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**BEFORE THE UNITED STATES SENATE
COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION**

“OVERSIGHT OF THE FEDERAL COMMUNICATIONS COMMISSION”

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Chairman Thune, Ranking Member Nelson, and distinguished Members of the Committee, thank you for the invitation to testify.

I want to begin by commending the Committee on its notable and bipartisan achievements—from the MOBILE NOW Act and the AIRWAVES Act, which identify the spectrum needed to win the race to 5G, to the STREAMLINE Small Cell Deployment Act and the SPEED Act, which would cut some of the regulatory red tape that threatens the deployment of those 5G networks.

These two issues—spectrum and infrastructure—are key to the deployment of next-generation networks. And action on these fronts makes a real difference when it comes to bringing more broadband to more Americans. In my time on the Commission, I have seen firsthand the challenges that come with deploying broadband to some of the hardest-to-serve parts of the country. I have spent time in many of your home states and heard from families and small businesses about the opportunities that connectivity enables in their communities—from better jobs, to 21st century education, to high-quality health care.

Chancellor, South Dakota (pop. 268) is one place that exemplifies those challenges and opportunities. It’s where I met Tyler, a scrappy entrepreneur who used to run a tech startup from his home. He lived on part of his family’s old homestead, which continues to be used as part of a larger farming operation. Tyler needed a better, faster, and more reliable broadband connection, so here’s what he did. He asked a broadband provider to run fiber to the closest accessible point to his house, which happened to be an old wooden utility pole. He had to enter the pole’s location as his “home address” to ensure the provider would run fiber to that point. He then set up a high-speed, fixed wireless link to bridge the gap between his house and the fiber connection. Turns out, this setup worked well to bring broadband to Tyler’s house. He looked around and realized that he could help bring more broadband to his neighbors around Chancellor by doing similar work. So Tyler decided to go into the broadband business with his brother, Jason. They now run a small Wireless Internet Service Provider or WISP called Leap Communications. Connecting rural South Dakota is not easy work. And you can’t be afraid of heights to do it.

Tyler took me on a tour of one of his deployments. We started out 180 feet above nearby Parker, South Dakota, on top of the town’s water tower. The view was almost worth the climb up three series of ladders. Once up there, he showed me the antenna he bolted onto the tower that points to a receiver a few miles away, which is where he connects to fiber and, ultimately, the Internet. On the other side of the tower, he has attached another antenna to beam broadband to a farm about nine miles away. We visited that farm and spoke with Duane, who runs the operation. Duane volunteered that he used to go to church regularly to improve his connection. You see, before he met Tyler, Duane did not have broadband at the farm. So he would go to church almost every day to use its Wi-Fi and upload the massive data sets he collects on his connected tractors and combines. Duane was quick to point out that he still goes to

church, but with a broadband connection provided by Tyler's company, he can now spend his time there focused on a higher purpose.

For communities across the country, broadband is giving families a chance to change their lives. I saw this during a visit to Indiana with Senator Todd Young. One of our first stops was at Linda Muegge's kitchen table. Linda lives in Blue River Township, a community of fewer than 1,500 people. She told us about the very real difference it makes when rural America gets a fair shot at next-gen connectivity.

Linda's farm and house in Blue River is served by an electric co-op that provides her with gigabit-speed fiber. In fact, Senator Young pitched in that morning by splicing fiber that is being deployed to the community. Linda said that the fast connection this fiber enables means HD Netflix, faster web browsing, and even some visits from neighbors who want to borrow her high-speed hookup.

But what struck me most in talking with Linda is the difference that this connection has made in the lives of her family. Linda's son, Chris, went to grad school at Purdue for a degree in animal nutrition. Chris has used his degree to build a successful consulting business, mostly for cattle owners, with clients as far away as Costa Rica. Chris needs to see the cattle in HD and download large data sets to monitor their feeding and health. Without the high-speed connection, Chris would not be able to live in Blue River. Now, he can stay close to home and pitch in at the farm while continuing to pursue his own high-tech business.

