how to achieve even higher granularity in the future. At Range, we are cautiously optimistic about the USTelecom group's location fabric proposal. We are fully aware of the errors contained in the current location databases and are hopeful that a more accurate database can developed. We look forward to the results of the pilot projects and will be able to comment further when more information is known. If a better customer location fabric is developed, it appears that it can be complementary to the shapefile proposal so that polygons can be more accurately overlaid on customer location maps. We do believe, however, that shapefile reporting processes can be created and used prior to the development of a customer location fabric and that development of the latter should not delay the development of the former.

With respect to crowd-sourcing, while we are supportive of opportunities for customers to challenge broadband speeds reported by companies, it is with the caveat that broadband speed and latency tests within a home over customer equipment may not be as accurate as those performed by companies for the portions of the networks they control. There are numerous factors within a home that can show speeds lower than what a customer is receiving, or capable of receiving, such as the age of the customer's hardware and software, inside wiring, and whether other devices are using the Internet at the time of the test, or whether the customer has subscribed to the highest speed available. Thus, while crowdsourcing could be

used for data points in limited instances, we don't believe there should be an over-reliance on the results of customer speed tests.

We do believe that before any decision is made on whether to provide funding to a new entity in an area where a provider has already received universal service support or broadband/infrastructure grants, or whether to eliminate or reduce universal service support for an existing recipient, or whether to deem an area served and thereby ineligible for support, there should be a challenge process whereby existing providers, state commissions, customers, and interested third parties can challenge the broadband availability for which the decision is being made to grant new support or reduce current support. Any map, no matter how carefully constructed, can be inaccurate either through errors or simply because it is out of date by the time a funding decision is being made. A challenge process need not be overly time-consuming and burdensome. We believe a streamlined process can be established to ensure that scarce funding is targeted to the areas that are most truly in need.

Concluding Remarks
There appears to be broad agreement that the FCC's current broadband mapping methodology needs to be changed. FCC Chairman Ajit Pai acknowledged as much in his testimony on June 12 to the Senate Commerce, Science, and Transportation Committee when he stated that he intends to "to circulate a Report and Order at the FCC's monthly meeting in August that would result in a more granular and more accurate broadband map. That means requiring broadband providers to report where they actually offer service below the census block level, and looking to incorporate public feedback into our mapping efforts." I will work with WTA and others in the industry to provide comments to the FCC in advance of the Order's release that are consistent with positions I provided in my testimony today. We are committed to doing our part to achieve a more granular broadband availability map via a less-burdensome reporting methodology that better reflects real-world network characteristics and customer locations, and that contains a meaningful challenge process.

USTELECOM
THE BROADBAND ASSOCIATION

JONATHAN SPALTER
President and Chief Executive Officer

June 25, 2019

The Honorable Jared Golden	The Honorable Pete Stauber
Chairman	Ranking Member
Subcommittee on Contracting and	Subcommittee on Contracting and
Infrastructure	Infrastructure
House Committee on Small Business	House Committee on Small Business
2361 Rayburn House Office Building	126 Cannon House Office Building
Washington, DC 20515	Washington, DC 20515

Dear Chairman Golden and Ranking Member Stauber:

USTelecom's members, including large and small internet service providers (ISPs), suppliers and manufacturers, commend you for prioritizing the importance of broadband mapping for delivering broadband access to small businesses throughout our country. We agree that pushing more connectivity into unserved parts of our nation will require a smart and sustained partnership between government and broadband providers of all sizes that prioritizes funding to communities on the wrong side of the digital divide.

There is widespread agreement that policymakers need better and more granular information about areas without broadband before they can design efficient funding programs to address the problem, avoid overbuilding, and track progress. Currently, there is not a comprehensive connectivity map indicating precisely where high-speed broadband service is available and, most importantly, where it is not. If our aim is to leave no American behind, then the tools and instruments we use—in both the public and private sector—must be capable of accurately pinpointing where we need to focus our efforts. That is why USTelecom, along with key partners, has launched the Broadband Mapping Initiative pilot.

Broadband Mapping Initiative Pilot

The growing use of competitive reverse auctions to distribute broadband funding puts an even higher premium on having the best possible data about the areas up for bid in order to ensure a fair and cost-effective result. Broadband providers' recent experiences with the FCC's Connect America Fund (CAF) programs, however, have revealed that the type of granular mapping data needed to efficiently fund targeted programs for broadband deployment in rural areas is neither readily available nor consistent.

Working with innovative broadband companies, associations across the country, and in close consultation with federal and state level government stakeholders, and with Congress, USTelecom launched the Broadband Mapping Initiative pilot to quite literally "map this gap." Our mission is to create a consistent national dataset identifying all broadband serviceable locations using a single methodology to provide a harmonized reference point for broadband reporting. The Broadband Mapping Initiative pilot, using modern data analytics, will deliver a more detailed and cohesive view of where broadband is, and is not.

Here's how USTelecom's proof of concept pilot program will be implemented:

We have begun in two states—Missouri and Virginia—with the aim of developing a single, comprehensive next-generation broadband mapping system for the nation. With the help of our partners at ITTA and the Wireless Internet Service Providers Association, our pilot involves multiple companies of different sizes and technology types, including AT&T, Chariton Valley Electric Cooperative, Consolidated, CenturyLink, Frontier, RiverStreet, TDS, Verizon and Windstream.

Working together, we are using new digital resources, including satellite imagery, digitized parcel and land attribute data, a mix of open source data sets and commercial software, and existing broadband provider address information. These data sets will be combined and organized by conforming addresses, removing duplicates, cross-checking information with carrier-provided address lists and using managed crowdsourcing to review records for accuracy. The pilot also will test different methods for reporting service availability. Carrier size and technology is likely to influence the method that works best for each participant, and we anticipate testing several methods including: reporting by individual address/locations; submitting shape files of service area; and submitting results of propagation maps for fixed wireless service. Once this process is complete and a full set of broadband serviceable locations is identified, carriers will be able to report where they can provide broadband.

Creating a database at this level of granularity is a major endeavor and enlisting the help of consumers and state officials on the ground will help confirm, correct, and refine the data. We are attempting to map in a highly dynamic environment where service deployment, homebuilding, business development, natural disasters, and developments in GIS resources create a constantly changing landscape that must be updated and improved over time. In addition to a systematic schedule to refresh data and reporting, this proposal pilot is designed to support a cooperative, collaborative approach to creating and maintaining an important national data source.

The hoped-for result? A comprehensive database of all broadband serviceable locations, homes and businesses, in our two pilot states—and a roadmap for a collaborative government-led effort to expand the system nationwide.

The opportunities associated with accelerating rural broadband connectivity to the small businesses that crave connectivity require an enduring public private partnership. USTelecom and its member companies stand ready to work with this Committee, Congress, and the Administration to improve broadband mapping, a critical step toward closing the digital divide. A sustained effort will take time and resources, along with partnership, imagination and innovation, but these are essential if all American businesses are going to have the opportunity to benefit fully from our nation's global digital leadership.

Sincerely,

Jonathan Spalter
President and CEO
USTelecom – The Broadband Association

Cc: The Honorable Nydia Velázquez
        The Honorable Steve Chabot

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