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THE STATE OF INFRASTRUCTURE IN RURAL AMERICA

HEARING

BEFORE THE

COMMITTEE ON AGRICULTURE
HOUSE OF REPRESENTATIVES

ONE HUNDRED FIFTEENTH CONGRESS

FIRST SESSION

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THE STATE OF INFRASTRUCTURE IN RURAL AMERICA

WEDNESDAY, JULY 19, 2017

HOUSE OF REPRESENTATIVES,
COMMITTEE ON AGRICULTURE,
Washington, D.C.

The Committee met, pursuant to call, at 10:00 a.m., in Room 1300, Longworth House Office Building, Hon. K. Michael Conaway [Chairman of the Committee] presiding.

Members present: Representatives Conaway, Thompson, Goodlatte, Lucas, King, Rogers, Austin Scott of Georgia, Crawford, DesJarlais, Hartzler, Denham, LaMalfa, Davis, Yoho, Allen, Bost, Rouzer, Abraham, Kelly, Marshall, Bacon, Faso, Dunn, Arrington, Peterson, David Scott of Georgia, Costa, Walz, McGovern, Vela, Lujan Grisham, Kuster, Plaskett, Adams, Evans, Lawson, O'Halleran, Panetta, Soto, and Blunt Rochester.

Staff present: Bart Fischer, Darryl Blakey, Emily Wong, Matthew S. Schertz, Paul Balzano, Rachel Millard, Stephanie Addison, Anne Simmons, Evan Jurkovich, Kellie Adesina, Liz Friedlander, Troy Phillips, Nicole Scott, and Carly Reedholm.

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

The CHAIRMAN. Good morning. This hearing of the Committee on Agriculture entitled, *The State of Infrastructure in Rural America,* will come to order. I would ask Mr. Bacon to open us with a prayer. Don.

Mr. BACON. Ladies and gentlemen, we are praying. Dear Heavenly Father, Lord, we thank you for a beautiful day. We thank you for the privilege of living in this country where we are free. And we just thank you for our farmers, our ranchers, our agriculture, which is such a rich resource for our country. You have blessed us. And, Lord, we ask for your wisdom today and for your presence. And we just ask you that you help us do a good job for our country. In Jesus' name, amen.

The CHAIRMAN. Amen. Thank you.

Well, based on the level of conversation before we started the hearing, apparently everybody is excited about our topic today. This is good stuff. Again, thank you for being here. I appreciate it.

There is, perhaps, no current public policy proposal that commands more bipartisan support than the idea of rebuilding America's public works. We have all heard the news reports about the impact aging infrastructure has on our ability to trade, travel, and communicate. But perhaps nowhere is the need to renew our infra-

structure greater than in America's heartland. Many Americans are familiar with the crumbling bridges and buckling roads that are highlighted in the news stories, and the tragic crisis in Flint has brought into sharp relief the urgent need to upgrade our water supply infrastructure.

Like urban America, rural America has its share of roads, bridges, and water systems in need of repair. We face unique challenges that are different than our neighbors. Rural America produces commodities, those fundamental products on which our modern economy is built. We produce food, fiber, energy, ore, lumber, and everything that goes into the products that are made in our factories, factories that, in many cases, reside in urban America. And transportation is the lifeline that facilitates this partnership. If we cannot get the commodities to market, urban manufacturers——

[Audio malfunction in hearing room.]

Mr. YOHO. Mr. Chairman, I don't believe your microphone is on. It is not working. The red light is on.

The CHAIRMAN. Would you come and read this.

[Discussion off the record.]

The CHAIRMAN. All right. Is it working now?

Okay. Speaking of infrastructure needs: transportation, improved communications technology remains a tremendous need in rural America. Here in this room we take for granted the awesome power of smartphones. Universal instantaneous access to the Internet has become essential to our lives. And as communications technology races ahead, we need to ensure rural Americans are not being left behind.

Further, many of the gains in rural America over the past 100 years have been due, in part, to the public investments made in agricultural research [Audio malfunction in hearing room.]

As we have heard before, the infrastructure on which our world class agricultural researchers rely is outdated, crumbling, even as other countries are making significant investments. At the root of many of these problems is the need for capital to be invested in rural America. Our shifting population moving out of rural communities into urban and suburban counties, is also shifting the tax base making it difficult for small communities to finance the upgrades they need to continue to be competitive in a modern economy. It is a cycle that seems unbreakable. Services are lacking, so families move out. As families move out, the tax base shrinks. And as the tax base shrinks, services must be curtailed and upgrades must be postponed.

While it is tempting to think it is a local problem, it is not. Our modern economy is built on the free movement of goods and ideas. We cannot grow our nation's economy adequately if 50 million rural Americans are unable to participate.

For 200 years, Congress has debated Federal financing of waterways, highways, electric systems, telephone lines, and research infrastructure. Across all of those debates, we have long understood the need to continue to pull all Americans further into the networks of commerce.

I applaud the President for drawing attention to this important issue. Today, we are fortunate to hear from six of over 200 organizations participating in the Rebuild Rural Coalition.

I want to thank them and the many other coalition partners for joining us here today. It is important that your members and our constituents are part of this process.

[The prepared statement of Mr. Conaway follows:]

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

Good morning and thank y'all for being here today.

There is perhaps no current public policy proposal that commands more bipartisan public support than the idea of rebuilding America's public works. We've all heard the news reports about the impact aging infrastructure has on our ability to trade, travel and communicate. But perhaps nowhere is the need to renew our infrastructure greater than in America's heartland.

Many Americans are familiar with the crumbling bridges and buckling roads that are highlighted in news stories. And the tragic crisis in Flint has brought into sharp relief the urgent need to upgrade our water supply infrastructure. Like urban America, rural America has its share of roads, bridges, and water systems in need of repair. But we face unique challenges that are different from our neighbors.

Rural America produces commodities, those fundamental products on which we build our modern economy. We produce food, fiber, energy, ore, lumber, and everything else that gets put into the products made by our factories—factories that, in many cases, reside in urban America. And transportation is the lifeline that facilitates this partnership. If we cannot get commodities to market, urban manufacturing centers and rural communities alike face challenges producing the very "made in America" products that create the jobs and grow our economy. Because of that, transportation infrastructure looms larger in rural America. It's not just roads and bridges, it's also locks and dams and railways and pipelines that allow our products to travel to the cities where they are needed. "Made in America" depends on the transportation networks we have built in rural America.

Like transportation, improved communications technology remains a tremendous need in rural America. Here in this room, we take for granted the awesome power of smartphones. Universal, instantaneous access to the Internet has become essential to our lives. And as communications technology races ahead, we need to ensure rural Americans are not being left behind.

Further, many of the gains in rural America over the past 100 years have been due, in part, to the public investments made in agricultural research. As we have heard before, the infrastructure on which our world-class agricultural researchers rely is outdated and crumbling, even as other countries make significant investments.

At the root of many of these problems, is the need for capital to be invested in rural America. Our shifting population, moving out of rural counties and into urban and suburban counties, is also shifting the tax base, making it difficult for small communities to finance the upgrades they need to continue to be competitive in the modern economy. It is a cycle that seems unbreakable—services are lacking, so families move out; as families move out, the tax base shrinks; as the tax base shrinks, services must be curtailed and upgrades must be postponed.

While it's tempting to think this is a local problem, it is not. Our modern economy is built on the free movement of goods and ideas. We cannot grow our nation's economy if 50 million rural Americans are unable to participate.

For 200 years, Congress has debated Federal financing of waterways, highways, electric systems, telephone lines and research infrastructure. Across all of those debates, we have long understood the need to continue to pull all Americans further into the networks of commerce.

I applaud the President for drawing attention to this important issue. Today, we are fortunate to hear from six of the over 200 organizations participating in the Rebuild Rural Coalition, and I want to thank them and many other coalition partners for joining us here today. It is important that your members—our constituents—are a part of this process.

With that, I yield to Mr. Peterson for any additional comments he might have.

The CHAIRMAN. With that, I would like to yield to Mr. Peterson for any comments he would like to make

OPENING STATEMENT OF HON. COLLIN C. PETERSON, A REPRESENTATIVE IN CONGRESS FROM MINNESOTA

Mr. PETERSON. Thank you, Mr. Chairman. And I want to thank the witnesses for being with us. And apologize. I have to go down the hall and testify on my wolf de-listing bill. I will be back, but I might miss a little bit.

Anyway, as the Chairman said, it is no secret that we have infrastructure issues, and we have been in decline. Our roads and bridges are in need of repair. And if we don't do it now, it will just cost more later. Our rural economy, in particular, faces unique infrastructure challenges. And it was said that strong infrastructure is necessary in rural America because it is so remote, and we depend on it to get our products to market.

I know it is surprising to a lot of folks, but in my district and others like it, there are large areas that lack broadband service. And there are USDA programs to build more broadband. But the problem is we don't have a sustainable long-term funding source. And we need something like the Universal Service Fund that we had when we built out the telephones. That is the only reason we got telephones out to every part of rural America. And, in my opinion, unless we have something like that in place, that can be relied on, we are not going to get this broadband done, it will be in fits and starts, with states doing things and so forth. Somehow or another, we have to figure out how to do this. It is not as easy to do on the broadband as it was with telephones, but I think we can do it.

There are a lot of components that are overseen by different Federal agencies. And if we are truly going to rebuild and keep our rural infrastructure strong, all these pieces need to work together. I appreciate the witnesses being here today, and I look forward to their testimony. And I yield back.

[Audio malfunction in hearing room.]

The CHAIRMAN. The chair requests that other Members submit their comments for the record so witnesses may begin the testimony.

[The prepared statement of Mr. Bacon follows:]

PREPARED STATEMENT OF HON. DON BACON, A REPRESENTATIVE IN CONGRESS FROM NEBRASKA

I ask that *The U.S. Infrastructure Advantage* report be included in the record for the hearing on the state of infrastructure in rural America. I applaud the Association of Equipment Manufacturers for their continued commitment to the future of our nation's infrastructure. The work of industry leaders including my constituent Leif Magnusson of CLAAS to produce *The U.S. Infrastructure Advantage* report is an import step to shaping our discussion about infrastructure in Congress. Strong infrastructure of all kinds will ensure that U.S. companies in all sectors remain competitive. I look forward to working with my colleagues to improve our infrastructure systems in the United States.

ATTACHMENT

The U.S. Infrastructure Advantage™

Introduction

The backbone of America's economy is its infrastructure. To have the strongest, most resilient economy in the world, America must have the best infrastructure in the world. In short, we must have an *Infrastructure Advantage.*

America's competitors around the world understand this. They are making unprecedented infrastructure investments and working hard to overtake the United States. Meanwhile, America is underinvesting, and is on the verge of squandering the *Infrastructure Advantage* we inherited from the investments made by our grandparents and great-grandparents.

It is time for America to rebuild and modernize its vast infrastructure network—our roads, highways, bridges, transit systems, ports, waterways, locks and dams, water and wastewater pipelines, as well as broadband. We must renew and strengthen our Infrastructure Advantage if we are to have the world's preeminent economy in the 21st Century and beyond.

As equipment manufacturers representing the agriculture, construction, forestry, mining, and utility sectors in North America, several factors impact our ability to manufacture and sell our products to customers inside and outside of the United States. These factors include labor force skill, trade policies that facilitate commerce in overseas markets, and Federal tax credits that boost reinvestment and expansion. Another important factor, which is the focus of this report, involves the maintenance and modernization of the U.S. infrastructure system.

What makes American manufacturers competitive is not so different from what makes the country economically competitive, and maintaining our infrastructure in a good and updated state of repair is yet another shared factor. In the 2016–2017 Global Competitiveness Report by the World Economic Forum, the United States remained in third place behind Switzerland and Singapore. More ominously, the U.S. ranked 11th in infrastructure competitiveness, with the report noting that "stagnating productivity has called for a downward revision of growth prospects, highlighting the need for a renewed competitiveness agenda."

If the United States is to remain a global economic leader, its infrastructure competitiveness ranking must be improved. The gradual demotion and stagnation of the United States' world infrastructure ranking is a direct consequence of an inability to strategically act on the opportunities that people, industry, and technology present in rethinking U.S. infrastructure.

This report makes the case for making U.S. infrastructure number one in the world and reclaiming the United States' *Infrastructure Advantage.* It outlines the consequence of not taking meaningful steps to regain this advantage, and offers five policy areas that lawmakers and infrastructure stakeholders should reference when considering infrastructure policy proposals for modernizing U.S. infrastructure and identifying a sustainable funding source. Rather than re-litigate our infrastructure problems, this document offers solutions and moves the conversation forward.

The Infrastructure Advantage

For the past 2 years, AEM and its member companies have sought opinions from a broad range of diverse infrastructure stakeholders. Based on this feedback it is clear that the United States must support and promote the following vision in order to reclaim its *Infrastructure Advantage*—the safe and efficient movement of people and goods, connectivity between and within rural and urban America, as well as strong economic growth and robust job creation. To effectively compete in the global marketplace, America's infrastructure must be the best in the world. That is the *Infrastructure Advantage.*

Why is the Infrastructure Advantage Important?

Rebuilding and modernizing America's core infrastructure to reestablish an *Infrastructure Advantage* is not only important, it is essential if the United States is to maintain its position as the world's strongest economy. It makes America more competitive internationally and puts domestic industry on the path to higher economic growth, greater productivity, and stronger private-sector job creation.

In today's global marketplace, U.S. companies must compete with companies from around the world, including ones located in countries with much lower labor costs and regulatory costs than the United States. This puts U.S. companies at a competitive disadvantage, and it creates incentives for U.S. companies to move their operations to countries with lower costs in order to compete more effectively.

To level the playing field, the United States must invest in strengthening its comparative advantages. The smartest area to do this is through the country's infrastructure system, which is central to international competitiveness. It is critical to moving goods, ideas, and workers quickly and efficiently and providing a safe, secure, and competitive climate for business operations.

Our competitors around the world understand this. They are spending enormous sums and expanding their infrastructure, with China and India leading the way.

Meanwhile, America is headed in the opposite direction. America's infrastructure was once the envy of the world and gave U.S. companies a big competitive boost

in the international marketplace. But in recent years we have been underinvesting in our infrastructure, resulting in a decline in our roads and bridges, transit systems, air traffic control systems, airports, railroads, ports and dams, and water infrastructure.

If America's businesses are to grow and remain competitive, and if foreign investors are to invest in businesses in the United States, then America needs to reclaim its *Infrastructure Advantage.* America must modernize and rebuild its infrastructure so that it is once again the envy of the world and ranks first in infrastructure competitiveness.

China, India, and other countries with low labor and regulatory costs are looking to the future by building a 21st century infrastructure capable of supporting a strong 21st century economy. This should be a wake-up call for the United States. It is time to accept the challenge. It is time to rebuild and modernize our infrastructure to ensure that America's 21st century economy is the world's strongest economy.

In the short term, significant investment will be required to modernize and rebuild America's core infrastructure. This infrastructure investment will create tens of thousands of jobs across a range of industries.

In the long term, the most important economic impact of the investment needed to create the *Infrastructure Advantage* comes as the investments are completed. The economic benefits of this investment are long-term competitiveness, productivity, innovation, lower prices, and higher incomes.

Consequences of Losing the Infrastructure Advantage

Every day Americans see the impact of underinvestment in our core infrastructure—congestion, potholes, transit outages, water main breaks, a sluggish economy, and the list goes on. This should not come as a surprise.

The United States is currently investing ½ of what it spent on transportation infrastructure more than 50 years ago as a percentage of the gross domestic product—close to 1.5% now compared with nearly 3% in the early 1960's.

America is at a crossroads. We either significantly increase investment in the infrastructure that has driven our economy in the past, or we continue to underinvest. If we increase our investment to levels sufficient to reclaim an *Infrastructure Advantage,* the benefits will be significant.

But what if we instead simply maintain the *status quo?*

Over time, these impacts will affect businesses' ability to provide well-paying jobs, further reducing incomes. If this investment gap is not addressed throughout the nation's infrastructure sectors by 2025, the economy is expected to lose almost $4 trillion in GDP, resulting in a loss of 2.5 million jobs in 2025.[i]

Upon completion of the Interstate Highway System, business logistics costs, as a percentage of United States GDP, were cut in ½ with a decrease from 16 percent in 1980 to eight percent in 2014.[ii] Failure to maintain and upgrade this system over the past 37 years has instead increased transportation costs for a variety of products, across many sectors. Congestion caused by highway systems that are at capacity and in disrepair cause 141 million hours to be wasted in freight truck productivity.[iii]

Failure to take meaningful action on upgrading United States infrastructure could also impact agricultural product transportation. Currently, America enjoys a trade surplus with it agricultural exports. However, steps are need to repair and upgrade the locks and dams system along U.S. inland waterways. These waterways serve as critical transportation channels that alleviate congestion on roads and rail by transporting agriculture commodities such as corn and soybean. For example, the agriculture sector could hypothetically see a 40% decrease in economic activity as the result of just one major lock disruption along the Upper Mississippi River and Illinois Waterway.[iv]

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[i] American Society of Civil Engineers, "Failure to Act." 2016. *http://www.infrastructurereportcard.org/wp-content/uploads/2016/05/2016-FTAReport-Close-the-Gap.pdf.*

[ii] TRIP, "The Interstate Highway System Turns 60: Changes to Its Ability to Save Lives, Time and Money." June 27, 2016. *http://www.tripnet.org/docs/Interstate_Highway_System_TRIP_Report_June_2016.pdf.*

[iii] American Automobile Association, American Trucking Associations, U.S. Chamber of Commerce, Joint Congressional Letter. January 26, 2015. *http://newsroom.aaa.com/2015/01/aaa-ata-u-s-chamber-ask-congress-fund-roads-bridges/.*

[iv] Yu, T.E., B.C. English and R.J. Menard. *Economic Impacts Analysis of Inland Waterway Navigability on the Transportation of Corn and Soybeans.* Staff Report #AE16–08. Department of Agricultural and Resource Economics, University of Tennessee. September 2016.

Steps To Reclaim the Infrastructure Advantage

This report outlines five areas that should be leveraged in any plan to reclaim the United States' *Infrastructure Advantage.* Within each area, this report includes infrastructure-related policy and regulatory suggestions that could be leveraged to facilitate promotion and implementation.

Focus on Networks and Systems

To achieve maximum efficiencies and benefits, infrastructure must be addressed on a network-wide and system-wide basis. A "project here and project there" approach will not work. America must tackle its infrastructure problems on a bigger scale. For example, the Interstate Highway System would not have produced the economic benefits that it has if it was simply a series of disconnected segments. The benefits are derived from the fact that it is a connected network. The same can be said for our national rail network. And this is especially the case when talking about the movement of freight.

As manufacturers, AEM and its member companies understand the importance of timely and reliable delivery—both in the transportation of finished products as well as in the parts and pieces that go into manufacturing those final products. As such, any proposal or plan must consider the effective and safe movement of people and goods as a primary objective. This requires efficient and well-designed networks and systems.

In the short term, AEM supports future implementation of dedicated transportation funding and policies that specifically target intermodal—ship to train to truck—network bottlenecks such as what was included in the 2015 Federal surface transportation reauthorization. Establishing a dedicated multi-modal freight discretionary grant program will ensure that authorized funding will go to freight-focused projects only. Further, user fees generated from freight providers would go towards this dedicated revenue stream.

In the long-term, the creation of a dedicated freight network will facilitate more efficient movement of products and goods, and directly alleviate personal vehicle congestion. AEM and its member companies support the continued development and implementation of a national freight plan.



Headquartered in West Fargo, North Dakota, and with U.S. manufacturing facilities in Bismarck, Gwinner, and Wahpeton, as well as Litchfield, Minnesota, and Statesville, North Carolina, Doosan Bobcat North America knows how reliant manufacturers are on the surrounding infrastructure system—both in getting raw materials to its facilities that produce loaders, excavators, utility work machines, hydraulic cylinders, as well as attachments for its heavy wheel loaders and excavators, but also getting those component parts and final products out to customers. That process must be efficient, cost-effective and reliable from start to finish.

"We depend on predicable and economical transportation and delivery options in getting our products and our attachments to domestic and overseas markets," said Doosan Bobcat North America and Oceania President Rich Goldsbury. "The infrastructure advantage afforded by our facility locations was a principal factor in choosing where we expanded and located our U.S.-based manufacturing operations. In certain cases, our manufacturing facilities are operating along a two-lane highway. As we identify new markets and products lines, it will be critical for us to have a plan and adequate resources both at the state and Federal level to build that supporting physical infrastructure so that operations continue smoothly and our product delivery to other facilities and our customers is seamless—both logistically and economically."

Maximize Use of Smart Technology

The integration of technology and infrastructure is already underway, but that integration is currently being implemented without a broad strategic plan in place. AEM and its member companies support the development and implementation of a national plan to upgrade and retrofit existing infrastructure systems with the latest in smart infrastructure technology. The need for this is two-fold: (1) to ensure that U.S. infrastructure is equipped to capitalize on the benefits that will come with technological advancements in areas such as embedded sensors, Information and

Communication Technology, automation, and unmanned aerial vehicle use, and (2) to ensure geographic parity across the country, particularly in rural areas.

In the short-term, the United States can help reassert its *Infrastructure Advantage* by auditing cross-agency research and development activities in the context of how they advance infrastructure innovation in this country. Currently, innovations are produced and assessed in silos and opportunities are missed. Collaborative policies need to be put in place that facilitate idea sharing and innovative partnerships across all agencies, levels of government, and the private-sector.

In the long-term, authorization for new federally supported infrastructure construction, maintenance or repair efforts must be contingent upon plans for technological upgrades and infrastructure adaptation. For example, self-driving cars and the need for sensor implementation is paramount to fully leveraging our infrastructure in a way that takes advantage of the advancements being made in the technological space across a range of industries. Roads, highways, bridges, and pipelines can and should do more for users. Federal infrastructure policy should require states and localities to demonstrate their commitment to implementing smart infrastructure across all assets and modalities. Infrastructure policy must put a premium on next generation infrastructure that takes full advantage of technological advancements that improve upon how current and future assets perform.



As an innovation company with its corporate headquarters in Silicon Valley, and locations across the country, Trimble integrates the digital and physical worlds by combining the Internet of Things, sensor-based monitoring, automation and data analytics into transformative solutions in a wide range of sectors including construction, agriculture, utilities, and transportation. The functionality and effectiveness of Trimble data-enabled solutions rely on a robust deployment of an expansive and reliable broadband infrastructure. To be effective the broadband network must provide ubiquitous and reliable connectivity from locations as diverse as a highway in Los Angeles to a peanut farm in Sylvester, Georgia.

"Increasingly, infrastructure must be integrated with technologies such as GPS," said Steve Berglund, Trimble's CEO. "Updating infrastructure assets must involve retrofitting them with technology that is going to enhance connectivity and circumstantial awareness. The need will intensify with more widespread adoption of autonomous vehicles, precision farming techniques, and automated work tools and machines. Our updated infrastructure will need to provide extended utility by actively interacting with the other elements that increase productivity, improve safety, or enhance quality of life—whether they are our personal devices, our vehicles, or our tools and machines. The end result will be an infrastructure that is smarter both in terms of performance but also its upkeep."

Ensure Rural-Urban Connectivity

Our transportation networks and systems must be developed and improved in a way that provides connectivity between and within urban and rural America. For example, it is rural America that feeds and fuels America. The food, fuel, and fiber produced in rural areas must, however, move to urban areas and to world markets. This only happens if America's transportation networks and systems provide connectivity. It is imperative that policies recognize this and act accordingly.

In the short-term, agriculture product transportation must not be overlooked, and future implementation and resource allocation of a national freight plan must involve other infrastructure assets beyond surface transportation such as waterways, rail, locks, dams and ports. These assets are also critical economic drivers and should be included in the freight funding category assigned in future surface transportation solutions.

In the long-term, a plan and commitment to ensure rural America is able to take full advantage of autonomous transportation and sensor technology must also be a part of a national infrastructure plan. Rural communities of populations of 50,000 or less stand to benefit from these technologies, as well as the broadband network they rely upon to function. Rural America must be included in any national plan to retrofit existing or new infrastructure with technologies such as embedded sensors. Much like the Federal support needed for public works projects, adapting

rural infrastructure to technological advancements must be a part of the next wave of ensuring parity and connectivity between urban and rural America.



As a global manufacturer of farm equipment such as combines, forage harvesters, balers, hay tools, and tractors, CLAAS North America not only manufactures equipment critical to agriculture production, an economic driver for rural communities, but also operates facilities in the very rural communities that rely on this equipment. It's a company that contributes doubly to the rural community.

"Rural infrastructure and the critical connectivity it provides in feeding America and the world is just one reason why it must be a part of a larger, national infrastructure plan," commented CLAAS Global Sales America President Leif Magnusson. "We look very closely at logistic costs when looking at the larger production picture, and if we can keep that cost lower it means that we can provide our product to our customers—farmers and ranchers in rural communities—at a more competitive price."

Broadband connectivity is also an important infrastructure component when considering rural development planning. The Internet of Things (IoT) is transforming agriculture and working to help producers become more resourceful, sustainable, and productive. Closing the digital divide in rural America must be the focus of legislators and government agencies to enable rural communities to compete in the digital age.

"Well over 35% of rural America remains without fixed broadband support," said Magnusson. "We manufacture farm equipment that can transmit mission critical data for analytics that then turns into actionable decisions. Connected machinery, fleet vehicles, weather stations, and soil sensors are just some of the early stages of connected farm innovations taking place. The ingenuity of tomorrow's farm starts with the infrastructure investments of today."

Expedite Project Delivery

Modernizing and rebuilding America's core infrastructure is costly and takes time. Approvals today can take a decade, sometimes longer. Delay dramatically adds to costs, and prevents projects from getting off the drawing board. Delay also prolongs bottlenecks which waste time and energy, causing America to lag behind global competitors. The impact of keeping project delivery on time extends beyond the life cycle of a project, allowing for all industries to anticipate the economic benefits that come with infrastructure update and increased capacity.

In the short-term, Congress must tackle reforming existing and yet-to-be-determined regulations that impact the most pressing infrastructure assets. These include, but are not limited to, automated vehicle guidance, water and wastewater rehabilitation standards, and big data usage and privacy protection guidance. Tackling these regulations now will empower the private sector to continue to innovate. It will also provide state and local governments with helpful guidance in preparing for future Federal funding opportunities.

In the long-term, AEM supports a 2 year or less environmental approval process for future infrastructure project delivery plans.[v] A legally enforceable deadline from approval of funds to a final permitting decision must complement this timeline so that project completion can be anticipated and appropriately planned for by state and local entities. AEM and its member companies support deputizing one agency to oversee large-scale, interstate infrastructure project approvals across all modalities and assets—from transportation to utilities.

[v] Common Good, "Two Years Not Ten Years: Redesigning Infrastructure Approvals." Philip K. Howard. September 2015.



Calder Brothers Corporation manufactures Mauldin Paving Products at its Taylors, South Carolina facility, offering a line of construction equipment such as asphalt pavers, asphalt distributors, motor graders, rollers, and water tank trucks—equipment that is integral in any road or highway worksite. In this case, manufacturer and contractor depend on a project approval and regulatory process that is streamlined and efficient.

"Predictability in project approvals over a multiyear horizon helps our customers determine if and when to place new orders, first and foremost," commented Calder Brothers Corporation Executive Vice President Glen Calder. "If a contractor can reliably predict when projects will be approved, we both can plan accordingly to make sure they have the right equipment to handle these infrastructure challenges. Equally important is the confidence this multiyear predictably gives us as manufacturers to invest in research and development, as well as plan for future facility expansion and job growth."

Provide Adequate and Reliable Resources

AEM and its member companies understand how important it is for U.S. infrastructure to have a funding mechanism that is reliably and responsibly resourced. As varied as infrastructure is, and as varied as its uses are, it is appropriate to consider multiple funding proposals based on the user, the mode, the product carried, and the frequency of use. What might work for highways may not work for waterways, and what is suitable for urban public transit may not be suitable for funding the infrastructure priorities of rural communities. As such, Federal lawmakers must consider a range of options.

In the short-term, this should include the widespread adoption of user fees, such as a gas tax, for all publicly supported infrastructure assets, not just ports, waterways, toll roads, or high-occupancy-vehicle lanes in urban areas. The solvency of the Highway Trust Fund depends on identifying and supporting a sustainable funding solution.

In the long-term, AEM and its members support infrastructure financing policies that encourage partnerships with the private sector (P3s), and recognize that this must also be coupled with a strong Federal investment, as many important and necessary projects are unable to generate a revenue stream sufficient to support P3 financing. In addition, one of the barriers to fully leveraging the P3 model is that not all 50 states have strong enabling legislation to fully facilitate these partnerships. While recognizing individual state and project needs, steps should be taken to standardize basic P3 enabling legislation at the state level.



With manufacturing facilities in Pella, Iowa, Vermeer Corporation produces a line of underground infrastructure solutions used on a range of utility infrastructure projects. These "unseen" infrastructure networks are critical to the ensuring urban and rural communities thrive. However, for many of these underground networks, public funds are essential and badly needed to complete much-needed repairs and new installations, either as the sole source or as a means to leverage private investment.

"Just like with road and highway construction, the utility construction sector needs funding and financing certainty with its projects," said Vermeer President and CEO Jason Andringa. "Utility infrastructure doesn't always attract private

investment and that's why Federal dollars play such an important role. Navigating a utility infrastructure project from start to finish requires using every option you have. This has to be the funding and financing approach we take to modernizing and repairing United States infrastructure."

Conclusion

For the better part of a decade, stakeholders have painstakingly detailed the pitiful state of American infrastructure, highlighted the rising costs of inaction, and made continual appeals to decision makers at the Federal level to do something—settling for piecemeal and short-term fixes—to stem the structural and functional decline of roads, bridges, ports, locks, dams, and water pipelines. Indeed, the path for the United States to retake the lead in the global infrastructure race appears steep.

What are the next steps in reclaiming the U.S. *Infrastructure Advantage* and making our infrastructure great once again?

AEM and equipment manufacturers will continue to push for a long-term plan to rebuild and modernize our infrastructure and help us reclaim the *Infrastructure Advantage.* This includes supporting efforts at the Federal, state and local levels intended to make U.S. infrastructure the priority it should be.

On a parallel track, AEM and its member companies will urge lawmakers to consider the five policy priorities outlined in this document in short-term as well as long-term legislative efforts. It is time to stop restricting the policy making process to the question of funding the infrastructure systems of the 1980s and push forward with efforts to retrofit the existing system in a way that will ensure the safe and efficient movement of people and goods, facilitate connectivity between urban and rural America, and promote economic growth and job creation.

AEM and its member companies will continue to encourage greater dialogue and collaboration among a broad variety of infrastructure stakeholders about the next big national project, whether it is above or below ground, on a magnetic levitation guideway, an autonomous vehicle revolution, platooning trucks, or technological upgrades to our once-impressive network of intermodal assets. It is time for the United States to reclaim its *Infrastructure Advantage* and meet the needs of the 21st century global economy.

About AEM

AEM is the North American based international trade association providing innovative business development resources to advance the off-road equipment manufacturing industry in the global marketplace. AEM membership comprises more than 950 companies and more than 200 product lines in the agriculture, construction, forestry, mining and utility sectors worldwide. AEM is headquartered in Milwaukee, Wisconsin, with offices in Washington, D.C.; Ottawa, Canada; and Beijing, China.

About the *U.S. Infrastructure Advantage*™

The U.S. *Infrastructure Advantage*™ was developed by a task force of executives from the equipment manufacturing industry after 2 years of engaging in discussions with, and soliciting ideas from, a wide range of infrastructure stakeholders. It will guide the strategic direction for AEM's ongoing infrastructure advocacy efforts and serve as a tool to assess infrastructure policy proposals at state and Federal Government levels. Those contributing include:

Jason Andringa, President & CEO, Vermeer Corporation, Pella, Iowa

Steve Berglund, President and CEO, Trimble Inc., Sunnyvale, California

Glen Calder, Executive Vice President, Calder Brothers Corporation, Taylor, South Carolina

Ron De Feo, President, Kennametal, Pittsburgh, Pennsylvania

Rich Goldsbury, President, Doosan Bobcat North America and Oceania, West Fargo, North Dakota

John Grote, Global Vice President of Marketing and Sales, Grote Industries, Madison, Indiana

Dennis House, Vice President of Marketing, Topcon Positioning Systems, Livermore, California

Jerry Johnson, President, Farm, Ranch, & Agriculture Division, Blount International, Oregon, Illinois

Shan Kirtley, Vice President of Sales & Marketing, Ditch Witch, Perry, Oklahoma

David Koppenhofer, Executive Director, OEM Sales & Support, Cummins, Inc., Indianapolis, Indiana

Leif Magnusson, President, CLAAS Global Sales America, Inc., Omaha, Nebraska

Kevin Smith, President, HammerHead Trenchless Equipment, Lake Mills, Wisconsin
Jim Wessing, President, Kondex Corporation, Lomira, Wisconsin

The CHAIRMAN. And with that, I would like to welcome our witnesses to the table.

First, we have Tom Halverson, President and CEO, CoBank. Mr. Lucas, have you a witness you would like to introduce?

Mr. LUCAS Thank you, Mr. Chairman. We have Dr. Tom Coon, Vice President of the Division of Agricultural Sciences and Natural Resources of Oklahoma State University; on behalf of APLU. He is responsible for the extension service experiment stations. He is a wonderful asset, and I look forward to his comments today.

[Audio malfunction in hearing room.]

The CHAIRMAN. Have you a witness you would like to introduce?

Ms. ADAMS. Thank you, Chairman Conaway. I am pleased to introduce Mr. Curtis Wynn, from my State of North Carolina. He is the President and CEO of Roanoke Electric Cooperative, and the Vice President for the National Rural Electric Cooperative Association. Mr. Wynn is nationally recognized in Roanoke, and does work to support local communities. They have developed and implemented pioneering financing community solar, and broadband service programs. Mr. Wynn is a perfect voice to help this Committee navigate the complexities of the development. I am looking forward to hearing his testimony

The CHAIRMAN. Thank you, Ms. Adams.

We also have Ms. Jennifer Otwell from District 11, which is kind of near and dear to my heart. Jennifer is the Vice President and General Manager of Totelcom Communications, LLC, De Leon Texas, on behalf NCTA—The Rural Broadband Association. And Mr. Vela, would you like to introduce our witness?

Mr. VELA. Yes. Thank you, Mr. Chairman, for this hearing and bringing our attention to the needs of rural America. Brian Macmanus is the general manager of the Rio Hondo Water Supply Cooperation. He was [Audio malfunction in hearing room.]—authority where he serves as Vice President. Additionally, Brian serves as Vice President of the Texas Rural Water Association Board of Directors and President of the South Texas Water Utility Managers Association. I am happy to have you here today, Brian, and thankful that you are here to highlight the water needs of south Texas and of all rural America.

The CHAIRMAN. I thank our witnesses. We are going to have to take about a 7 to 8 minute break to reboot the system. Please, everybody, stay where you are. We will reboot and try to move on. Everybody hang with us.

If this problem persists, we will simply turn it all off. I will ask the witnesses to speak loudly so the stenographer can capture what you are saying. And we will not be able to broadcast this thing out further than that. But we will move forward.

So with that, Dr. Halverson 5 minutes.

Oh, by the way, given this delay, given the importance of this and how much all of our Members are interested in this, I am going to be really strict on the 5 minute clock. If you see the red light go on and I start banging the gavel up here, then I will need you to wind it up really quickly. And then, Members, please under-

stand, you have 5 minutes, and then I am going to have to move on to the next person.

So with that, Dr. Halverson, your 5 minutes.

STATEMENT OF THOMAS HALVERSON, PH.D., PRESIDENT AND CHIEF EXECUTIVE OFFICER, COBANK, WASHINGTON, D.C.; ON BEHALF OF FARM CREDIT SYSTEM

Dr. HALVERSON. Well, good morning, Chairman Conaway, Ranking Member Peterson, and Members of the Committee. Thank you for calling this hearing today. My name is Tom Halverson. I am the President and CEO of CoBank, and I am testifying today on behalf of the Farm Credit system.

We are proud to be helping to organize the Rebuild Rural Coalition, engaging more than 200 organizations from across the country that are dedicated to highlighting the unique infrastructure needs of agriculture and rural communities and advocating for investment in America's rural infrastructure.

We are grateful for the Committee's interest in rural infrastructure, and we ask that, as infrastructure legislation moves forward in this Congress, that you work aggressively to address the important needs of agriculture in rural communities.

As Rebuild Rural points out, our nation's ability to produce food and fiber, and transport it efficiently across the globe, is a critical factor in America's global competitiveness. Infrastructure that supports rural communities and links them to the global market has helped make the United States the unquestioned leader in agricultural production.

People in rural communities have seen their infrastructure deteriorate jeopardizing jobs, the competitiveness of American agriculture and the quality of life for rural families and communities. The scope of the investment that is needed is staggering, and government resources cannot fill that need entirely.

Creative solutions that pair government investment with private sources of capital hold great promise. We stand ready to work with you and the Trump Administration on this important initiative. Among the Farm Credit institutions, CoBank is uniquely chartered to directly lend to rural infrastructure providers. CoBank's $31.5 billion in loan commitments to rural infrastructure includes community facilities, rural water and wastewater treatment companies, rural electric cooperatives, and rural communications service providers.

CoBank partners with many Farm Credit associations to finance an additional $9.4 billion in loan commitments to rural infrastructure. We partner with commercial banks to add $1.6 billion more in commitments to that sum. And as a cooperative owned by our customers who live and work in rural America, our primary interest is maximizing the quality and the availability of infrastructure to rural communities. Hospitals, senior care centers, walk-in clinics, schools, and other community facilities are critical to the viability of rural communities and are important contributors to the quality of life for rural families. In many rural communities, those essential facilities are not available or need modernization.

A pilot program authorized by our regulator, the Farm Credit Administration, helped to address the need for community facility

investment. Farm Credit was able to invest $733 million in 210 rural communities, catalyzing commercial bank investment of an additional $315 million on almost ½ of those projects. That pilot program expired in 2014, and we would hope that this Committee will encourage the Farm Credit Administration to facilitate a new sustainable program to resume these critical partnerships between Farm Credit, commercial banks, and the USDA to support rural community facilities.

GAO estimates that almost $190 billion is needed to cover the cost of replacing outdated rural water and wastewater infrastructure. There continues to be a well-publicized digital divide between urban and rural broadband subscribers. The Federal Communications Commission estimated that nearly 40 percent of rural Americans do not have access to the current FCC target for ideal minimum Internet service. That lack of access slows the deployment of technology, hampering efficiency on our farms, limiting other business opportunities, and threatening our local and rural communities.

Rural America helped pull the country out of the Great Recession, thanks to the strength of agricultural exports and rural energy production. In recent years, however, the rural economy has suffered, due to low commodity prices and other difficulties. All of us should be looking for ways to support the health and the vitality of the rural economy during this period of challenge. And infrastructure investment is one of the best strategies to do that.

Thank you, Mr. Chairman, for the opportunity to testify today. And I very much look forward to your questions.

[The prepared statement of Dr. Halverson follows:]

PREPARED STATEMENT OF THOMAS HALVERSON, PH.D., PRESIDENT AND CHIEF EXECUTIVE OFFICER, COBANK, WASHINGTON, D.C.; ON BEHALF OF FARM CREDIT SYSTEM

Good morning, Chairman Conaway, Ranking Member Peterson, and Members of the Committee. Thank you for calling this hearing today to explore the infrastructure needs of rural communities and agriculture.

My name is Tom Halverson and I am President and CEO of CoBank. Today, I am testifying on behalf of the Farm Credit System. CoBank, is a proud member of the Farm Credit System, and we share the Farm Credit mission to support rural communities and agriculture.

Farm Credit is proud to be helping organize the Rebuild Rural Coalition, engaging more than 200 organizations from across the country focused on U.S. agricultural producers, rural communities, businesses, and families. Rebuild Rural is dedicated to advocating for investment in rural America's infrastructure and understands that rural America's infrastructure needs are fundamentally unique.

On behalf of the Coalition, we are grateful for the House Agriculture Committee's interest in rural infrastructure and ask that as infrastructure legislation moves in this Congress, as part of the farm bill or other legislation, this Committee work aggressively to ensure that the unique needs of agriculture and rural communities are specifically addressed.