This is why the work of this Committee and the FCC is so important. As legislators and regulators, we can help ensure that every community—from Parker, South Dakota to Blue River, Indiana—has a fair shot at the opportunity that broadband enables. This is particularly important as we make the transition to next-generation networks, which can unleash a new cycle of innovation and entrepreneurship in the country. We do not want to see any community get left behind.

To meet that goal, we must extend American leadership in wireless as we move from 4G to 5G networks. Following the Committee's lead, the FCC's game plan is straightforward: we must free up more spectrum and we must remove barriers to infrastructure deployment. I am proud to report that the Commission has made substantial progress on both fronts.

With respect to spectrum, the Commission has taken a number of concrete steps in the past few months alone. In February, we paved the way for opening up spectrum above 95 GHz. In March, we sought comment on designating the 4.9 GHz band for flexible use. In April, we took a step towards bringing over 1.5 GHz of millimeter wave spectrum to auction. In May, we started a proceeding to put spectrum in the 2.5 GHz band to more productive use. In June, we finalized rules for the 24 GHz band and sought comment on opening up the 26 GHz and 42 GHz bands for flexible use. In July, we sought comment on clearing mid-band spectrum for wireless use, and Chairman Pai announced the auction of spectrum in the 37 GHz, 39 GHz, and 47 GHz bands. And at our last open meeting two weeks ago, we took steps to rationalize the 39 GHz band ahead of next year's auction.

On wireless infrastructure, I appreciate that Chairman Pai asked me to lead the FCC's efforts. And we have already made significant progress in ensuring that our regulatory structures are 5G Ready.

As you know, 5G networks are going to look very different than the 3G and 4G deployments of the past. While hundred-foot towers accounted for the lion's share of prior deployments, up to 80% of new cell sites will be small cells with antennas no larger than a backpack plus associated equipment. But a year ago, our regulatory structures were threatening to hold us back—to limit 5G deployments to only the most profitable-to-serve areas. The problem was that our regulations assumed that every new cell site was a hundred-foot tower. So in the intervening months, we have worked with stakeholders to update and modernize our approach—to ensure the United States wins the race to 5G.

In March, for instance, we adopted an order that exempts small cells from certain federal historical and environmental review procedures that were designed for those large, hundred-foot towers. This decision extended the same regulatory treatment to small cells that the Commission has always applied to the deployment of other types of infrastructure, including Wi-Fi routers and consumer signal boosters. This one step is expected to cut about 30% of the total cost of deploying small cells. In fact, an Accenture study determined that our action could save \$1.56 billion, which could be used to deploy 55,000 new cell sites and create more than 17,000 jobs.

This reform alone could flip the business case for thousands of communities, particularly in rural and disadvantaged parts of the country. Almost no matter what we do, 5G and next-gen networks will be deployed in New York and San Francisco. But there are thousands of other communities that might lose out if we do not modernize our approach to broadband infrastructure. So the FCC is continuing to work with all stakeholders as we move to further update our approach to infrastructure deployment.

We know that broadband deployment can create jobs, but it can also save lives. I have seen it in places like Beatty, Nevada, where a rural health care clinic is staying open because a new broadband connection allows patients to visit virtually with a doctor located in a much larger town. I have seen it in the small community of Manokotak, Alaska, where a broadband-enabled otoscope can allow an ENT located in Dillingham to diagnose a child's ear infection before it threatens her hearing. For years, the FCC has been playing a key role in supporting the deployment of broadband to these facilities through our Rural Health Care Program.

But there's a new trend in telehealth—a trend towards connected care everywhere. The delivery of high-tech, high-quality health care is no longer limited to the confines of connected, brick-and-mortar facilities. With remote patient monitoring and mobile health applications that can be accessed on a smartphone or tablet, we now have the technology to deliver high-quality care directly to patients, regardless of where they are located—places like the Mississippi Delta.

The Delta is ground zero for the country's diabetes epidemic. It sees diabetes at rates that are about twice the national average. Ruleville, Mississippi is no exception to this trend. In addition to having one of the highest rates of diabetes in the state, more than half of all children in this area live in poverty. That only adds to the challenge of finding and accessing affordable health care. But the Delta is also a place where remote patient monitoring technology is already making a difference.