As the Rebuild Rural Coalition pointed out earlier this year. those in rural communities have seen our infrastructure deteriorate, jeopardizing jobs, our agricultural competitiveness, the health of rural families and communities. Past public-sector infrastructure initiatives often focused on urban and suburban infrastructure improvements while ignoring or inadequately addressing the unique needs of rural communities.

American agriculture truly feeds the world and creates millions of jobs for U.S. workers. Our nation's ability to produce food and fiber and transport it efficiently across the globe is a critical factor in U.S. global competitiveness and economics. Infrastructure that supports rural communities and links them to global markets has

helped make the U.S. the unquestioned world leader in agricultural production. Our deteriorating rural infrastructure threatens that leadership position.

Transportation infrastructure improvement is the most obvious need in rural communities, though not the only one. Highways, bridges, railways, locks and dams, harbors and port facilities all need major investment if we are to continue efficiently moving U.S. agricultural products to domestic and global markets. For example, ¼ of our road system's bridges require significant repair, or cannot efficiently handle today's traffic and many of the 240 locks and dams along the inland waterways are in need of modernization. Most of our locks and dams have outlived their useful life. Those waterway corridors supported $128 billion in agricultural exports in 2015. Importantly, 74% of bridges and 73% of roads are in rural areas. Additionally, critical needs exist in providing clean water for rural families, expanding broadband and other communications capabilities to connect rural communities to the outside world, and enhancing the ability to supply affordable, reliable and secure electric power for the rural economy.

The scope of the investment needed to sustain and upgrade our rural infrastructure is staggering. Clearly the Federal Government must continue to play an important role in providing funding and we believe that those Federal investments should increase. However, Federal resources likely cannot fill the need entirely. Creative solutions that pair Federal investment and state/local government investment with private sources of capital hold promise for raising a portion of the funds necessary to do the job.

The members of Rebuild Rural, including all of us in Farm Credit, stand ready to work with Congress and the Trump Administration on this important initiative. In fact, the Farm Credit System has a long history of supporting rural infrastructure and CoBank has traditionally led those efforts.

Farm Credit and Infrastructure

Unlike most Farm Credit institutions, CoBank doesn't directly lend to individual farmers. Instead, we provide funding to 23 farmer-owned Farm Credit associations that, in turn, finance more than 70,000 agricultural producers in 23 states in the Northeast, Plain States, and West. As a cooperative, CoBank is owned by those Farm Credit associations along with our infrastructure and agribusiness customers throughout the country.

CoBank is unique in Farm Credit in that we finance or facilitate the export of more than $9 billion worth of U.S. farm products annually—by our estimate more than 15% of U.S. bulk and intermediate agricultural exports—around the world. CoBank also lends to farmer-owned cooperatives, agribusinesses, and rural infrastructure providers that are essential to the financial success of farmers and economic success of rural America. The importance of that infrastructure lending is what brings me before you today.

I appreciate that you have called this hearing to examine *The State of Infrastructure in Rural America.* As you know, the infrastructure needs of the nation are substantial and exist in every state. But the needs in rural America differ considerably from our urban centers and their suburbs. Those unique needs deserve a second look and this hearing is an excellent opportunity to highlight them.

In the critical area of agricultural research, Rebuild Rural has identified $8.4 billion in funding needs for deferred maintenance in the buildings and infrastructure where cutting edge research is conducted. Investment in facilities provides critical research for ensuring that U.S. agricultural remains the most productive, sustainable, and economically efficient producer of agricultural products in the world.

Rural communities also need access to health care, which has become an increasing challenge. Eighty rural hospitals have closed since 2010 and 673 more facilities have been identified as vulnerable—that's over ⅓ of the rural health facilities in the nation. Funding is needed to address the 77% of rural counties that are in Primary Healthcare Professional Shortage Areas. Telehealth can ease this pressure but only with significant additional broadband investment to close the rural-urban digital divide.

Financing these improvements is a major part of the challenge we face and I would like to describe some of our experience in lending in these markets.

Community Facilities

Hospitals, senior care centers, walk-in clinics, schools and other community facilities are critical to the viability of rural communities and are important contributors to the quality of life for rural families. In many rural communities those essential facilities are not available or need modernization.

Federal investments, made available through USDA's successful Community Facilities Loan and Grant program continue to be necessary. Attracting private-sector

investment in these facilities will help speed up the progress of projects and increase the number of community facilities.

Farm Credit institutions are working to create a scalable solution for financing rural community facilities in partnership with community banks and the USDA. The partnership will focus on building, modernizing and expanding rural healthcare facilities, rural senior care facilities, rural educational facilities and others critical to creating vibrant rural communities.

Farm Credit will identify rural projects and partner with local community and regional banks to create comprehensive financing packages to include short- and long-term bond investments paired with USDA guaranteed and direct loans and grants that fund facility construction and provide stable permanent facility financing.

Previously, under a pilot program authorized by the Farm Credit Administration (FCA), Farm Credit institutions invested in bonds issued by the community developing the facility. In creating many of those bond investments, Farm Credit worked closely with community banks to include them in the financing package and then partnered with USDA's Community Facility Loan and Grant program to ensure the project's affordability for the community.

Rural Critical Access Hospital Expansion

For example, in 2016, Farm Credit institutions partnered with Grand Marais State Bank, Central Bank and Trust, CenBank, Security State Bank and the USDA to finance a $24.7 million expansion project for Cook County North Shore Hospital and Care Center in Grand Marais, Minnesota (population 1,353). The 16 bed critical access hospital and 37 bed skilled nursing facility plans to add 26,150$^{2\prime}$ and renovate 42,680$^{2\prime}$ of existing space.



Hospital Administrators, county officials and patients break ground on North Shore Hospital's expansion and renovation in 2015. Farm Credit, community banks and the USDA partnered to finance the project in Grand Marais, MN.

A year before CoBank and AgStar (a Farm Credit association that recently merged with two others to form Compeer Financial) led this effort in Grand Marais, they partnered with three community banks, two additional Farm Credit Institutions and a credit union on a hospital improvement in Moose Lake, Minnesota. They financed a $38 million addition to Mercy hospital that led to 900 more visits year over year after completion, saving the residents an additional hour drive to urban medical centers in Duluth.

Under the FCA pilot program, Farm Credit institutions invested $733 million in 210 rural community projects across the country. Commercial banks partnered with Farm Credit on more than 100 of those projects, catalyzing an additional $315 million of investment.

The original pilot program at FCA ended in 2014 and now the FCA has to provide specific and individual approval for each community facility investment made by each Farm Credit institution. This approach has made the community facilities partnership non-viable.

Under current FCA procedures, Farm Credit institutions have to individually apply to FCA for permission to make each bond investment. FCA staff reviews the investment applications and prepares separate recommendations for action by the FCA Board of Directors. The FCA Board then must consider each application separately and formally vote on approval. This process is expensive, slow and does not result in the robust, sustainable business model necessary to facilitate partnerships between Farm Credit, commercial banks and the USDA that would provide communities with these vital facilities more quickly.

Congress should instruct the Farm Credit Administration to create a more comprehensive, efficient and programmatic approach to approving these investment partnerships. This would greatly enhance financing options for rural community facilities and result in more projects that provide jobs and offer more benefits for rural families.

CoBank finances infrastructure in every state. Our 1,267 infrastructure customers have loan commitments of $31.5 billion with CoBank. That portfolio includes community facilities like those described above; rural water and wastewater treatment companies; wholesale electric generation and transmission cooperatives and retail electric distribution cooperatives; and providers of rural telephone, Internet, and cable television and wireless services.

Though CoBank leads Farm Credit's rural infrastructure effort, many more Farm Credit institutions are deeply involved. Partnering together, Farm Credit institutions finance an additional $9.4 billion in infrastructure. We partner with commercial banks to fund another $1.6 billion in infrastructure. This Farm Credit partnership means that rural America has a powerful financial ally in supporting its unique infrastructure needs. And, as a cooperative—owned by our customers who live and work in rural America—our primary interest is maximizing the quality and availability of infrastructure to rural communities.

Water

There are approximately 54,000 community water systems in the United States. The vast majority are small systems with less than 1,000 taps. Supporting rural communities and the businesses that provide their economic lifeblood is a key role for water providers. Without the capacity to deliver enough safe water, communities can't grow, businesses can't expand, and opportunities for new employers to revitalize rural areas are lost. There is significant need for capital in this sector to continue to deliver clean and safe water and to properly treat waste water to ensure environmental safety. The price tag for this investment is high. In 2015 the U.S. Government Accountability Office (GAO) released the results of their study of rural water infrastructure. They found that many communities have a hard time covering the cost of water system improvements or enhancements, in part because of their smaller number of residents and businesses. The GAO estimates that almost $190 billion is needed to cover the costs of replacing water and waste water infrastructure in rural communities.

The Federal Government is by far the largest provider of capital to rural water systems and will play a vital role for the foreseeable future. The government is able to provide grants and loans with repayment terms of up to 40 years. This allows smaller water systems to make improvements to their infrastructure in a cost effective manner. CoBank offers a variety of loan products to compliment EPA and USDA financing, such as bridge financing, interim financing and long-term loans. We also believe innovative public-private partnerships can also play a vital role in meeting the unique and vast funding needs for rural water systems.

The EPA has estimated that over the next 20 years more than $384 billion is needed to repair or update the drinking water systems across the country. Another $271 billion is needed for the wastewater and storm-water systems. More than 10% of that need is to help systems comply with Safe Drinking Water Act regulations. Approximately $64.5 billion of that sum would be needed just for the smallest systems in the nation, which make up 83% of the number of community water systems that need improvements. That is where many rural systems fit in. And for 90% of our nation's water utilities, that need is just to keep delivering safe drinking water to their customers.

Talquin Electric Co-op and Talquin Water and Wastewater serve 53,000 customers in the Florida Panhandle. Their location necessitates preparation and specialized construction to address powerful storm impacts. CoBank helped Talquin finance a new sewer main and pumping station to serve Wakulla County residents. The station was deliberately located away from the coastline to minimize the risk of storm damage and associated environmental liabilities. To help the cooperative reduce costs, CoBank provided almost $22 million in financing to enhance the water and wastewater infrastructure and refinance some of the long-term debt to reduce interest rates. Our leasing subsidiary provides Talquin with leases for their fleet vehicles. With a variety of services, Farm Credit helps Talquin reduce costs to hold rates steady for its customers in four Florida counties.

In Texas, CoBank financing has allowed rural water and waste systems address immediate needs to address severe drought. CoBank is a primary source of financing for emergency wells and lines of credit for emergency situations. We provide gap funding for grant-funded projects and provide construction financing for USDA

projects. We have also helped save utilities significant money by refinancing old expensive debt.

Energy

CoBank provides a variety of loan and leasing products to companies that generate and distribute reliable, reasonably priced electricity, natural gas, and other essential energy-related services to rural communities. We have relationships with 58 of the 64 Generation and Transmission (G&T) cooperatives in the U.S. The G&Ts generate electricity and transmit it to our electric distribution customers under long-term power purchase agreements. The electric distribution cooperatives then distribute this electricity to serve their local members.

The USDA's Rural Utilities Service (RUS) is a major provider of capital to our electric distribution customers and CoBank frequently partners with RUS under joint mortgage agreements to ensure that our customers are able to fund their extensive capital spending needs. CoBank also maintains a Project Finance division which makes loans directly to independent power producers that specialize in producing electricity for sale to utilities and corporations under power purchase agreements or into the wholesale power markets. Many of our electric distribution cooperative customers are also deploying broadband in their service territories and CoBank leverages its long experience in the communications industry in support of these important initiatives that are helping to close the digital divide. CoBank has lent nearly $60 million to electric co-ops in districts represented on the Committee to support broadband delivery.

While we continue to see demand for traditional fossil-fuel fired generation, especially natural gas-fired plants, renewable energy is one of the fastest growing sectors in the economy. Our Project Finance division finances many wind and solar projects. Moreover, our G&T and regulated utilities customers are increasingly investing in renewable energy as costs come down, reliability improves, and customer preference for renewable energy increases. Many of our electric distribution cooperatives are also investing in renewable energy projects to reach their own sustainability goals and reduce their reliance on power purchased from others. Bloomberg New Energy Finance analysts estimate that U.S. power infrastructure spending will total $283 billion over the next 10 years: 70% of this is expected to come from renewables, with about ½ of that from solar and the other ½ from wind.

Communications

Mr. Chairman, there is not a staffer (and probably not many Members, either) who is not regularly checking their smartphone during this hearing. Like your staff, their friends, family and classmates in college became accustomed to high levels of service from their communications technology. But when some returned to their rural hometowns and farms, their broadband service did not follow them.

There continues to be a well-publicized "digital divide" between urban and rural broadband subscribers. The FCC's 2016 *Broadband Progress Report* estimated that nearly 40% of rural Americans do not have access to Internet speeds of 25 Mbps, which is the current FCC target for ideal minimum service. 25% lack access to 10 Mbps. Contrast that with urban areas where less than 5% lack access to 25 Mbps and only about 2% lack access to 10 Mbps.

That lack of access slows the deployment of technology; thus, hampering efficiency on our farms. It stands in the way of adopting telemedicine to manage costs and improve health outcomes for our rural residents. It limits the availability of our rural students to access the Internet to enhance their education, and that in turn is preventing some people from bringing their skills and their families to rural communities. It hinders businesses from locating in rural areas, thereby reducing economic activity and rural employment opportunities.

Estimating the costs of closing the digital divide vary according to assumed minimum required speeds. However, most analysts put the cost of meaningfully closing the digital divide at as much as $100 billion at the 25 Mbps level. 100% coverage of all Americans at the 25 Mbps could cost upwards of $300 billion. By anyone's estimate, it is an enormous task and private capital providers, including CoBank, cannot do it alone. Government grants, loans or loan guarantees, public-private partnerships, and a stable regulatory regime that supports adequate cost recovery mechanisms for rural broadband operators will be essential in closing the digital divide.

While the cost of expanding broadband in rural communities is great, the cost of inaction that results in lost jobs and lost communities is even greater.

President Trump emphasized that importance in Iowa last month as he committed to a provision in his infrastructure proposal to promote and foster enhanced broadband access for rural America also, saying, "We have to make sure American farmers and their families, wherever they may be, wherever they may go, have the

infrastructure projects that they need to compete and grow." Access to enhanced broadband infrastructure is essential to the long-term capacity of American farmers to compete globally in marketing their production and manage their farming operations to high degree of efficiency and sustainability. On farm technology has skyrocketed over the past 10 years, and the most effective use of this technology requires access to enhanced communications connectivity.

CoBank provides a variety of loan and leasing products to help communications companies ensure that rural Americans have access to advanced broadband services. CoBank provides funding to all types of communication providers including rural local exchange carriers, cable companies, wireless carriers, and other data infrastructure and telecommunication services companies. The RUS is a major provider of capital to rural communications companies. CoBank partners with RUS in many situations, providing short-term interim financing for capital spending projects until permanent financing through RUS is arranged and longer-term financing for important projects that may not qualify for RUS funding. CoBank also partners with other private-sector lenders to catalyze additional capital to finance our communication customers.

Farm Credit firmly believes that a sustainable cost-recovery mechanism is imperative to support the financing of rural broadband in high cost areas. If communication companies don't have a sufficient, sustainable predictable level of support, deploying affordable broadband in high cost areas is not economically viable and therefore, not financeable. In addition to the high costs associated with constructing broadband infrastructure in rural areas, there are ongoing costs associated with maintaining and upgrading these networks to accommodate growth of data traffic. The broadband network is a dynamic infrastructure, subject to frequent technological advances that require upgrades and capital spending.

One of CoBank's Customers is Big Bend Telephone in Alpine, Texas, serving 5,000 telephone lines and 2,800 broadband customers. This small family-owned company has operated for 67 years and serves along 485 miles of the Texas-Mexico Border. Their customers include farmers and ranchers, the U.S. Border Patrol, state and local law enforcement, schools, medical providers the world renowned McDonald Observatory and even Big Bend National Park.

Serving this huge, sparsely populated territory of 17,593^2 miles is difficult and expensive. There are just 0.333 customers per square mile. In New York City, there are 27,000 customers per square mile! For their capital needs they rely on the Federal Communications Commission's Universal Service Funds and Farm Credit. CoBank worked with the Farm Credit Bank of Texas and Capital Farm Credit to finance Big Bend. According to Big Bend's General Manager, Rusty Moore, this financing ensures that Big Bend can . . . "deliver the vast array of technology-centric solutions required to keep our nation's southern border secure and our country stronger as a whole."

Conclusion

As I have discussed, the infrastructure needs in rural America are significant and unique. While Farm Credit and others are helping to finance these needs, more needs to be done. As advocated by the Rebuild Rural Coalition, infrastructure legislation by Congress should specifically address the unique needs of agriculture and rural communities. We also recognize that the Federal Government needs strong private investor engagement to partner with to meet the infrastructure needs in rural America. Farm Credit stands ready and capable to do its part and work closely with the Federal Government and private investors to meet rural infrastructure funding needs.

I appreciate the big job before you in addressing these challenges and opportunities and the Farm Credit System looks forward to working with the Committee as you begin writing and advancing the farm bill.

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

The CHAIRMAN. Thank you, Tom.

Apparently, the clocks and the lights are not working for the witnesses. With 30 seconds left, I will give you a tap on the gavel as a heads-up.

So with that, Mr. Coon, 5 minutes.

Dr. COON. Thank you.

The CHAIRMAN. Dr. Coon. Excuse me.

Dr. COON. That is fine. Tom. That is what my mom called me.

STATEMENT OF THOMAS G. COON, PH.D., VICE PRESIDENT, DIVISION OF AGRICULTURAL SCIENCES AND NATURAL RESOURCES, OKLAHOMA STATE UNIVERSITY; CHAIR, TASK FORCE ON DEFERRED MAINTENANCE, BOARD ON AGRICULTURE ASSEMBLY, ASSOCIATION OF PUBLIC AND LAND-GRANT UNIVERSITIES, STILLWATER, OK

Dr. COON. Thank you, Chairman Conaway, Ranking Member Peterson, and Congressman Lucas and other honorable Members. I am honored to represent Oklahoma State University and the Association of Public and Land-grant Universities, or APLU, here today. I also want to thank the Rebuild Rural Coalition for including agricultural research infrastructure in their initiative. The Farm Credit Council, the American Farm Bureau Federation, and other members of the coalition, clearly see the connection between the innovation that comes from agricultural research at the nation's public schools of agriculture and the positive influence that research has on economic development in rural America. The Rural Prosperity Task Force lead by Secretary Perdue also calls attention to the challenges that our rural communities face today. Because most agricultural production takes place in America's rural landscape, research that strengthens agriculture's future helps to support strong school systems, healthcare systems, and thriving businesses in rural America.

My message is simple: First, prosperity in agriculture in rural communities has depended on public investment and research at our agriculture schools. Second, the future of that infrastructure is at risk. Those of you on the Biotechnology, Horticulture, and Research Subcommittee heard testimony from Dr. Jay Akridge of Purdue University in March about the importance of Federal funding in support of agricultural research. In the 19th and 20th centuries, that support transformed American agriculture and made our industry a world leader of innovation.

In June, deans from public and land-grant universities in Florida, California, Alabama, and Texas described ways they have leveraged the Federal investment in agricultural research with state, local, and private funds to continue growth and innovation in their state's agricultural economy.

In 2015, the APLU commissioned a study to document the state of research facilities at public schools of agriculture. The study collected data from 91 schools and included nearly 16,000 buildings and 79 million gross square feet of space. The replacement value of that space is $29 billion. The total value of deferred maintenance across the 91 institutions is $8.4 billion. Of this, $6.7 billion, or 80 percent, is in facilities that are more than 25 years old. Agriculture colleges are funding maintenance at about 60 percent below the university average. And because buildings require more maintenance as they age, the combination of older infrastructure and under-funded maintenance is undermining the productivity and dependability of our research enterprise. The USDA Agricultural Research Service works closely with public universities. And, in fact, 30 percent of the research is conducted in facilities of their cooperators, most of which are universities.

In 2012, the ARS released a capital investment strategy that is complementary to the APLU study. The ARS has facilities valued

at $3.7 billion. The report stated a need for $148 million in annual maintenance funding, and another $100 million in annual expenditures to replace aging facilities.

It is clear that public agricultural universities need to tackle these facility challenges on two fronts: One is that we need to take better care of our facilities; and the other is that we need to replace much of that outdated infrastructure.

Deans tend to fund faculty lines at the expense of infrastructure needs, and that needs to be recalibrated. In addition, we need to be honest and transparent about the real cost of research. For example, the USDA limit on facility and administration costs that can be recovered is set at 50 to 60 percent of the federally negotiated F&A rate, and that undermines our investment in facility maintenance.

We need to invest aggressively in new facilities and major renovations. We proposed a funding mechanism whereby Federal funds are used to leverage other investments into our research infrastructure needs.

Federal funding is especially important for addressing research needs in the national interest. Federal funds should come with some expectations and contingencies. They should be competitive. They should address national or regional needs, and they should be matched with state, local, university and/or private funds.

The need is great. We project a need to replace $20 billion in infrastructure over the next 10 years. If our Federal partners can invest ½ of that, it is incumbent on us as deans to raise the other ½ through our other partnerships.

The competitiveness of our agriculture sector, the security and safety of our citizens' food supply and, in large part, their health, as well as the health of our environment, depends on the research our scientists produce. The challenging investments that the partnership made in our research infrastructure in the 20th century have created a dynamic, innovative, and job creating food and agriculture industry and a safe and secure food supply today.

We owe it to future generations to make the investments that will ensure they benefit from the bounty of our tremendous natural resources, and uniquely American collaboration between scientists and the farmers, ranchers, and workers in our nation's food and agriculture systems. Thank you.

[The prepared statement of Dr. Coon follows:]

PREPARED STATEMENT OF THOMAS G. COON, PH.D., VICE PRESIDENT, DIVISION OF AGRICULTURAL SCIENCES AND NATURAL RESOURCES, OKLAHOMA STATE UNIVERSITY; CHAIR, TASK FORCE ON DEFERRED MAINTENANCE, BOARD ON AGRICULTURE ASSEMBLY, ASSOCIATION OF PUBLIC AND LAND-GRANT UNIVERSITIES, STILLWATER, OK

Introduction

Thank you, Chairman Conaway, Ranking Member Peterson, Congressman Lucas and other Honorable Members. I am honored to represent Oklahoma State University and the Association of Public and Land[-g]rant Universities (APLU) today.

I also want to express my appreciation for the inclusion of agricultural research infrastructure needs in the Rebuild Rural Coalition—The Farm Credit Council, American Farm Bureau Federation and other members of the coalition clearly see the connection between the innovation that derives from agricultural research at the nation's public agriculture colleges and the positive influence that has on economic development in rural America.

The Rural Prosperity Task Force that is being led by Agriculture Secretary Sonny Perdue also calls attention to the challenges that our rural communities face today. Because so much agricultural production takes place in America's rural landscape, research that strengthens agriculture's future helps to support strong school systems, health care delivery systems, and thriving businesses.

Perhaps I can summarize my message in this way: prosperity in food, agriculture and rural communities has depended on public investment in research that supports food and agriculture industries, and we stand at a crossroads of commitment for the future of the infrastructure that has supported publicly funded research.

Investments in Research Fuel Innovation in Rural America

I have been fortunate to work with farmers, ranchers and natural resource managers in my native Iowa, and in California, Minnesota, Michigan, Missouri and Oklahoma. In every case, I have worked with university colleagues who see their role as being in support of those front line producers and managers. Our scientists push the envelope of discovery to develop new insights and new technologies that enhance the yield of our rich natural heritage for food, fiber and environmental benefits for all Americans.

Just as roads, electricity, water and other infrastructures support and sustain people in our rural communities, the innovations from research have helped rural residents build individual and community wealth, whether through improved plant and animal genetics, in healthy soils and clean water, the latest irrigation scheduling application software or improved food safety practices on the farm or in the market.

Those of you on the Biotechnology, Horticulture, and Research Subcommittee heard testimony from Dr. Jay Akridge of Purdue University in March about the importance of Federal funding in support of agricultural research. In the 20th Century, that support transformed American agriculture and made our industry a leader of innovation. Dr. Akridge pointed out that other nations have followed our lead, and as public support for agricultural research has stagnated in the U.S., other nations have surpassed us. As of 2011, the nations of Brazil, India and China together spend $2.15 for every $1.00 that the U.S. invests in public agriculture research and development.

In June, a number of my colleagues from public and land-grant agriculture colleges in Florida, California, Alabama and Texas expanded on how they have leveraged the Federal investment in agricultural research with state, local and private funds to continue growth and innovation in their state's agricultural economy. One of the great strengths of the American food and agriculture system is the tremendous diversity of environments we use, the yields our farmers and ranchers produce and the processed food and fiber products consumers can purchase. The Federal partnership with state and local governments and with industry and non-government organizations has created a unique engine of innovation across the breadth of that diversity.

We have a similar heritage of resourcefulness and productivity in Oklahoma, where in spite of diminished purchasing power of Federal funds and recent declines in state funding, we continue to develop and release new varieties of hard red winter wheat and forage crops developed for the unique soil and farm management practices of the southern plains, our scientists develop and release new software applications to help manage beef cattle herd health and our scientists are creating faster and more definitive technologies for detecting and eliminating pathogens in food supply chains.

Research Depends on Modern Facilities

One of the hallmarks of our agricultural colleges at public universities has been the infrastructure dedicated to research, teaching and extension in agricultural and natural resource sciences. That includes laboratories on university campuses as well as field stations for research and extension demonstrations. The Hatch Act of 1887 recognized the need for specialized facilities dedicated to research on agricultural topics, and many states have used the Federal capacity funds they receive through the farm bill to build and maintain those facilities.

However, those facilities are aging, and with stagnant or reduced Federal and state funding, many of the facilities that helped to drive innovation in agriculture have deteriorated to the point of limiting their usefulness and safety for conducting 21st century research.

In 2015, the APLU commissioned a study to document the state of research facilities at public colleges of food, agriculture and natural resources. The study was conducted by an independent organization, Sightlines, and they queried 101 institutions and received responses from 91 of them. The study included data from 15,596

buildings, which contain 87 million gross square feet of space. They estimate the replacement value of this space, based on a larger database that Sightlines maintains, at $29 billion.

Our study followed one completed by the USDA Agricultural Research Service in 2012. In that study, they classified the status of 122 major research facilities owned by the ARS, which totaled $3.7 in capitalization value. That study applied an industry standard of annual capital expenditures equal to 4% of the capitalization value to conclude that $148 million would be needed annually for maintaining the ARS facilities and another $100 million per year for replacement of outdated facilities. As much as 30% of the ARS research is conducted in facilities of cooperators, most of which are public universities, and not in ARS facilities. The Capital Investment Strategy of the ARS is complementary to the proposal we have developed based on the APLU study. Indeed, implementation of the recommendations from the APLU study will benefit ARS research as well.

One of the more noteworthy findings to emerge from the APLU study is that the total value of deferred maintenance across the 91 institutions is $8.4 billion. Annual capital spending in agriculture research infrastructure is estimated to be $1.82/GSF, which is 41% of the public university average ($4.40/GSF). Of this, $6.7 billion (80%) is in facilities that are more than 25 years old. Because buildings require more maintenance as they age, the combination of older infrastructure and under-funded maintenance is undermining the ability of our research enterprise to provide the information needs of today and the future.

The APLU study estimated the Net Asset Value of the infrastructure—in other words the replacement cost minus the cost of deferred maintenance to be at 71%. Moreover, the current deferred maintenance figure of $95/GSF puts us very close to the threshold of $100/GSF that is associated with a greater likelihood of building systems failures—such as HVAC or electrical systems—that can result in catastrophic losses of research findings.

Our study at Oklahoma State was reflective of the national study: Of our facilities on campus, 49% of the square footage was assessed as being in need of major repair or past useful life. Of our facilities at our research farms in Stillwater, 38% was in that state of disrepair.

In some respects, our faculty are being penalized for being too resourceful. One of our hallmark programs at Oklahoma State is our Wheat Improvement Team, which includes a wheat breeder, a molecular geneticist, two entomologists, a plant pathologist, a soil nutrient agronomist, a commodity market economist, and a cereal biochemist. Together, they have developed a number of varieties of hard red winter wheat well suited to the agronomic practices and environmental conditions of the southern Great Plains. For the crop that was harvested this summer, we had 15 OSU varieties of wheat available for growers to plant, and those comprised about ½ of the acreage planted in Oklahoma. Our wheat team continues to perform in a way that is meeting the agronomic demands of our growers and the wheat quality demands of millers. They are doing this in a greenhouse complex that was constructed before World War II and in field laboratory buildings that were constructed before I was born. We are extremely proud of their accomplishments, but we also wonder how much more successful they might be with modern facilities.

Addressing the Challenge

A group of administrators and scientists from APLU developed a set of recommendations for following up on the findings of the facility survey. Those include two primary directions: one is that we need to be better stewards of our facilities. Clearly, the greatest assets of our Agricultural Experiment Station resources are the faculty, technicians and students who carry out the research. As universities have faced stagnant and declining budgets, the tendency has been to protect faculty positions as the top priorities. I think there has been a tendency to interpret a decrease in funding as a temporary phenomenon and so facility maintenance and upgrades are put off until the funding picture improves. In the meantime, faculty are expected to bring in funding through competitive grants and industry contracts to help finance the additional personnel and operating costs of their research. In many cases, the optimism that funding will return hasn't been fulfilled, and so the facility maintenance delays become permanent deferrals and we end up asking our scientists to "get by" with diminished capacity and increased unreliability of our facilities.

University administrators need to be more disciplined in adopting best management practices for facility maintenance and replacement. We need to direct more of the funding for Facilities and Administration—or Indirect Costs—into implementing those best management practices. In addition, we need to clearly communicate with our funding partners the real costs of research. Most Federal agencies pay a nego-

tiated F&A rate for university-conducted research. Those rates are carefully scrutinized by the funding agencies and each university. However, the U.S. Department of Agriculture is authorized to fund less than the full indirect costs rate, yet we need those funds in order to carry out the necessary stewardship of our research facilities.

Even improved stewardship will not fix the problems that the APLU study has demonstrated. Some of the facilities we are using are simply outdated and cannot be brought up to 21st century standards. The other key recommendation from the APLU task force is to invest aggressively in new facilities or major renovations to upgrade and modernize our research infrastructure. There is still a great public good that comes from research in food, agriculture and natural resource management. The nation's interest depends on research findings that are made available to all participants in the food, agriculture and natural resource economy. The same is true for each state and local governmental entity. At the same time, many private interests, from producers to processors to wholesalers and retailers derive benefits from publicly funded and publicly available research findings. They have a part to play in financing investments in America's public agricultural research infrastructure.

We propose a funding mechanism whereby Federal funds are used to leverage state, local, private industry, and private philanthropic investments into our research infrastructure needs. Our very successful public agricultural research enterprise has been built on this multi-partner model of collaborative funding.

Federal funding is especially important for addressing research needs in the national interest. It would seem important to provide Federal funds with some contingencies, such as a required match with some combination of state, local, industry and/or non-governmental organization support. In addition, Federal funds should be contingent on demonstrating that the research will address national or regional needs and that it will build on a record of accomplishment in research among the faculty and programs that will use the facilities. Collaboration across universities should be favored over duplicative programs in neighboring states.

Based on the findings in the APLU study, we determined that we would need to replace 68% of the research infrastructure over the next 10 years in order to position our scientists to be successful in addressing food security, food safety, agricultural productivity and environmental stewardship needs for the 21st century. The estimated replacement cost of all research facilities included in the APLU study is $29 billion, and 68% of that is $20 billion. A Federal program of investing $1 billion per year over 10 years would help to stimulate the other investments needed to complete this initiative and would position the U.S. agriculture research system to be on par with other nations who are competing in the world food and agriculture markets.

This proposed level of funding is large. Whether our Federal and other partners are up to this challenge, it is important to recognize that the need is real and it is of strategic importance. The competitiveness of our agriculture sector, the security and safety of our citizens' food supply—and in large part their health—as well as the health of our environment depends on the research our scientists produce. The challenging investments that Federal and state funding made in our research infrastructure in the 20th century have created a dynamic, innovative and job-creating food and agriculture industry and a safe and secure food supply today. We owe it to future generations to make the investments that will ensure they benefit from the bounty of our tremendous natural resources and uniquely American collaboration between scientists and the farmers, ranchers and workers in our nation's food and agriculture systems.

The CHAIRMAN. Thank you, doctor.

Mr. Calhoun for 5 minutes.

STATEMENT OF RICHARD R. CALHOUN, FORMER PRESIDENT, CARGO CARRIERS, CARGILL, INC., SILVER SPRING, MD; ON BEHALF OF NATIONAL GRAIN AND FEED ASSOCIATION

Mr. CALHOUN. Good morning. I am Rick Calhoun, the immediate past Chairman of the Waterborne Commerce Committee of the National Grain and Feed Association on whose behalf I testify today.

The NGFA was established in 1896, and consists of 1,050 member companies that handle approximately 70 percent of the U.S. grain and oilseed crops. The importance of infrastructure to the

success of U.S. farmers in competing to provide Americans agricultural bounty to consumers is undisputed. But by numerous markers, America's infrastructure is falling behind. We have fallen out of the top ten in the World Economic Forum's global competitiveness report. We used to be able to ship soybeans to China for nationally $80 a metric ton, cheaper than Brazil. Today they have narrowed the transportation gap by about 75 percent to just $20 a metric ton.

The American Society of Civil Engineers' most recent infrastructure report card doled out the following grades: Roads, D; inland waterways, D; and bridges, C+. NGFA appreciates the renewed sense of urgency by Congress and the Trump Administration to enact an infrastructure package that includes a reliable funding mechanism to recapitalize our dilapidated inland waterways and restore our rural roads and bridges. Today, I will focus on the 12,000 mile inland waterway system, which supports 540,000 jobs, and provides the lowest cost, most fuel efficient, and environmentally friendly way to transport grain and ag products.

Most of our locks and dams have exceeded their 50 year life design, and it is starting to show. During the past decade, work stoppages for repairs have increased 700 percent. In 2005, Hurricane Katrina halted our ability to ship on the inland waterways and ports, sending barge rates up as much as 50 percent and causing basis values on corn to decline 40¢ to 70¢ per bushel.

We appreciate that Congress has begun to respond. Thank you for passing the WRDA Acts in 2014 and 2016 to streamline projects and for increasing operation and maintenance funding for locks and dams.

Also, President Trump recently visited the Ohio River to put an unprecedented presidential spotlight on the state of our locks and dams.

But to bring our waterway system into the 21st century, a new approach is needed. Here are some ideas that we believe would help you get the biggest bang for your buck. Priority one, support stronger Federal investment in U.S. locks and dams. Currently, there is a portfolio of 25 critical inland waterways projects that need to be funded to modernize the system at a cost of $8.75 billion. Also, the Harbor Maintenance Trust Fund has a $9 billion surplus, and Congress should ensure these funds be spent to maintain U.S. ports and harbors through dredging.

Priority two, support the existing public-private partnership to finance our locks and dams and oppose unworkable tolling and lockage fees. The inland waterway system benefits from the successful 3P, where the barge and towing industry, but ultimately the U.S. farmer, pays 50 percent of the cost of the inland waterways projects through a 29¢ per gallon diesel fuel tax, which is matched by Federal dollars. Perennial calls to impose lockage fees and tolling on the inland waterways by past Administrations have consistently been rejected on a bipartisan basis by Congress.

Commercial users of the inland waterway locks and dams are the only private entities that pay into this trust fund even though the benefits are freely enjoyed by numerous other stakeholders. Therefore, the question should not be how much more can we extract

from those who pay, but rather how can we get the other beneficiaries of the system to support it?

Rural America also relies heavily on roads, bridges, and highways to transport ag products from farm to market and provide access to education, jobs, healthcare, and social services. But the roads and bridges that connect the country's rural areas face several significant challenges, including inadequate capacity to handle commerce, limited connectivity, and deteriorated conditions.

Congress should explore prioritizing increases in Federal funding and/or reclassification of rural roads and bridges to be eligible for funding.

One concept that may warrant your consideration is to develop a system of block grants where states and localities with feedback from rural and ag stakeholders could prioritize road and bridge projects they deem most important.

One final thought: By 2050, the world will be challenged to feed nine billion people. If we maintain the *status quo* on infrastructure investment we will fall short of meeting that demand.

We need to be pragmatic. Let's not allow under $9 billion in waterways investments to stand in the way of our ability to better feed our country and the soon-to-be nine billion people around the globe.

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

[The prepared statement of Mr. Calhoun follows:]

PREPARED STATEMENT OF RICHARD R. CALHOUN, FORMER PRESIDENT, CARGO CARRIERS, CARGILL, INC., SILVER SPRING, MD; ON BEHALF OF NATIONAL GRAIN AND FEED ASSOCIATION

Good morning, Chairman Conaway, Ranking Member Peterson, and Members of the House Committee on Agriculture. Thank you for the opportunity to testify at this important hearing examining *The State of Infrastructure in Rural America.*

I am Rick Calhoun, the immediate past Chairman of the Waterborne Commerce Committee of the National Grain and Feed Association (NGFA), on whose behalf I testify today. The NGFA was established in 1896, and consists of 1,050 member companies that operate 7,000 facilities that handle approximately 70 percent of the U.S. grain and oilseed crop. NGFA also consists of 34 state and regional associations. I also previously served as NGFA's elected industry Chairman and am a past Chairman of Waterways Council Inc., the national organization representing barge and tow-boat operators, shippers, conservation groups, as well as labor organizations that focuses on the modernization, rehabilitation, and operation and maintenance of our nation's inland waterways' locks and dams. I retired June 30, 2017, after working my entire 41 year career at Cargill Inc., most recently as President of Cargo Carriers, the company's barge and marine business, and as Senior Vice President of Cargill's Grain and Oilseed Supply Chain North America.

Throughout my industry career, I witnessed first-hand how important infrastructure is to the success of U.S. farmers, ranchers and agribusinesses in competing to provide America's agricultural bounty to U.S. and world consumers. But over the last decade, I also have witnessed an alarming decline in historical competitive advantage that our transportation infrastructure has provided U.S. agriculture, and the corresponding increase in investment in critical infrastructure being made by our foreign competitors.

The NGFA appreciates and agrees with the renewed sense of urgency by this Congress and the Trump Administration to enact a comprehensive infrastructure package that includes a predictable and reliable funding mechanism to recapitalize our dilapidated inland waterways system, as well as to restore our rural roads and bridges. Both are essential to the future vibrancy of rural communities and competitiveness of U.S. agriculture.

I want to focus primarily on the 12,000 mile inland waterways system, which supports more than 540,000 jobs and provides the lowest-cost, most fuel-efficient and

most environmentally friendly and sustainable way to transport grains, oilseeds and other agricultural products. The U.S. inland waterways are used to transport about ⅔ of the U.S. grains and oilseeds destined for export while U.S. ports help move more than 90 percent of U.S. grain and oilseed exports. In addition, U.S. inland waterways and ports are essential arteries for farm inputs. For example, 33% of fertilizer relies on this infrastructure in order to get essential nutrients to farmers for their crops. Our country exports about 25 percent of its total grain production, with nearly 50 percent of U.S. soybeans, more than 40 percent of U.S. wheat, and about 15 percent of U.S. corn exported each year. On the meat and poultry side, the U.S. exports approximately ten percent of its beef, 20 percent of its pork, and 15 percent of its poultry production.

The U.S. transportation system is used more by agriculture than any other business sector. In 2012, agriculture accounted for 22 percent of all tons transported, and 31 percent of all ton-miles moved. Thanks to our transportation system, U.S. agricultural exports will contribute $21.5 billion to the U.S. balance of trade this fiscal year. Exports invigorate the rural economy, support more than one million jobs on and off the farm, and provide farmers with 20 percent of net farm income.

The Challenge

Earlier this year, during testimony before the House Transportation and Infrastructure Committee on the importance of infrastructure, Cargill's Chairman and CEO referenced a *BusinessWeek* article from 1964 that still rings true today about the indispensable role transportation infrastructure plays in the success of U.S. agriculture. The excerpt reads, "What the grain division does is buy grain at a point of surplus and carry it to a point of deficit. Or buy it at a time of surplus and carry it over to a time of deficit. Our profit comes from being able to do this at a lower cost than our competitors."

Historically, the United States has been blessed with a transportation system where the four major modes (truck, rail, barge and ocean-going vessels) complement and to an extent compete with one another. Utilizing the inland river system relieves congestion and wear and tear on our highways and helps discipline rail rates. The result is a highly efficient, balanced system that provides an edge in a fast-changing market which saw U.S. agricultural exports double from 2006 to 2016. For America to avoid losing this edge, we must be strategic and willing to make stronger investments in our transportation system. However, as a percentage of gross domestic product (GDP) the U.S. is spending less on its transportation infrastructure than at any point since World War II and our major trading partners are besting us when it comes to infrastructure investment.

As a result, our competition is catching up. USDA data show that in 2007, the total transportation costs to move a metric ton of soybeans from Davenport, Iowa, to Shanghai, China, was $82.83. That compared to a total transportation cost of $161.30 to get that same metric ton of soybeans from North Mato Grosso, Brazil, to Shanghai.

Fast forward a decade and our competitive advantage is slipping. In the first quarter of 2017, it cost $90.83 to ship a metric ton of soybeans from Davenport to Shanghai and $111.80 to transport a metric ton from Mato Grasso to Shanghai. Brazil has closed the transportation cost gap by $57 or 73 percent per metric ton! Also of concern, Brazil and China just announced a joint $20 billion effort in which China will invest billions in Brazilian infrastructure projects.

By numerous markers, America's infrastructure is falling farther and farther behind. For instance, the United States has declined to 11th in infrastructure in the World Economic Forum's most recent Global Competitiveness Report. We were seventh as recently as 2008. The American Society of Civil Engineers' 2017 infrastructure report card doled out the following grades to American Infrastructure: Roads, "D"; Inland Waterways, "D"; and Bridges "C+". I wouldn't have fared very well bringing home a report card with those kinds of grades.

A sense of urgency also is warranted given most of our inland waterway locks and dams were built in the 1930s and have far exceeded their 50 year design life. We're in a high-stakes game of rolling the dice:

- During the past decade, there has been a 700 percent increase in unscheduled work stoppages for repairs.
- A recent *University of Tennessee study* (*http://economics.ag.utk.edu/publications/logistics/EconomicImpactsInlandWaterwaysDisruptions092016.pdf*) concluded that disruptions at Mississippi River Lock 25 would result in a loss of 7,000 jobs and $2.4 billion in reduced economic activity.
- Hurricane Katrina in 2005 also demonstrated the economic damage that results when the ability to ship on the inland waterways and ports is halted, as barge

rates increased by as much as 50 percent (to 900 percent of tariff) and basis values on corn declined 40¢ to 70¢ per bushel, and rippled temporarily throughout the country—affecting not just farmers located near the Mississippi River and the tributaries that feed into it. Higher transportation costs resulted in significantly lower prices paid to farmers, and complicated rail and truck movements, as well.

We appreciate that Congress has begun to respond! Congress is to be commended for enacting Water Resources Development Acts (WRDA) in both 2014 and 2016 to help streamline inland waterway renovation projects, as well as consistently increasing operations and maintenance funding for locks and dams stewarded by the U.S. Army Corps of Engineers. President Trump also is to be applauded for recently visiting the Ohio River to put an unprecedented presidential spotlight on the dilapidated state of our locks and dams and the need to fix them.

But to truly bring our waterways system in to the 21st century, a new approach is needed. Thus, as Congress develops priorities for an infrastructure package with up to $1 trillion in public and private funds, I'd like to take this opportunity to share several ideas on where we believe it could get the biggest bang for the buck:

Priority No. 1: Supporting Stronger Federal Investment in U.S. Locks, Dams and Ports

Currently, there exists a portfolio of 25 critical inland waterways modernization projects that need to be funded to modernize the system at a cost of $8.75 billion.

This includes a project of utmost importance to American agriculture: The Navigation and Ecosystem Sustainability Program (NESP). NESP already has been authorized by Congress and includes construction of seven top-priority 1,200′ locks (LaGrange, Peoria, Upper Mississippi River Locks 20, 21, 22, 24 and 25) at the most congested locations on the Upper Mississippi River System and Illinois Waterway.

In addition, the Harbor Maintenance Trust Fund (HMTF) which is supported via a 0.125% tax on the value of shipped cargo has a $9 billion surplus. Unlike the highway trust fund, the HMTF can only be drawn on when Congress makes an appropriation. We believe Congress should direct that these funds be spent to maintain U.S. ports and harbors, including dredging activities. We appreciate that Congress, through WRDA 2014, is directing that an increasing percentage of these funds be used for their intended purpose.

Priority No. 2: Supporting the Existing Public-Private Partnership To Finance Renovation of the Inland Waterways Locks and Dams without Imposing Counterproductive, Inequitable and Ultimately Unworkable Tolling, Lockage or Tonnage Fees

Since 1978, the inland waterways system has benefited from a successful public-private partnership through the Inland Waterways Trust Fund (IWTF). The barge and towing industry (but ultimately mostly the U.S. farmer) pays 50 percent of the cost of inland waterway construction and major rehabilitation projects, while Federal appropriations are used to finance the remaining 50 percent.

The private-sector's contribution is made through the assessment of a 29¢ per gallon diesel fuel tax paid into the IWTF. In the highly competitive global agricultural market, transportation costs typically cannot be passed on to the ultimate customer, so they are reflected primarily in the price paid for commodities at the point of production—the U.S. farmer. It's important to emphasize that in 2014, U.S. farmers, agribusinesses and the barge industry raised their collective hands and successfully advocated that Congress approve legislation to increase this user fee by 45 percent to increase private-sector investment in the inland waterways system.

Unfortunately, commercial users of the inland waterways locks-and-dams are the *only* private entities that pay into this trust fund, even though the benefits of the inland waterways are enjoyed freely by numerous other stakeholders, including recreational users, those who receive hydropower, municipal and agriculture water systems, and those who benefit from flood control.

As this Committee is painfully aware, no effort to contribute more to deficit reduction or offer to have your user-fees raised to support the system goes unpunished. Perennial calls to impose lockage fees and tolling on the inland waterways date to the Clinton Administration. The Agricultural Transportation Working Group which is comprised of 40 diverse associations representing the ag value chain, including NGFA, believe this is a mistaken approach for several reasons.

First, the waterways system differs from the highway system, where a driver can choose between the new capacity provided by a toll road or continue to rely on previously existing non-toll roads. Further, unlike highways, major beneficiaries of the inland waterways noted previously would not be subject to tolls.

We encourage Congress to continue its bipartisan opposition to such a concept. Imposing additional costs on those utilizing commercial barge transportation—on top of the 50 percent cost-share that farmers and the private sector already pays into the IWTF—would risk diverting traffic from the most efficient mode of transportation available to U.S. agriculture, further congesting U.S. highways and resulting in higher rail freight rates ultimately paid by farmers.

In 2015, the Illinois Corn Growers Association conducted a study to examine alternative private financing options for Illinois Waterway Projects and determined that this could result in an additional user fee or lockage fee of $0.014 to $0.036 a bushel. This means that one 15 barge tow carrying 875,000 bushels of corn could cost an additional $31,500 per lock. Again, this would be on top of the fuel tax industry already pays.

As Congress and the Administration debate how to finance infrastructure projects, the NGFA believes the question should not be "how much can we extract from those who already pay?" but rather, "how can we get other beneficiaries of the system to support it financially?" That is the essence of equity and provides an opportunity to greatly modernize the inland waterways system to benefit all users.

Finally, to enhance efficiency and reduce costs of upgrading the inland waterways, it will be important that any future funding mechanism be reliable and predictable. Projects that are plagued by stops and starts because of funding shortfalls create inefficiencies that dramatically increase total costs.

Rural Roads and Bridges

Rural America, the home of 60 million Americans, also relies heavily on roads, highways and bridges, which constitute the first step in transporting agricultural products from farm to market and provide access to education, jobs, health care and other social services, and encourage tourism and movement of goods and services. Transportation also is a critical factor in a company's decision on where to locate new businesses.

The nation's rural areas account for 97 percent of America's land mass and are home to the vast majority of the nation's 2.2 million farms. As this Committee knows well, production agriculture, by necessity, is geographically dispersed because the sources of production cannot simply be relocated to be closer to customers. Without functioning rural road and bridges, farmers and ranchers cannot get their harvests to consumers both domestically or internationally.

Roads and bridges that serve and connect the country's rural areas face several significant challenges, including inadequate capacity to handle growing levels of traffic and commerce, heavier truckloads, limited connectivity, deteriorated road and bridge conditions, and a traffic fatality rate that is far greater than more urban roads and highways.

Funding and Overall Condition

Road construction and maintenance primarily is a function of government, with more than 80 percent of the financing derived from fuel taxes, other fees and tolls. Needs and demands for maintenance and construction of roads and bridges are outpacing current and projected funding, creating a need to identify additional funding sources.

According to 2012 Federal data, 74 percent of bridges, 73 percent of the 4 million miles of public roads, and 33 percent of all vehicle miles traveled (VMT) are in rural areas. But only 44 percent of rural road mileage is eligible for Federal grants, with the rest maintained by state and local funding. Meanwhile,15 percent of the nation's major rural roads consists of pavement rated in poor condition, while an additional 21 percent is rated in mediocre condition.

Of the more than 445,000 bridges in rural areas, only 43 percent are eligible for Federal aid. More than 20 percent of rural bridges are rated either structurally deficient or functionally obsolete. Combined, nearly 69,000 bridges on local and minor collector highways in rural areas (not eligible for Federal aid) either are structurally deficient or functionally obsolete. More than 32,000 bridges in rural areas that *are* eligible for Federal aid either are structurally deficient or functionally obsolete.

Potential Solution for Rural Roads and Bridges

To ensure rural Americans have access to adequate and safe bridges and roadways, Congress should explore prioritizing increases in Federal funding, and/or reclassification of rural roads and bridges to be eligible for funding. One concept that may warrant consideration is to develop a system of block grants with guidelines under which states and localities could prioritize those road and bridge projects that they deem most important. The NGFA would recommend that local rural and agricultural stakeholders be required to be consulted as part of a state's deliberations to ensure that the needs of farmers, ranchers and rural communities are considered

fully. Congress also should direct agencies to account for the unique needs those rural roads and bridges present to ensure they are eligible for Federal grants and funding. Finally, identifying adequate long-term funding sources would provide certainty, enable better long-term planning, and improve efficiency in road maintenance and construction.

Conclusion

I'd close with a final thought. As you know, by 2050 the world will be challenged to feed nine billion people. If the United States maintains the *status quo* on maintaining our transportation infrastructure, it will fall far short of meeting that demand. The critical waterways projects I've discussed today will take several years to construct and complete. So, we cannot wait until the moment is upon us to get started. The road to feeding a growing country and world population will be met by looking forward, not through the rear-view mirror. Let's not allow just under $9 billion stand in the way of our ability to feed our country and the soon to be nine billion people around the globe.

Thank you for this opportunity to provide our thoughts on the current state of the transportation supply chain and its infrastructure that is of vital importance to rural America. We look forward to working with this Committee, Congress and the Administration to pursue enactment of a comprehensive infrastructure package that will make a real, positive difference to rural communities, U.S. economic growth and job creation, and world food security for decades to come.

The CHAIRMAN. Thank you, Mr. Calhoun.

Mr. Wynn, 5 minutes.

STATEMENT OF CURTIS WYNN, PRESIDENT AND CHIEF EXECUTIVE OFFICER, ROANOKE ELECTRIC COOPERATIVE; VICE PRESIDENT, BOARD OF DIRECTORS, NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION, AHOSKIE, NC

Mr. WYNN. Thank you, Chairman Conaway and Ranking Member Peterson, for inviting me to testify today. My name is Curtis Wynn, and I am the President and CEO of Roanoke Electric Cooperative. We are a member-owned, not-for-profit distribution cooperative, and we serve 14,000 rural customers, in some of the poorest parts of our state. That is why above and beyond just delivering electricity, we have a calling to provide a broad set of services and support to help our community thrive.

Among our biggest challenges, going forward, are adapting to changes and consumer demand, accommodating an evolving generation mix, and protecting against cyber threats. I am going to talk today about some investments that my co-op is making to modernize and meet these needs.

I am aware that resources will be limited in the upcoming farm bills, but I believe a separate infrastructure package gives us a great opportunity to make further investments like these to ensure the success and stability of rural America in the 21st century.

For decades, the Rural Utilities Service's electric loan program has been the foundation of what we do, providing low cost financing to co-ops for installing and maintaining the grid. Today, RUS also helps us fund more advanced projects to make our systems more modern, efficient, and secure.

We have enjoyed strong support for robust RUS funding because we are such a good investment for the Federal Government providing valuable services to our communities and reliably paying back our loans.

We ask that you help us maintain that support. In the 21st century, robust communications infrastructure is just as important to

our business as are traditional assets like poles, wires, and power plants.

My co-op is currently investing $4 million to lay a fiber communications backbone in our service territory. Our main motivation is to take care of our internal operational needs to make our system more efficient and secure. However, once this foundation is in place, there are lots of things we can do with it. One option could be providing broadband Internet to our customers' homes. Many people in our region don't have access to reliable Internet. That puts our consumers, schools, hospitals, and employers at a disadvantage.

I believe it will take many different types of technologies, partnerships, and engagement from all stakeholders to address this challenge. As Congress thinks about infrastructure and telecommunications policy, we believe all potential providers who have a community need and a willingness to engage, including some electric cooperatives, should have access to a diverse set of tools to help bridge this digital divide.

For years, electric co-ops across the country have provided information and advice to consumers to help them use electricity more efficiently and cost-effectively. Because we don't have a profit motive, we have a unique opportunity to help our consumers use less energy and save money. For example, at Roanoke, we have a program called Upgrade to $ave, where we work with our member owners to make energy efficient retrofits in their homes, like adding insulation or replacing old HVAC units.

Customers immediately began to save money without making any up-front payments. And by sharing the energy savings, we ensure full cost recovery for our cooperative. We can do all this through a $6 million loan from the USDA through a new energy efficiency and conservation loan program.

In the first 18 months of the program, we worked with local contractors to retrofit over 200 homes with an average energy savings above 20 percent. That is after the repayment of the note. We also recently used a USDA Rural Energy for America Program grant to build, through our power provider, a community solar project. Now our members have the opportunity to purchase energy from these panels investing in clean, renewable energy, and lowering their monthly electric bills.

Last, the Rural Economic Development Loan and Grant Program at USDA provides financing so that co-ops can partner with local schools, hospitals, emergency services, and businesses to fund projects that create jobs and meet our communities' need.

Since 2012, North Carolina has been involved with 99 REDLG projects that created over 2,600 jobs. Most of our country's food, minerals, energy, and manufactured goods still come from rural areas. That is why the health of rural America should be of interest to all Members of Congress and to all Americans.

You have a great opportunity and an infrastructure package to make needed investments that will address our unique challenges.

We look forward to working with you, and thank you very much for this opportunity, Mr. Chairman.

[The prepared statement of Mr. Wynn follows:]

PREPARED STATEMENT OF CURTIS WYNN, PRESIDENT AND CHIEF EXECUTIVE OFFICER, ROANOKE ELECTRIC COOPERATIVE; VICE PRESIDENT, BOARD OF DIRECTORS, NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION, AHOSKIE, NC

Thank you, Chairman Conaway and Ranking Member Peterson, for inviting me to testify today. My name is Curtis Wynn. I am the President and CEO of Roanoke Electric Cooperative headquartered in Aulander, North Carolina. I am also Vice President of the Board of Directors for the National Rural Electric Cooperative Association. Roanoke is a member-owned, not-for-profit, electric distribution cooperative serving around 14,000 residential, agricultural, commercial and industrial customers in northeastern North Carolina. Our system consists of over 2,000 miles of line (about seven members per mile) in seven counties.

We serve some of the poorest, most rural parts of our state. But despite those challenges, we are doing some truly innovative work to improve the quality of life for our members. While our first priority is to deliver clean, safe, reliable, affordable electricity to our members, we have a calling to be more than just a poles, wires and electrons company. Our broader purpose is to provide the services and support that empower our communities to thrive. Rural electric cooperatives are much more than just electric utilities—we are the engines that drive economic opportunity across the heartland and to rural areas everywhere. I am proud of the role we play in these communities.

More than ever, whether you live in a rural area or in a city, we are all connected in this country. Rural areas, in particular, still grow most of the food, generate much of the power, and manufacture many of the goods that this country consumes. When rural areas suffer, the country as a whole suffers. That's why the state of rural infrastructure should be of interest to all Members of Congress, no matter what type of district you represent.

Among our biggest challenges going forward are adapting to changes in consumer demand, accommodating an evolving generation mix, and protecting against cyber threats. I'm going to talk today about some investments that my co-op is making to modernize and meet those needs. I am aware that resources will be limited in the upcoming farm bill, but I believe a separate infrastructure package gives us a great opportunity to make further investments in these types of projects to ensure the success and stability of rural America in the 21st Century.

Rural Utilities Service (RUS)

In the early 1900's, as urban areas began to electrify, rural areas lagged behind. Eventually, farmers and ranchers in remote areas took the initiative to form electric cooperatives and did it themselves. In the past 80 years, a lot has changed, but the same fundamental challenges still exist—how to affordably connect those few customers in low-density, high-cost rural areas. What was then called the Rural Electrification Administration (REA) is now the Rural Utilities Service (RUS) and it is as relevant today as it was back then. REA and RUS loans have helped build, expand, and improve the infrastructure across rural America necessary to provide power, deliver clean water, and deploy advanced telecommunications technologies to rural areas.

Today, RUS loans help electric co-ops reduce costs and improve reliability for our members by financing basic maintenance like replacing poles and wires. But it also helps us fund projects to make our systems more modern, efficient, and secure.

RUS depends on a yearly appropriation from the Agriculture Appropriations bill. We have historically enjoyed strong support for robust RUS funding in large part because we're such a good investment for the Federal Government. The President's Budget request for 2018 estimates that the Federal Government could earn up to $300 million in net revenue from RUS loans. We ask that you help us maintain that support.

We also ask that you support policies that allow us to use RUS loans to address a broad set of co-op needs—whether for advanced utility communications, renewable generation, baseload generation, or for making environmental upgrades to existing generation. Just as the times have changed and the needs of rural America have changed, so too has the RUS loan program. We have appreciated working with the Committee over the years to help make the program more streamlined and efficient, and we look forward to exploring new ways to continue to improve the program. Modernizing the RUS loan program is good for both electric cooperative borrowers and taxpayers. The RUS annually reviews and approves billions of dollars of loans, and finding ways to more efficiently process those loans reduces burdens on taxpayers while meeting borrowers' needs more efficiently as well. Another important financing option available to electric cooperatives is loans from cooperative banks.

Co-op banks add healthy competition and a diversity of sources of capital to the marketplace. We encourage you to continue that policy.

Robust Communications Infrastructure

In the 21st century, robust communications infrastructure is just as important to our business operations as traditional generation, transmission and distribution assets. This high-speed communications capability makes our system more efficient, it makes our grid more secure, and it has the capability to make our consumers more comfortable and productive.

Roanoke Electric Cooperative is currently undertaking a $4 million project to lay a fiber communications "backbone" in our service territory. Our main motivation for bringing this broadband technology to the area is to take care of our internal, operational needs. As a result, this project will reduce outage frequency as well as response time to outages while better equipping Roanoke to help member-owners manage energy and reduce system losses. We want to ensure that all of our substations can communicate with one another in order that we can better predict and manage outages, protect our substations and metering equipment from vandalism and theft, and communicate with each individual member-owner about their usage.

Once this foundation is in place, there are a lot of things we can do with it. One option we are currently studying is whether we can leverage this fiber backbone and partner to provide broadband Internet to our consumers' homes. In a world of video streaming, telecommuting, video conferencing, online education, and telemedicine, connectivity is not a luxury. It's a necessity. A connected home is also a more efficient, comfortable taking advantage of "smart" technologies like thermostats and hot water heaters which assist the cooperative in managing peak load and save money for our members.

Unfortunately, many homeowners and businesses in our region do not have access to reliable Internet service. The absence of high-speed Internet denies our member-owners and others in the region access to all the amenities that most urban areas enjoy. It also discourages businesses from investing in our communities which results in missed job opportunities.

Many comparisons are drawn between the lack of access to robust broadband service today and the need for electrification in rural areas 80 years ago—with the urban areas of the country well-served, and rural areas being left behind. We believe that many different types of solutions will be needed to help rural Americans keep pace with their urban counterparts. As Congress contemplates telecommunication and infrastructure policies, we believe that all potential providers including electric cooperatives should have access to a diverse set of tools to help bridge the digital divide.

Innovation and Energy Efficiency

Upgrade to $ave

For years, electric co-ops across the country have provided information and advice to consumers to help them use electricity more efficiently and cost-effectively. As I mentioned before, because we don't have a profit motive, we have a unique opportunity to help our consumers use less energy and save money.

At Roanoke, we have a program called *Upgrade to $ave* where we work with our member-owners to make investments in energy efficiency in their homes that allow them to save money on their bills without making any up-front payments or incurring new debt obligation. In return, participating member-owners share the energy savings with the cooperative at a level that assures immediate financial savings for our participants and full cost recovery for our cooperative. In addition to improved comfort and saving money for our members, the program promotes local jobs by using local businesses and contractors to do these building retrofits.

We can do all this because we received a $6M loan from the Rural Utilities Service through the new Energy Efficiency & Conservation Loan Program (EECLP). In the first eighteen months of the program, local contractors completed upgrades to over 200 homes with average estimated energy savings above 20%. Most of the projects involved air sealing, duct sealing, insulation, efficient lighting, and installation of high efficiency HVAC equipment such as heat pumps.

In addition to generating energy savings, participants in *Upgrade to $ave* also generate spillover benefits such as reducing demand during periods of extreme weather. As a result, our cooperative benefits from lower wholesale costs for both peak demand and energy. We use some of the surplus benefits that accrue to all member-owners to pay for the cost of administering the program, which is an option open to all member-owners.

Community Solar

We're also proud to be partnering with several of our neighbor co-ops to install a 360 panel community solar project in our service territory. Our project was created in the same spirit that drove the creation of Roanoke Electric Cooperative. More than 75 years ago, electricity was out of reach for residents in our community. A group of people joined together to create our electric cooperative and power our lives. Today, solar energy is out of reach for a lot of people. Among other barriers, it can be expensive to set up and maintain. So we answered our members' call to do something about it.

Today, our members have the opportunity to purchase the energy output of these panels, investing in clean renewable energy and lowering their monthly electric bills. We think community solar has a lot of advantages for our members. For example, it can be a cost-effective alternative to installing new panels on your own home, and it provides options for renters who don't own their own property. Our site is well suited for a solar installation, so you can be sure you're getting the most out of the sun's potential. And we take care of the maintenance.

Today the North Carolina Electric Cooperatives and its consumer members support more than 2MW of community solar at 11 electric cooperatives throughout the state. To help make these projects more affordable, we have received four Rural Energy for America Program (REAP) grants from USDA. The total cost of all these projects was approximately $5.1 million and the REAP grants offset approximately 20% of the cost, around $1 million.

Microgrids

A microgrid is a group of interconnected loads and resources connected to the main electric system, which can connect and disconnect from the grid. North Carolina's electric cooperatives have the state's first grid-interconnected microgrid on Ocracoke Island and another microgrid in development, the Butler Farms Microgrid. We partnered with several organizations, EPRI, Telsa, and Ecobee to implement the microgrid.

The Ocracoke Island microgrid located off the outer banks is an exercise in community resilience, protecting the island that is often in the path of offshore storms, and can be used for demand response, energy arbitrage, and ancillary services in the PJM power market. The resources in the microgrid include a 3 MW diesel generator, a TESLA 500 kW/1 MWh battery, 15 kW of solar, and 300 Internet-connected consumer devices (thermostats and water heaters). These resources also can reduce reliance on the main power grid during times of high demand when the island reaches its peak population in the summer. It also serves as an opportunity to test the integration of this technology as the state's electric cooperatives look to use the concept elsewhere.

The Butler Farms microgrid is an opportunity to integrate swine-waste biofuel generation and solar existing on the farm to support the local community. With the addition of a Samsung 250 kW/750 kWh battery and distribution controls, the generator can continue to produce energy, even if the main grid has been disconnected. Additionally, another first for the state, up to 100 homes in the area can be supported during times of localized outages through these distribution controls. This utility-facing consumer microgrid will also be used for demand response to save consumers money when electricity is most expensive.

The North Carolina Electric Cooperatives are working together on these innovative research projects in order to learn how these technologies can be integrated into our distribution systems, while continuing to provide affordable, reliable energy to our members. These demonstration projects with successful outcomes can later be integrated into the grid through multiple applications modernizing the electric system.

Rural Economic Development Loans and Grants (REDL&G)

No matter how successful you are at delivering electricity, if you don't have an economy that supports good jobs, rural America will languish. Under the Rural Economic Development Loan and Grant (REDLG) program, USDA provides zero-interest loans to utilities (including electric co-ops), which, in turn, pass the funds through to local businesses and other groups that create jobs in rural areas. This positive cycle of business development can strengthen both the co-op and the local community by helping stabilize populations and the co-op's customer base. Since REDLG is funded in part by the interest and fees paid by co-op borrowers, it's a good deal for the Federal Government as well.

North Carolina has utilized REDLG loans and grants better than any other state in the country. Since 2012, North Carolina electric cooperatives have used REDLG programs to partner with 99 projects for a total investment of nearly half a billion

dollars which have created over 2600 jobs. REDLG funding has been used for weatherization, school construction, libraries, public safety, medical facilities and equipment, industrial buildings and equipment, and infrastructure.

For example, Energy United provided a $2 million loan to Davie County and $1 million loan to the town of Mocksville which was used to provide infrastructure to support the recruitment of Gildan manufacturing. Gildan ultimately invested $116 million in their new facilities at the site and created 292 jobs.

Another example of how the REDLG program has benefited rural communities is the $950,000 loan made by Lumbee River EMC to the Puppy Creek Fire Department. The fire department is located in a rural area of Hoke County which has grown recently due to its location near military bases. Because the fire department didn't have the ability to reach the upper floors of some of the newer, taller buildings, insurance rates were going up for everyone in the neighborhood. We were able to facilitate the purchase of a new ladder truck that could better service the community, bringing down insurance premiums for the entire community.

Regulatory Reform

Last, we believe electric cooperatives should have broad latitude to take necessary actions they need to take to meet their consumer demands. The cooperative model of local, democratic control makes us good stewards of our communities. The Federal Government should have a reasonable regulatory philosophy that recognizes that relationship.

We support reforms to the National Environmental Policy Act (NEPA) and to the Endangered Species Act (ESA) to promote the development of rural infrastructure. In addition, streamlining Federal Government management practices on Federal lands will make it easier for electric co-ops to maintain safety and reliability by performing needed vegetation management to prevent threats to power lines and respond to emergencies.

Conclusion

We are a healthy nation because we have vibrant, bustling urban cities **and** because we have verdant, productive rural areas. Unfortunately, whether it's infrastructure or jobs or access to health care, it seems that too often rural America gets the short end of the stick. You have an opportunity to address some of those disparities.

Electric cooperatives enjoy a productive partnership with the Federal Government and with the communities we serve to promote the health of rural America. We look forward to continuing to work with you toward that important goal. Thank you again for the opportunity to testify here today. I'm happy to answer any of your questions.

CHAIRMAN. Thank you, Mr. Wynn.

Ms. Otwell, 5 minutes.

STATEMENT OF JENNIFER L. OTWELL, CPA, VICE PRESIDENT AND GENERAL MANAGER, TOTELCOM COMMUNICATIONS, LLC, DE LEON, TX; ON BEHALF OF NTCA—THE RURAL BROADBAND ASSOCIATION

Ms. OTWELL. Thank you, Chairman Conaway, Ranking Member Peterson, and other Members of the Committee. Thank you for inviting me here today to talk about the importance of rural broadband as part of rural infrastructure, how that infrastructure is built and maintained, and the needs of rural consumers.

Totelcom recently built fiber to the only hospital in Comanche County, Texas, enabling countless important functions, such as sending CT scans and other diagnostic imaging to radiologists in faraway metropolitan hospitals. It is essential for our county seniors and other residents to have our hospital nearby, and that wouldn't be possible without a high speed, high capacity broadband connection. This is one of many examples I have witnessed during my tenure at Totelcom of broadband making the rural way of life possible, to say nothing of the agricultural and energy production

and other rural goods and services that broadband makes more affordable and available to a global market.

Simply put, broadband is now essential rural infrastructure, yet it is an expensive undertaking. Totelcom serves an area of around 1,182[2] miles, with an average of only 3.4 customers per square mile. You can do that math. That is not enough customers to recoup the cost of delivering broadband over such a large area. But 59 percent of Totelcom's customers have access to speeds of 10 megabits or greater, and 29 percent of our customers now have access to speeds of up to 1 gigabit, thanks to our recently completed Fiber to the Home Project in the Town of De Leon.

These results are similar to what other small rural telecom providers have achieved around the country, and none of it would be possible without support from the USF High-Cost Program, which helps rural carriers make the business case for providing the service and securing loans from USDA's Rural Utilities Service, CoBank, and RTFC, which are among the very few lenders committed and willing to finance broadband-capable plants in rural America.

Indeed, our U.S. loans and high cost USF support work in concert to help deploy broadband where it is not sustainable and improve it where it already is. For purposes of a Congressional infrastructure initiative, let me reiterate: The affordable financing is essential to rural broadband deployment, but it is not feasible without the presence of direct support for recovering the cost of providing the service.

Providing rural broadband is an ongoing effort that requires sustained commitment. We cannot declare success just for the very preliminary act of connecting a certain number of locations.

Congress was quite visionary in calling for reasonably comparable services and rates between rural and urban America in the 1996 Telecom Act. The FCC was wise to follow this principle by drafting rules for USF that mandate robust networks that can be readily upgraded over time to meet increasing consumer demands and expectations. Anything less would deny rural consumers the educational, economic, healthcare, and public safety benefits of broadband that other Americans take for granted.

While USF rules are designed to support robust networks, its high cost program budget currently is not as it has been under the same hard cap since 2011. Meanwhile, other USF program budgets have grown considerably. This hard cap is now driving consumer rates higher, deterring rural broadband investment, and even cutting USF support for investments already made.

The artificially low high-cost budget is the greatest barrier to rural broadband deployment today. Because the USF high-cost program is designed well but under-funded, we encourage Congress to offset this shortfall via any infrastructure package. This would help address the funding shortfall and save time and resources that would otherwise go towards creating and administering a new program from scratch.

Thanks to recent reforms, the high-cost program is already designed to put support where it is needed most and avoid wasteful overbuilding of existing networks by targeting very specific locations. Also, efforts to standardize and speed Federal land permit-

ting processes would free resources for broadband investment, and loan processes could be improved by allowing environmental and historical reviews to be conducted after funds are obligated but prior to disbursements.

In short, the best funded, best planned networks may never fully deliver on their promise if they are caught in regulatory red tape and needless delay. While small rural carriers have done a remarkable job of leveraging available resources for broadband deployment, much work does remain.

Fifteen percent of NTCA member customers don't yet have access to 10/1 broadband, while 90 percent of Americans have affordable access to 25/3 service or greater. The broadband industry is eager to close this gap by working with Congress and the Administration on policy that helps to build and sustain broadband in rural markets that would not otherwise justify such investments and ongoing operations.

Thank you for the honor of testifying today, and I look forward to your questions.

[The prepared statement of Ms. Otwell follows:]

PREPARED STATEMENT OF JENNIFER L. OTWELL, CPA, VICE PRESIDENT AND GENERAL MANAGER, TOTELCOM COMMUNICATIONS, LLC, DE LEON, TX; ON BEHALF OF NTCA—THE RURAL BROADBAND ASSOCIATION

Introduction

Chairman Conaway, Ranking Member Peterson, and Members of the Committee, thank you for this opportunity to testify about the importance of broadband infrastructure to rural areas and how rural broadband networks are deployed and sustained. I am Jennifer Otwell, Vice President and General Manager at Totelcom Communications in De Leon, TX. My remarks today are on behalf of Totelcom, 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 37 percent of the U.S. landmass; in most of this vast expanse, they are the only fixed full-service networks available. Small telecom providers connect rural Americans with the world—making every effort to deploy advanced networks that respond to consumer and business demands for cutting-edge, innovative services that help rural communities overcome the challenges of distance and density. Fixed and mobile broadband, video, and voice are among the services that many rural Americans can access thanks to our industry's networks and commitment to serving sparsely populated areas.

Totelcom is a local, community-based telecommunications provider with 39 employees serving a $1,182^2$ mile area with an average of 3.4 customers per square mile. But, 19 percent of our customers reside in just 2^2 miles, while the remaining 81 percent reside in the other $1,180^2$ miles—so the population density of the more rural areas is only 2.75 customers per square mile. We provide just over 4,000 total connections to customers, delivering voice services and broadband using a variety of methods. We employ fiber-to-the-home technology and traditional copper-based facilities to provide broadband to most customers, and even fixed wireless point-to-point broadband for the most remote portions of our service area.

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

Unique Challenges of Rural Broadband Deployment

Building broadband networks is capital-intensive and time-consuming; building them in rural areas involves a special further set of obstacles. The primary chal-

lenge of rural network deployment is in crossing hundreds or thousands of miles where the population is sparse and the terrain is diverse.

To complicate further the unique rural challenges of distance and density, when crossing Federal lands or railroad rights-of-way in rural America, network operators must address environmental and historical permitting concerns or contractual obligations that can delay projects and increase their already high costs. Then, once networks are built, they must be maintained over those hundreds or thousands of miles—this requires technicians who regularly travel long distances to make service calls and customer service representatives trained to deal with questions about things like router and device configurations that were unimaginable for legacy "telephone companies."

And even the best local networks in rural markets are then dependent upon "middle mile" or long-haul connections to Internet gateways dozens or hundreds of miles away in large cities. Reaching those distant locations is expensive as well, and as customer bandwidth demands increase—moving from Megabytes to Gigabytes to Terabytes of demand per month per customer—so too does the cost of ensuring sufficient capacity to handle customer demand on those long-haul fiber routes that connect rural America to the rest of the world.

Small telcos are eager to meet and overcome all of these challenges for the rural communities in which they live and serve, but it's important that they have the resources and regulatory stability to do so considering the importance of broadband to the current and future success and quality of life of rural America.

Broadband Is Essential Rural Infrastructure

Rural Broadband Benefits the Entire U.S.

Rural broadband has far-reaching effects for both urban and rural America, creating efficiencies in health care, education, agriculture, energy, and commerce, and enhancing the quality of life for citizens across the country. A report released last year by the Hudson Institute in conjunction with the Foundation for Rural Service found that investments by rural broadband companies contributed $24.1 billion to the economies of the states in which they operated in 2015. Of this amount, $17.2 billion was the direct byproduct of the rural broadband companies' own operations while $6.9 billion was attributable to the follow-on impact of their operations.

The Hudson study also determined that while small telcos provide a range of telecommunications services in rural areas, much of the benefit actually goes to the urban areas where the vendors, suppliers, and construction firms that rural telcos use are often based. Only $8.2 billion, or 34 percent of the $24.1 billion final economic demand generated by rural telecom companies accrues to rural areas—the other 66 percent or $15.9 billion accrues to the benefit of urban areas.

Additionally, the report found that the rural broadband industry supported nearly 70,000 jobs nationwide in 2015 both through direct employment and indirect employment from the purchases of goods and services generated in connection with broadband deployment and operations. Jobs supported by economic activity created by rural broadband companies are shared between rural and urban areas, with 46 percent in rural areas and 54 percent in urban areas.

Immense Benefits for Consumers and Communities

Beyond the direct economic impacts of broadband network investment and operations that I have just described, the broader socioeconomic benefits of broadband services for users and communities cannot be ignored. A Cornell University study, for example, found that rural counties with the highest levels of broadband adoption have the highest levels of income and education, and lower levels of unemployment and poverty. Access to healthcare is a critical issue for rural areas, where the lack of physicians, specialists, and diagnostic tools normally found in urban medical centers creates challenges for both patients and medical staff. Telemedicine applications help bridge the divide in rural America, enabling real-time patient consultations and remote monitoring, as well as specialized services such as tele-psychiatry. One study found that doctors in rural emergency rooms are more likely to alter their diagnosis and their patient's course of treatment after consulting with a specialist via a live, interactive videoconference.

In Hawkinsville, Georgia, rural provider ComSouth partnered with the county public school system to deploy telehealth equipment to connect the school nurses' offices with physicians at Taylor Regional Hospital. Working with the Georgia Partnership for Telehealth, the hospital, the school system, and ComSouth facilitate better health care for students who might not otherwise be able to be seen by a physician in an area where parents can ill afford to miss a half or full day for a doctor visit. This is a very simple but elegant telehealth solution—the technologies

(broadband and the monitoring equipment) are not new, but ComSouth helped put the pieces together to improve student health and save everyone time and money.

Other benefits accrue in the form of distance learning and commerce. A shortage of teachers in many areas of rural America means public-school districts rely on high-speed connectivity to deliver interactive-video instruction for foreign language, science and music classes. Broadband networks also enable farmers and ranchers to use the Internet to employ precision agriculture tools and gain access to new markets.

Retail e-commerce has benefited tremendously from sales in rural America as well, where consumers may lack access to local retail outlets, but through the availability of rural broadband networks, can access a variety of shopping options. According to the Hudson Institute, rural consumers generated $9.2 billion in online sales in 2015 and if all rural Americans had access to broadband networks, the authors estimate that Internet sales would have been $1 billion higher. A recent Pew Study further finds that among those Americans who have looked for work in the last 2 years, 79 percent used online resources in their most recent job search and 34% say these online resources were the most important tool available to them.

Indeed, job creation appears to abound when fast, high-capacity broadband is deployed in a rural area. In Sioux Center, Iowa, a major window manufacturer recently built a 260,000$^{2\prime}$ plant to employ 200 people. The company considered more than 50 locations throughout the Midwest, but selected Sioux Center in part because the rural broadband provider enabled this plant to connect with its other locations throughout the U.S. using a sophisticated "dual entrance" system that could route traffic to alternate paths, ensuring that the main headquarters 250 miles away and other facilities would remain connected. In Cloverdale, Indiana, a rural broadband provider met with developers and helped bring an industrial park to its service area. Powered by this provider's broadband, the facility brought more than 800 jobs to the area. In Havre, Montana, a rural broadband provider is partnering with a tribally-owned economic development agency to create a Virtual Workplace Suite and Training Center that is expected to create about 50 jobs. These stories are repeated throughout NTCA member service areas.

Consumer Demand, Fiber, and Future-Proof Networks

Despite these unique rural challenges, small rural telcos have made remarkable progress in deploying advanced communications networks. Based in the communities they serve, these companies and cooperatives are committed to improving the economic and social well-being of their hometowns through technological progress wherever possible.

A survey of NTCA members conducted last year found that 49 percent of respondents' customers are served via fiber-to-the-home (FTTH), up 20 percent from 2013. Twenty-nine percent of customers are served via copper loops, 15 percent cable modem, six percent fiber-to-the-node (FTTN), 0.5 percent fixed wireless, and 0.1 percent satellite. Due in no small part to increased fiber deployment, rural customers have access to faster broadband speeds. Per last year's survey, 85 percent of NTCA members' customers can purchase broadband at speeds of 10 Mbps or higher. Seventy-one percent can now access speeds above 25 Mbps.

Fifty-nine percent of Totelcom's customers have access to 10 Mbps or greater service. The remaining forty-one percent are served by long local loops that provide 1 to 6 Mbps service.

Totelcom recently completed its first fiber-to-the-home buildout in the town of De Leon, Texas. Due to that and other Fiber to the Node construction projects used to push high speed connectivity further into the rural areas, 29% of Totelcom's customers now have access to speeds up to 1 Gigabit. We work with our customers on an individual basis to find solutions to their broadband needs.