Six months ago, I had the chance to visit Mississippi, where Senator Wicker mentioned an innovative pilot program run by the University of Mississippi Medical Center. Using remote patient monitoring technologies, the pilot program was helping to treat and control cases of Type II Diabetes in the Delta.

One of the program's patients is Ms. Annie. She noticed the first signs of her diabetes when she woke up one day with blurred vision. After seeing little progress in managing her diabetes with traditional care options, Ms. Annie signed up for a remote patient monitoring pilot program. She walked me through the blood sugar monitor that she uses at home. The monitor uses Bluetooth to connect to her iPad, which chimes every morning to remind her to check her blood sugar. Ms. Annie then pricks her finger and her A1C level is displayed on-screen. Based on that, the iPad app suggests appropriate actions—from a particular food or exercise, to watching a relevant video. If she forgets to enter her numbers that day, she'll get a phone call from a nurse. With this technology, Ms. Annie's A1C levels have gone down and she says she's never felt better.

A few weeks earlier, at the University of Virginia's Children's Hospital, Dr. Karen Rheuban talked about the role that these new telehealth technologies are playing in saving lives—new technologies like a connected tablet for parents whose babies have heart problems. An app called Locus Health tracks a baby's weight, heart rate, and oxygen levels and sends the data to the hospital. The data provide early warning signs that can head off problems that might result in ICU stays and invasive procedures.

Finding ways to use remote patient monitoring technologies to manage chronic diseases, which account for over 85% of direct health care spending, is a challenge that merits our attention.

The relatively limited trials to date are showing significant cost savings:

- A remote patient monitoring program run by the Veterans Health Administration costs \$1,600 per patient—an 88% savings from VHA's home-based primary services.
- Another telehealth project found that every \$1 spent on remote monitoring resulted in a \$3.30 return in savings.
- The Mississippi Delta trial resulted in nearly \$700,000 in annual savings due to reductions in hospital readmissions alone, which, assuming just 20% of Mississippi's diabetic population enrolled in this program, Medicaid savings in the state would be \$189 million per year.

And these connected care technologies are improving health outcomes:

- A study of 20 remote patient monitoring trials found a 20% reduction in mortality and a 15% reduction in hospitalizations related to heart failure.
- The Veterans Health Administration's remote patient monitoring program resulted in a 25% reduction in days of inpatient care and a 19% reduction in hospital admission.
- Another remote patient monitoring initiative showed a 46% reduction in ER visits, a 53% reduction in hospital admissions, and a 25% shorter length of in-patient stay.

Given the significant cost savings and improved patient outcomes associated with connected care, we should align public policy in support of this movement in telehealth. At the FCC, we can play a constructive role by bringing more health care options to communities through broadband. We can help bridge the "doctor divide" by closing the digital divide. And many members of this Committee, including Chairman Thune, Senator Wicker, Senator Schatz, Senator Fischer, Senator Gardner, and Senator Young,

have led the way on these efforts as well, recognizing that the FCC can do more to connect people around the country with high-quality care.

So I am glad that Chairman Pai asked me to lead the FCC's new telehealth initiative. I am pleased to report that two weeks ago the Commission unanimously approved a proposal to seek comment on setting up this program. The Connected Care Pilot Program would provide up to \$100 million for connected care benefiting low-income patients, including those eligible for Medicaid and veterans. It would support a limited number of projects over a two- or three-year period, with controls in place to measure and verify the benefits, costs, and savings associated with connected care. It could take the results we've already seen in the limited trials to date and help replicate those results in communities across the country.

From chronic disease management to pediatric cardiology, from PTSD to opioid dependency, this pilot has the potential to make a real difference for low-income individuals that currently lack access to quality health care. I look forward to working with my colleagues at the FCC, federal and state partners, Members of this Committee, and all stakeholders as we consider establishing the Connected Care Pilot Program.

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Chairman Thune, Ranking Member Nelson, and Members of the Committee, thank you again for holding this hearing and for the invitation to testify. I welcome your questions.