Totelcom also serves many important community anchor institutions, including a rural hospital and related EMS services, a low-income government medical clinic that serves three area towns, three school districts, two public libraries and nine public safety entities, including police and rural volunteer fire departments. In 2015, Totelcom built fiber to a new wind power facility, which currently operates 87 wind turbines that generate enough energy to power 50,000 homes in Texas each year. Totelcom also operates our own "genius bar" in the form of the Totelcom Learning Center, open weekly to assist customers in a one-to-one setting in a comfortable environment. Customers can bring in their electronic devices and seek assistance with email, saving and sending pictures, and even social media.

As we look to future data needs of our customers and our communities, we have taken aggressive steps to focus on the anticipated increase in usage, including establishing a future-proof connection to a statewide fiber network that provides our middle-mile transport. This puts our customers in a great position as data needs grow,

as we have seen our average data usage increase over 750% within the last 5 years. Due to this demand, we continue to employ new technology in our fiber-to-the-node and copper networks to meet demand, but also continue to deploy fiber. The speed and sustainability of deployment, however, will depend on both reasonable access to capital to finance construction and the availability of USF support to make sure user rates on these rural networks, once upgraded, are not astronomical and unaffordable.

Much Progress, but Much More Work to Do

Despite the progress discussed above, many parts of rural America still need better connectivity. Fifteen percent of NTCA member customers don't have access to even 10/1 broadband. In a country where the Federal Communications Commission (FCC) has indicated that 90 percent of Americans already have affordable access to 25/3 Mbps service and many urban consumers and businesses benefit from 100 Mbps or Gigabit speeds, broadband access in rural America lags behind urban areas despite the best efforts, innovation, and entrepreneurial spirit of NTCA's members.

And the price of broadband for the consumer must be considered too. As I will discuss later in this testimony, it does no good to build a network if no one can afford to make effective use of the services offered atop it. Federal law recognizes this by mandating that the Federal Universal Service Fund (USF) ensure reasonably comparable services are available at reasonably comparable rates in rural and urban areas alike. Yet, in many of the rural areas served by smaller providers today, this mandate is simply failing to be achieved, as the combined effect of recent USF reforms and USF budget cuts have resulted in prices that are tens or even hundreds of dollars more per month for rural Americans than urban consumers.

Finally, once a network is built, it is not self-effectuating, self-operating, or self-sustaining. Services must be activated and delivered atop it, maintenance must be performed when troubles arise, and upgrades must be made to facilities or at least electronics to enable services to keep pace with consumer demand and business needs. In addition to these ongoing operating costs, networks are hardly ever "paid for" once built; rather, they are built leveraging substantial loans that must be repaid over a series of years or even decades.

All of these factors make the delivery of broadband in rural America an ongoing effort that requires sustained commitment, rather than a one-time declaration of "success" just for the very preliminary act of connecting a certain number of locations. Particularly when one considers that even where networks are available many rural Americans pay far more for broadband than urban consumers, it becomes apparent that the job of really connecting rural America—and, just as importantly, sustaining those connections—is far from complete. The rural broadband industry and our nation as a whole has a great story of success but we also have much more work to do—and this is where public policy plays such an important role in helping to build and sustain broadband in rural markets that would not otherwise justify such investments and ongoing operations.

A Holistic Approach to Broadband Infrastructure

The critical role of communications infrastructure is as necessary to the present and future needs of rural America as is electricity and other infrastructure that enables the ordinary course of a thriving society. The current Administration expressly recognized the importance of advanced communications networks by including "telecommunications" within an initial list of infrastructure priorities prior to taking office, followed by over 100 Members of Congress writing to the President urging him to include broadband within any broader infrastructure initiative. President Trump indeed recently pledged to include measures to spur rural broadband in his infrastructure proposals. NTCA applauds the apparent consensus already achieved with respect to making broadband an infrastructure priority, and welcomes the opportunity to participate in a further discussion on how best to tackle this priority.

Before turning to specific thoughts on paths forward, it may make sense first to outline a few key objectives for consideration with respect to any broadband infrastructure plan:

- **First,** the plan should at least account for, if not specifically leverage, what is already in place and has worked before. Creating new programs from scratch is not easy, and if a new broadband infrastructure initiative conflicts with existing efforts, that could undermine our nation's shared broadband deployment goals.
- **Second,** there should be meaningful expectations of those who leverage any resources made available through such an initiative. Looking to providers with proven track records in delivering real results makes the most sense, but whomever receives any support should be required to show clearly that they used

those resources to deliver better, more affordable broadband that will satisfy consumer demand over the life of the network in question.

- **Third,** any broadband infrastructure plan needs to be carefully designed and sufficiently supported to tackle the challenges presented. This is a question of both program focus and program scope.
  - From a focus perspective, any infrastructure plan should aim toward getting broadband where it is not and also sustaining it where it already is; deployment of duplicative infrastructure in rural areas that are uneconomic—and may not even support a single network on their own—will undermine the sustainability of existing network assets.
  - From a scope perspective, deploying and sustaining rural broadband is neither cheap nor easy; we obviously need to recognize that finite resources are available to address any number of priorities, but any plan that calls for broadband deployment—especially in high-cost rural America—should match resources to the size of the problem to be solved.
- **Fourth,** any resources provided as part of an infrastructure plan should look to get the best return on such long-term investments. For networks with useful lives measured in decades—especially private investments that leverage Federal dollars—this should mean the deployment of infrastructure capable of meeting consumer demands not only today and tomorrow, but for 10 or 20 years. Putting resources toward infrastructure that needs to be substantially rebuilt in only a few years' time could turn out to be Federal resources wasted—and still risk leaving rural America behind.
- **Fifth,** while the economics of deployment are an essential component of any infrastructure plan, a comprehensive approach to promoting deployment is required. Barriers or impediments to broadband deployment must also be addressed as part of any holistic plan to promote and sustain infrastructure investment. Put another way, the best-funded, best-planned networks may never deliver fully on their promise if they are caught in regulatory red tape and needless delay.

Universal Service Fund and Rural Broadband Infrastructure

Any potential path forward with respect to broadband infrastructure policy should be evaluated against such criteria. As one example of a policy with promise, and as NTCA first outlined in a December 2016 letter to the National Governors Association when that group was evaluating infrastructure priorities in collaboration with the Presidential transition team, strong consideration should be given to leveraging and supplementing the existing high-cost Federal Universal Service Fund ("USF") programs under the oversight of the Federal Communications Commission (the "FCC") as a primary means of implementing a broadband infrastructure initiative.

The USF programs have been in place for years, and the FCC recently reoriented them under a "Connect America Fund" ("CAF") banner to promote broadband in high-cost rural areas. The high-cost USF/CAF programs are essential both in justifying the business case for broadband infrastructure investment in the first instance, and then in keeping rates for services affordable atop the networks once they are built.

The FCC's high-cost USF programs therefore could represent a logical focal point for future broadband infrastructure initiatives. The FCC is the nation's expert agency in telecom policy, and it is already tackling the broadband challenges described above with respect to availability and affordability. Moreover, recent USF reforms adopted by the FCC have sought to: (1) reorient the programs toward broadband, (2) ensure funding is targeted to where it is needed (*i.e.,* to places where the market does not enable service delivery on its own), and (3) define what the FCC considers an efficient level of support in each area.

The reformed program rules now compel significant accountability, to the point that support recipients must meet specified deployment obligations and geocode new locations to which they deploy broadband leveraging USF support. The FCC is also working to finalize rules that make USF resources in wide swaths of rural America available for companies of all kinds—cable companies, traditional telcos, wireless Internet Service Providers, and satellite providers—to leverage in making the business case for rural broadband investment and service delivery.

Although some implementation efforts remain ongoing and some questions remain outstanding, and while some minor conforming changes would likely be needed to implement any resources available as part of a new broadband infrastructure initiative, it would seem more straightforward to coordinate any new initiative as a sup-

plement to such existing programs than to stand up an entirely new program from scratch and then attempt "on the back end" to coordinate that new program with ongoing efforts. Indeed, as NTCA has recently described in filings at the FCC and elsewhere, additional broadband infrastructure resources, if flowed through the high-cost USF programs, could achieve immediate and compelling effects given significant and troubling current budget shortfalls in those programs.

USF High-Cost Program Budget

Unfortunately, these otherwise very effective programs are significantly underfunded to achieve their goals as designed, relegating tens of thousands of rural Americans to lesser broadband than their urban counterparts (or no broadband at all), and leaving millions of other rural Americans paying tens or even hundreds of dollars more per month than their urban counterparts do for the same broadband services. Such impacts undermine the benefit of building rural broadband infrastructure in the first instance, as well as hindering the value of broadband as a component of a broader economic development strategy. They put at serious risk the very ability of our nation to achieve the universal service mission articulated by Congress in Communications Act Section 254 for millions of rural consumers and businesses—and they will undermine the viability of a broadband infrastructure initiative if not addressed up-front.

While the Federal Communications Commission (FCC) thankfully took steps to provide some level of additional funding earlier this year within the fixed overall USF budget for a subset of carriers that elected model-based High-Cost USF support, the funding was insufficient to achieve the goals of the model the FCC designed. An additional $110 million per year is needed to fully fund an alternative model that the FCC created to promote broadband deployment. Because of this budget shortfall, 71,000 rural locations will receive lower-speed broadband, and nearly 50,000 may see no broadband investment at all.

And the problem is even more dire for those small carrier recipients of High-Cost USF that could or did not elect model support. The High-Cost USF has been locked at the same budget level overall since 2011, and a lower budget target first adopted in 2011 for smaller carriers within that overall budget total is now being enforced via a strict budget control mechanism that threatens to wreak havoc on consumer rates and network investment.

Under this tightly constrained USF budget, over the next 12 months, small rural network operators will be denied recovery of $173 million in actual costs for private broadband network investments that these carriers have already made. In other words, small rural network operators and the customers they serve will need to come up somehow with $173 million to pay for broadband investments that the USF program would have supported just a year ago—and that the rules would still provide for recovery today via USF had it not been for arbitrary "haircuts" made to enforce an artificial budget target adopted 6 years ago when the program was oriented toward voice services only.

Real World Impacts of USF High Cost Budget Cuts

Because of these support cuts, rural network operators are already increasing rural broadband rates for consumers and cutting back on future infrastructure investments. NTCA reports, for example, that one member telco has indicated it cannot justify seeking a $26 million loan to build high-speed broadband infrastructure due to the USF cuts; a project that would have delivered approximately 1,000 miles of fiber to over 7,000 rural customers is now on indefinite hold. Similarly, due to the USF budget cuts, a cooperative in the upper Midwest will put several 2018 new construction projects on hold worth several million dollars; these projects would have upgraded or delivered broadband for the first time to approximately 500 rural consumers and businesses, but the company now needs to scale back future investment because the USF cuts are taking away millions of dollars that were counted upon for investments already made in the past. In Mississippi, a small rural provider has been forced to hold off indefinitely on plans for future investments due to the USF budget concerns, instead making minimal investments just to keep existing network plant operational rather than upgrading that network for higher-speed broadband that would help those areas thrive. In Nebraska, a small company with only 12 employees that just recently completed a significant fiber-to-the-home project has declined to fill four open positions—effectively cutting its workforce by 25%—because of concerns with declining USF support and its impact on the ability to pay for the network construction already completed. And in Iowa, a small carrier has not been able to lower its prices for standalone broadband because the USF budget cuts are effectively wiping out any support for such connections, despite the intention of the reforms and the repeated calls for such a fix from Congress.

All of these effects translate to one conclusion—the USF budget cut is hindering recovery of prior private investments, deterring future investments, driving up consumer prices, and hurting job creation. These are all directly contrary to the stated goal of a broadband infrastructure initiative, and highlight how predictable and sufficient USF is a condition precedent to the success of any such initiative.

Unpredictability of USF High Cost Support

Perhaps the most troubling aspect of this budget control is that it not only cuts support that the rules indicate should be available, but it does so in unpredictable ways. For the last 4 months of last year, the budget control was 4.5% on average; for the first 6 months of this year, it rose to 9.1% on average. Now, as of July 1, the budget control will on average reduce USF support by 12.3% for the next 12 months. As if the support losses for investments already made were not bad enough, this lack of predictability makes it even harder to justify building going forward.

If a company does not know whether the budget control will be 5% or 10% or 20% next year—and given the growth trends, all we can guess is that the budget control will grow—that company cannot make informed decisions to invest in capital-intensive broadband infrastructure. If it does not get fixed soon, we will be looking at years of lost rural broadband investment to the detriment of millions of rural Americans. Rather than creating new programs from scratch or taking flyers on untested theories of broadband deployment, why not use a program that has a proven track record and has just been improved in recent years? Why starve that program's budget while throwing dollars at new initiatives that might not work or, worse still, might conflict with this proven program? If rural broadband is really a priority, good public policy would indicate we should be building upon what has worked to promote it, rather than neglecting it.

Congressional Support for Addressing High Cost Budget

It's not just NTCA that is concerned about the USF budget shortfall. In May 2017, nearly 170 Members of Congress—including 22 Members of the House Agriculture Committee—wrote to the FCC expressing serious concern about how the USF budget shortfalls will undermine private infrastructure investment and consumer rates. This letter demonstrated the shared bipartisan interest in prompt action on this issue, and a window of opportunity exists. We are hopeful that with continued Congressional interest and leadership we can see these issues addressed, and the promise of last year's USF reforms can be realized by the millions of rural consumers served by smaller rural network operators.

Benefits of Shoring Up USF High Cost Program

Providing additional resources to allow the FCC's cost models and competitive bidding programs to function as designed could yield measurably improved delivery of broadband to tens of thousands of additional locations at higher speeds, and help deliver service to many more who currently face the prospect of no broadband at all. Industry estimates show that 71,000 more households would be the beneficiaries of better broadband infrastructure if the FCC's cost model were funded as designed, while 47,000 households are currently at risk of receiving no broadband at all due to a lack of sufficient support.

Meanwhile, in other rural areas, additional resources could mitigate the fact that millions of rural consumers are still forced to pay tens or even hundreds of dollars more per month for standalone broadband than their counterparts in urban areas—*despite the fact that hundreds of Members of Congress wrote to the FCC in 2014 and again in 2015 expressly asking for this concern to be resolved.*

A recent survey of NTCA member companies revealed that the average respondent estimates charging $126 per month for standalone broadband under the budget control—far more than most rural consumers could afford. Further, the average response predicted charging only $70 per month for standalone broadband if the budget control were not in place and carriers received support for investments under program rules. These numbers reveal that the budget control is preventing the High Cost program from helping rural providers offer reasonably comparable services and rates as called for in the Communications Act.

From an infrastructure perspective specifically, it is far harder to justify future investments in broadband networks when consumers face prices such as these and cannot reasonably afford the services once delivered. These are concerns common to many rural consumers, and they are particularly acute of course in areas with significant rural poverty levels and Tribal areas.

The FCC's various high-cost USF programs—both the CAF II initiative and the programs that enable service delivery in rural areas served by smaller businesses—therefore offer a ready-made platform that, with additional resources but with very

little additional "heavy lifting" or process, could "hit the ground running" and yield immediate, measurable benefits for rural consumers.

Other options for implementing a broadband infrastructure initiative could include alternative grant or capital infusion programs through other agencies, comparable to what several states have used to address "market failure areas"—places where the business case for investment is difficult, if not impossible, to make without additional resources. At the same time, creating such programs would require more administrative effort than leveraging existing programs, and the rules for any such new program must still be informed by the objectives I first articulated above and any "lessons learned" from similar prior efforts at the Federal and state levels. For example, as a matter of program integrity and to ensure the most efficient possible use of resources, it would be necessary to ensure such a capital infusion program is carefully coordinated with the existing USF programs, among other things. And although some have alternatively touted tax incentives as offering promise—and while there are certainly areas in which such incentives might help—such measures are unlikely to make a material impact in most rural areas where distance and density make it difficult, if not impossible, to justify a business case for infrastructure investment to start.

Rural Utilities Service Telecom Financing

The Strength of RUS Experience

Deploying a communications network in a rural area requires a large capital outlay due to the challenges of distance and terrain. The number of rural network users (as compared with more densely-populated urban areas) is too small to pay the costs of deployment and ongoing operations through customer charges. As Congress considers the details of legislation to promote infrastructure deployment, it's important to note that USDA's Rural Utilities Service (RUS) has long played a crucial role in addressing rural broadband challenges through its telecommunications programs that finance network upgrades and deployment in rural areas.

Since the early 1990s, the RUS telecom programs have financed advanced network plant at a net profit for taxpayers and helped deploy state-of-the-art networks to rural Americans left behind by providers unable or unwilling to serve low-population-density markets. With rare exception, RUS, CoBank and RTFC are the primary lenders that small rural providers can turn to for outside financing. Not only does RUS help rural America remain connected, its Broadband Loan & Guarantees program and traditional Telecommunication Infrastructure Loan & Guarantees program make loans that must be paid back with interest—creating a win/win situation for rural broadband consumers and American taxpayers.

RUS and USF Work in Concert

While RUS lending programs finance the substantial up-front costs of network deployment, the USF High Cost Fund helps make the business case for construction and sustains ongoing operations at affordable rates. More specifically, USF by law aims to ensure "reasonably comparable" services are available at "reasonably comparable" rates. Not to be confused or conflated, RUS capital and ongoing USF support serve distinctly important, but complementary rather than redundant, purposes in furthering rural broadband deployment. The availability of USF—the ability to make sure that consumers can actually afford to buy services on the networks once built—is so essential to the RUS telecom loan calculus that uncertainty in the Federal USF program in recent years has hindered some of the success, momentum, and economic development otherwise and previously enabled by the RUS telecommunications programs.

Farm Bill Considerations

Apart from infrastructure legislation, the pending expiration of the current farm bill affords opportunity to review the farm bill Broadband Loans & Loan Guarantees program that was first authorized in the 2002 Farm Bill. Each subsequent farm bill has made extensive reforms to the program with the goal of greater accountability, efficiency, and effectiveness. Two rounds of program reforms in less than 15 years—the first of which was significantly delayed by the ARRA BIP program's use of the Broadband Loan Program mechanism—means that the Broadband Loan Program has been almost continuously "under construction" since its inception, rendering the program inaccessible to borrowers for long periods of time. While the program isn't perfect, it may be helpful to simply let borrowers use the Broadband Loan Program in current form and become familiar with it for a few years before undertaking another extensive reform effort.

NTCA urges the Committee to continue to support the RUS Broadband Loan program that is subjected to the farm bill reauthorization process at or above current

funding levels as you formulate recommendations. Furthermore, we urge the Committee to continue its long history of support for the Telecommunications Infrastructure and Community Connect programs that are also vital to the ongoing deployment and maintenance of advanced communications infrastructure throughout rural America.

The Broadband Opportunity Council (BOC), which includes USDA as a member, released a report in September 2015 that recommended authorizing more USDA programs to make grants and loans for broadband infrastructure. The BOC's January 2017 progress report affirmed this recommendation. While more resources for rural broadband deployment are needed, involving more government entities and programs in broadband financing should be undertaken cautiously to avoid duplicating efforts and undermining a coherent, cohesive approach to financing and then sustaining rural broadband networks.

Infrastructure Investment and Barriers to Deployment

Infrastructure investment depends not only on financing but also on prompt acquisition or receipt of permissions to build networks. Barriers or impediments to broadband deployment must also be addressed as part of any holistic plan to promote and sustain infrastructure investment. Such roadblocks, delays, and increased costs are particularly problematic for NTCA members, each of which is a small business that operates only in rural areas where construction projects must range across wide swaths of land.

Permitting and access, particularly with respect to Federal lands, can present a significant impediment to the deployment of rural broadband infrastructure. Navigating Byzantine application and review processes within individual Federal land-managing and property-managing agencies can be burdensome for any network provider, but particularly the smaller network operators that serve the most rural 40 percent of the U.S. landmass. The review procedures can take substantial amounts of time, undermining the ability to plan for and deploy broadband infrastructure—especially in those areas of the country with shorter construction seasons due to weather.

The lack of coordination and standardization in application and approval processes across Federal agencies further complicates the deployment of broadband infrastructure. While not specifically regarding Federal lands, the terms of local franchises, pole attachments, and railroad crossings can also create substantial costs and concerns in deploying broadband infrastructure. Government at all levels—state and local, counties, tribal lands, and Federal—should work collaboratively to harmonize their process to expedite placement of facilities.

These issues significantly affect broadband network operators and consumers. In Wyoming, the Bureau of Land Management (BLM) state office adopted a unique bonding policy and application process that appeared to equate deployment of telecom facilities with installation of pipelines transporting hazardous substances, dramatically increasing the application burdens and potential costs. In California, the U.S. Forest Service waited months to begin work on environmental reports for a small rural provider's broadband deployment and then refused a temporary construction permit, costing the carrier most of the 2017 construction season and delaying the project into next year. In Utah, carriers have faced construction delays due to inter-agency permitting disagreements between the BLM and the U.S. Department of Transportation. From my experience at Totelcom, I can attest that when building new fixed wireless towers for deployment, the cost of the various permits and approvals normally runs higher than the actual construction of the tower.

We have seen much agreement for some time now on solutions to simplifying the administrative barriers to deployment. The standardization of application, fee and approval policies and procedures across Federal land-managing and property-managing agencies to the extent possible should be a high priority. The Senate MOBILE NOW (S. 19) bill contains changes that should be considered for near-term implementation on Federal lands, such as improved "shot-clock" measures, while the FAST Act (P.L. 114–94) included sound reforms that should be extended to smaller projects as well. Such actions would enable smaller operators to remain focused on providing high-quality broadband service to their customers rather than dealing with onerous regulations.

FCC Chairman Ajit Pai's "Digital Empowerment Agenda" contains many thoughtful suggestions on how "to make it easier for [Internet Service Providers] to build, maintain, and upgrade their networks," ranging from greater scrutiny of local franchising regulations to ensuring reasonableness in the costs for pole attachments. Chairman Pai's formation of a Broadband Deployment Advisory Committee also represents a meaningful step in evaluating and taking real action on these issues. Con-

tinued progress in consideration and implementation of such ideas must be seen as an essential component of a holistic broadband infrastructure initiative.

Finally, though rural telcos have long enjoyed productive working relationships with RUS, there is always room for improvement. Small carriers typically spend about 2 years and about $250,000 securing loan approval from RUS. Some providers would love to take advantage of RUS's low rates, but the procedural barriers to borrowing from RUS send them to private lenders that offer higher rates. RUS could make its processes more user friendly and free up resources for broadband deployment with loan sequencing reforms that would allow borrowers to delay costly reviews until a loan is approved, but before funding is released.

Conclusion

Robust broadband infrastructure is crucial to the current and future success of rural America. But the characteristics that enable the unique beauty and enterprise of rural America make it very expensive to deploy advanced communications services there. Our nation's small, rural telecom providers are deploying faster broadband throughout their service areas, but no carrier—regardless of size—can deliver high-speed, high-capacity broadband in rural America without the ability to justify and then recover the initial and ongoing costs of sustaining infrastructure investment in high-cost areas.

A legislative infrastructure initiative offers a unique opportunity to provide the resources needed to make these investments, and mechanisms that ensure efficiency and accountability in the expenditure of funds are already in place. Our industry is excited to participate in this conversation regarding broadband infrastructure initiatives, and we look forward to working with policymakers and other stakeholders on a comprehensive infrastructure strategy to ensure that all Americans will experience the numerous agricultural, economic, health, and public safety benefits of broadband.

Thank you for the opportunity to testify, and for the Committee's commitment to creating an environment conducive to broadband infrastructure investment in rural America.

The CHAIRMAN. Thank you, Ms. Otwell.

Mr. Macmanus for 5 minutes.

STATEMENT OF BRIAN E. MACMANUS, P.E., GENERAL MANAGER, EAST RIO HONDO WATER SUPPLY CORPORATION, RIO HONDO, TX; ON BEHALF OF TEXAS RURAL WATER ASSOCIATION; NATIONAL RURAL WATER ASSOCIATION

Mr. MACMANUS. Good morning, Chairman Conaway, Ranking Member Peterson, and Members of the Committee. Vice Ranking Member Vela, thank you for your kind introduction.

It is an honor to testify before you on the drinking water and wastewater infrastructure needs and concerns for rural America. I am Brian Macmanus, and I serve as the General Manager of the East Rio Hondo Water Supply Corporation in the Rio Grande valley of Texas.

In 1979, East Rio Hondo began construction of its potable water system with our first USDA Farmers Home Administration loan of $1,100,800 to serve 975 customers. These customers were farmers, ranchers, rural, and colonia residents who were utilizing a mix of contaminated and non-potable water sources.

The enormous cost to start a water system over such vast rural areas was not a possibility without the grants, low-interest loans, and 40 year terms that USDA funding made possible.

The dollar value of the current infrastructure needs for water and wastewater in rural America can be tied directly to the current USDA rural water application backlog of $2.5 billion for almost 1,000 pending applications.

East Rio Hondo currently has an application pending for approximately $4.5 million for a new, 1 million gallon elevated water storage tank. This backlog truly represents my utility and rural and small community water infrastructure projects throughout the country.

Why does rural America water and wastewater infrastructure matter to the average American? It is really simple. First, the people living in rural America produce the food, fuel, and fiber products for our entire country, and depend on safe and clean water to maintain their health and their community's economy. Second, all American citizens depend on safe drinking water in rural America for the safety of their food supply as it takes clean, potable water to wash and process the fruits, vegetables, and meats at packaging facilities in rural America. Third, the wastewater treated and discharged by rural American communities is likely the drinking water source for the next community downstream. Although small drinking water systems outnumber large water systems ten to one, they still have a minority of the country's population, often at a much higher cost per household.

As a prime example, East Rio Hondo has constructed a UV light disinfection treatment process at our surface water treatment plant to inactivate cryptosporidium, which was detected in our raw water source. This project cost East Rio Hondo approximately $1.5 million in capital construction, or $191 for each and every connection in our system.

Lack of economy of scale is also demonstrated by East Rio Hondo serving 7,850 connections with 466 miles of pipe, equivalent to 16.8 connections per mile. Much larger urban utilities can have hundreds of equivalent connections per mile of pipe, and more easily spread infrastructure cost over their larger customer base. USDA funding is what continues to make growth and compliance projects truly affordable to rural America.

In 2017, there are still rural communities in the country that do not have access to safe drinking water or sanitation due to the lack of population density or lack of funding.

My associate, Finley Barnett, General Manager of S.U.N. Water Supply Corporation in Merkel, Texas, is seeking USDA funding for the expansion of his system to serve 300 rural residents whose wells have gone dry.

My entire rural neighborhood hauled bottled drinking water to our homes due to private wells with salty ground water until 2009 when East Rio Hondo laid a new pipeline on our rural road.

My next-farm-over neighbors, Richard and Cheryl Johnson, were ecstatic to have safe potable water from East Rio Hondo as they had both been previously hospitalized due to fecal contamination of their private well from their septic system.

A very crucial point to take home today is that rural America is being overlooked in the funding as currently proposed to partially occur through the U.S. EPA's state revolving fund process.

SRF dollars have historically been absorbed by large metropolitan water utilities. East Rio Hondo's experience in applying for DWSRF funding is that our applications historically ranked too low, and have largely been unsuccessful. East Rio Hondo's and NRWA's preferred funding avenue for water and wastewater infra-

structure projects is the USDA Rural Development Direct Loan and Grant Program.

NRWA urges Congress to consider the following rural water and wastewater infrastructure concepts: First, provide a minimum set-aside for small and rural communities; second, provide grants not just loans; third, contract qualified private nonprofits to service the USDA water and wastewater loan and grant programs. The current checklist for a USDA loan and grant project requires an applicant and their consultants to complete 90 separate items before beginning construction.

This checklist is included in *Attachment C* of my written testimony.

NRWA would like to thank the Rebuild Rural Coalition for organizing this effort today. Thank you, Chairman Conaway, Ranking Member Peterson, Vice Ranking Member Vela, and Members of the Committee for allowing me to testify.

I would be happy to answer any questions that you may have.

[The prepared statement of Mr. Macmanus follows:]

PREPARED STATEMENT OF BRIAN E. MACMANUS, P.E., GENERAL MANAGER, EAST RIO HONDO WATER SUPPLY CORPORATION, RIO HONDO, TX; ON BEHALF OF TEXAS RURAL WATER ASSOCIATION; NATIONAL RURAL WATER ASSOCIATION

Good morning Chairman Conaway, Ranking Member Peterson, and Members of the Committee. It is an honor to testify before you on the drinking water and wastewater infrastructure needs and concerns for rural America. I am proud to represent the many rural water and wastewater utility systems across America in sincerely thanking this Committee for your long support of the Department of Agriculture's (USDA) Rural Development water programs that have lifted up the quality of life for so many of the residents in my home state of Texas and throughout this great nation.

I am Brian Macmanus and I serve as the General Manager of the East Rio Hondo Water Supply Corporation (**ERHWSC**). I am a licensed engineer and water and wastewater treatment operator in the State of Texas. ERHWSC was incorporated in 1972 and began construction of our first pipelines in 1979 when ERHWSC closed our first Farmers Home Administration loan of $1,100,800 in order to serve 975 customers. Since our inception, we have expanded our water service and started wastewater service using additional funding assistance from the United States Department of Agriculture (USDA) (see *Attachment B*). ERHWSC now directly serves approximately 24,000 residents in Cameron and Willacy Counties, and wholesales potable water to an additional 1,816 people through the U.S. Immigration Customs Enforcement, Port Isabel Detention Center, the Town of Indian Lake, and to a portion of Military Highway Water Supply Corporation, all within a 407^2 mile service area.

I come before this Committee representing the Texas Rural Water Association which is a state affiliate of the National Rural Water Association. The National Rural Water Association (NRWA) is a water utility organization with over 31,000 community members. Our member communities have the very important public responsibility of complying with all applicable regulations and for supplying the public with safe drinking water and sanitation every second of every day. Most all water supplies in the United States are small; 94% of the country's 51,651 drinking water supplies serve communities with fewer than 10,000 persons, and 80% of the country's 16,255 wastewater supplies serve fewer than 10,000 persons. In my home state of Texas, the national trend continues as there are presently 4,310 community water systems that have a population under 10,000 people, representing 93% of the water systems in the state.

I am here today to testify on the water and wastewater infrastructure needs of rural America. I believe it is important in my testimony today that I identify to the average American who lives in an urban or suburban setting why it is important to invest our United States Federal budget dollars in the water and wastewater infrastructure of rural America. I know that the Members of this Committee are very familiar with the fact that our country's food, fuel, and fiber come primarily from rural America. The people in communities producing the food, fuel, and fiber depend

on safe and clean water to maintain their health and their community's economy, no differently that most Americans. Let's take it a step further though on why the average American citizen should care about investing in safe drinking water in rural America.

The United States currently enjoys the safest most affordable food supply of any industrialized country in the modern world. This is due, in a large part, to the efforts of past and present Members of this Committee and we wish to thank you for this tremendous achievement. A huge part of this achievement was past investment in the rural water infrastructure to produce safe drinking water and properly treated wastewater in rural America. Imagine consuming fruits and vegetables that were processed at packaging facilities in rural America, typically not far from where they are harvested, that were washed in water from an unsafe potable water supply. The potential resulting food borne outbreak could endanger the health and lives of many people in the more populated centers of our country. Fortunately, each of us can follow the USDA My Plate nutrition guidelines and make half of our plate fruit and vegetables, and do so in confidence because our fruits and vegetables were washed with clean potable water in rural American packaging facilities and again at our homes to prevent the spread of parasitic organisms such as *E. coli.* This clean potable water used to wash them did not show up on its own. In rural America, it was likely provided via USDA water and wastewater loans and grants.

There is a saying in the water and wastewater industry, that a certain product rolls down hill. This stands true for any community in America, including rural communities, that discharge treated wastewater into our rivers and streams. Their wastewater is likely the drinking water source for the next community downstream, which could easily be an urban center. Sufficient wastewater treatment is critical to maintain the safety of the drinking water source. I hope I have your attention on the critical need to sustain the infrastructure for our water and wastewater systems in rural America.

One other point which I will cover in more detail later in this testimony is that suburban America is now growing into what today is rural America. We have all seen the subdivisions occurring in areas that were previously farms, ranches, and forests. Growing rural America on the outskirts of population centers is a key component of the American economy growing again, and having water and wastewater infrastructure available to handle new growth is critical for the financial viability of these potential developments.

When thinking about national water infrastructure proposals, I ask you to reflect on my previous statement of facts that ***most*** water utilities are small. These small systems have more difficulty affording public water service due to lack of population density and lack of economies of scale. My utility, ERHWSC, is a prime example of this lack of economy of scale with approximately 7,850 connections being served by 466 miles of pipe which equates to 16.8 connections per mile of pipe. This concentration is considered high for some rural systems, yet large urban centers can have hundreds of equivalent connections per mile of pipe, depending upon their density.

The small community paradox in Federal water policy is that while we supply water to a minority of the country's population, we have much more difficulty providing safe, affordable drinking water and sanitation due to limited resources and technical expertise. Also, while we have fewer resources, we are regulated in the exact same manner as a large community; we outnumber large communities by a magnitude of ten-fold, and Federal compliance and water service is often a much higher cost per household. As a prime example of this, ERHWSC has constructed an ultra-violet (UV) light disinfection treatment process at our surface water treatment plant, to maintain compliance with US EPA log removal requirements for the parasite cryptosporidium, which was detected in our raw water source. This project cost ERHWSC approximately $1.5 million in capital construction, or $191 for each and every member (connection) in our system. Much larger urban utilities would be able to more affordably spread this cost over a much larger customer base. USDA funding made this project affordable for the rate payers in ERHWSC.

A great man named Billie Joe Simpson was the founder of ERHWSC and my predecessor until his passing in 2013. He told me shortly before his death that he could not believe what ERHWSC had grown into and what an impact it had created upon the local rural economy. ERHWSC was truly a rural community of farmers, ranchers, rural residents, and colonia residents when Billie Joe and his wife Martha Ann applied to USDA for our first project. The enormous cost to start a water system over such vast rural areas was not a possibility without the grants, low interest loans, and long loan terms of 40 years that USDA funding made possible. This story of small beginnings and huge results repeats itself, although with different demographics, over and over again throughout our great country. The continued develop-

ment of growing rural America is a strong stimulus to our nation's economy. The USDA rural water and wastewater loan and grant program is what continues to make growth and compliance projects like ERHWSC's UV light disinfection system truly affordable to rural America.

The dollar value of the current infrastructure needs for water and wastewater in rural America can be tied directly to the USDA rural water application backlog of **$2.5 billion with 995 pending applications.** I can tell you from first hand discussions with other water and wastewater utility managers in Texas, this number is artificially low because many utilities fall into noncompliance with regulatory requirements while waiting, sometimes for years, for closure on the funding process. As you can see in *Attachment B,* ERHWSC currently has an application pending for $4,454,238.00 for a new 1,000,000 gallon elevated water storage tank. The backlog of pending applications truly represents my utility and rural and small community water infrastructure projects throughout the country that can't access alternative affordable sources of funding.

In 2017, there are rural communities in the country that still do not have access to safe drinking water or sanitation due to the lack of population density or lack of funding—many in rural Texas. Just this past week, my colleague Finley Barnett, the General Manager of S.U.N. Water Supply Corporation in Merkel, Texas, told me how dependent he was on affordable USDA funding for the expansion of his system to serve 300 rural residents whose wells had recently gone dry. Each day, there are numerous rural families driving their pick-up trucks to central filling stations to fill up large plastic storage containers to "haul" the water back to their remote and isolated homes, farms, and ranches. Included with my written testimony are just a few of many recent news profiles of communities that lack basic drinking water access (*Attachment A*). My water utility and our rural water association's mission has been to expand water service to these communities and rural areas—often for the first time. The delivery of drinking water and sanitation to rural America has been one of the great public health accomplishments of the second half of the twenty-first century.

Over the last 73 years, through the combined financial assistance of the U.S. Department of Agriculture's rural water grant and loan initiative (exceeding $50 billion), the country has made great advancements in the standard of living in rural America. Millions of rural Americans now have access to safe potable drinking water that their parents did not have. I personally hauled bottled drinking water to my home in 5 gallon bottles due to salty groundwater until 2009 when ERHWSC laid a new pipeline to me and my neighbors on our rural road. My next-farm-over neighbors, Richard and Cheryl Johnson, were ecstatic to have safe potable water from ERHWSC as they had both been previously hospitalized with gastrointestinal disease due to fecal contamination of their well from their septic tank. Thousands of rural communities now have public sanitary wastewater systems that have allowed for elimination of millions of questionable septic tanks, cess-pools, straight pipes, or worse. This rural water infrastructure development has been the engine of economic development in rural communities, and it has provided for dramatic improvements to the environment and public health.

As an example of the key role that USDA rural water grant and loan initiative plays in the development of rural systems and the economy of communities they serve, please reference the loan and grant portfolio which ERHWSC has generated since its beginnings (see *Attachment B*). As noted above, without the total grant funds and affordable loans provided to ERHWSC via USDA funding, rural Cameron and Willacy Counties would never have seen the development of a potable water system. The farmers, ranchers, rural and colonia residents in ERHWSC's service area were utilizing high iron and brackish, non-potable wells, shallow wells contaminated by fecal coliform (like Richard and Cheryl Johnson), or raw or partially treated Rio Grande River water contaminated with wastewater discharges from upstream in Mexico. These south Texans, with at times completely inadequate water infrastructure, would never have been able to afford a potable water system without the collective community efforts made possible via USDA funding. USDA funds for water and wastewater infrastructure are critical to the affordability of continuing this life-critical service.

Rural America faces a significant dichotomy today. Some rural areas and particularly the Great Plains are depopulating because of changing factors in predominantly agriculture economies where farms are larger and farmers are fewer. A decreasing customer base makes financing projects mandated by continually growing regulations a difficult if not unaffordable task. In Texas, many towns and counties in far west Texas struggle to overcome depopulation. Other rural communities are challenged with areas of rapid growth where populations from nearby urban and suburban growth centers are moving to locales of what used to be farms, forests,

and ranches. It seems at times that everyone wants a little piece of the calmness of the country in rural America after the wear and tear of work in suburban/urban America. Rural system infrastructure that is prepared and capable of growing affordably with new arrivals from neighboring population centers is critical for this stimulus in our national economy to occur. In Texas this too is occurring in the area called the Texas Triangle between Houston, Dallas-Fort Worth, and San Antonio. My good friend Chris Boyd, General Manager of Mustang Special Utility District, struggles to keep up with capital infrastructure in Collin County, Texas, 50 miles north of Fort Worth, in an area that is quickly changing from farms to subdivisions. Maintaining affordable water and wastewater rates via USDA capital project funding is critical for both spectrums of our rural American economy.

Just how much water and wastewater infrastructure demand is there today? Every 4 years, EPA works with states and community water systems to estimate the drinking water state revolving fund-eligible needs of community drinking water systems by state. In 2011, EPA published their fifth national assessment of public water system infrastructure needs and it showed a total twenty year capital improvement need of $384.2 billion. This estimate represents infrastructure projects necessary from January 1, 2011, through December 31, 2030, or an average of **$19.21 billion per year,** for water systems to continue to provide safe drinking water to the public. EPA's Clean Watersheds Needs Survey (CWNS) is an assessment of capital investment needed nationwide for publicly-owned wastewater collection and treatment facilities to meet the water quality goals of the Clean Water Act. These capital investment needs are reported periodically to Congress. EPA's 2012 CWNS Report was the sixteenth survey since the enactment of the CWA in 1972 which requires the Report. The total capital wastewater and collection needs for the nation are $245.8 billion over the next 5 years, or an average of **$49.16 billion per year** as of January 1, 2012. This includes capital needs for publicly-owned wastewater pipes and treatment facilities ($197.8 billion), and combined sewer overflow (CSO) corrections ($48.0 billion).

President Trump has made improving the country's infrastructure, including water and wastewater, a priority. NRWA is extremely grateful for this prioritization and excited about the potential for rural America. However, despite my testimony to the critical nature of this funding in rural America, my main point here today is to tell you that rural and small town America is being overlooked in the proposed process to develop the funds for new water and wastewater infrastructure initiatives. The funding as currently proposed to partially occur through the US EPA's State Revolving Loan process will by-pass rural America and be absorbed by large metropolitan water developments.

Most of the funding for rural American's water and wastewater development has come from the U.S. Department of Agriculture's (USDA) rural water grant and loan initiative because it targets communities who are most in need based on economics and water quality. Most of the EPA water infrastructure funding is dedicated to larger communities because EPA does not require a similar needs-based criteria.

- Approximately 77 percent of Clean Water State Revolving Fund (CWSRF) funding for Fiscal Year 2015 were awarded to communities with a population over 10,000 (*EPA Clean Water State Revolving Fund Annual Review* (*https://www.epa.gov/sites/production/files/2016-05/documents/2015_annual_report_3-14-16.pdf*)).

  Approximately 72 percent of Drinking Water State Revolving Fund (DWSRF) funding for Fiscal Year 2016 were awarded to communities with a population over 10,000 (*EPA Drinking Water State Revolving Fund National Information Management System Reports* (*https://www.epa.gov/drinkingwatersrf/drinking-water-state-revolving-fund-national-information-management-system-reports*)).

My water system's experience in applying for DWSRF funding is that ERHWSC's applications have historically been ranked insufficiently to receive funding. The normal annual funding is usually consumed by the top projects ranked at the very top of a list of hundreds of applicants in Texas alone, and large municipal projects take very large percentages of the funding. Although ERHWSC has received DWSRF funding on one project recently, it was only due to ranking in the top ten in the state, due to potential emergency water outages brought on by drought conditions. All other ERHWSC applications for DWSRF funding have not scored high enough on the state ranking to receive funding. ERHWSC's preferred funding avenue for water and wastewater infrastructure projects is the USDA-Rural Development Direct Loan and Grant Program.

If forced to choose, NRWA would prefer the USDA water and wastewater loan and grant program over DWSRF, although both can provide significant benefit. The USDA water and wastewater loan and grant program has been the historical solu-

tion for small and rural water infrastructure needs and is largely responsible for the success of delivering water and sanitation to almost every corner of rural America. Since Fiscal Year 1940 USDA's Water Program has made **96,724 loans and grants** totaling **$54.6 billion.** This is perhaps the most discriminating assessment of need because it only measures rural and small community projects that meet USDA strict criterion for need-based high cost per household and local economic conditions.

To make sure any water infrastructure initiative helps rural and small town America, NRWA urges Congress to consider the following global policy principles—and observations—based on their merit:

1. A minimum portion of the infrastructure initiative funds should be specifically set-aside for small and rural communities, regardless of how the funding is established. This ensures that small and rural communities are not left out of the solution.
2. Allow infrastructure funds some ability to provide grants—not just loans. Commonly, low income communities do not have the ability to pay back a loan, even with very low interest rates, and require some portion of grant or principal forgiveness funding to make a project affordable to the ratepayers.
3. A small percentage of water funding programs should be set-aside for experienced nonprofit entities to provide specific technical assistance in completing the applications for water and wastewater infrastructure funding. Small communities often lack the technical and administrative resources to achieve compliance and complete the necessary applications to access the Federal funding programs. Providing these small communities and the funding agency with shared technical resources can expedite loan closing and construction of facilities. This assistance can save thousands of dollars for the community and help the systems maintain long-term compliance with EPA rules by expediting the loan process.
4. Federal water funding programs should be used to ameliorate compliance with Federal unfunded mandates or standards. Currently, the Safe Drinking Water Act and Clean Water Act are creating a tremendous financial burden on small and rural communities. Federal compliance costs for the Federal drinking water rules, many for naturally occurring elements in groundwater, can be exorbitant. The U.S. Environmental Protection Agency's (EPA) most recent noncompliance reporting data, via the Government Performance and Results Act, shows that for drinking water regulations 9,949 communities are in noncompliance; most all of these communities are simply struggling to achieve Federal compliance and avoid fines.
    - EPA lists 444 communities in violation of the arsenic standard; all have a population of fewer than 25,000 persons; 98% have a population of fewer than 10,000 persons; and 85% have populations under 1,000 persons.
    - EPA lists 1,374 communities in violation for the most recent disinfection byproducts rule; 1,310 have a population of fewer than 25,000 persons; and 94% have a population of fewer than 10,000 persons.
    - EPA lists 76 communities in violation for naturally occurring fluoride in their drinking water; all but two of these communities have a population of fewer than 10,000 persons; and 80% of these communities have a population of fewer than 500 persons.
5. Local communities have an obligation to pay for their water infrastructure and the Federal Government should only subsidize water infrastructure when the local community can't afford it and there is a compelling Federal interest such as public health. The USDA water infrastructure program contains this needs-based criterion. USDA calls this the "credit elsewhere" criterion and it is unique to USDA's funding.

As you are aware, Texas is one of the four border states that serve colonias. ERHWSC is one of many rural water and wastewater systems that has benefitted from USDA infrastructure funds to remedy the deplorable conditions that exist in these low-income communities. Colonias are often in unincorporated areas, which unfortunately are similar to some Tribal areas, and lack some of the most basic necessities such as potable water and functional sewer systems, without municipal jurisdiction for development or zoning. ERHWSC and many rural water supply corporations along the border are prime examples of how a regional rural water utility can provide the capacity with USDA capital low interest loans and grants to relieve the squalid conditions that exist in these communities. NRWA encourages the avail-

ability of affordable colonia specific funding sources as part of the infrastructure package.

NRWA provides the following conceptual changes specifically to USDA water and wastewater loan and grant funding to the Committee for consideration:

1. Provide the Secretary with the authority to use a small percentage of the funding made available for the Rural Development programs to contract with private nonprofits with demonstrated experience to conduct non-inherent government activities and functions necessary to deliver and service the Rural Utilities Service Water and Waste Water Disposal loan and grant programs. The application process to access USDA water and wastewater infrastructure funding can easily overwhelm the small and rural communities who often lack the capacity to administer and deliver the items required in the lengthy application process. The current application form (see *Attachment C*) requires an applicant or the applicants engineer or attorney to complete ***90*** separate checklist items before beginning construction on a project. The back and forth corrections between the applicant and USDA in completing this checklist can often take months and sometimes years. This impediment is compounded by the recent reduction of over 1,000 Rural Development program staff and office locations that can assist applications with the process. NRWA has identified over 40 loan processing and servicing functions and activities that can be performed by non-governmental third party entities. The inherent government activities would still be performed by Federal employees. Assistance could include but not limited to preparing the application with all required documentation (audits, environmental report, preliminary engineering report, *etc.*). Direct assistance could also be performed for preconstruction requirements, closing review, Buy America compliance, construction inspection, rate studies, budget preparation, warranty inspection, addressing letter of conditions, drafting emergency response plans and other activities as needed. Assistance to the applicants in all of the applicant checklist requirements would greatly expedite the process of capital delivery for construction purposes. My personal experience at ERHWSC regarding the loan processing timeframe from application to closing is that it can take years. The assistance of experienced private nonprofits to manage and expedite this process would be a welcome occurrence in rural America.
2. Allow the Secretary the flexibility or waiver authority to exceed the current population ceiling of 10,000 for the Rural Development Water and Wastewater Direct Loan and Grant Programs will also help many rural communities. With the changing demographics in Rural America, we believe that providing the Secretary flexibility to assist these communities that are still experiencing economic hardship would be beneficial. The Committee could limit this authority to areas that are rural in character; provide a demonstrated need for financial assistance; demonstrate the ability to complete construction within a reasonable time frame; and demonstrate they cannot afford commercial credit at the prevailing rates and terms.
3. Allow the Secretary the flexibility or waiver authority to increase the Water and Waste Water Guaranteed Loan Program to a much higher population ceiling, for example 50,000, would be a benefit to higher populated communities that don't need the subsidized loan or grant funding. This program currently has a positive subsidy of only .48 percent. This program has been vastly under-utilized, for example, in FY 2016, only four guaranteed loans were obligated that totaled $7,118,000. This change would stimulate private capital at minimal cost to the Federal Government.
4. Allow the interest on these federally guaranteed water, wastewater, and essential community facilities loans to be tax exempt. This modification would generate increased affordable financing options for rural communities including increasing the lending authority and activity of rural banks, allowing for longer loan terms, reduced interest rates as well as improving the marketability of the loans on the secondary market. The utilization of these guaranteed programs would increase while simultaneously reducing the current backlog.

Thank you Chairman Conaway, Ranking Member Peterson, and Members of the Committee for allowing me to testify. I would be happy to answers any questions that you may have at this time.

ATTACHMENT A

[1]

A Toilet, but No Proper Plumbing: A Reality in 500,000 U.S. Homes

The New York Times
By *Sabrina Tavernise* (*https://www.nytimes.com/by/sabrina-tavernise*)
Sept. 26, 2016



Dorothy Rudolph in front of her home in Tyler, Ala., which does not have a septic tank. Credit Bryan Meltz for *The New York Times.*

Tyler, Ala.—The hard clay soil in this rural Southern county has twice cursed Dorothy Rudolph. It is good for growing cotton and cucumbers, the crops she worked as a child and hated. And it is bad for burying things—in particular, septic tanks.

So Ms. Rudolph, 64, did what many people around here do. She ran a plastic pipe from her toilet under her yard and into the woods behind her house. Paying to put in a septic tank would cost around $6,000—a little more than half of her family's annual income.

"It was a whole lot of money," she said. "It still is."

Here in Lowndes County, part of a strip of mostly poor, majority-black counties that cuts through the rural center of Alabama, less than half of the population is on a municipal sewer line. While that is not a hardship for more affluent communities—about one in five American homes are not on city sewer lines—the legacy of rural poverty has left its imprint here: Many people have failing septic tanks and are too poor to fix them. Others, like Ms. Rudolph, have nothing at all.

That is not so uncommon. Nearly ½ million households in the United States lack the basic dignity of hot and cold running water, a bathtub or shower, or a working flush toilet, according to the Census Bureau. The absence has implications for public health in the very population that is the most vulnerable.

Crumbling infrastructure has been a theme of this country's reinvigorated public conversation about race—for instance, a botched fix for old pipes in Flint, Mich., that contaminated the city's drinking water with lead. But in poor, rural places like Lowndes County, there has never been much infrastructure to begin with.

"We didn't have anything—no running water, no inside bathrooms," said John Jackson, a former mayor of White Hall, a town of about 800 in Lowndes that is more than 90 percent black and did not have running water until the early 1980s. "Those were things we were struggling for."

There is no formal count of residents without proper plumbing in Lowndes, but Kevin White, an environmental engineering professor at the University of South Alabama, said that a survey that he did in a neighboring county years ago found that about 35 percent of homes had septic systems that were failing, with raw sewage on the ground. Another 15 percent had nothing.



Cheryl Ball in her trailer home in Tyler, Ala. Ms. Ball can't afford a septic tank, so she runs a plastic pipe that empties waste behind her property. Credit Bryan Meltz for *The New York Times.*

"The bottom line is, I can't afford a septic system," said Cheryl Ball, a former cook who had a heart attack several years ago and receives disability payments. She lives in a grassy field on which only three of seven homes have septic tanks. Most banks now require proof that a home has proper sewage disposal before lending, but Ms. Ball paid cash for her mobile home—$4,000.

This area, known as the Black Belt (so called more for its soil, than its demographics), is haunted by its history of white violence toward African Americans and a deep, biting poverty. Lowndes is one of the poorest counties in the country, and its rural population, whose trailers and small houses dot the lush green landscape, often cannot afford the thousands of dollars it costs to put in a tank. Municipalities, with low tax bases, cannot afford extensive sewer lines.

Ms. Rudolph, a retired seamstress, and her husband, a carpenter, live in a tiny, white clapboard house that he built after he, his parents and his siblings fled their home on land owned by a white man who forbade the family to vote. She remembers, as a young girl in the 1950s, not having electricity. They obtained running water in the early 1990s, she said, and used an outhouse until the mid-1990s.

So their white toilet with a fuzzy green cover was a marker of progress. A plastic pipe carries its contents outside and empties into a wooded area not far from the house. There is no visible pooling of sewage, but there are other problems.

"The smell gets so bad," said Ms. Rudolph, sitting on her porch guarding her chicken coop against a marauding fox. When it rains, she wages war with her toilet. One recent downpour brought its contents gurgling up to the rim.

"I was sitting there looking at it and got me a plunger," she said. "It took me some plunging to get it clear. I was scared it was going to come back and go on the floor. Horrible."

She added, "There's nothing we can do."

The problem is prickly for the state. Parrish Pugh, an official with the Alabama Department of Public Health, agrees that money plays a part.

"That's where the rubber hits the road," he said.

"But Alabama law forbids the use of 'insanitary sewage collection,' and the responsibility for that rests squarely with the homeowner," Mr. Pugh said. Resisting is not only illegal, but could have health consequences: Raw sewage can taint drinking water and cause health problems.

"'My parents had a pipe that ran into the woods, and that's good enough for me,'" Mr. Pugh said, explaining a common argument. "But we didn't know as much about disease back then. People are more educated nowadays. They are more concerned."

The state health department begs, cajoles, and eventually cites people who have problems and do not fix them. In the early 2000s, the authorities even tried arresting people. That prompted a public outcry and the practice soon stopped, but one person spent a weekend in jail and others were left with criminal records.

The department cited about 700 people in the 12 months that ended in March, often because someone complained.

The clay soil makes the problem worse.

"Rural wastewater is usually managed with a septic tank and a drain field, which slowly infiltrates the wastewater into the ground," Professor White said. "Well, it won't go into the ground here. Period."



John Jackson, former mayor of White Hall, Ala., said that until the early 1980s, "we didn't have anything—no running water, no inside bathrooms." Credit Bryan Meltz for *The New York Times.*

He added: "There are some options that may be available, but it's going to cost thousands of dollars, and most people here can't afford it. The answer, quite frankly, is not out there yet."

Experts and advocates have tried to find one. Grants from the state and Federal Governments to study the problem have come and gone, as have academics wielding surveys. There was even talk of self-composting toilets.

"It's like we're going in circles," said Perman Hardy, a cook in Tyler who even did a *urinalysis* (*http://health.nytimes.com/health/guides/test/urinalysis/overview.html?inline=nyt-classifier*) for a study of health effects. For years, her sewage backed up every time it rained. In December, she spent all the money she had saved for Christmas presents on a new septic tank.

Some change is happening. The town of White Hall recently received funding to connect about 50 homes to sewer lines, the first in its history. Town officials are thrilled: City sewer lines are critical to attract businesses that would bring jobs. But the pace is glacial.

Eli Seaborn, 73, a White Hall councilman, said progress would be slow, like the pace of civil rights gains, where legal discrimination is gone but lingers in other forms. Similar patience is required for sewage, he added.

"Time is going to be the only thing that solves this problem," he said. "It took more than 50 years for it to happen. But hopefully, it won't take more than 50 years to fix it."

[2]

What happens when a water utility becomes an orphan



In tiny Coal Mountain, in West Virginia, residents are left to fend for themselves with a water system they can't afford to test for lead. Government agencies have all but given up on forcing tests even though residents continue drinking the water. Jasper Colt.

Editor's note: the video clip *What happens when a water utility becomes an orphan,* is retained in Committee file, and is available at: *https://www.usatoday.com/videos/news/nation/2016/12/13/what-happens-when-water-utility-becomes-orphan/95332502/*.

[3]

The American Neighborhoods Without Water, Sewers, or Building Codes

Low-income residents bought cheap land outside of border cities decades ago. But the promised infrastructure never came.

The Atlantic
Alana Semuels (*https://www.theatlantic.com/author/alana-semuels/*)
Mar. 3, 2016



A boy in Los Fresnos colonia in Texas Jessica Rindaldi/*Reuters.*

Montana Vista, Tex.—No one objected when developers bought up dusty vacant land here in the 1950s and 1960s and turned it into unincorporated subdivisions—areas outside city limits where no one had authority to enforce building standards.

Neither the state nor the county stepped in when the developers turned around and sold that land—making empty promises to later add running water and sewer systems—to low-income immigrants who wanted, more than anything, to own a home of their own. And no one batted an eyelash when low-income landowners in these unincorporated border subdivisions, called colonias, started building homes from scratch without building plans or codes, or when they started adding additions to those homes as their families grew, molding structures together with nails and extension cords and duct tape.

That's because, in Texas, all of these actions were perfectly legal. Texas prides itself on its low taxes and lack of regulation, but it's possible that decades of turning a blind eye to unregulated building is starting to catch up with the state. Today, around 500,000 people live in 2,294 colonias, and many still lack access to basic services, such as running water or sewer systems. Lots of residents live in dilapidated homes with shoddy plumbing and electrical wiring that they've cobbled together themselves to save money on contractors. And now, they want the state to pay to extend basic services in their homes. Water, for instance, should be a human right in America, they say.

"You have families that live in third world conditions in the state of Texas with a modern city just miles away," said Veronica Escobar, the County Judge of El Paso, who functions as a county chief executive. "But the state of Texas has essentially put counties in charge of health, safety and welfare, at the same time they give us very limited authority."

Alejandra Fierra lives with her husband in the Hueco Tanks colonia, where they bought land in 1987. They still don't have access to running water or a sewer system. When her children were growing up, she would pour water from a well into a tub and wash them, one, two, three, in the same water. She does the same for her dishes. She gets a delivery of a 2,500 gallon water tank for bathing and washing, and buys bottled water from Walmart for drinking and cooking.

In Montana Vista, a colonia some 22 miles east of El Paso, the septic tanks of the 2,400 families who live there frequently overflow, creating rivers of sewage in their backyards. In the summer, the smell can be horrific. Tina Silva, a resident and activist, lives here in a spacious one-story adobe house surrounded by a stone wall. She raises chickens and a giant pig in her backyard, where a rusted out car sits, half painted, in the sun. She loves her home and her neighborhood, but she doesn't understand why it has taken so long to put in a sewer system. "We're human

beings. We pay taxes. Somebody needs to listen to us," she says. Various politicians have promised her they'd help get the money to install services, but it's never actually happened, Silva told me.



Tina Silva feeds the chickens in her backyard at Montana Vista (Alana Semuels/*The Atlantic*).

Part of the problem is that no one wants to take responsibility for paying to install these services. The developers who sold the land promising water and sewers are long gone. And for many the thinking—at least according to Escobar—is that if the homeowners wanted to buy land without access to running water, that's their problem.

It may seem obvious that the homeowners who bought cheap land without access to water and sewers should be responsible for installing access to services. But that isn't realistic either. More than 40 percent of colonia residents live below the poverty line, according to a *2015 report* (*https://www.dallasfed.org/assets/documents/cd/pubs/lascolonias.pdf*) from the Federal Reserve Bank of Dallas. The median household income in colonias is less than $30,000 per year. And the conditions in the colonias are troubling. There are water and mosquito-borne illnesses, high rates of asthma, lice, and rashes. One doctor *told the* ***Texas Tribune*** (*https://www.texastribune.org/2011/07/10/conditions-health-risks-sicken-colonias-residents/*) that rates of tuberculosis in the colonias are two times the state average and that there is a lingering presence of leprosy.

In 2012, the Texas Department of State Health Services issued a nuisance determination in Montana Vista documenting the health problems the septic tanks were causing, which meant the El Paso Water Utility could receive a grant for more than half of the project costs. In December, the Texas Water Development Board agreed to provide a $2.8 million grant to El Paso Water Utilities so that the utility could start designing the sewer system. But it will cost an estimated $33 million to build the system, and that money has not yet been secured.

"It's getting there, unfortunately, it's taking a lot of time," said Munzer Alsarraj, the infrastructure program manager for El Paso County.

The state is stepping in to upgrade some of the colonias, too. Between 2006 and 2014, 286 more colonias, were linked to drinking water, drainage, wastewater disposal, paved roads, and legal plats, according to the Federal Reserve report. In 2006, 443 colonias had access to no basic infrastructure, by 2014, that number had dropped to 337.

But it's slow going.

It's not easy to install infrastructure in areas that are far from the main water and sewer lines and in places that have grown with no central plan. It was not until 1989 that the Texas Legislature even asked state agencies to *come up with rules*

(*https://www.texasattorneygeneral.gov/cpd/historical-laws-colonias*) that would ensure new residential developments had access to water and sewer services. Now, cities can regulate development in Texas, but in unincorporated areas, counties have little regulatory power. Zoning regulations that would limit the size of buildings or of lots in cities don't exist for the colonias.

In some instances, the county can't install infrastructure to homes because they're not up to code. Because people building on unincorporated land don't have to follow many rules, there are odd constructions in the colonias, including units that combine two RVs, homes with rooms tacked onto the side standing on cinder blocks, homes with extension cords that run outside, wooden planks as sidewalks. This makeshift construction can lead to roof collapses and electrical fires, said Irene Valenzuela, the interim director of community services for El Paso County.



A home in a Texas colonia consists of a trailer and a house (Eric Gay/*AP*).

The county is giving grants out to people interested in bringing their homes up to code, but people are often hesitant, she said. "I think the majority of them are afraid," she said. "They say, 'This is a takeover. What are you going to ask for next? If you assist me, are you going to take my property away when I pass away?'" Alsarraj, with the county, added.

Then there's the cost. The county is trying to install sewer lines in the Square Dance colonia. That colonia is located just a few blocks from established subdivisions that are part of the county's water and sewer system. But the price of adding those services to the colonia's 264 homes is $8.5 million. Installing water and sewers in another colonia, called Hillcrest, would cost about $120,000 per home, Alsarraj said. But the homes are worth just $20,000 to $30,000 each.

It's ironic, too, that the county is trying to extend water and sewers to far-off subdivisions as it also tries to *execute a vision* (*https://www.theatlantic.com/business/archive/2016/01/el-paso-urban-walkable-americans/431661/*) that cuts down on sprawl. "For 30, 40 years, we've continued to sprawl out to the edges of the [E]arth and it was costing us more than we were making as a community," Beto O'Rourke, a U.S. Congressman who led the charge to cut down on new subdivisions, told me.

But El Paso has had little success regulating far flung subdivisions, even when they are incorporated.

Perhaps most worrying to Escobar and others is that *new colonias* (*http://www.bloomberg.com/news/articles/2015-10-15/texas-towns-push-back-on-instant-slums*) are still being built across the state. This time around, they have basic water and sewer hookups, but don't have paved roads or streetlights, according to the Federal Reserve. Plots cost as little as $25,000, and developers offer 20 year financing at a 12 percent interest rate and just $500 down, according to ***Bloomberg News*** (*http://www.bloomberg.com/news/articles/2015-10-15/texas-towns-push-back-on-instant-slums*).

It's proof to Escobar that developers will always be willing to sell substandard plots of land to people desperate to own a home. But she had hoped Texas would step in and regulate.

Two sessions ago, the county tried to get permission for zoning authority over 60[2] miles near a border crossing south of El Paso. But the state legislature refused to grant it, in part because real-estate agents objected to the bill, said Escobar, the judge. Legislators also didn't believe that government should trump property rights,

she said. But perhaps that's because they don't have to deal directly with the after-effects.

"We are having to fix the problems caused by unregulated government," Escobar said. "There are innumerable examples and costs associated with fixing problems that could have been prevented. There's just a fundamental belief in Texas—if you own property, you can do what you want with it."

[4]

Like Flint, water in California's Central Valley unsafe, causing health problems

Fox News Latino (*http://latino.foxnews.com/index.html*)
By Rebekah Sager (*http://latino.foxnews.com/archive/rebekah-sager*)
Published March 8, 2016



(Photo by Justin Sullivan/Getty Images) (2015 Getty Images).

While the water crisis in *Flint, Michigan* (*http://latino.foxnews.com/latino/news/2016/01/22/flint-immigrants-last-to-know-about-contaminants-in-water/*), made headlines around the country when the city's leaders exposed residents to a tainted water supply for almost 2 years, families living in the Central Valley of California have been struggling without clean drinking water for decades.

The population of the Central Valley, a basin surrounded by mountains that once offered hope to migrants like the fictional Joads in the "The Grapes of Wrath," today is about 80 percent Latino, and 92 percent of the migrant farm workers in the Valley are Latino.

There are vast dairy farms reeking of manure, highways lined with fast-food restaurants, liquor stores, prisons and numerous dialysis centers.

Much of fruits and vegetables consumed in the U.S. are grown here, and the soil has been decimated by agricultural activity—overuse of fertilizers and pesticides, manure from livestock. One result is a toxic soup of nitrates in the area's drinking water.

Residents in towns along the San Joaquin Valley rely predominantly on pumps and ground water—which is not effectively regulated for contamination.

When pumped up into people's homes, the nitrates are so dangerous that people are known to get rashes when they shower. The presence of nitrates in the water supply also has been linked to "blue baby syndrome," which is caused by the decreased ability of blood to carry oxygen—one of the most common causes is nitrate in drinking water.

People turn to buying 5 gallon jugs to shower with and using 300 gallon tanks of non-potable water for basic needs.

"Generations of people who live here know not to drink the water," Susana De Anda, a clean-water advocate and the co-executive director and co-founder of the Community Water Center NGO, told *Fox News Latino.*

"People pay more for this 'toxic water'—sometimes as much as $100 a month for water just to shower with. On top of that they're paying for drinking water," De Anda said.

According to the Environmental Justice Coalition for Clean Water, rural Central Valley communities pay the highest drinking water rates in the state, with some families shelling out as much as two to six percent of their income for water that they can't drink.

According to a *Pacific Institute report* (*http://www.pacinst.org/wp-content/uploads/sites/21/2013/02/nitrate_contamination3.pdf*), nitrate exposure's health impacts in the Central Valley fall disproportionately on poor Latino communities.

Due to the state's severe drought, new wells have to be dug more deeply, demand is high and the cost is between $1 million and $2 million.

"The drought actually causes the pollutants in the soil to be more concentrated and levels of contaminants such as nitrates to rise. Also, when deeper wells are dug, and that would be by maybe wealthier farmers, they actually end up syphoning water away from poor communities," Genoveva Islas—program director at Cultiva la Salud ("Cultivate Health"), a nonprofit health advocacy organization in the Central Valley—told *Fox News Latino*. "And it creates a real inequity."

Most people in the area live a large distance from the closest big grocery store. Liquor and convenience stores become the default place to buy food and produce, and, all too often, sugary drinks are less expensive than drinking water.

"We're in a food desert. People would buy water in bulk, but big stores are often very far outside of communities, and so families make a tough trade-off. Soda might be more affordable," De Anda said.

In addition to other factors, the consumption of soda *vs.* water is one of the leading reasons for the severe health problems in the Valley. The region has big problems with obesity and the highest rate of Type 2 diabetes in the state.

An analysis of state's death records by the ***Fresno Bee*** (*http://www.fresnobee.com/news/local/article19499391.html*) and the Center for California Health Care Journalism at the University of Southern California paints a vivid picture of the disproportionate toll diabetes has taken in the Valley.

At least 19 people die from diabetes-related complications in the eight San Joaquin Valley counties every day, the highest rate in the state.

"I've lived here all my life, and not until I was an adult was really aware of dialysis clinics. Now, I have an aunt and a close family friend who are both on dialysis. I'm seeing a number of these [places] pop up. More than ever before," Islas says.

The Central Valley may be the fruit and veggie center of the country, but for poor people healthy food is still significantly more costly than food sold in bulk, such as beans, rice, tortillas, white bread, ground beef and large bottles of soda. Many of the stores in the Valley offer free soda with groceries, and a small bottle of water runs about $1.69 *versus* a large soda at 99¢.

In the last 3 years, the state has paid to retrofit water filters on drinking fountains in some pockets of schools and daycare centers, and provided filtered bottle stations, where people can fill-up containers. But Islas says it's not universal.

"There's still a lot of marketing of sugary drinks to kids, which in addition to diabetes and obesity, dental health problems. In Flint, the Governor has set aside money for the kids impacted by the lead, but in the Central Valley, we have the same issues of long term health problems for impoverished kids. We use education as a pathway out, but if you're thirsty or you have health concerns, it's pretty hard to learn," Islas says.

The drought in California may be shining a light on the region and its water supply, but the issues in the Valley have been left largely unaddressed.

"All these are interim solutions, but we also need to create water awareness. The water may look clean, but that doesn't make it safe. It shouldn't matter who you are or where you live, clean drinking water is a basic human right," De Anda says.

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ATTACHMENT B

East Rio Hondo Water Supply Corporation USDA and DWSRF Debt

Closed Loans With USDA Original Date		Original Date	Original Principal Amount	Unpaid Principal Balance	Interest Rate	Monthly Payment	Maturity	Grant Amount	Notes:
USDA RD	91–14	2/8/1978	$163,000.00	$—	5.00%	$801.00	2/8/2018		AWSC Merger paid in full
USDA RD	91–01, 91–02	9/17/1979	$1,100,800.00	$—	5.00%	$5,405.00	3/12/2020	$2,866,000.00	Original system note
USDA RD	91–03	5/7/1981	$556,500.00	$—	5.00%	$2,683.00	5/7/2021	$1,669,500.00	Original plant & distribution
USDA RD	91–06	3/14/1996	$909,500.00	$590,038.59	5.00%	$4,393.00	3/14/2036	$580,500.00	Plant expansion
USDA RD	91–11	9/26/2003	$677,000.00	$568,195.04	4.25%	$2,969.00	1/26/2043	$—	MASWT plant
USDA RD	91–12	9/26/2003	$7,890,200.00	$6,561,632.81	4.25%	$34,560.00	9/23/2043	$1,946,200.00	MASWT plant
USDA RD	91–15	5/2/2001	$593,800.00	$478,165.06	4.50%	$2,696.00	5/2/2041	$—	Arroyo WSC

East Rio Hondo Water Supply Corporation USDA and DWSRF Debt—Continued

Closed Loans With USDA Original Date		Original Date	Original Principal Amount	Unpaid Principal Balance	Interest Rate	Monthly Payment	Maturity	Grant Amount	Notes:
USDA RD			$—	$—	0.00%	$—	N/A	$2,392,000.00	Wastewater, PH I
USDA RD	91–18	11/9/2010	$650,000.00	$593,417.73	3.759%	$2,620.00	11/9/2050	$104,000.00	Nelson Rd. ground storage tank
USDA RD	91–17	10/22/2014	$3,065,200.00	$2,994,878.07	4.00%	$12,813.00	10/22/2054	$—	FM510 Transmission line
USDA RD	91–22		$677,000.00	$677,000.00	2.125%	$2,133.00	4/10/2058	$379,400.00	UV Disinfection project
USDA RD	91–26		$243,600.00	$243,600.00	1.750%	$719.00	4/10/2058	$—	UV Disinfection project
			$16,526,600.00	$12,706,927.30				$9,937,600.00	
Loans Pending Closing With USDA									
USDA RD			$1,109,000.00		2.75%	$3,812.00		$2,872,838.00	Colonia WW Phase II
USDA RD			$889,000.00		2.50%	$2,932.00		$484,700.00	Bean Road Transmission Pipeline
Loan Applications									
USDA RD			$4,454,238.00	Loan & Grant Determination Pending				Unknown	1.0 MG Elevated Water Tower
USEPA—Drinking Water State Revolving Fund									
Texas Water Development Board	L10 00198	8/14/2014	$1,379,000.00	$1,264,300.00	*	$8,364.83	9/1/2034	$591,000.00	HWWS Pump Station

*Not Fixed.

ATTACHMENT C

Form RUS-TX 1780-6
Revised 2-2010

USDA, RURAL UTILITIES SERVICE
WATER AND WASTE
PROCESSING CHECKLIST FOR NONPROFIT CORPORATION

Applicant:	**Applicant Contact Person:**	**Telephone:**
Engineering Firm:	**Project Engineer:**	**Telephone:**
TYPE OF REQUEST: **Water Sewer** **Water & Sewer** **Other:** _____	**Applicant Address:** _____ _____ _____	**Engineer Address:** _____ _____ _____

If subsequent loan, the following should be brought forward:
a) Articles of Incorporation;
b) Bylaws **with State Office approval memo**

STEP 1 – Pre-Application
Initial application and supporting material - Applicant will submit Items 1-9 to the Area Office (AO).
Forms may be obtained at: http://www.usda.gov/rus/water/wwforms.htm and
Texas forms at: http://www.rurdev.usda.gov/tx/utilities.htm

Item No.	Folder File Position	Document	Document or Form Number	Prepared By	Request Date	Date Rec'vd
1	3	Notice of Intent to File Application – 1780.19(a)	Publication	Applicant		
2	3	Application for Federal Assistance (include Tax ID & DUNS No.) 1780.33(a)	SF 424.2, SF 424C & 424D	Applicant		
3	3	Project Description to include service area map - 1780.11(a)		Applicant		
4	5	Organizational Documents - 1780.7(3) & 1780.33(d) **If current borrower, provide amendments since last approval memo, if applicable.**	Articles & Bylaws RB-TX 1780-20 & RB-TX 1780-20A & Amendments	Applicant		
5	3	Council of Governments or State Inter-Governmental Review and Recommendations - 1780.33(b)	Letter	Applicant		
6	1	Current Audit or Financial Report 1780.33(e)		Applicant		
7	3	Supporting Documentation on Existing Debt other than RD debt– 1780.33(e)	Letters Bank Statements	Applicant		
8	3	Verification of inability to obtain Credit at reasonable rates & terms – minimum 2 lenders – 1780.33(d) & N/O unnumbered letter dated 6/30/04	SI 1780-6 Attachment 2 and lender contacts	Applicant & AO		
9	3	Certification for commercial credit and outstanding judgments – 1780.7(d), (g) and .33(d)	RB 1780-22	Applicant		

Item No.	Folder File Position	Document	Document or Form Number	Prepared By	Request Date	Date Rec'vd
10		**Has the Applicant applied with another Agency/Lender for this proposed project? If so, whom**		**Applicant/ Engineer**		
11	3	Initial Processing Conference 1780.39(a)	Initial Processing Conference Guide Form	AO/Appl/ Engineer		
12	3	Project Selection Criteria 1780.17	RB 1780-1	AO/SO		
12a	Attach to RB 1780-1	Evidence Regarding Median Household Income of the Service Area - 1780.1(b) & .17(c)	Copy of Census or other data used	AO		
or						
12b	Attach to RB 1780-1	Documentation for Income Survey - 1780.1(b) (if applicable)	Approval Memo If applicable	AO		
12c	Attach to RB 1780-1	Population in Service Area - 1780.17.(a)	Copy of Census or other data used	AO		
13	3	Review most recent Debarment Suspension List to insure Applicant's and their representative's names do not appear. RD 1940-M, 1940.606 (b) https://www.epls.gov/	Printout	AO		
14	3	CAIVRS https://entp.hud.gov/caivrs/public/home.html	Printout	AO		
15	3	Identify known Relationships/ Associations with Agency Employee - 1780.1(f)	Memo	Applicant/ AO		
16	3	Initial User Analysis	Worksheet Guide Form	AO		
17		Input data in CPAP	CPAP	AO		
18	4	Initial Application Eligibility Determination & Recommendation to State Office	Memo	AO		
19	4	**Submit File of Items 1-18 to State Office for Pre-Application Review**				
20	4	Evidence of Initial Application Review (State Office Comments)- 1780.32(b)	Memo	SO		
21	4	Notification to Applicant of Initial Application Review Determination	Letter	AO		
22	4	Application Conference Discuss target dates of Steps 2 & 3 1780.39(a)	RCR	AO		
23		Update status in CPAP	CPAP	AO		

The Area Office should submit the above items for State Office (SO) review filed in an 8-position folder.
All running case records (RCR) should be filed on top in position 3 in date order.

AO = Area Office or Sub-Area Office
SO = State Office
SI = RUS Staff Instructions
RB = RUS Bulletin

Step 2 – Preliminary Engineering Report & Environmental Report

APPLICANT AND ENGINEER WILL ASSEMBLE THE FOLLOWING MATERIALS AND SUBMIT AN ORIGINAL AND ONE COPY TO THE AREA OFFICE. FOR QUESTIONS OR CONCERNS ABOUT PREPARING THE PRELIMINARY ENGINEERING REPORT OR ENVIRONMENTAL REPORT, PLEASE CONTACT THE STATE OFFICE.

Item No.	Folder File Position	Document	Document or Form Number	Prepared By	Request Date	Date Rec'vd
24	3	Site Visit — SI 1780-2(2.4)(a)	RCR	AO		
25	6	Agreement for Engineering Services - 1780.39(b)	EJCDC, RB 1780-26. RB-TX 1780-26	Applicant/ Engineer		
26	6	AD-1048, "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion" -1780.33(h)	AD-1048	Engineer		
27	6	Certifications for Contracts, Grants, and Loans (Regarding Lobbying) – RD 1940-Q & 1780.33(h)	RD 1940-Q, Exhibit A-1 or SF-LLL, if applicable	Engineer		
28	6	Forward to SO recommending approval of Agreement 1780.39(b)(1)	Memo	AO/SO		
29	PER File	Preliminary Engineering Report – 1780.33(c) – 2 copies	TX Guide in Preparing PER, TX RUS Instruction 1780-C	Engineer		
30	6	Forward to one copy to SO recommending approval of PER	Memo	AO		
31	6	Preliminary Engineering Report Approval by State Engineer	Memo	SO		
32	ENV File	Environmental Report - 1780.33.(f) 2 copies	RB 1794A-602	Applicant/ Engineer		
33	ENV FILE	Forward one copy to SO recommending approval ER	Memo	AO		
34	ENV File & 3	Environmental Report Approval by State Environmental Coordinator (SEC)	Memo	SEC		
35	ENV File	Environmental – Public Notice and Publisher's Affidavit (if applicable)	RB 1794A-602 Exhibit B.1 to B.4	Applicant/ Engineer		
36	ENV File	Environmental – FONSI Letters/Documents (if applicable)	SI 1794-1 Exhibit D	SEC		
37	ENV File & 3	Environmental – FONSI Newspaper clips and Publisher's Affidavit (if applicable)	SI 1794-1 Exhibit E& F	Applicant/ Engineer		
38		Update Environmental Approval dates in CPAP	CPAP	AO		

STEP 3 – Application

APPLICATION AND SUPPORTING MATERIAL SUBMITTAL – THE APPLICANT WILL SUBMIT ONE COPY OF ALL ITEMS LISTED IN STEP 3. THE AO AND SO WILL DETERMINE THE TYPE AND AMOUNT OF ASSISTANCE IT IS WILLING TO CONSIDER AND THE CONDITIONS THE APPLICANT MUST MEET TO RECEIVE ASSISTANCE. ALL SUBMITTALS WILL BE CONSIDERED FOR A GUARANTEED AND DIRECT LOAN OR COMBINATION, AND THEN GRANT ASSISTANCE WILL BE CONSIDERED.

Item No.	Folder File Position	Document	Document or Form Number	Prepared By	Request Date	Date Rec'vd
39	3	**Notice of Public Information Meeting and Minutes** – 1780.19(b)	Publication and Minutes	Applicant		
40	3	Certification Regarding Debarment or Suspension - 1780.33(h)	AD-1047	Applicant		
41	3	Certification Regarding a Drug-Free Workplace - 1780.33(h)	AD-1049	Applicant		
42	3	Certifications for Contracts, Grants, and Loans (Regarding Lobbying) – RD 1940-Q & 1780.33(h)	RD 1940-Q, Exhibit A-1 and SF-LLL, if applicable	Applicant		
43	5	Current list of Board of Directors, Term and Expiration Date	Memo	Applicant		
44	1	Audit Reports for previously 3 years	Audits	Applicant		
45	3	Proposed Operating Budget - 1780.33(h) & 1780.41(2)	RD 442-7	Applicant		
46	RCR	Inequities within Service Area (pending disputes) - 1780.11	RCR	AO		
47	3	Certification of Users by Rural Development Manager	RB-TX 1780-40	AO		
48	3	Update Lender contacts from Item 8 (info cannot be 6 months old) SI 1780-6 and Commentary	Lender Letters	AO		
49	3	Documentation relative to Health or Sanitary problems - 1780.10(c)(1) and 1780.13(b)(1)	Letter- applicable for 75% grant or Poverty rate	Applicant		
50	5	Water Purchase Contract or Sewage Treatment Contract w/ approval memo– **if applicable** (if new contract, must submit **DRAFT** prior to funding) 1780.62 or 1780.63	Guide for Water Purchase RD 442-30	Applicant/ Attorney		
51	4	Submit Water Purchase Contract to SO for review prior to loan submittal **If applicable.**	Memo	AO		
52	3	Evidence of Availability of Other Funds – 1780.44(f) **Leveraged Funds**	Memo	Applicant AO		
53						

Item No.	Folder File Position	Document	Document or Form Number	Prepared By	Request Date	Date Rec'vd
54	3	Evidence of Overall Review of Applicant's Financial Status – SI 1780-2(2.4)(c)	RCR	AO		
55	5	Verify with Texas Comptroller of Public Account the certification of account status - 1780.33(e) http://ecpa.cpa.state.tx.us/	Computer printout	AO		
56	3 Attach to Project Summary	Cost Estimate of Proposed Project (info cannot be 6 months old prior to requesting funds)	Cost Estimate in PER	Engineer		
57	3	Update Project Summary and Underwriting - 1780.41	Print Automated Forms In CPAP	AO		
58	4	Transmittal Letter to SO with recommendations/comments/history	Memo	AO		
59		**Submit File to State Office for funding**		AO		

STEP 4 – State Office Review

STATE OFFICE WILL PREPARE THE LETTER OF CONDITIONS FOR AREA OFFICE. THE AREA OFFICE WILL PREPARE THE NECESSARY FORMS STATED IN THE LETTER OF CONDITIONS AND DELIVER TO THE APPLICANT FOR CONSIDERATION.

Item No.	Folder File Position	Document	Document or Form Number	Prepared By	Date Completed
60	3	Prepare Letter of Conditions - 1780.41(a)(5)	RB 1780-19	SO	
61	3	Prepare Proposed Budget	RD TX 1942-7	SO	
62	3	Prepare briefing of proposed project for Project Announcement – SI 1780-2(2.7)(e)	Memo	SO	
63	4	National Office Approval (If applicable)	Memo	NO	
64	4	Evidence of Full Application Review (State Office Comments authorizing the issuance of the LOC and 1940-1) - 1780.32(b)	Memo	SO	
65					

STEP 5 – Deliver Letter of Conditions

THE AREA OFFICE WILL SCHEDULE AN APPOINTMENT TO DELIVER THE LETTER OF CONDITIONS ALONG WITH THE ATTACHMENTS. THE LOAN SPECIALIST MUST READ OVER THE CONTENTS OF THE LETTER AND ANSWER ANY QUESTIONS THE APPLICANT MAY HAVE.

Item No.	Folder File Position	Document	Document or Form Number	Prepared By	Request Date	Date Rec'vd
66	3	Letter of Conditions (LOC) Signed by the AD or authorized RD representative – 1780.41(a)(5)	LOC	AO		
67	3	Letter of Intent to Meet Conditions – **Discuss timeframe to meet conditions**- 1780.41(a)(6)	RD 1942-46 Automated	Applicant		
68	2	Request for Obligation of Funds – 2 originals must be signed 1780.41(a) **Under item 44, Comments & Requirements – List Security requirements and add "Approval of financial assistance is subject to terms of the Letter of Conditions dated _____.**	RD 1940-1 Automated	Applicant & Agency		
69	3	Applicant Certification, Federal Collection Policies for Consumer or Commercial Debt - 1780.33(h)	RD 1910-11	Applicant		
70	3	Equal Opportunity Agreement – RD Inst. 1901-E	RD 400-1	Applicant		
71	3	Assurance Agreement – RD Inst. 1901-E	RD 400-4	Applicant		
72	5	Loan Resolution Security Agreement – 1780.39(f)	RB 1780-28	Applicant		
73	5	Water and Waste System Grant Agreement **(if applicable)**	RB 1780-12	Applicant		
74	3	Credit Alert Interactive Voice Response System (CAIVRS) https://entp.hud.gov/caivrs/public/home.htm Update CPAP	website	AO		
75						
76						
77	4	Submit 2 original signed Obligation forms to SO for approval, along with copy of budget, letter of intent, and 1st & last page of LOC (dated & signed)	RD 1940-1	AO		
78	2	Evidence Applicant Notified of Approval - 1780.41(b)	Letter	SO		

STEP 6 – Pre-Loan Closing

NOTE: IT IS VERY IMPORTANT THAT THE APPLICANT, ENGINEER, ATTORNEY, AND AREA OFFICE COORDINATE THEIR EFFORTS AT THIS TIME. EVERYONE WILL BE OBTAINING AND FINALIZING A VARIETY OF INFORMATION TO GET THIS PROJECT TO THE BIDDING STAGE. NOTE: BIDDING WILL NOT BE AUTHORIZED UNTIL CLOSING INSTRUCTIONS HAVE BEEN OBTAINED FROM THE OFFICE OF GENERAL COUNSEL (OGC).

Item No.	Folder File Position	Document	Document or Form Number	Prepared By	Request Date	Date Rec'vd
79	5	Legal Services Agreement - 1780.39(b)	RB-TX 1780-7	Applicant/ Attorney		
80	5	Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - 1780.33(h)	AD-1048	Attorney		
81	5	Certifications Regarding Lobbying - 1780.33(h)	RD 1940-Q, Exhibit A-1	Attorney		
82	5	Check Debarment/Suspension (Attorney)- https://www.epls.gov/	Printout from Website	AO		
83	5	Legal Services Agreement - 1780.39(b)(2) – Concurrence from SO	Approval letter	SO		
84	3	Agreement Between Applicant and Individual Users - 1780.9(g)(2) **(if applicable)**	Agreement	Applicant		
85	5	Copy of Membership Certificate		Applicant		
86	3	Management Plan, Facility Maintenance Plan, proposal for the maintenance of accounts & records and auditor's agreement – See LOC 1780.39(b)(4) & SI 1780-4(1)(ii)		Applicant		
87	3	Management Agreement/Agency Concurrence - 1780.39(b)(4)	RCR or Letter	LO		
88	5	Resolutions of any environmental mitigation measures – See Letter of Conditions & Environmental Report 4.0 Summary of Mitigations	Resolution	Applicant		
89	5	Water Purchase Contract or Wastewater Treatment Contract – **Concurrence** 1780.62 or 1780.63 **(if applicable)**	RD 442-30 or other format	Applicant & AO/SO		
90	5	Water User Agreement/Sewer User Agreement – 1780.39(c)	RB TX 1780-9	Applicant		
91						

Item No.	Folder File Position	Document	Document or Form Number	Prepared By	Request Date	Date Rec'vd
92	Easement Folder	Right-of-Way Easements - 1780.44(g)(1)	RD TX 442-8 or RD TX 442-9	Applicant/ Attorney		
93	Easement Folder	Right-of-Way Map (Approved by President, Attorney, & Engineer)	Map	Engineer		
94	5	Right-of-Way Certificate by Corporation	RD 442-21	Applicant		
95	5	Opinion of Counsel Relative to Right-of-Way – 1780.44(g)(1)	RD 442-22	Attorney		
96	5	Right-of-Way Certificate by Engineer	Letter	Engineer		
97	Easement Folder	State and County Road permits (if located in several counties, obtain permits from each county)		Engineer		
98	Easement Folder	Railroad Permits (if applicable) (Must be assigned to USA)		Engineer		
99	5	Certificate of Convenience and necessity (CCN) (amended CCN is required if lines are extended outside the current service area)	CCN	Engineer		
100	5	Water and/or Wastewater Treatment Permits from Regulatory Agency (for surface water/sewer treatment projects if applicable)		Engineer		
101	5	Water Rights (if applicable) - 1780.44(g)(3)		Attorney		
102	5	Option to Purchase Real Property (if applicable (prefer proposed Warranty Deed) - 1780.44(g)	RD 440-34 or similar format	Attorney		
103	5	Warranty Deed, Leases and/or Site Easements (if applicable) (no reverter provisions –original or copy) – 1780.44(g)	Conveyance Instrument	Attorney		
104	5	Preliminary Title Opinion or Commitment for Title Insurance (must cover land costs plus site improvements) 1. Real Estate owned by applicant 2. Real Estate to be acquired 3. Lease (if applicable) 4. Ingress-Egress Easement (if applicable) 5. Sanitary Control Easement (if applicable) – 1780.44(g)	RD 1927-9	Attorney		
105	5	Certificate from Secretary of State of Lien Search (requested by UCC-11)		Attorney		

Item No.	Folder File Position	Document	Document or Form Number	Prepared By	Request Date	Date Rec'vd
106	6	Approval of Final Plans, Specs, Unexecuted contract document by SO - 1780.61	Memo	Engineer SO		
107	6	Approval of Final Plans & Specs by State Regulatory Agency (TCEQ) - 1780.61	Memo	Engineer		
108	6	Resume of Resident Inspector - 1780.76(c)	Resume	Applicant Engineer		
109	6	Approval of Resident Inspector from SO – 1780.76(c)		SO		
110	2	Request for Pledge of Collateral (if applicable) 1780.45(e)(2)&(3)		LO		
111	2	Evidence that Collateral is Pledged (if applicable) 1780.45(e)		LO		
112	2	Electronic Funds Transfer/Automated Clearing House (EFT/ACH) and setup in ADPS - 1780.45(b)(2)	SF-3881	Applicant/ Financial Institution		
113	3	Proposed updated operating budget	RD 442-7 or similar form	Applicant		
114	3	Rate Study Analysis based on the proposed loan - Letter of Conditions Contact a Technical Assistance Provider		Applicant		
115	3	Certification of Vulnerability Assessment (VA) - Letter of Conditions - Contact a Technical Assistance Provider		Applicant		
116	3	Certification of Emergency Response Plan (ERP) – Letter of Condition Contact a Technical Assistance Provider		Applicant		
117		Update CPAP for VA & ERP plans. Certification must be every 3 years from date of certification.	CPAP	AO		
118	5	Transmittal Letter to S/O recommending Closing Instruction (Follow applicable format in submitting docket)	Memo	AO		
119	5	Request Office of General Counsel to issue Closing Instructions	Memo	SO		
120	5	Closing Instructions issued with special requirements to LO and authorization to advertise & receive bids	Memo	SO		
121	4	Provide copies of Closing Instructions to Applicant, Attorney, and Engineer	Memo	AO		

STEP 7 - BIDDING

APPLICANT, ENGINEER, AND ATTORNEY SHOULD COMPLETE THE FOLLOWING ITEMS. REFER TO TEXAS RUS INSTRUCTION 1780, SUBPART C FOR ADDITIONAL GUIDANCE.

Item No.	Folder File Position	Document	Document or Form Number	Prepared By	Request Date	Date Rec'vd
122	6	Once all requirements can be met Authorize Engineer to Advertise to Bid the Project	Memo	AO		
123	3	Interim Financing — Evidence of Commitment from Lender and Notice of Agency's Commitment (if applicable) - 1780.39(d)	RB 1780-10	Applicant/ AO		
124	5	Initial Compliance Review – pre-loan review – RD 1901-E & 1780.44(c)	RD 400-8	AO		
125	3	Check Debarment/Suspension (Applicant)- RD 1940-M, §1940.606(b) https://www.epls.gov/	Printout	AO		
126	3	CAIVRS (applicant) https://entp.hud.gov/caivrs/public/home.html	Printout	AO		
127	2	Authorization Agreement for PreAuthorized Payment (PAD) – on all loans outstanding – update CPAP	RD 3550-28	Applicant/ Financial Institution		
128	3	Verification of Applicant Contribution or leveraged fund (if applicable) 1780.44(b)	Memo	Applicant		
129	6	Pre-Bid Opening Teleconference AO should notify State Office of teleconference - TX RUS 1780, Subpart C	Guide Form	AO/ Engineer		
130	6	Bid Opening – Rural Development representative must attend – 1780.72(b)(2)		Engineer		
131	Construct File	Submit Bib Tabulations to SO and recommendation of award – TX RUS 1780, Subpart C & 1780.61(b)		Engineer		
132	Construct File	Executed Contract Documents - AO include assembly checklist TX RUS 1780, Subpart C * * * * * * * * * * * * * * * * * * * Contract equal or exceeds $25,000 – Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion	AD-1048 w/ each Contract	Engineer Contractor		

Item No.	Folder File Position	Document	Document or Form Number	Prepared By	Request Date	Date Rec'vd
133	Construct File	Check Debarment/Suspension (Applicant, Engineer., Contractor)- https://www.epls.gov/ RD 1940-M, §1940.606(b)	Printout from Website	AO		
134	6	Legal Certification Regarding Adequacy of Contract Documents - 1780.61(b)	RB 1780-14 Page 7	Applicant/ Attorney		
135	6	Contract Review and Approval by SO	Memo	SO		
136	Construct File	Construct Test Wells (if applicable) prior to bidding of distribution lines TX RUS 1780 Subpart C		Engineer		
137	Construct File	Approval of Water Source by State Regulatory Agency (if applicable) TX RUS 1780 Subpart C	Memo	Engineer		
138	Construct File	Revised Project Cost Estimate based on award contracts		Engineer		
140	2	De-obligate excess funds prior to closing or provide RCR of justification. 1780.44(e)	RCR or RD 1940-10	AO		
141	7	Evidence of Insurance—Property Insurance, General Liability, Flood, and Worker's Compensation - 1780.39(g)	List of Policies or Other Documents	Applicant		
142	7	Fidelity or Employee Dishonesty Bond - 1780.39(g)(3)	Copy of Bond	Applicant		
143						

STEP 8- LOAN CLOSING

IF THE AWARDS OF THE CONTRACTS ARE WITHIN THE FUNDS AVAILABLE, THE AREA OFFICE MAY PROCEED WITH CLOSING. IN THE EVENT ADDITIONAL FUNDS ARE NEEDED, REFER TO THE "GUIDE FOR COST OVERRUNS."

A. AREA OFFICE WILL REVIEW THE CHECKLIST, LETTER OF CONDITIONS, AND OGC'S CLOSING INSTRUCTIONS. IF IT IS DETERMINED THAT ALL CONDITIONS CAN BE MET, THEY SHOULD MAKE ARRANGEMENTS FOR THE CLOSING AND FOR A PRE-CONSTRUCTION CONFERENCE.

B. CLOSING AND PRE-CONSTRUCTION CONFERENCES WILL BE HELD AND ALL APPLICABLE REQUIREMENTS, INCLUDING THE FOLLOWING WILL BE COMPLETED.

C. AREA OFFICE WILL MONITOR USE OF FUNDS WITH A TRACKING SHEET BASED ON THE CONTRACT DOCUMENTS AND REVISED COST ESTIMATE.

Item No.	Folder File Position	Document	Document or Form Number	Execute By	Date Completed
144	5	Closing Instructions from SO and OGC. Appropriate parties must sign at closing	Closing Instructions	AO/ Attorney	
145	2	Promissory Note	RD 440-22	Applicant	
146	5	Deed of Trust – USI	RD TX 1927-1	Applicant	
147	5	Certification of the Loan Resolution Secretary of the Board must sign at closing	RB 1780-28 Certification	Applicant	
148	5	Other Security Instruments as prepared by OGC	OGC Closing Instructions	Applicant	
149	Construct File	Pre-Construction Conference (once closing is complete) 1780.76(a)	RD 1924-16 or similar format	Engineer	
150	Construct File	Notice to Proceed with Construction	RB 1780-13 Attachment 8	Engineer	
151	Construct File	Estimate of Funds Needed for 30 Day Period - 1780.45(b)(1)(ii)	RD 440-11	Borrower Engineer	
152		Check Debarment/Suspension (Applicant)- https://www.epls.gov/ RD 1940-M, §1940.606(b) **Prior to loan closing**	Printout from Website	AO	
153	2	Fax Loan Closing Information to Deputy Chief Financial Officer (Finance) along with Promissory Note	Guide Form Loan Closing Information	AO	
154		Update CPAP		AO	
155	Construct File	Request Loan Funds – verify that EFT/ACH is setup for loan and grant		AO	
156					

STEP 9 - POST LOAN CLOSING

THE LOAN DOCKET FOR FINAL OPINION SHOULD BE COMPLETED AS SOON AS THE LEGAL DOCUMENTS ARE FILED WITH THE SECRETARY OF STATE. FINAL PAYMENT TO ATTORNEY SHOULD NOT BE MADE UNTIL FINAL OPINION IS RECEIVED FROM THE OFFICE OF GENERAL COUNSEL.

Item No.	Folder File Position	Document	Document or Form Number	Prepared By	Request Date	Date Rec'vd
157	5	Final Title Opinion - 1780.44(g)(2)	RD 1927-10	Attorney		
158	2	Promissory Note - 1780.45(a)(1) Submit copy of original with advance of funds listed to date	RD 440-22	AO		
159	5	Request for Final Opinion to SO Submit all related material as stated in the Closing Instructions.	Memo	AO		
160	4	Review and submit docket to OGC	Memo	SO		
161	5	Post Review of Loan Closing - 1780.45 (g)	Memo	OGC		
162	4	Notify Applicant of OGC post closing opinion	Memo	AO		
163		Update CPAP	CPAP	AO		

STEP 10 – CONSTRUCTION FILE

CONSTRUCTION BEGINS. AREA OFFICE SHOULD SET UP CONSTRUCTION FOLDER.

Item No.	Folder File Position	Document	Document or Form Number	Prepared By	Request Date	Date Rec'vd
164	Construct File	Statement of Deposits and Withdrawals (Monitor & Track Funds) 1780.45(e)(1)&(4)	RD 402-2 or similar form	AO		
165	Construct File	Estimate of Funds Needed for 30 Day Period - 1780.45(b)(1)(ii)	RD 440-11	Borrower/ Engineer		
166	Construct File	Partial Payment Estimate - Approval of Invoices - 1780.45(e)(1) and 1780.76(e)	RD 1924-18	Borrower/ Engineer/ AO		
167	Construct File	Contract Change Order – SO Approval - 1780.75(h) and 1780.76(h)	EJCDC Form or RD 1924-7	Borrower/ Engineer/ AO/SO		
168	Daily Reports File	Evidence of Daily Diary and Inspection Reports - 1780.76(d)	RB 1780-18	Resident Inspector		
169	Construct File	Project Monitoring/Inspections – SI 1780-2 (3)(3.1)	RD 1924-12	AO		
170	6	Prefinal or Substantial Inspection - 1780.76(f) - **SO should be contacted to attend prefinal.**	RD 1924-12	Borrower/ Engineer/ AO/SO		
171		Update CPAP once prefinal is complete		AO		
172	6	Final Inspections - 1780.76(g) **Provide Copy of Final Inspection to State Office**	RD 1924-12	Borrower/ Engineer/ AO		
173		Update CPAP to 402 status once final is complete		AO		
174	6	Update CPAP Warranty Inspections for each Contract (11th month warranty) SI 1780-2,3.2(a)(i)(A)	RD 1924-12 CPAP Servicing	AO		
175	Construct File	Remaining Funds – Notify Borrower giving them appeal rights in accordance w/ 1780.45(f) & 1780-2, 2.14(e) once project is completed. SO must approve any remaining funds		AO		
176	Construct File	Submittal for remaining funds (if applicable) 1780.45(f) & SI 1780-2, 2.14(e) **SO must approve any remaining funds**	Memo	AO		
177	6	District Director's Report (between 9th & 11th month of first year of operation) SI 1780-2(3)(3.2)(a)(i) Update CPAP Servicing	RD 442-4	AO		

STEP 11 – SERVICING

UPDATE CPAP TO SHOW ALL SERVICING ACTIONS ONCE THE PROJECT IS IN A 402 STATUS. THESE ARE JUST A FEW THAT SHOULD BE UPDATED. REFER TO CPAP SERVICING FOR A LIST OF ALL INFORMATION REQUIRED OF THE BORROWER. THESE REPORTS ARE REQUIRED IN ACCORDANCE WITH THE LETTER OF CONDITIONS AND RUS INSTRUCTIONS AS WELL AS THE STATE INTERNAL REVIEW (SIR) GUIDE. REPORTS SHOULD BE PULLED MONTHLY TO SCHEDULE VISITS, IF NEEDED.

DUE DATE	TYPE OF SERVICING	REFERENCE		
Quarterly	Quarterly Management Reports	1780.47(f)(1) SI 1780-4(2)(ii)]		
Annual	Audit/Annual Report	SI 1780-4(2)		
Annual	Budget	SI 1780-4(2)(i)		
Annual	Insurance	1780.39(g)(4)		
Annual	Reserve Account	1780.39(e)		
3 years	Compliance Review – every 3 years for 2 consecutive times, then every 6 years.	1901E§1901.204(e)		
3 years	Security Inspections	SI 1780-2(3)(3.2)		
3 years	Vulnerability Assessment – update certification even if no changes have occurred	Letter of Conditions TX Unnumbered Letter		
3 years	Emergency Response Plan – update certification even if no changes have occurred	Letter of Conditions TX Unnumbered Letter		
	Graduation Review	1951-F, § 1951.263		
	UPDATE CPAP SERVICING			

The CHAIRMAN. Well, thank you very much.

The chair will remind Members that they will be recognized for questioning in order of seniority for Members who were here at the start of the hearing. After that, Members will be recognized in the order of arrival. And, again, I appreciate Members' understanding, the strict adherence to the 5 minute clock.

I now recognize myself for 5 minutes.

Well, thank you very much for your testimony. It is clear the challenges facing the entire spectrum of infrastructure with respect to rural America. And the witnesses have laid that out really, really well this morning. I appreciate that.

Ms. Otwell, one of the fundamental concepts behind Federal communications policy was this universal service. In other words, everyone should have a landline.

Can you talk to us about why that was important in the past and why, looking forward, that we need to morph that concept across the entire spectrum of communications?

Ms. OTWELL. Absolutely. Thank you, Mr. Chairman.

The concept of universal service is that no matter where an American lives, if they are lucky enough to be in a rural area or if they live in an urban area, that they should have access to equal services at reasonably comparable rates.

It started with voice services, and it was a huge success for rural America. We got everyone connected. Now we are connecting everyone with broadband, which is the connection of the present and of the future, and it is even easier to see the benefits of a broadband connection with the educational opportunities, telehealth, telework, some smart farming initiatives. Broadband makes everything more efficient. The concept of universal service is something that every single representative at this table can agree upon, the fact that whether you are connecting people with water, electricity, actual highways, or the information superhighway, that the continued connection to that, regardless of where you live, is what continues to make America the land of opportunity.

The CHAIRMAN. I wish the rest of us were as cooperative as the Cities of Comanche and De Leon were. With respect to your hospital, it is about equidistance between the two communities, and it is a great example of a good partnership.

Mr. Calhoun, I live in a relatively dry part of Texas. We call the Pecos River a river, but it would only be called that in Texas.

Help us understand how do we go about communicating to those who don't really have an appreciation or direct contact with locks and the waterways of our country to make sure they understand it is important? How can we do a better job of communicating that?

Mr. CALHOUN. Well, thank you, Mr. Chairman. It is a tough thing to do, because the further that you are away from a navigable river, the less important it would seem to you. But I would contend that there are many different things, from airplane jet fuel to agricultural products to coal to steel to cement, everything that builds and rebuilds America and will make it great again.

A lot of them move on the waterways. And we just need to continue to tell our story. And the real key is getting people within this body, within Congress, to understand the value of it and getting your colleagues that don't understand the value of the rivers

and the navigable waters of the nation to understand them better. I think that is one of the things we can continue to do, as well as educate the general public. But education, as we all know, is a difficult task.

The CHAIRMAN. Sure. I appreciate that.

Dr. Halverson, I was pleased to see that CoBank was able to step up and meet the needs of Texans when they were facing drought conditions, by providing emergency capital and gap funding to communities in need. For reference, how quickly can communities access private capital for such projects? By comparison, how long would an USDA project take and does a partnership help expedite the project?

Dr. HALVERSON. Well, thank you, Mr. Chairman.

We, as a privately owned cooperative, have tried to be as extremely responsive in terms of time, terms and conditions to our customers as we can, whether the situation that they face is a wildfire or a flash flood, or what have you. We work with lots of partners to that end, be they partners in the Farm Credit System, the Department of Agriculture, state and local authorities, or whichever combination is most appropriate.

We value, particularly, our relationship with USDA, and we look for ways to expedite those situations to the maximum degree possible when they arise.

The CHAIRMAN. I appreciate that. Again, thank you, witnesses, for your being here today and being really clear about the needs of rural America.

Mr. Peterson, 5 minutes.

Mr. PETERSON. Thank you, Mr. Chairman.

Ms. Otwell, I had the Minnesota telecom people into my office yesterday, and they were telling me that, for $200 million a year, we could get broadband everywhere. And in your testimony, it says $110 million. What is the number? Do you know?

Ms. OTWELL. Absolutely. I can speak to that.

The rural community-based carriers that NTCA represents, we currently have two paths for how we are going to go about regulations, these updated regulations. Both are significantly under-funded, though the first is a model-based path. And that one ties a certain number of locations to a certain amount of money. That one is under-funded currently by $110 million. And we know because it is tied to numbers and locations, how many consumers that affects. So that is going to affect 70,000 rural Americans that are going to get less broadband than they would under full funding. And 50,000 additional rural Americans probably will receive no broadband because of the underfunding.

On the other side, the non-model side, is actually worse. They are under-funded for the next 12 months by $173 million. And that represents money that has already been invested, but the support mechanism is under-funded so much that they did not receive that recovery of $173 million. What that means is they plan their infrastructure projects for 2018, 2019 and forward. They have to make up that difference. That difference has to come from somewhere. So that means lesser deployment to the tune of that amount. That is where you get those different amounts.

Mr. PETERSON. This is money that is used to actually put the system in place.

This is not necessarily the money to keep it running once it gets there.

Ms. OTWELL. That is actually the money to keep it running. In rural America, because we have so few customers per square mile, we need that ongoing support to make the business case to be there in the first place.

Mr. PETERSON. One of the reasons, from what I know, the Universal Service Fund worked for telephones is that we had a tax on the bill, and so you could collect it from everybody. But we don't have a tax on the Internet. There is no way to collect anything from broadband service. What we are doing is we are collecting money on the telephone, and we are using some of that for broadband. And that is why, when I hooked up my hunting cabin, I had to put a landline in even though I didn't want one, because that is what I had to do in order to get Internet, I guess.

Ms. OTWELL. You are absolutely correct.

Part of the changes to our regulations now, we no longer would necessarily need to require that landline. However, because it is so under-funded, the average company, in order to provide standalone broadband would cost $226 in our area to provide standalone broadband, and that is not a reasonable cost compared to urban America.

But you are exactly right. That is part of the problem.

Mr. PETERSON. Well, I have some co-ops that have really done a great job. They have taken money from RUS and other places, and they have gotten 1 gigabyte service to every community in their service territory. We have other places that don't have anybody out there serving them because the big companies abandoned those folks, and there is no co-op in that area, and so forth. And so they have nothing.

I have been trying to figure out how we can work this out. And it is very frustrating. We had one situation where the city in this county had service, and the state had a grant program that would have worked to extend it to the rest of the county. But the two big companies that I won't mention that were in that city vetoed it. They not only abandoned these areas, they are actually standing in the way of us getting service out there. And I had the electric co-op come in and try to talk them into going into the business. Well, they looked at the situation. And because there is no ongoing funding to make up the shortfall, they decided they couldn't do it.

Somehow or another, we have to figure out how to get a funding stream, as I said in my statement, that is there on an ongoing basis so people can go out and extend this stuff out there and make it happen, like we did with telephones back in the 1930s. And whatever we can do to get that done, sign me up.

Thank you very much. I yield back.

The CHAIRMAN. The gentleman yields back.

Mr. Austin Scott, 5 minutes.

Mr. AUSTIN SCOTT of Georgia. Thank you, Mr. Chairman. I was just wondering if maybe the telecom companies can tell us where that hunting camp was. I am kidding. I am just picking on you, Mr. Peterson.

Ms. Otwell, I read your testimony. And the one issue, I take with it is that you say we are paying more for the same level of service. I would suggest we are paying levels and paying more not getting the same level of service in rural America. I live in a little town of Chula, Georgia, in between Tifton and Ashburn. And while, certainly, Ashburn has had its challenges with Internet services, Tifton being a little larger, has done better. But you get into those small towns that even are pretty close to larger areas, our service is subpar at best.

And it was interesting that my neighbor decided to try a different route because they weren't satisfied with what they currently had. And so when they tried that different route, the different route didn't work. Then they had to go back into a waiting list to even get back on the Internet service that they had before, which, again, was a little slow.

I appreciate you mentioning ComSouth in Hawkinsville in my district. They are a great company. I want to mention one of the things that has become a concern to us in Georgia with a different carrier up in the northern part of the state is that they take money to expand the networks, but it is the CAF funds, I believe—is that correct—where they are actually supposed to—well, maybe those funds are being taken and not being used for the proper purposes, and maybe being diverted to other projects.

What type of accountability measures would you suggest so that we make sure that the money that we as Congress put into expanding access actually gets used for access, instead of supplanting funds that the companies would have put into those areas?

Ms. OTWELL. That is a great question, Congressman. I appreciate that.

Whenever we talk about the small company, the rural community-based carrier, Universal Service Fund, some of our forms have recently been updated for more accountability. For example, all companies, no matter which model or which regulation path you took, every year we have to report geocoded locations to all the locations we build broadband to. And if you are in that model-base path, we actually even have to report locations we previously have built to. At the end of that 10 year period, the FCC will have a geocoded map of every single place that we have broadband service. We also are not receiving support in certain Census blocks. Census blocks that are deemed either too low cost for the high-cost area or have a competitor already serving without support, those blocks are not eligible for support. Our system really has been built to only put the money where it is desperately needed and to enforce build-out requirements in those areas.

Mr. AUSTIN SCOTT of Georgia. You mentioned one thing that we need to revisit, and that is competitors. It seems to me that one of the problems is that once someone receives a grant for an area, if they are not doing a good job in that area, nobody else is eligible for a grant in that area when maybe they would do a better job for the people.

Ms. OTWELL. That is not untrue. And what you are mostly talking about there are areas that we call the——

Mr. AUSTIN SCOTT of Georgia. It is or is not true? It is true or it is not true?

Ms. OTWELL. That others may not be eligible?

Mr. AUSTIN SCOTT of Georgia. That is right.

Ms. OTWELL. You are correct about that. Those are what are in the price cap areas. So that is your larger providers usually. There are lots of rural areas that they cover that there is not as much accountability for.

Mr. AUSTIN SCOTT of Georgia. In an area where, say, Windstream had taken a grant to expand access, but maybe did not do what we expected them to do with the grant, because of the way the current law is written, you can't turn around and support somebody else that may come in and do what the funds were intended for.

Ms. OTWELL. For example, a company like mine, we cannot come in and receive funding for that area. Most of these areas are your higher-cost areas with fewer consumers. And so without that ongoing support, there is really not a business case for one network much less two. We do try to not be inefficient in our building and using funds in the same area.

Mr. AUSTIN SCOTT of Georgia. Sure.

Ms. OTWELL. But that is an issue.

Mr. AUSTIN SCOTT of Georgia. But my concern is where we have allocated Federal money to expand it. It is not being used by the company as we intended for it to. But then we can't help somebody who actually would compete with them.

Ms. OTWELL. Now, there is an option. In some of the latest reforms, some of those companies can turn in some of their areas that they are not serving, and there is——

Mr. AUSTIN SCOTT of Georgia. They are not going to do that. They are not going to voluntarily turn in those areas.

Mr. Chairman, my time has expired, but I hope that we will continue to look at that area, because a lot of money is being taken and then not used for the purpose that it was intended for.

The CHAIRMAN. The gentleman's time has expired.

Mr. David Scott.

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

As we approach this issue of rebuilding the crumbling infrastructure, there is another pressing need that we need to attach to that. I believe strongly that divine intervention and divine providence has played an extraordinary role in the movement forward of our nation. And nowhere is that more prevalent than in our having the right people at the right time in the right places, and we have had many great Presidents, two of which are FDR, Franklin Delano Roosevelt, who gave us the New Deal, and Dwight David Eisenhower, who gave us the building of the highway interstate system. Both men at the right time.

But it wasn't just that. It was the fact that they utilized these Public Works programs to address lifting up the employment, and the opportunities, and training that strengthen and broaden a new era, each time. And as we move to rebuild this crumbling infrastructure, we have another problem, and that is the crumbling family infrastructure.

We have an extraordinarily high unemployment rate which is accompanied by the opiate crisis. And where is that happening? No greater place than where we are going to rebuild the crumbling in-

frastructure, in our inner cities, and in the rural areas, where, among our American young men, the employment rate in some of our rural and urban centers is a staggering 41 percent.

And so I would like for us to take a look at a bill that we have introduced in a bipartisan way. Kevin Cramer and I, my Republican friend and I, have come up with a bill that would use this Public Works, Private Works Partnership as we move to rebuild the crumbling infrastructure, much as Dwight David Eisenhower used the Highway Bill, much as Franklin Delano Roosevelt, without which we never would have survived.

We have a severe opiate crisis throughout our community. But nowhere is it more piercing than in the rural areas. Families breaking down, joblessness, hopelessness. We put House Resolution 52 together that would direct our Secretary of Labor to connect on-the-job apprenticeship training programs that would help in these areas.

Our American families right now are in a crisis, particularly as it appeals to our young men between the ages of 18 and 39.

And so we hope that we can address that as we move forward. And our bill is H.R. 52, and my colleague, Kevin Cramer, and I, the gentleman from North Dakota, would appreciate it if you did.

Let me ask you, Dr. Halverson, in your testimony, you described the Community Facilities Program as a successful model for public-private partnerships. Could you tell us, is there anything that we in Congress can do to help you improve this program?

Dr. HALVERSON. Well, this is a program that we think has proved highly successful over time on its face. It also is successful, not just for the individual investments that have been made, but also because it mobilizes and catalyzes additional capital to communities that need it. So not just capital from CoBank and/or the Farm Credit System, but from community banks, local banks, and state and local authorities, and our request to the Committee to help us do this is to speak with our regulator.

We have an approval process now that I would describe as administratively burdensome, one at a time approvals. We would like to see that become an institutionalized programmatic approval process so that the business can be executed in a more sustainable and viable manner, because we think there are ample opportunities for us to do this in rural America, and we would like to do it in a more skilled way than we currently can.

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

The CHAIRMAN. Thank you. The gentleman yields back.

Mr. Rick Crawford.

Mr. CRAWFORD. Thank you, Mr. Chairman.

Dr. Halverson, the President has indicated that private dollars can be leveraged with public funds to repair crumbling infrastructure. In your view, are the private financiers of CoBank prepared to meet that demand?

Dr. HALVERSON. We absolutely are. As I said in my verbal testimony and written testimony, CoBank and the Farm Credit System cannot meet every demand for every project in every place in America. We have decades of experience, however, of leveraging private-sector capital, working closely with commercial banks, in particular, and USDA and others to do precisely that. What is hap-

pening and changing, particularly around communications infrastructure is technology is changing, the demand for capital that deal with these issues is growing.

We have a great track record, we believe, of doing the right thing to meet the needs, and we would like to continue to do more of it and make a substantial contribution, along with all of the other sources of capital that include commercial banks, other private sources, as well as state and local governments where appropriate, and the Department of Agriculture.

Mr. CRAWFORD. CoBank has a history of these kinds of partnerships, financing through partnerships with local banks, as you mentioned, and through utilities, the Rural Utilities Service. Why do you think others have been sort of shying away from that type of partnership?

Dr. HALVERSON. Well, I want to give credit where it is due, right? There are thousands of community banks across the country who do a lot to provide for the needs of their local communities, and regional banks as well. But as you heard in Ms. Otwell's testimony and other members of the panel here this morning, it is nothing new in the economies of scale problem. There aren't that many people in rural America, so the revenue stream that is possible upon which to make investments and build businesses is much more challenging where population densities are as low as they are in rural America.

And in its wisdom, the Congress established the Farm Credit System 101 years ago, and our mission is to meet that fundamental issue, and do as much as we possibly can to meet the needs of agriculture, and in the last several decades, infrastructure investment. And we intend to continue to do that, and broaden and deepen our partnerships with other capital providers to meet these very substantial needs that you are hearing about this morning.

Mr. CRAWFORD. Ms. Otwell, in your testimony, you talked about the important distinction between raising capital for construction and assistance in funding the ongoing costs of servicing the system. It is kind of like buying the horse and feeding the horse.

Ms. OTWELL. Exactly.

Mr. CRAWFORD. The initial investment is one thing, but the upkeep is another. Can you talk about that? Why is it not enough to just simply provide cheaper financing to rural systems?

Ms. OTWELL. Absolutely. Thank you for the question. It does. It takes both. The initial loan from either public sources or private sources is what helps us put the infrastructure in the ground. But as I talked about in my testimony, with only 3.4 customers per square mile, that is simply not enough customers to provide for the ongoing costs of operating that network, making the loan repayments, *et cetera.* We really do need that predictable, sustainable support to make the business case for the loans in the first place and the investment in the first place.

Mr. CRAWFORD. I am going to stick with you on this one too. If you would kind of explain some of the effects of the shortfalls of the USF, how that is affecting you and other companies like you in rural communities that you serve.

Ms. OTWELL. Sure. Just like when I was talking to Mr. Peterson, we have some actual numbers for the shortfalls. For the model

side, it is 70,000 rural Americans will get lesser service, 50,000 may get none. For my company alone, it is 551 customers over the next 10 years. And if you are one of those customers, you are likely in some of the highest cost areas that we serve, which means you likely don't have another option. So that is definitely a detriment to rural companies.

Companies are having to slow down their investments. When we are making long-term investments like this, any sort of unpredictability definitely is hard to make those long-term investments on. Workforces are reducing in some cases, and so it is really bad for rural consumers.

Mr. CRAWFORD. Thank you.

Mr. Chairman, I yield back.

The CHAIRMAN. The gentleman yields back.

Ms. Adams for 5 minutes.

Ms. ADAMS. Thank you, Mr. Chairman, Ranking Member Peterson.

And thank you to all of the witnesses who have testified today. And particularly to you, Mr. Wynn. Thank you for coming in from North Carolina.

Ensuring that we have sound and flourishing rural infrastructure is essential to addressing disparities in economic opportunity. The state of our rural infrastructure affects food security, education quality, access to necessities like broadband, clean water, and many other important issues that North Carolina and states across America face. Hopefully, the Committee won't lose sight of what constitutes *rural* in terms of my district and many others across the country.

Also looking forward, we must ensure that any potential infrastructure package addresses the concerns of our rural areas, land-grant universities, particularly 1890s, and our most vulnerable Americans.

Mr. Wynn, let me begin with you and ask, in your testimony, you mentioned that in today's world of video conferencing and online education, telemedicine connectivity is not a luxury, it is a necessity. I agree with you. Broadband Internet helps close educational divides. It provides access to quality healthcare and crucial work support. But unfortunately, many North Carolinians still don't have access to reliable Internet service.

Could you talk a little bit about what types of tools that you believe electric cooperatives should have access to in order to help bridge this digital divide between the haves and the have nots?

Mr. WYNN. Yes. Thank you, Ms. Adams. And as some of the colleagues here at the table have been already saying, it is a challenge, and it is a necessity to have those things as rural citizens. And we hear it clearly from our members who know that rural electric cooperatives have brought electricity to rural areas where no one else would. And we are hearing that same theme as we realize that broadband and telecommunications is necessary.

Some of the tools that are necessary, of course, obviously, funding is a major need. I think that we have an opportunity that we are seeing at our cooperative as we try to address this in the ability to leverage what we already have. And as I mentioned in my testimony, we have started building infrastructure for the purpose of

providing better service for being more cost effective from a utility standpoint.

But as we build this infrastructure and start looking at the possibility of leveraging that infrastructure to bring broadband, doing it in a way that is closely connected and tied in with our current business structure is one that provides somewhat of a promising opportunity for us, because a lot of the investment is already being made on the utility side of the business, and to leverage that investment to bring broadband is in many ways making the numbers look a lot better.

I think that the tools, some of them have already been mentioned, as far as looking at the Universal Service Fund, as far as looking at RUS financing, those tools are great, but many of my colleagues across the country are still finding it very hard to make the numbers work because of the sparseness of our populations.

Ms. ADAMS. Thank you very much.

Dr. Coon, it is good to have you here representing APLU. Last month, the Committee heard testimony from Dr. Walter Hill from Tuskegee who, in his testimony, talked about the devastating land-grants deferred maintenance. Tuskegee alone has about $43 million. My alma mater, North Carolina A&T, has as part of its course, $8 billion.

What infrastructure priorities would you recommend to ensure that 1890s and all land-grant universities are prepared to take on the important agriculture research of the 21st century?

Dr. COON. Well, one of the great opportunities here is for the Committee, through policy, but then also in the administration of that through the USDA, to identify those priorities. For example, our sister institution, Langston, has a very strong programming goat research and delivering that information to goat producers not only in Oklahoma but far beyond. I know the small farmer programs at North Carolina A&T are very strong programs. We talked about that.

Dr. Hill was on the Committee that I was a part of, and we talked about having sort of several tiers to a grants program for infrastructure. So that you can set the priorities as they are needed to support those kinds of programs, but also that the level of funding is tiered as well. If there is a need for $1 million to help with the facility, that that is not in some way competing with another program that another university requires $30 million for.

Ms. ADAMS. Okay. Great. Thank you very much. I am out of time.

Mr. Chairman, I yield back.

The CHAIRMAN. The gentlelady's time has expired.

Mr. Davis for 5 minutes.

Mr. DAVIS. Mr. Chairman, I find it ironic that out of all the microphones that don't work today, it happens to be mine. Is there some type of conspiracy from any of our colleagues?

Completely on purpose, let the record show. But now what is wonderful is I have two microphones, so I am in stereo and even louder.

First off, thank you to the witnesses. I want to start my questioning with Mr. Calhoun. I am about to go over to another hearing for another committee that I serve on, the Transportation and In-

frastructure Committee, to talk about the importance of our locks and dams in our inland waterway navigation system. And I would like to get your opinion on a few of the issues that you mentioned in your opening testimony in regards to that inland waterway system.

As you know, Mr. Calhoun, there are a lot of my farmers that rely upon their grain being able to be shipped via barge on the Illinois and Mississippi Rivers in and around the areas that I serve in central Illinois. But we saw the Obama Administration zero out dollars for those projects in the line item that we call NESP.

Can you give us a brief synopsis of why it is important for our agricultural sector, not just in the Midwest, but nationwide, to have access to that inland waterway system and why it is crucial to invest more dollars into it?

Mr. CALHOUN. Thanks, Congressman. The two words that I always come back to are *competition* and *capacity*. And without the waterways, the nation is going to lack capacity to get your farm products to market. And when you don't have enough capacity, do prices go up or down? They go up. And the price of transportation goes up. The price of grain then goes down.

And likewise, when you want to have competition, you want to have different modes. You need the access to the waterways, and competition is a great thing when it comes to American business. Those are the two words that I focus on.

The projects in your neck of the woods are very important. They are very important. I had a previous life. I worked for Cargill for 41 years. They are very important to all the members of the National Grain and Feed Association. They are important to all farmers, because the river prices every bushel of grain that is produced in this country, not just the ones that are grown around the river. When the prices along the river decline, the prices all over the nation are going to decline.

And so it is very, very critical, some of these locks and dams are older than I am, and I am old. And they need to be replaced and they need to be revitalized. Because if we have a catastrophic failure, it will cost this country billions of dollars if you shut down one of these segments for extended periods of time. And I don't think this nation can afford to do that.

I know you are on the T&I Committee, and I wish you great luck over there. We are very excited about what the President's come out, and he is paying attention to infrastructure. But the trillion dollar question always is, who is going to pay for it and how is it equitably to be done.

Mr. DAVIS. Right. Thank you very much for your response.

Dr. Coon, I thank you for being here. As somebody who represents a land-grant institution in central Illinois, the University of Illinois, I am always thankful that anyone from Oklahoma State continues to support the U of I colors every time you come in. I notice that Chairman Lucas does the same on a regular basis. I am thankful for that.

But in all seriousness, I want to talk to you a little bit about ag research. It has been dwindling. I mean, we haven't grown it at the rate that other research dollars and other agencies have grown. Now, as we move forward, I only have a little bit of time left, so

if you could on behalf of all the land-grant institutions, and especially the one I represent, can you kind of talk about some of the regulatory hurdles that you face in accessing those ag research dollars right now and what we can do to relieve them in the future?

Dr. COON. Thanks for the question, Congressman. And first of all, there is no blue. This is all black.

Mr. DAVIS. It is that orange.

Dr. COON. Yes. Well, that is ½ of the Illinois colors. Congressman Lucas just showed up. I had to cover that.

Seriously, with respect to the regulatory hurdles, any kind of public investment is going to come with some level of accountability. And we understand and we appreciate that. We want to be accountable.

But sometimes the accountability ends up consuming more of our time, perhaps, than the actual doing of the research. And if we can find a way to get to a point of simply saying, did we do what we said we would do? Did we spend money responsibly to accomplish it? And did what we accomplish make a difference, or do we have a reasonable expectation that it will make a difference? If we can get back to sort of those sorts of principles, it might help.

Certainly, in animal handling and well-being, it is important that we are good stewards of the animals that we work with, pretty high levels of accountability there as well, sometimes puts us in kind of a quandary of, well, are we going to invest in that or are we going to, actually, going to get some research done with the facility?

Mr. DAVIS. Thank you. My time has expired.

Thank you, Mr. Chairman.

The CHAIRMAN. The gentleman's time has expired.

Ms. Plaskett for 5 minutes.

Ms. PLASKETT. Thank you, Mr. Chairman. And thank you all for being here.

This is, of course, one of the primary subject matters that we here in ag need to be discussing.

I was very grateful that yesterday, I had a meeting with the Secretary of Agriculture and talked with him about the President's infrastructure proposal and the need to really have concretely in there issues relevant to the rural area.

Dr. Halverson, you mentioned in your testimony innovative public-private partnerships and the role that they play in helping to meet financial needs for infrastructure projects. That is a particular area that is very important to me.

Before coming to Congress, when I had a real life, I was an attorney doing public finance law. Public-private partnerships are something that I think are very important and instrumental.

One of the concerns I have with regard to public-private partnerships is how do we incentivize developers and others to come to rural areas to engage in those projects? And how do we incentivize developers to come into areas where there is not going to be the amount of local public funding to support that?

For example, in the Virgin Islands, which I represent, we face enormous financial issues. And so what are the ways that you think that we can deploy funding into rural areas that have those

limited local resources? And have you seen that, and what are examples of that that you can cite for us?

Dr. HALVERSON. Well, thank you, Representative Plaskett, for the question. The facts and circumstances in the local area are going to be very determinative in what is possible, right? Whether you are in a place with one person per square mile or 50 persons per square mile and so forth is going to make a big difference. The level of capital requirement and the type of business that we are talking about.

That is a long way of saying, it depends on what the facts and circumstances are and the location that you are looking at. And there isn't a one-size-fits-all answer. You can look at them on a continuum, and on one end of the continuum you need a higher amount of public funding, Universal Service Funds, and other forms to help drive down the costs. But you always look for the ability to attract institutions, like CoBank and our partners in the Farm Credit System, who are providers of reasonably priced capital in loan form.

And there are, in fact, a great array of private companies already that are in the infrastructure business, whether it is communications or otherwise. And we bank a lot of those companies, and they are always looking for new places to go to continue to grow their businesses. We try to support them in whatever way is appropriate. If you have a particular situation you would like us to look at, we would be happy to do so.

Ms. PLASKETT. Thanks. Thanks so much.

Ms. Otwell, a question for you. In the agriculture appropriations bill, they recently reported out, the full committee report, language directing USDA, the FCC, and the Commerce Department to prepare a report that details each agency's area of responsibility for addressing data speed. We talk about building infrastructure, we talk about the role of broadband in that infrastructure for rural areas. One of the things that we find very troublesome is the data speed and the lack thereof in rural areas, and this becoming a divide for our farmers and for these communities in rural areas.

Do you believe that it is the Agriculture Department's area of responsibility to address this? And if so, how? And how does the Department of Agriculture and this Committee work to create any broadband infrastructure investment plans in this area?

Ms. OTWELL. Thank you, Congresswoman. That is a very good question. We do have issues with speeds in rural areas. Sometimes that is what we talk about when we are trying to build future proof networks. And when we are putting fiber in the ground, that is only limited by the electronics on either end. And so when we try to build networks, that is part of what we are trying to put in the best possible infrastructure to be ready for the future. Some of what the FCC still deems as broadband is really not fast enough to do all these applications that we talk about.

One thing we do want to think about is with limited resources from whatever possible way, we don't want to necessarily reinvent the wheel. The FCC oversees that Universal Service Fund that has been revamped. It is ready to go. It just doesn't quite have enough funding in it right now.

We are always interested to hear other opportunities, things like that. But we want to be careful not to reinvent processes and not be efficient in that way. We also don't want to overbuild networks where they do already exist and waste money that way either.

Ms. PLASKETT. Okay. Thank you very much.

I yield back. Thank you.

The CHAIRMAN. Yes, ma'am. The gentlelady's time has expired.

Mr. Rick Allen, 5 minutes.

Mr. ALLEN. Thank you, Mr. Chairman.

And we are, I guess, going to talk about broadband here and the critical application of that service. Obviously, we know that agriculture, from a technology standpoint, has advanced very rapidly. And I will say that I planted some peanuts, and the first time I have ever done that, and I touched the wheel of the tractor, and I planted them like 17″ over from the year before. And so it is pretty amazing what we are able to do in agriculture today.

But the bottom line is, we have to do something about connecting our rural America, our farmers, and all those in agribusiness, not only through the various programs, but also education and things of that nature. And we have to have good service, because these folks are, obviously, very dependent on it.

With that, as far as, if you could share your organization's perspectives on the need to develop infrastructure that supports broadband in both wired and wireless formats and, in particular, where access to high-speed mobile services are currently lacking. Who in the panel would want to address, how can we get where we need to get here?

Ms. OTWELL. I would love to speak to that. Thank you, Congressman.

Mr. ALLEN. Yes.

Ms. OTWELL. We do see a lot of working together with wireless networks. In our area, in some of our most remote areas, we do actually use a fixed wireless product to serve, especially some of those farms in those extremely remote areas. However, the thing to know about that is that even with a wireless network, those customers don't know which one they are on. They don't care. They are still generating huge amounts of data.

You talked about some of the smart farming initiatives. People are using video streaming for some of the educational things, telehealth applications, that is generating huge amounts of data. And any wireless network cannot handle that amount of data except over a very short distance. You still have to have that wired network in place to the tower to be able to offload that data.

In our area, we also have some national cellular carriers that have towers in our area, and we have built fiber to those towers, because they face the same problem. It is still a huge amount of data that has to meet the rest of the world somewhere.

Mr. ALLEN. Is this like a density issue, in other words, costs per user situation to pay for this amount of data that is needed?

Ms. OTWELL. It is. I mean, it doesn't matter if you are in a rural area or not, we are still using massive amounts of data. And certain networks just can't handle that yet.

Mr. ALLEN. Okay.

Yes, sir.

Mr. WYNN. Yes. Congressman, I think the same issues that the farmers and other people that you mentioned are having, so are utilities, electric co-op.

Mr. ALLEN. Okay.

Mr. WYNN. Because the way we operate as a business now has changed tremendously over time. We have to have smarter devices downstream on the lines, which really require broadband infrastructure. Anything we do now has to almost be connected some way and have some level of communication.

One solution that we are looking at is as we build our infrastructure as the electric cooperative, the members who are being served by us are also reaping the benefits of that. So that leveraging is another possibility that we are toying around with. The utility, the cooperative that is having to do this is almost not an option as it once was in the past, so there may be some opportunities.

Mr. ALLEN. All right. Well, we have private companies implementing broadband service or co-ops in private companies right now. We have had this tremendous lag from getting service to the user as we get more dispersed into the less populous areas of the country. And, of course, that is a financial matter.

Of course, it sounds like it is also a data requirement matter. In other words, our farmers and folks like that need tremendous access to data, and I guess it is the same in the electric co-ops as well, it is pretty complex?

Mr. WYNN. Absolutely. Data is becoming the thing that we really have to have to operate. And it is really driven by the demands of our members or consumers. What they expect today is totally different from before, and data is definitely in the mix of being necessary.

Mr. ALLEN. Right. Well, of course, in my district, agriculture is the number one industry. And in my State of Georgia, agriculture is the number one industry. I don't quite understand why we can't serve that industry the way we need to serve that industry with these technical services. And, obviously, electric co-ops are a big part of my district as well. Thank you for your testimony.

Mr. Chairman, I yield back.

The CHAIRMAN. The gentleman's time has expired.

Mr. Panetta for 5 minutes.

Mr. PANETTA. Thank you, Mr. Chairman.

And thank you to all the witnesses who are here, your preparation, your time, as well as your testimony. I appreciate you coming in. And I apologize for having to step out, but I am back, and now you get to hear from me a little bit.

I hail from the central coast of California, what many of my members here know as the salad bowl of the world. We have a number of specialty crops. Specialty crops take a lot of labor to produce. Unfortunately, we have a lack of labor right now, and that is an issue. And there is, obviously, two ways to deal with that. One is here in Congress with proper immigration reform, but two is mechanization in dealing with the lack of labor.

One of the valleys I have is Salinas Valley. Right now, it is obviously big in specialty crops. There are a number of other valleys. But one of the other valleys that is paying particular interest to the Salinas Valley is Silicon Valley, because they are seeing that that

is kind of a way to go in regards to where their investment can go. And that is happening. We are seeing a lot of ag tech innovation. And they are very excited about it, let me tell you. They are very excited about coming up with ways to help the farmers out to fill that lack of labor.

But my question to you is, and what I am seeing and what I am hearing, is that without proper broadband, the mechanization will not be implemented, and it will inhibit innovation when it comes to mechanization. And so I was wondering if any of the witnesses could testify to that fact as to how it does inhibit innovation, how it could prevent actual implementation of mechanization in our agriculture.

Dr. HALVERSON. Well, I will take a stab at that, Congressman Panetta. I have had the opportunity to be out in your area, and we have some very important Farm Credit partners who lend to farmers and ranchers in your district and all over the State of California. But I hear that exact same thing all over the country. Right? I go out and I visit farmer producers all over the place. And modern technology, which generates exponential growth in data, as my colleagues just indicated, is a substantial contributor to the dramatic increases in productivity in American agriculture over our lifetime.

And there is no end in sight to the upside to our ability to continue to produce. We do have some significant constraints, however, in our ability to realize the tremendous value that our agricultural productivity can generate in the long run. Right? One of them is the transportation infrastructure, the other is communications.

If Congressman Allen were here, I would tell him the same thing. If you get into your combine or your tractor, sometimes you need a USB chip with a bunch of data in it and you need wireless communications; otherwise, you can't actually operate your technology. To your point, it becomes a real impediment.

Many of the pieces of high technology equipment these days that people use, whether in specialty crops in particular, they get downloads of new software overnight. Their difficulties get diagnosed remotely from the foreign country where the thing was produced or from somewhere else in the country, and they can't take it to a shop, and there is not somebody for 500 miles to come and fix it. It gets diagnosed remotely.

What we are seeing is a dramatic convergence between the communications industry and the agricultural industry, because they are so interdependent on each other. And our ability to continue to generate the kind of agricultural productivity that we have, whether in base row crops or specialty crops, increasingly depends on our ability to deploy high-quality, ubiquitous communications infrastructure.

Mr. PANETTA. Exactly. Thank you.

Any other witnesses?

Dr. COON. Yes. Congressman, just a few other things. Information really is key to success in agriculture today. And the faster the better. And so in cooperative extension, we find ourselves with a tremendous opportunity to deliver information and programs to producers very effectively using technology, but it doesn't get to

them if they don't have the bandwidth. Right? So that is one of the challenges.

And, likewise, we have a meteorological network within Oklahoma that we provide, along with the University of Oklahoma. And, again, it is extremely valuable information for producers in determining when it is best to spray or burn or whatever, but they have to be able to get that data, so it is really key.

One of our ag econ faculty members is conducting a study currently. It is USDA funded. Dr. Brian Whitacre is looking at if you make it available, how do people use information when it becomes available in a rural setting? And so he is going out and basically, creating hot spots in rural communities and then studying the behavior of people as they use that to get information. What are they using it for? Where are they going, and so on.

Finally, rural health is also tied in with this. And our dean for the Center of Health Sciences, Dr. Kayse Shrum, is developing a network to provide telemedicine, in effect, in rural communities. Again, we have to have that bandwidth.

Mr. PANETTA. Thank you.

Thank you, Mr. Chairman.

The CHAIRMAN. The gentleman's time has expired.

Mr. Denham, 5 minutes.

Mr. DENHAM. Thank you, Mr. Chairman, and thank you for holding a hearing on this important topic.

This is an area I focus a lot on, on Natural Resources and Transportation and Infrastructure as well. I introduced the New Water Act, because in our area, agriculture does not survive without having, not only proper conveyance, but equally important, if not more important, proper storage.

And I thought it was important to make sure that we had a program where we could borrow money where users would pay that up-front funding back, as a water user, I pay for my water, and that would go to paying back the infrastructure.

Our challenge is, like WIFIA and TIFIA, we need another type of funding for the Bureau of Reclamation districts, so the New Water Act would deal with WIFIA.

Mr. Macmanus, I wonder if you could tell us a little bit about some of the work that has been done with WIFIA and whether or not you see other benefits to storage across the country?

Mr. MACMANUS. Congressman, thank you for your question. I was beginning to feel a little neglected up here.

But our focus in the water industry is on potable water, predominantly. We do not focus on the irrigation and delivery and conveyance for crop production. But we deliver predominantly to people's homes, businesses, and commercial facilities, processing facilities but not irrigation water. We are not familiar intimately with that program.

Mr. DENHAM. But you have utilized WIFIA in the past?

Mr. MACMANUS. Sir, I am not familiar with that program.

Mr. DENHAM. Okay. Well, let me just ask it one step further. On the Clean Water Act, we end up with a lot of compliance issues. You had talked about this in your testimony.

What I have heard from some water users is that the compliance issue oftentimes is a hindrance to putting new projects in place, be-

cause they are concerned about whether or not, as they have implemented new projects, they can actually achieve the compliance and end up facing penalties that they would not have faced previously.

Mr. MACMANUS. Yes, sir. The example I gave in my testimony, the UV disinfection system, we sampled our raw water the first time in 2010. And when our samples came up positive for the cryptosporidium, we had to start a process of implementation to get this infrastructure built to have a treatment technique that would deal with these log removals that the EPA requires.

My concern with the regulation itself is no matter how the results on our raw water turn out again in the future, if the cryptosporidium is no longer there, the EPA still mandates that I provide the treatment continuously whether or not the cryptosporidium is even present anymore. A lot of the regulations that we deal with don't necessarily have a real-world practical application.

The other side of this story is we have been treating the same raw water from the Rio Grande River in our treatment facility with conventional coagulation, sedimentation, and filtration for 30 years, have never had a water-borne disease illness outbreak. And now that we have started testing for cryptosporidium, I have to add an additional $1½ million of infrastructure to treat an organism that we have haven't really had an issue with.

Do the regulations always make sense? No, sir, I can't say that they do on the investment that we have to make in that regard.

EPA is always going to err on the side of safety when it comes to public health, and their drive on this whole issue on the cryptosporidium goes back to Milwaukee when you had a massive release of manure into the receiving stream or the raw water source for the City of Milwaukee, and they had a massive water-borne disease outbreak. We are not looking at the same circumstances by any means, but we are still having to comply with those strict issues.

And I will give you another example.

Mr. DENHAM. Thank you. My time is short. I have one more question. But I do agree that we have seen a lot of projects that have been hindered just because of the compliance and the fees associated with it.

My final question. Mr. Calhoun, on the Transportation and Infrastructure Committee, we talk a lot about the inland waterways and the conveyance of a lot of our products that move interstate commerce through our waterways.

We have a 29¢ tax, fuel tax, that goes to the Inland Waterways Trust, which is also matched by public funds. It is a great way to make sure that those waterways stay open. But we always see new efforts to put new fees, toll ways, locks and dams, that could interfere with that interstate commerce. I wonder if you could briefly discuss that.

Mr. CALHOUN. Certainly, thanks, Congressman. I commented in my testimony about our objection to tolls and fees. There is the difference between the waterways and a toll road. First of all, if you build a new toll road, you still have the state highway you could drive on and go around it. You have other alternatives than paying

these high-priced fees, and we don't see that on the waterways. You have one way to go, and it is through the locks and dams.

And we feel very strongly that you are going to penalize the users of the system, in this case the American farmer. Because if you have a 25¢, 50¢, 75¢ charge, that will have to be passed through to either the ultimate consumer or the person who produced the product. So that cost is going to go someplace.

Mr. DENHAM. Thank you. I am out of time, but if I could ask you to respond in writing, if you could elaborate on the other beneficiaries that may also have a stake in the inland waterway system and making sure that it works properly. We are looking at those other beneficiaries that might also not be able to be helpful.

Mr. CALHOUN. Absolutely.

Mr. DENHAM. I yield back.

The CHAIRMAN. The gentleman's time has expired.

Ms. Blunt Rochester.

Ms. BLUNT ROCHESTER. Thank you, Mr. Chairman.

Many people don't realize that Delaware, they might drive to our beautiful beaches, but don't recognize the diversity of our state. We have a very strong agricultural community, and so I want to, first, thank the Chairman and the Ranking Member for this panel. I mean, speaking of diversity, it is very diverse issues as well.

Really, I want to address my first question to Dr. Coon. And I am on the Biotechnology, Horticulture, and Research Subcommittee, and so it kind of dovetails with Ms. Adams' question and also Mr. Davis' question. As we know, there are many benefits of research conducted at public universities, including the fact that the information gathered is publicly available and transferable. The academic setting allows for more long-term goals in research, and we can look forward, and it is not constrained by the profitability goals of private research. Also, as our country ramps up and tries to make sure that our investments are there, it helps us to be competitive.

I am fortunate to have two land-grant institutions in my state, University of Delaware, which is my alma mater, and also Delaware State University, both doing really great research in the areas that are important to this Committee and supported by Federal funds.

But you talked about the fact that, basically, you have to deal with faculty lines over facility lines. And my question is, how does deferring maintenance over time increase the likelihood of agricultural research being dominated by private research? And what kind of research may we lose out on because of this shifting dynamic?

Dr. COON. Thank you, Congresswoman. I appreciate the question, your thoughtful considerations there.

I think, in part, the risk of everything become being privatized, it is real. And at the same time, right now, we have a healthy balance in that a lot of the fundamental research that is important for agriculture still is being done primarily at the public universities. It has been that way, still is that way. And where the private-sector takes over is in the application of that, developing varieties, using technology that was originally developed at the universities. I think that is a good balance.

And the risk is if the support for the fundamental research goes away, what will happen to the private interests that have depended on that in the past? Will they pick that up? There is a lot of risk with it. A lot of things don't turn out, and so the payoff isn't quite the same. We run the risk of losing our overall capacity if it all becomes in the private-sector.

And then at the same time, the private-sector tends to focus on the larger commodities, the more profitable areas and so on. Specialty crops tend to not get as much attention, and some of the other local issues don't get the attention that they might otherwise.

Ms. BLUNT ROCHESTER. Thank you.

I have a quick question for Mr. Wynn. It might not be quick, but I have a quick question for you. You mentioned microgrids. Can you talk about why these are an important infrastructure investment, and also, if there is potential for them to help alleviate the maintenance cost of having to wire our most rural areas?

Mr. WYNN. They are important because of the diversity of our system and how it is evolving and the demands of our consumers.

Having a microgrid also provides more resiliency when there are outages. And electricity is becoming more and more critical, and the loss of it is becoming more and more of an issue when it is not there. Microgrids provide another opportunity to make sure that our systems are more resilient.

We are kind of going back from where we come, because in the beginning, that is what we really had, was microgrids, and we got larger and became more centralized. I think that is important.

The second part of your question was?

Ms. BLUNT ROCHESTER. And do you think it would help alleviate the maintenance of having to wire?

Mr. WYNN. There are situations even with our system where we are looking at the possibility of microgrids, especially in rural areas where you, in some cases, have miles and miles of line to get to a load that is centralized, that is very far away from the centralization. There are going to be opportunities, yes, that I think microgrids will make a lot of sense financially.

Ms. BLUNT ROCHESTER. Great.

And I only have like 10 more seconds, and I wanted to ask Ms. Otwell a really quick question.

You mentioned about sending information to the FCC on the geocoded map. Is there a map of the country, I have heard yes and no, that shows how we look from a broadband perspective?

Ms. OTWELL. I don't think there is an accurate one right now. How about that?

Ms. BLUNT ROCHESTER. Thank you.

The CHAIRMAN. The gentlelady's time has expired.

Mr. Dunn, 5 minutes.

Mr. DUNN. Thank you, Mr. Chairman.

Dr. Coon, in recent months, a proposal to cap the indirect cost of certain Federal grants, research grants, has been floated. Today, fortunately, in the Appropriations Committee, they are marking up a bill that would prohibit those caps on NIH grants and USDA grants.

Would you discuss the impact those caps have on your research?

Dr. COON. Thank you, Congressman. I appreciate the question. And thank you also for all who had a part in protecting us from that change.

We call them facilities and administration costs. They are real. If we are doing research in a building that was built for classes, that is great, but the research that is going on in there wasn't necessarily included in that original construction. We really have to recognize that the mission of the university going into research is beyond what it was created for, or what our state funding offers for.

We really need to find a way to pay for the actual cost of the utilities that go into the research and so on.

Mr. DUNN. I am going to suggest that you keep pounding on everybody that the cost of overhead is how you do business. I mean, your business is research.

Dr. COON. Absolutely.

Mr. DUNN. Your overhead is not going to go away.

Dr. COON. It is real.

Mr. DUNN. Yes, it is real. So thank you very much. I am going to keep you in mind.

Dr. COON. Thank you.

Mr. DUNN. Ms. Otwell, I so liked the last question on the mapping, because that is the complaint that I hear about, that the maps aren't real. We hear that there is broadband and there isn't, or there isn't broadband and there is. And so I am just going to ask, submit to you that I think that we need some better maps. And I have an Internet page that looks like it reveals that information, can you comment.

Ms. OTWELL. And that is why some of our reforms have changed, to give a better view of what is exactly out there to each and every location. I think that is definitely the reason why some of those have changed.

Mr. DUNN. In general, it is a bad idea for the government to be competing against private enterprise in these spaces. However, Mr. Scott made a good point. Just because you have a provider and service in there doesn't mean it is good service.

In the 2 minutes or so left to us, I would like you and I to speculate on which technology or technologies are actually ultimately going to deliver the broadband to all the rural and remote areas in our country, whether the Virgin Islands or in the second district of Florida, which is very agrarian, and a lot of areas that are under-served. This is part cost-benefit analysis, and it is part sort of science techie analysis. I also sit on the Science, Space, and Technology Committee. We think we have some insights to share with you over there on that. Please speculate.

Ms. OTWELL. You are right. There are definitely some varying options for different technologies. However, I would, once again, restate that a lot of those futuristic technologies, some of your satellite and wireless and whatnot, those cannot handle the amount of data currently that we are looking at.

In my company alone, our average usage for our users at night has gone up more than 750 percent over the last 5 years. And that is not slowing down. It grows exponentially by the day. And so

right now, the only technology that can handle that much data is a fiber network.

Some of these other options are great for that last little bit to reach the consumer. I had mentioned that we also use some fixed wireless in some of our higher cost areas. It is a better benefit ratio. But there comes a point where you have to have that wired network to complement all of those other options. They really are complementary networks.

Mr. DUNN. I actually sat with some of the very, very large ISP providers. I don't need to name them. You know who they are. And they are hesitant to build out that. It is the cost-benefit analysis. They just don't see that they are ever going to get that investment back on fiber or wire or beamed broadband. But they do think that they have the solution in hand with satellites. There are new satellites, new cube sats, constellations of cube sats that they have already rented the launch times in Florida to put these things up.

I think that that is what you are going to see, is going to be the——

Ms. OTWELL. The only thing I would say about satellite technology, especially in these rural areas, sometimes our network is the only voice network, and that is still extremely important for public safety purposes, things like that. And with satellite, you do have issues with weather. Sometimes they have latency issues, and so we do want to keep that in mind too, that there are other things that these networks are used for that maybe some of that technology is just not quite there and can provide just yet.

Mr. DUNN. All right. Well, thank you very much. I thank all the panel.

I yield back, Mr. Chairman.

The CHAIRMAN. The gentleman yields back his time. Thank you.

Mr. O'Halleran. Tom, I am going to figure out how to say your name one of these days.

Mr. O'HALLERAN. We will talk about it. Thank you, Mr. Chairman.

Getting back to cost-benefit analysis, I guess I wasn't going to go in that direction initially, but it is the right direction to go in.

We have these urban centers all around the world, but in America especially, and then we have rural areas. And they are interdependent on one another. There is just no doubt that the urban centers need that electrical grid, they need the water, they need the natural resources that come out of these rural areas, they need the food. And the rural areas need the telemedicine. They need the quality of life issues. The urban areas need the rural areas. On the weekend, this coming weekend, we will be flocking out of Washington to get to those rural areas to relax and enjoy and hopefully have decent broadband.

But the core issue here is that there is a cost-benefit analysis on that side of the equation. The idea that this interdependency is only a one-way street that we have to look at these urban centers with large populations in order to make sure that we have benefit from the cost standpoint when it is a shared environment. And we must find a way to be able to identify that.

What I am asking is does anybody up there know of any type of studies that have been done to clearly identify this cost-benefit of

the urban environment coming out to us and our environment coming into urban all the time, and that this is a crucial area for us to invest in as a country, and the urban people get as much out of it as we do in rural Arizona? Anybody.

Ms. OTWELL. I would be happy to speak to that. I don't have it in front of me. I would be more than happy to send it to you afterwards. Last year, the Hudson Institute did a study in combination with the Foundation for Rural Service that showed just rural broadband infrastructure contributed $24 billion to the nation's economy as a whole, and that ⅔ of that actually benefited urban Americans with only ⅓ of it benefiting rural Americans.

And so just like you said, they need us; we need them. And so anything we can do, like providing adequate broadband in rural areas, everything we do to make rural areas more efficient saves money for urban Americans too. The price of milk, different commodities that come out of rural America, those efficiencies in turn help urban Americans save too.

Mr. O'HALLERAN. Ms. Otwell, I did read in your testimony, or somebody did. But the core issue to me is that we study the economic development potential and the potential of the cost to rural areas of serving that population that is coming out. The cost to the children that live in rural areas by not having the education necessary, the cost-benefit of rural areas being able to go out and compete for language teachers, doing it through telecommunications or broadband, telemedicine through broadband, instead of having to have that specialist at the hospital.

There are these benefit analysis processes that must go on, I believe, in order for us to get a true picture and thereby be able to justify the investment in broadband throughout our country. Because my district, when you take a look at Navajo at 60 percent unemployment and White Mountain at 80 percent unemployment, these are critical issues. In rural America in general, the unemployment rate is so high, much higher than in urban settings.

And so we have to find a way to balance this process in an appropriate way, and get others to recognize the need for more of a community approach to this than just, well, I have to run a line from point A to B, and here is how much it costs, and we just can't do that. It costs us all, if the quality of life of people and our ability to get people to service the infrastructure of America is lost, and these towns and cities are lost.

I open up that to anybody for discussion in 34 seconds.

Dr. HALVERSON. Well, sorry. Go ahead.

Mr. WYNN. I yield.

Dr. HALVERSON. I mean, the logic of that is very compelling, Congressman. The challenge, of course, is it is really, really hard to measure. Right? We recently produced a piece of research to try to illuminate the differences between the service provision and various infrastructure segments in rural America *versus* urban America, and we found it challenging to get data to demonstrate the case and to measure some of these things.

What you tend to get is organizations who are focused on a more micro level on their industry, their region, or what have you. I am unaware of anyone who has done this in the way that you are describing, which is kind of on a national basis, to try and come up

with some proxy for what is the value to urban America of everything they get in rural America and, therefore, that they ought to contribute in some way to paying for, which is, we would probably agree is worthy, but very, very hard to measure.

Mr. O'HALLERAN. Thank you, Mr. Chairman.

The CHAIRMAN. The gentleman's time has expired.

Mr. LaMalfa, 5 minutes.

Mr. LAMALFA. Thank you, Mr. Chairman.

Ms. Otwell, you mentioned that there are Federal proposals to accelerate the ability to do projects, and examples I have, like in the Siskiyou County in the far north part of my north Cal district, you have delays from U.S. Forest Service, for example, in starting environmental reports, because they are doing a lot of other things besides that.

For one provider, their project has already cost them a full year, and now additional delays are taking into the next year. This happens a lot. You have BLM, where there is cross jurisdiction, perhaps. Again, Forest Service, California Department of Transportation. Then you have to deal with NEPA and historic preservation compliance.

And we are not talking like we are building a dam here. We are not building a four-lane freeway. We are running some wire, maybe in a lot of cases already down in, perhaps, an existing right-of-way or something that will be buried and never seen again after we have made our initial footprint.

Do you see that some of the proposals being talked about to accelerate projects is—do you really think it would provide any true regulatory relief? Do you have any recommendations that we could build off of those to take it a little farther and be able to accelerate what people need in these areas?

Ms. OTWELL. Absolutely. Thank you, Congressman. That is a very timely question. Anything that can be done to streamline the many difference processes, especially involving areas that deal with Federal lands, would be helpful and free up resources to go back into deployment.

For example, sometimes when you are dealing with those, you are going to have to file the same type of report and reviews across many different agencies. They all have their own timeline, they all have their own processes. Anything that can streamline that would definitely be a savings, and maybe having a certain agency be a lead on that and kind of oversee the whole process.

Another thing that happens sometimes, we have duplicative reports between state and Federal levels. Sometimes, if there is a way that the Federal permit can use the state review as being useful, then that helps too.

Mr. LAMALFA. Well, we are looking at some one-stop shopping proposals. Do you see anything on the horizon already I might not be aware of that is being done administratively or other legislation that we should be aware of to get behind?

Ms. OTWELL. There are a few things. I know there was a 2015 highway bill that involved some NEPA reviews, trying to consolidate those, but they were only for projects over $200 million, which is quite a bit larger than most of our companies are doing. Some-

times, even just making sure those thresholds are low enough to benefit the small companies as well would be very helpful.

Mr. LAMALFA. Yes. A tiny threshold maybe would be good here, because these seem like pretty low impact, low footprint projects we are talking about.

Mr. Wynn, kind of a similar line with you here on this, is that you mentioned that reform priority, NEPA, ESA. And we are going to have a pretty good look at ESA this week as well. Would significant reform help stretch the dollars significantly further for infrastructure funding? With the limited funds we have available, do you see these hangups being actually very costly in getting them accomplished?

Mr. WYNN. Yes. Congressman, they are costly in terms of lost opportunities that we otherwise would have if those were not there. So the short answer is yes.

Mr. LAMALFA. Not necessarily the building of the infrastructure, but just blowing up the idea, people look at it and throw their hands up and say——

Mr. WYNN. In our world, yes, there are costs. And some of those regulations are really driving us towards private sources of funding because of the overhead burden that is there, the need for engineers to come in and do the inspections even after the fact.

We think there are some real costs involved that——

Mr. LAMALFA. What would be one or two things you would like us to get done in that area, if we could? One NEPA, or what would it be?

Mr. WYNN. Well, really, just recognizing the nature of our business. We are electric cooperatives that really don't have a profit motive at all. We are governed by people we serve. Just the model itself really can alleviate some of the concerns that may be there that we are not going to intentionally do something that would hurt our neighbor if you would. I think we just really should be taking a new look at the motive behind some of the regulations in the beginning and realizing that the threat that might have been feared is not there any longer.

Mr. LAMALFA. Bring them back to the original mission?

Mr. WYNN. That is right.

Mr. LAMALFA. Okay. Thank you, panelists.

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

The CHAIRMAN. The gentleman's time has expired.

Ms. Lujan Grisham, 5 minutes.

Ms. LUJAN GRISHAM. Thank you, Mr. Chairman, and thank you for this hearing today.

Ms. Otwell, the Federal Government has historically played a major role in the expansion of all major technology advances in communications. Whether it is electricity or radio, the telephone, the Federal Government has certainly made these technologies ubiquitous throughout the country.

And, well, it feels a little bit awkward to say this, given that I have been talking about broadband since, it seems like, laying fiber was invented. Clearly, for rural America, it is the next frontier. And unless we get that done, we are not going to be able to support, not only our rural communities, but I would submit that even in ag, narrowing it completely, just the advances now in dairy

farming, where quite literally we have dairy cattle wearing pedometers and computer technology figuring out when these cows are ovulating, and they are having a huge increase in the success rates of fertilization for their herds by using technology.

Interestingly enough, where we have some of the largest dairies in the country, we can't access any of this technology in a routine and productive manner. And when we talk about innovations in ag communities, we know that most of these large ag enterprises are, thank goodness, are in rural America and providing incredible economic footprints as well as feeding the world. But they can't take advantage of those innovations and the work that we invest in, in other titles in the farm bill unless we deal with broadband.

And my colleague, Congressman Scott, he actually stole my question, because I spent 30 years working in state government on and off, and the big issue about any technology investments through government was that the accountability aspects, we would be promised a product, we would be promised that this would happen in this way, that would not occur. We would spend billions of dollars and folks would feel a bit as if we are not understanding technology in the way that makes it reasonable for a lot of stakeholders or folks who are doing that contract work or competitive review or accountability, perhaps we shouldn't be investing anymore. And the problem is, of course, that is not right and, at least in my opinion, that gets you nowhere.

You started to talk about accountability. What could we do in addition that makes it very clear that getting broadband everywhere it needs to be should be a priority and should be in the farm bill, making sure that states like mine, where you heard them refer to the Navajo Nation, 90 percent of the Navajo Nation has no access to the Internet, 90 percent.

We have to get that addressed, and they are a huge ag producer. What else can we be doing?

Ms. OTWELL. Thank you, Congresswoman. I appreciate the question. To be perfectly honest with you, for the community-based rural carriers that have served some of those most rural areas, we have just undergone the reform to address some of those sparsest areas. However, the funding is not there for the mechanism.

We have actual numbers for how much it is unfunded. You can see the investment that rural broadband deployers want to put in but simply can't because it is not there.

Ms. LUJAN GRISHAM. But I want to make that case for you. I agree with you.

Ms. OTWELL. Yes.

Ms. LUJAN GRISHAM. What would I tell my colleagues about making sure that the investments that we could put into the farm bill would be carried out in the most effective, reasonable, and accountable manner, given that, I would guess, there is not a single Member who hasn't felt like some stakeholder in a technology investment at government didn't exactly get what we thought we were going to get and yet spent a ton of money? Any specific ideas that we could advocate for that, because I feel like the farm bill is one of the most accountable efforts in terms of a private-public partnership to advance the issues that we think are a priority, including rural economic development.

Is there anything specific for you, or anybody on the panel, that we could contemplate to create that balance, and then maybe provide an incentive for more funding as a result?

Ms. OTWELL. I think just pushing those that have worked on these mechanisms to fund them, that accountability is there, the targeted funds to build those targeted locations is there.

There was a letter that many of the Committee Members signed to the FCC earlier this year talking about that lack of funding, impressing upon them to put the funding there, to put these reforms into action, because it will build broadband.

Ms. LUJAN GRISHAM. Thank you. I yield back.

The CHAIRMAN. The gentlelady's time has expired.

Chairman Lucas for 5 minutes.

Mr. LUCAS. Thank you, Mr. Chairman.

Dr. Coon, in your comments, you noted that the land-grant universities, and I would be remiss if I don't remind everyone the miracle and the wonder of the Morrill Act of 1862, and the 1862 land-grants, and the 1890 land-grants, and the 1994 facilities. That opportunity for the first time truly in the history of the world for anyone with enough effort, enough energy, and some smarts to be able to secure a college education. Just an amazing thing, the land-grant universities.

But you mentioned the $29 billion replacement value of the infrastructure of these facilities and the $8 billion in deferred maintenance that we face now. Could you expand for a moment on what kind of things we are talking about that $8 billion would go to? And would you explain how that would help facilitate researchers, students, and the industries that utilize all this information that is developed?

Dr. COON. Well, thank you, Congressman. I appreciate your loyalty to the land-grant system and share your respect for it.

Where we find ourselves is we need to look at ways of solving the problem without simply going out and saying we are going to spend $8.4 billion. Because the kind of facilities—let me use it as an example from Oklahoma State. We have a dairy barn. It is a beautiful dairy barn built in the 1940s. And gorgeous design and so on. Our Holsteins don't fit in it. It was built for Jerseys. Our Jerseys would probably fit in it, but they wouldn't stay in it today if we tried to put them there. And it is this gorgeous wooden roof that has no protection or prevention for a fire. And so to go in and make that a useable facility, we would spend millions of dollars to put sprinklers in and so on and so forth, and end up with a substandard facility.

In cases like that, we are better off to do what we are doing, which is to build a new free stall barn at a lot lower cost that is going to last for a long time. Some of it is simply replace it. But the rest of it is to, as I said, to be more diligent in ourselves in using our finances to make sure that we are taking care of the facilities. And no one wants to spend money on that, because it isn't glitzy and it doesn't get the attention of the public. But, the bottom line is it is good stewardship, and that is what we need to take on.

Mr. LUCAS. And those facilities enable the scientists, who are also professors and teachers, working with the undergraduate and graduate students to do their work.

Expand on that for just a moment. Sometimes we forget that land-grants are a hands-on experience.

Dr. COON. Absolutely. Well, one of the great risks that I fear is if we don't address this adequately, we are going to continue to lose our most valuable faculty, our greatest expertise, either to the private-sector, or it may be we are stealing each other's best, perhaps from one university to another. But what that means is that we no longer have that expert on our campus teaching students, either graduate students or undergraduates. In other words, we are not creating the next generation of scientists.

And so it is important to have the research done. But in the process of conducting that research, we are also building in the sustainability of this whole approach to agriculture that we created beginning in 1862, where research is what is driving innovation in agriculture.

Mr. LUCAS. I was late this morning, slightly, because a number of us from the Financial Services Committee had gone down to the Federal Reserve Board to visit with the Chair and the Vice Chair and one the Governors. And we got into a discussion about productivity and the decrease in the rate of productivity improvement in this country in the last 20 years. And the bottom line from their research department was, essentially, we weren't investing with the intensity we had in the previous decades or century, and that this dramatic increase in productivity, which is how you increase people's standards of living. They produce more. You don't run faster. You work more efficient with more efficient processes, that we were entering a point where, through lack of investment, that rate of productivity was slowing in comparison to the rest of the world, and that, if we were going to increase the standard of living, we had to enhance that, which tees off quite well in what you are describing about continuing the mission.

Because there will come a time, correct, as you just noted, where if we don't invest enough, and that infrastructure, both physical and intellectual, will go away, and we will never catch up once we are behind the curve.

Dr. COON. Well, as you know, we have a fantastic wheat breeder, Dr. Brett Carver, who heads up our wheat improvement team, and he puts up with some really ugly facilities.

Mr. LUCAS. He could work on any of four continents if he wanted to go somewhere.

Dr. COON. Yes, he could. He could go anywhere in the world and be paid a lot more than we are paying him. Don't let him know that I said that.

But, the point is he will probably stay with us. And I am going to do everything I can to make sure he has great facilities. He will probably stay with us. But who is going to follow him? How do we replace him if we don't have any better facilities than we have today?

Mr. LUCAS. Thank you, Mr. Chairman.

The CHAIRMAN. The gentleman's time has expired.

Ms. Kuster, 5 minutes.

Ms. KUSTER. Thank you, Chairman Conaway. And thank you for this hearing on rural America. We appreciate it.

Most of you have spoken about conditions that are very familiar to me in New Hampshire and rural New England. And we have talked about all of these things in the 4½ years that I have been in Congress, and made some good progress on red-listed roads and bridges, replacing aging municipal water systems, modernizing our electrical grid, and expanding broadband access to our rural communities.

But I want to focus in on the broadband, because that has been of particular concern to regions of my district. According to the FCC 2016 *Broadband Progress Report,* there are over 99,000 Granite Staters who live without access to fixed advanced telecommunications capability. And a lack of broadband infrastructure has had significant consequences for those rural regions of the state. When the rural markets go unserved, companies are less likely to relocate and invest in new jobs. Housing prices are now depressed because of lack of access. Schools are burdened with costs and hospitals are less likely to use innovative telemedicine.

My question is for Jennifer Otwell. In your testimony, you referred to the importance of the Universal Service Fund and how it relates to Federal loans and grants by small telecom providers. Can you explain why it is so important and what effects the current shortfalls in the budget are having on small telecom providers in rural communities?

Ms. OTWELL. Absolutely. Thank you, Congresswoman. The Universal Service Fund is what allows our company to make the business case to have those networks in the high-cost rural areas in the first place. If we only have 3.4 customers per square mile, those customers themselves cannot pay enough, or should not have to pay enough to make those networks feasible. While we have programs like RUS and companies like CoBank and RTFC that provide the capital to make that initial investment, the loan programs that allow us to make those very finance-heavy investments, we really need that predictable sustainable USF support to make the business case for it to be there in the first place.

Ms. KUSTER. My question is what can we do in a bipartisan way? And in particular, do we need to change how the USF collects fees? And I am concerned about what is going to happen to rural broadband deployment if the high-cost budget doesn't change.

Ms. OTWELL. You and me both. That is a very good question. There are proposals out there to start thinking about contributions and who is contributing to the fund. Those are very pressing questions that the FCC needs to work through, and we need Congress to continue to press them to work through those issues.

Ms. KUSTER. Thank you.

Now this is a question for Curtis Wynn. Can you share with us a bit what the increased adoption of distributed energy resources, like wind or solar, is doing in your system? I know you have community solar. And if you could talk about your investments for the future, are you considering distributed energy in future investments?

Mr. WYNN. Yes, Congresswoman. We are, in North Carolina, really embracing this whole concept or movement, if you will, of distributed energy resources. We are investing, as you mentioned, in the community solar projects. There are several in the state

where, if you look at it from the standpoint of how it gets the availability of solar to every person who wants it, whether they are a renter or they live in an area that has trees that can't get to the sun, it is available through a model that has been pretty creative and very effective. So that has been one area.

But as in terms of the impact, it is another source of power, is the way we look at it. And how it fits into the grid is very important, and we are making the adjustments. Because the traditional way that the grid was built was basically not designed to have the fluctuation and power sources coming as they are. But that is not an excuse. That is just a reality of how things are going. And we are making adjustments.

As a matter of fact, in my testimony I mentioned that we have a microgrid project that is an experimentation opportunity for us to see how it can be more fully deployed throughout the whole state with other systems, and across the nation, because it actually is a collaboration between our national association and our state G&T.

Ms. KUSTER. Well, I just want to give a shout-out to a wonderful project in my district, the Town of Peterborough, New Hampshire, where they took a water treatment facility that had big ponds, and they used USDA funding for a much more efficient tertiary water treatment plant, and then they took the 7 acres where the ponds had been and filled it in and covered the whole thing with solar. And the whole town is using it. It is great.

Thank you. I yield back.

The CHAIRMAN. The gentlelady's time has expired.

Mr. Yoho.

Mr. YOHO. Thank you, Mr. Chairman. Thank you all for enduring a long hearing, and we appreciate you being here.

I would like to expound on what Chairman Lucas was talking about. But before that, I want to mention what Congressman Crawford said about the horse. Buying the horse is the cheap part. Being a veterinarian, I know that. And that is the easy part.

I want to start with you, Dr. Coon. With the land-grant universities, and I hail from Florida, University of Florida, Double Gator. And they're great facilities. I mean, it is a marvel. I went to vet school there. Their vet school would put a lot of human hospitals to shame. Great facility. And then we met with the director of IFAS, and he was talking about they need more facilities, and we have to build them. And yet they are complaining about the maintenance of maintaining them. And so I want to praise my university, and I am going to pick on them a little bit, because I know this applies to all universities in the land-grant situation.

When we put these infrastructures in, sometimes they become a Taj Mahal. And they are looking at expanding a research facility. We were just down there on an ag tour. And they were talking about the new research facility that they are going to put in, state of the art. But I worry about the maintenance of this.

And so when you put in a project, what do you do for long-term maintenance? And before you answer that, I want to add that I was talking to somebody that is in charge of a municipality, their infrastructure as far as their water, wastewater. And I asked them, I said, "What do you build into the project to take care of it, for

the maintenance and replacement 10, 15, 20 years down the road?" He shocked me because he says, "Oh, we don't plan on that."

When you guys design something, as you are the association for public land-grants, when you sit down and you are into your think tanks and you are talking to people, yes, build this nice facility, but where is the funding for the maintenance? Because where we are at today, and Chairman Lucas brought this up, the competitiveness and the productivity of what we have today is based on what we invested in 150 years ago, and now we are at the point where we haven't kept up with that. How do we get beyond that for the next generation so that your top researcher stays at your university and that it invites the new ones?

What is your recommendations on that?

Dr. COON. Well, thank you, Congressman. We talked about this in one of the reports that preceded this. And that was that, basically, if you are going to get Federal funds, you need to have a stewardship plan as part of the proposal. In other words, to answer your question, before you ever are granted the funds. It is a best practice that we have shirked, and just as the fellow you talked with perhaps may have in the water treatment system. We need to build it in at the beginning.

And one of the ways that we are already doing that is, if someone comes to us and says they want to give us land, but they want us to keep it forever so that it doesn't get developed, and so on and so forth, that is great. And what we say to them is, we will do that under one condition: Provide us an endowment that will cover those maintenance costs. We need to do the same with anything we build.

Mr. YOHO. Let me ask you about that, because I know some of these universities are sitting on a billion or billions of dollars endowment. The question that I have here is what are some of the ways that the institutions are looking beyond Federal appropriations to modernize the facilities and equipment? Keep in mind where we are as a nation. We are at $20 trillion in debt. And we have to bend that cost curve or this is going to get worse next year and the next year.

Go ahead.

Dr. COON. For one thing, it is always going to be a mixed package. Federal funds are part of it. They are never going to be the whole package. State funds have to be part of it, university funds and others. If it involves teaching, student fees end up coming in and helping to cover it as well. Philanthropy is huge. It is big part of it, certainly for us and for a lot of universities.

That is part of the mixed package, I guess, but the opportunity here at the Federal level is to use Federal funds to bring that other money. In other words, to make it contingent. You only get the Federal funds if you are able to match it with these other sources.

Mr. YOHO. I am going to move on to another question. I am running out of time.

Ms. Otwell, so many times we can bring the infrastructure, the rural broadband, so far. How do you go that last mile? What is the best way to go? Because, as you said, you might have one or two people per square mile. Who should be responsible for that? And

is there a smarter way to do it? And then keeping in mind 20 year replacement or maintenance of that.

We have 20 seconds.

Ms. OTWELL. Okay. Exactly. We are looking to put in future-proof networks as much as possible. If you are going to go through putting in a piece of fiber into the ground, you want it to be what will last for 20, 30 years. Some of those older networks, there is really not a midrange network. The older networks, they are already almost obsolete for what we are going to need them for in just a few years. There are different technologies. You almost always need that fiber——

Mr. YOHO. I am out of time, and I will reach out to you. Thank you, ma'am, because I want to follow up.

The CHAIRMAN. The gentleman's time has expired.

Mr. Soto, 5 minutes.

Mr. SOTO. Thank you, Mr. Chairman.

I have the honor of representing central Florida on citrus and cattle country. We, in the citrus areas, are facing a huge crisis with citrus greening. Over 70 percent of our production is down from peak production. And as we are developing resistant rootstocks that are currently about to be deployed, we are going to need an ability to be able to get these out into the field quite a bit.

And I want to thank you, Dr. Halverson, you and CoBank, for your partnership with our citrus producers.

If we were able to get out a lot of these resistant rootstocks, are you prepared, with your bank, to work with our growers and government to help really deploy these, even if they are semi-resistant in getting us closer to addressing this great crisis?

Dr. HALVERSON. Absolutely, we are. I mean, that is really why the Farm Credit System is here, to support agriculture. There are risks, obviously, associated with that, and the industry is facing some really catastrophic difficulties. We will absolutely be able and willing to support the growers through other Farm Credit Association institutions that will lend directly to the growers but also to the co-ops as well.

Mr. SOTO. Well, as we continue on our quest for the resistant-proof, citrus greening rootstock, in the meantime, there are a lot of good strains that are being developed right now.

The second thing I would like to talk about is organics. As we know, investments in infrastructure are key to spurring more production of organics, including organic grain. And since it has to be processed in a facility that is certified to handle organic products, it could require a lot of investment in infrastructure.

How can CoBank and other of our ag lenders help with these organic hotspots to bring more opportunities to our rural economy?

Dr. HALVERSON. Well, there is clearly a lot of dynamic change going on in agricultural production. Organic production is a part of that. And without getting into too much detail about the mechanisms and mechanics of becoming organically certified and otherwise, we, the Farm Credit System, we, CoBank, we finance everybody. We finance organic producers, and non-organic producers.

What I would say, as you know, we are delighted to be focused and have the Committee's attention as well focused on infrastructure, because whether you are an organic producer or not an or-

ganic producer, all of these producers are going to benefit from the type of quality of infrastructure that we are focused on providing for them.

Mr. SOTO. Well, I would strongly encourage you all to consider pilot programs on the subject, being that the profit margins are pretty good, and they really bode well for the future of our American farmers.

Turning next, this Committee is about new infrastructure, which is really an opportunity in rural America. And I know that our national rural electric cooperatives are really leading the way in renewable energy.

And, Mr. Wynn, you may be familiar of the Town of Clewiston in Florida, which is run predominantly by bagasse, which is a byproduct of sugar. Where are we with renewables and going forward? How key is that going to be in delivering energy in our rural communities?

Mr. WYNN. I think you said it in terms of its deployment. NRECA and its member systems have been very aggressive in many ways and very proactive in terms of deploying renewable energy. Many of our cooperatives are developing systems on their utility lines to help to modernize the system, help them become more resilient. We have really embraced that. It is conceived as a part of our future, and we are embracing that.

Mr. SOTO. Well, I strongly encourage you to consider continuing doing that, whether it be biofuels through byproducts of commodities that aren't used, whether it be hydroelectric or solar, these are all great opportunities for areas that may not have access to other sources.

And I want to end with you, Ms. Otwell. We have certain fields in Florida where they have WiFi to be able to measure how tall a crop is, or sensors to develop when they need to have more water nutrients. Do we have that capability now in most of our farms, based upon our broadband access to really have those types of high-tech opportunities available?

Ms. OTWELL. Absolutely. And we are trying to build to as many farms as we possibly can. And with the fully funded USF budget, we will have the ability to make those investments, knowing that there is a business case to build out to the most rural farms in those areas.

Mr. SOTO. Thank you, and I yield back.

The CHAIRMAN. The gentleman yields back.

Mr. Thompson, 5 minutes.

Mr. THOMPSON. Thank you, Mr. Chairman, and thanks for this important hearing as well, looking at the state of infrastructure in rural America.

Mr. Macmanus, I have a close working relationship with the Pennsylvania Rural Water Association. I appreciate what you all do at the state level, and certainly our National Rural Water Association. When we talk, especially potable water, we kind of hear about some cities that have had some issues. But, I know when some of my townships and boroughs are replacing water lines, we are still finding some wooden water lines.

And so my question for you is you recommended allowing not-for-profit organizations to take over some of the non-inherently govern-

mental activities and functions of USDA. What activities are you talking about, and how would this suggestion improve the ability of systems like yours to build infrastructure and serve our rate payers?

Mr. MACMANUS. I have been doing USDA rural development and loan and grant applications for 17 years at East Rio Hondo, and I can tell you the most difficult part is the bureaucracy of the waiting process of the back and forth between the funding agency and the entity. And what we are proposing is that nonprofits would be able to do the loan processing and servicing functions that is difficult, in particular for small communities, to follow the process.

And I mentioned in my testimony *Attachment C,* the 90 points that the individual systems have to do on the checklist. I think it is greatly beneficial. If you had an individual whose sole function in life was to help the system and the USDA employees that are processing the loans to get a complete package from the applicant initially up front and then to push that through with the USDA employees, that is the exact type of assistance we are talking about. Hands-on, checking the list off with the customer, the applicant, and then helping the USDA employee verify their end of it as well.

Mr. THOMPSON. Thank you.

On the theme of bureaucracy, and how that impacts on infrastructure, I had the opportunity to go to the White House last week for a small luncheon, bipartisan, but it was on infrastructure. Really pleased to hear the White House. The President is committed to make sure that there is some type of rural title within that, which was outstanding. I know Secretary Perdue has done a lot of work with that.

But it was interesting to me that the numbers, where the Federal Government owns, if you want to put it that way, about eight percent of infrastructure. We fund 12 to 14 percent of it. But we permit 100 percent of infrastructure.

And the countries like Australia, which is pretty green actually, in their infrastructure, is my understanding, they have reduced their permitting time down to 18 months, a considerable economic activity that it has increased. Our average for this country is 10 years, not 1½ years.

And so my question, just a broad question. When it comes to infrastructure in rural America, and Ms. Otwell already outlined some strategies on how to do this without really cutting any, without compromising the environment. How important is this in terms of the infrastructure in rural America? What would it mean for you or your members if we were able to get the permitting streamlined, get it closer to Australia *versus* our current 10 years?

I will just throw that open to whoever would like to respond.

Ms. OTWELL. I'm sorry. Go ahead.

One thing for our companies, the less time and energy and resources we have to spend on permitting for multiple agencies and on individual basis, the more time we have to build broadband.

Mr. THOMPSON. Mr. Macmanus?

Mr. MACMANUS. And I would add, Congressman, when you have identified a need in your system, you need the infrastructure. The faster you can get that built, the less the inflation factor of your

identified cost is going to have on eating away at what you are applying for. If you are sitting, waiting, because of permitting and other issues, the money that you are trying to apply for is not going to be sufficient by the time you get to construction. You are going to have to turn around and apply for another loan or whatever it may be to find that additional financing to actually complete the project if there is a long delay in the permitting. It has a direct impact on the end-user on the cost that they will end up paying for the project itself.

Mr. THOMPSON. Dr. Halverson, I appreciate CoBank and Farm Credit. I appreciate in your testimony you had about the role of both with our rural critical access hospitals. I mean, we have had 80 rural hospitals close since 2010. Part of that is just dealing with the bureaucratic cost inefficiencies. And so I am out of time, but I just want to say I appreciate the role that both CoBank and Farm Credit has played. Because if we don't have those facilities in our rural communities, I don't care how you pay for healthcare, we don't have access to healthcare. So thank you.

The CHAIRMAN. The gentleman's time has expired.

Mr. Costa, 5 minutes.

Mr. COSTA. Thank you very much, Mr. Chairman. I think this is a very important conversation. I thank the Chairman and the Ranking Member for holding this hearing.

A lot has been discussed about broadband. I am not going to go back over that area. Obviously, it is important. Transportation, access to our markets to move our farm products to where they need to go is clearly critical, not only for our population centers, but also for our export purposes. Water has been discussed earlier. It seems to me the focus of the discussion, though, on water has been more as it relates to local water quality issues and water access to rural communities.

I don't know that any of you have touched upon the notion possibly in this effort to develop a bipartisan, big infrastructure investment in America that we are considering water projects that have been so important to the West for generations. I am talking about major water projects to investing and using, not only investments in reservoirs, but the kinds of investments that we might see in groundwater recharge and using all the water management tools in our water toolbox to take advantage of the changes that are occurring.

What I would like to ask the witnesses is—let's say that we come together with—the President's talked about $1+ trillion package, and we are still grappling on how we finance that. But it seems to me that the rural component is going to be some part of it, if we are successful. Now, is it going to be 20 percent of it, 25 percent of it? I know this Committee would like to, obviously, put our stake out there in terms of what we think is appropriate for rural America. That often gets overlooked. I would like you to respond to that.

I would also like you to respond to the notion of leveraging. We have a number of localities, either counties, communities, service districts, that put together financing to help deal with their water needs, their infrastructure needs. Are there transportation needs? States that have put up significant money that have skin in the game.

One of the ways that we always finance projects here is Federal, state, and local funding. Are we going to acknowledge and reward those localities or those states that already are making investments so that we can further leverage the potential of this infrastructure package?

Who would like to address those basic concepts? Because, I mean, we all have our wish list. And then finally, how do we prioritize? Because we all have our wish list, but how do we prioritize where the greatest needs are for rural America, knowing that transportation, water, and communications, *i.e.,* broadband and others are critical needs.

Dr. COON. So thank you, Congressman. There is a lot to cover there, and I promise I won't try to do it all.

But, in terms of the investment and attracting other money, leveraging money, part of it is thinking about what is it that attracts private capital, for example. And generally, it is the promise of a return on that investment. And so the public-private partnerships that work very well in other sectors, could they apply here? Are there applications, whether it is, perhaps, with irrigation projects, like you have suggested, or others where there is something to be earned over the long-term that would justify private investment in those projects. That is one example.

And as I said earlier, one of the things is whatever Federal funds come, they really need to be tied to other sources of funding or the Federal money doesn't come.

Mr. COSTA. Should we reward states and localities that already have skin in the game as we construct the package?

Dr. COON. Absolutely.

Mr. COSTA. How do we prioritize?

Mr. CALHOUN. If I could, I think that is a difficult question, because I guarantee you, if you went around to 20 people and said let's prioritize where the project should go, you are going to get 20 different answers.

Mr. COSTA. I know it is difficult.

And I don't want to end up with just a political response in the legislation, hopefully, we come together with, because we know how the political responses usually get handled.

Mr. CALHOUN. Well, I would look to get answers from your constituents and then try to get a group like this to come together and try to make that prioritization, because if we went around here today and you saw all the questions that were asked——

Mr. COSTA. No. And the needs are going to be far greater than what we are funding that with, or we will be able to come up with.

Mr. CALHOUN. Absolutely.

Mr. COSTA. And that is why it is important to prioritize based upon some sort of criteria that makes sense.

Mr. CALHOUN. Yes. I am not sure I can tell you what that criteria is.

The CHAIRMAN. The gentleman's time has expired.

Mr. Bost for 5 minutes.

Mr. BOST. Thank you, Mr. Chairman.

Mr. Calhoun, in your opening testimony, you referred to the need to fund 25 different inland waterway modernization projects. Can you tell us, the Committee, where those are, where they are lo-

cated, what benefits they will have as the bottom line, and for the shippers, that use the waterways?

Mr. CALHOUN. Certainly. The 25 projects are projects that have been authorized but not appropriated by Congress over the years. A number of years ago, the Inland Waterway Users Board came together with the Corps of Engineers and tried to prioritize these projects in the order of importance based on a criteria of risk of failure, where the greatest economic benefit was to the nation. A number of different criteria. And that list at the time was developed at a point in time, and, of course, as time changes, that list could change too. But that is where the list came from. And it is all over the system. It is in the Gulf regions. It is in the upper Midwest. It is in the Pittsburgh area. It is all over the navigable system.

Mr. BOST. Could you elaborate a little bit on the importance of the Federal and non-Federal levee systems, and I will tell you where I am going with this, but as far as navigation and the importance of flood protection?

Mr. CALHOUN. Well, navigation is just one of the values of the inland waterway system. Certainly, flood protection, irrigation, water use. We talked about water use, in California you pay for water. You don't pay for water off the Mississippi River.

Mr. BOST. Right.

Mr. CALHOUN. There are a number of different beneficiaries. The problem we have had funding the river, historically, is only one of the beneficiaries pays anything into the trust fund, which is why the trust fund is low today.

There are a lot of beneficiaries. And the trick has been, how do you charge someone on the other side of the levee for having that levee there? And when you talk about privatizing the locks, how do you charge recreational boaters for using it, for the improvement on the value of the real estate? Municipalities don't pay for water. There is a lot of value being created, but nobody is being charged. And for the first 200 years in the nation, nobody was charged anything.

It is a more recent trend that we want to try to have the users pay that back. But so far, we have only identified one user that we have been able to tax.

Mr. BOST. Right.

Dr. Halverson, as a follow-up to the question I just asked on the importance of levees. In Illinois, the Len Small levee in my district is a non-Federal levee that was breached, what they refer to as the holiday flood of 2015 and 2016. Let me tell you, it was no holiday.

Dr. HALVERSON. I imagine.

Mr. BOST. There is a mile-wide gap in this levee now. And this leaves about 38,000 acres of productive farmland in several rural communities without any flood protection.

Would Farm Credit, or any other lender, for that matter, engage with a levee district to finance a reconstruction of the non-Federal levees in the absence of any involvement with the Army Corps of Engineers?

Dr. HALVERSON. That is a very good question. I can't tell you the answer, off the top of my head. I would give you a commitment that we will go and research that and come back to you in writing.

Mr. BOST. We are trying desperately to figure out the damage, as a matter of fact, one reason why I wasn't here earlier is we were in Transportation dealing with the Army Corps specifically on this, because if we don't get that one repaired, it is not only for the farmland, but also for navigational purposes. Because if you look at the State of Illinois and you go down to the bottom, there is a place where the river bends like this. It is actually called the Dogtooth Bend. It is about 17 miles around. Drops 12′ in that 17 miles. If that levee is not replaced, it is already cut better than a mile of the 3 miles across, and navigation from New Orleans to the Great Lakes will be stopped.

And so we are trying desperately to express how important it is to put the protection back in place. And it is amazing when dealing with bureaucracies how we can't get things done.

Thank you, Mr. Chairman. I yield back.

The CHAIRMAN. The gentleman yields back.

Mr. Lawson, 5 minutes.

Mr. LAWSON. Thank you, Mr. Chairman. And a welcome to the Committee. When I left the Committee, you all were talking about the tremendous amount of infrastructure research that the land-grant institution had such a backlog. I want to ask a question about that.

But I was deeply concerned about the co-ops, because I can recall, when I was growing up in the rural areas, when we first got electricity, my brother and I stayed up all night trying to see what was going to happen with that light, but it never did go out. And so that was very interesting.

But my question today centers around there are 1,000 people that are moving to Florida a day. And we are told that a lot of these people now, they wanted to be on the coastline, but now they are moving into rural areas where they are going to be served by co-ops.

My question will be what kind of pressure does this put on electric co-ops, Mr. Wynn? Because if that many people come in, and Florida is now the third largest state in terms of population in America, but it is going to put a considerable amount of pressure on co-ops. How are they going to be able to handle it?

Mr. WYNN. Well, we are welcoming growth from most co-ops. I know many of us don't get an opportunity to see growth. I know the ones in Florida are experiencing that. But the good thing about it is that the good news is that we have access to capital, which is the biggest restraint that we would probably run into in terms of getting people to build the lines. That is something that we can always do. But, fortunately, we have three very good sources of capital. CoBank is one, RUS is the other, and CFC is another. And then there are syndications that can happen to bring other people to the table to do the financing.

I don't really see many barriers, barriers to the growth, but it is certainly something that can be managed and has been managed in other areas.

Mr. LAWSON. Okay. And I guess the question would be with the President's proposal to cut back on rural funding, serving in the Florida Legislature for a number of years, roundabout 28 years, House and Senate, one of the greatest things that, when the gavel

went down, that we carry back were water projects. Water projects from these local governments in those areas, which I had about 13 rural counties that I was serving in. Water projects meant everything to him.

And so when they are doing this farm bill, and I know the Chairman here, and they probably referred to it, it would be just devastating to cut back on water projects for rural areas. And if you have already talked about it, I don't think there is enough talking that we can do about it. I would ask Dr. Halverson, will you comment on that.

Dr. HALVERSON. Well, I would share your focus and your concern, Representative Lawson. I refer to my testimony, the fact that there is somewhere in the ZIP Code of $190 billion worth of investment required in refurbishing and reinvesting in the nation's water infrastructure. That number gets bigger every day, not smaller. It is a deferred maintenance bill.

We are making contributions as CoBank and the Farm Credit System. We would like to do more, but we can only make a small dent in what is a very large total requirement there. But we are very passionately committed to doing so, and that is why we are so encouraged by the Committee's interest in moving this forward and expanding that activity.

Mr. LAWSON. Okay. Thank you.

And, Dr. Coon, I have limited time left. And you might have mentioned it. I caught the back end when I was going to the other committee. What are universities doing to try to make up for all of the infrastructure backlog that they have in terms of research?

Dr. COON. We are looking for help everywhere we can get it. Basically, it ends up being pretty much crisis management. If we have freezers that go down, we have to go and address that right away. And so that takes our attention away from whatever else we might have been doing. We really need to step back and develop more complete plans that are more sustainable than the current reactionary mode that we are operating in.

Mr. LAWSON. Okay. Thank you.

Mr. Chairman, I yield back.

I know one thing, in your closing argument if you could say, how does this relate with our competition with other countries.

The CHAIRMAN. Thank you. The gentleman yields back.

Mr. Arrington, do you have questions?

Mr. ARRINGTON. Thank you, Mr. Chairman. I do.

The CHAIRMAN. Five minutes.

Mr. ARRINGTON. Thank you all for coming. And we have a budget markup today. I apologize for coming in late.

But Ports-to-Plains is a transportation infrastructure initiative to enhance and expand transportation in middle America, essentially from Texas to Canada. Probably most of you are familiar with it. And, again, I apologize if I am making you repeat yourself. But talk about initiatives like Ports-to-Plains and the transportation infrastructure and how important that is, and how would you rank that, and what thoughts do you have, strategically, on that component of sustainable rural communities in getting our food, fuel, and fiber to market?

And anybody can take the question. Whoever wants to volunteer first.

Mr. Calhoun, they seem to think you have the answer to this.

Mr. CALHOUN. Well, that was a draft, by the way. I don't know I volunteered.

But I am not familiar with the initiative that you are speaking about, which is why I didn't volunteer. But, one of the things when we talk about the inland waterways, one of the problems that we face is we are not actually under the jurisdiction of the Transportation Department. It comes under the Army Corps of Engineers. It is handled in a different fashion.

When you talk about the things that I talked about today, that we have talked a lot about, broadband and everything else, but just physically the roads and bridges to get around this country, which are getting old and dilapidated and in need of fixing up. There is a large job to do, and it needs to be done in a coordinated fashion as much as we can. I don't know that I answered your question.

Mr. ARRINGTON. Yes. No. That is great.

Dr. HALVERSON. I would just supplement that by saying the Administration is very focused on international trade and our trade balance and the like. And agriculture is one of the biggest single positive contributors to the trade balance and the current account balance of the United States for many, many years. That looks likely to be the case in the future, provided we can continue to innovate and continue to invest in our backlog of infrastructure weaknesses.

We need to be able to get our agricultural production from the farm gate to a waterway. And ultimately, ¼ to ⅓ of all of our agricultural production gets exported to foreign markets. It is vitally important. And it is why the Rebuild Rural Coalition is very, very focused on it, because our long-term trade, our long-term competitiveness for rural America and the quality of life is very dependent on our ability to get our products to the marketplace.

Mr. CALHOUN. Yes. Last year, the U.S. ag exports, they contributed $21.5 billion to the balance of trade. And trade is very important to this country. And as I mentioned in my remarks, feeding a growing world is going to be very important to this country. And you cannot do it without the infrastructure.

And the other thing that we haven't talked about here much today is just the length of time it takes to build this infrastructure and get to where we need to be. Some of these projects, particularly on the inland waterway system, have taken 10, 15, 20 years to build. And then the permitting process before that. If you start today, you are not going to be done for a decade. And we just can't afford to delay this process any longer.

Mr. ARRINGTON. Thanks again for your time.

And, Mr. Chairman, I yield back.

The CHAIRMAN. The gentleman yields back his time.

Thank you all.

Dr. Halverson, given the role that the Rebuild Rural Coalition had in putting the panel together today, would you give us a couple of seconds or a couple of sentences on how you have been doing with that coalition? And are you worried that partisan politics

might creep into what you are trying to do and accomplish? And if that is the case, what are you doing to try to avoid that?

Dr. HALVERSON. Thank you, Mr. Chairman. We have been serving in a, call it a convening capacity for that coalition. We are deeply excited and enthusiastic about the fact that we have been able to convene such a broad and deep group of institutions around what others have said should be and hopefully will be a relatively bipartisan agenda. There is seemingly, not a lot of things people can agree on these days, particularly here. We are hopeful and optimistic, based on the dialogue we are having within that coalition, that this is a bipartisan consensus.

The devil is in the details, and there will be challenges ahead if we get legislation or an ability to mobilize some of the resources that everybody is interested in and addressing the question that Mr. Costa asked, which is how do you allocate that and so forth? But hopefully, that good old fashioned allocation mechanism that Congress has been familiar with for over 200 years can be digested in a relatively nonpartisan way. And we are hopeful and optimistic, and we will do everything within that coalition to support your efforts in that regard.

The CHAIRMAN. Well, thank you very much. I appreciate that. Thank you for what the coalition is doing and the impact that you are going to have.

We are at a great point with two opportunities to address within this broad spectrum of challenges. We will have the infrastructure bill probably before the farm bill, but we will have the infrastructure bill as well as the farm bill itself to take a look.

The bad news about the farm bill is we are going to have a whole lot fewer resources this time than we did in 2014 to get that done, which will present terrific challenges. Mr. Costa asked about setting priorities. We are going to get an exercise in trying to do that, because we will have to get the farm bill done.

I appreciate all of you coming to D.C. today and presenting a very clear statement as to why this is important to rural America, the impact across the entire spectrum. All your comments are very timely and much appreciated. And we hope there are other people listening and paying attention to this today, because this is a big deal to the folks like us who, like Jodey and I, live in rural America, and so we appreciate that.

Under the Rules of the Committee, today's hearing will remain open for 10 calendar days to receive additional material and supplemental written responses from the witnesses to any question posed by a Member.

This hearing of Committee on Agriculture is adjourned. Thank you.

[Whereupon, at 1:00 p.m., the Committee was adjourned.]

[Material submitted for inclusion in the record follows:]

SUBMITTED STATEMENT BY NATIONAL FAMILY FARM COALITION

The National Family Farm Coalition (NFFC) and their member organizations represent farmers, ranchers, community-based fishermen and their rural communities who strive daily to provide food and create jobs by adding value to sustainable agriculture and fisheries. In order to further these goals, our farmers and their communities rely on critical rural infrastructure such as affordable and reliable water and waste water systems. Rural Communities continue to lose population with the graduation of each senior high school class. What's left behind are the elderly and the poor representing the under-served in communities who are sometimes susceptible to suffer from health issues or witness environmental degradation due to a lack of safe drinking water and waste water sewer systems.

In an Environmental Protection Agency (EPA) report entitled ***Still Living Without the Basics in the 21st Century: Analyzing the Availability of Water and Sanitation Services in the United States,*** the U.S. EPA echoed this predicament. In the report, EPA highlights the fact that the people who lack these basic services live in some of the most productive farmland in the United States, along the U.S.-Canada and U.S.-Mexico borders, on Indian reservations, and in the states of the South and the Southeast. The EPA report further states that rural people are working and living in rural areas with dilapidated or nonexistent infrastructure. For example, rural places with populations of less than 1,000 and rural farm populations have the highest percentage of homes lacking services, well above the national average of 0.64 percent. See, *http://opportunitylinkmt.org/wp-content/uploads/2015/07/Still-Living-Without-the-Basics-Water.pdf.**

NFFC members—like all rural residents—rely heavily on the USDA's Water and Environmental Program (WEP) for funding to meet the needs safe drinking water and environmentally sound sewer systems. Other relevant water and waste water program includes EPA's Clean Water State Revolving Fund (CWSRF), Drinking Water State Revolving Fund (DWSRF), and Environmental Justice Grants and Cooperative Agreements. In Fiscal Year 2016, USDA Rural Development through WEP, funded 945 projects with a total funding amount of $1,766,037,313. NFFC applauds USDA for its implementation of the WEP program. Nevertheless, we are compelled to point out that equity issues exist when local leaders of the funding projects place poor and minority communities on the back burner when deciding which area of the local municipality to first service.

Under the USDA regulations that guide the implementation of the Water and Environmental Program, small towns and cities with populations of less than 10,000, have discretion, through the votes of local elected officials, as to which part of the city or town will be first serviced with new or improved water or sewer systems. Applicable case studies reveal that non-minority, affluent parts of a rural city are serviced first with USDA loans and grants. This environmental injustice typically occurs when USDA WEP funds are exhausted and the town's project is cut back or down sized during the design phase. When downsizing occurs, the city council votes to fund the project in the rich part of town leaving the poor minority communities on a funding waiting list that may take decades to receive attention. Poor rural communities that must wait for basic services such as water and sewer will continue to see a swift decline in population. Young rural citizens are not likely to remain.

Housing

Rural residents—farmers and fishermen as well as small business entrepreneurs—also need access to high-quality, dependable broadband Internet services. As the USDA moves to become more efficient by requiring farmers to submit many of their reports online, the ability to upload and share data in a timely manner becomes even more necessary. 'Last mile to the farm' initiatives, such as Maine's Three-Ring Binder project, have been supported by rural development funds through public-private partnerships that should be continued and expanded, especially as the proposed cuts to rural USDA offices go forward. We must think of this initiative as equivalent to the rural electrification projects in the 1940s and 1950s or, even more apropos, a universal service obligation like the post office or the phone companies. Broadband is indisputably necessary to the continued development of our farms and fisheries, rural economies and communities.

The National Family Farm Coalition recommends that Congress mandate, through statutory language, that all rural communities, regardless of socioeconomic

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* **Editor's note:** the hyperlink to the report, *Still Living Without the Basics in the 21st Century: Analyzing the Availability of Water and Sanitation Services in the United States,* is no longer valid. The correct link is *http://rcap.org/wp-content/uploads/2017/05/Still-Living-Without-the-Basics-Water.pdf*.

status, are treated equitably in the application of all water, waste water, housing, telecommunications and environmental programs, regardless of funding shortfalls.

SUBMITTED STATEMENT BY NATIONAL RURAL HEALTH ASSOCIATION

The National Rural Health Association (NRHA) is pleased to provide the Committee on Agriculture a statement regarding the state of infrastructure in rural America and the role it plays in rural health care delivery.

NRHA is a national nonprofit membership organization with a diverse collection of 21,000 individuals and organizations who share a common interest in rural health. The association's mission is to improve the health of rural Americans and to provide leadership on rural health issues through advocacy, communications, education and research.

Access to quality, affordable health care is essential for the 62 million Americans living in rural and remote communities. Rural Americans are more likely to be older, sicker and poorer then their urban counterparts. Access in rural America is impeded by not only geography, but also by decreasing reimbursements, physician shortages, and excessive regulatory burdens.

Rural communities rely on rural infrastructure—from suitable roads and bridges, to clean water and broadband Internet access—to serve as necessary access points for a community, just as they rely on the rural health care delivery system as their access point for medical services. Investing in hospitals, broadband, and transportation will not only bolster local rural economies, but will also provide increased access to care.

The Rural Hospital

Investing in rural health infrastructure is more important than ever as rural America faces a hospital closure crisis. Eighty-one rural hospitals have closed since 2010, resulting in 10,000 rural Americans losing their jobs and 1.2 million rural patients losing access to their nearest hospital. Even more concerning are the 673 rural hospitals at risk of closure.[1] Sustained Medicare cuts threaten the financial viability of one in three rural hospitals. The loss of these hospitals would result in 11.7 million patients losing access to care in their communities. Continued cuts to rural providers have taken their toll, forcing far too many closures. Medical deserts are appearing across rural America, leaving many of our nation's most vulnerable populations without timely access to care.

Paired with the closure crisis, rural hospitals are also facing a brick and mortar crisis. Several rural hospitals standing today are original Hill Burton facilities. Built decades ago, these facilities need renovations or replacements, but unfortunately the rural hospital or community does not have the resources to replace their buildings.

Local care is necessary to ensure patients' ability to adhere to treatment plans, to help reduce the overall cost of care, and to improve patient outcomes and their quality of life. The crisis of rural hospital closures cannot be overstated: closures are devastating to the health of a community and to its local economy. When a rural hospital closes, rural residents lose access to their nearest emergency room. Rising Emergency Medical Services (EMS) costs, delays in obtaining results from diagnostic laboratory tests and scans, and difficulty in obtaining treatment for chronic conditions characterize communities that have experienced hospital closures. Additionally, the network of other providers that surround hospitals tend to become unstable or dissolve completely when a hospital is lost.[2]

The economic implications of rural hospital closures are staggering. When a rural hospital closes, the community it served experiences a per-capita income decrease of $703. Unemployment increases by 1.6 percentage points. Retirees and businesses are discouraged from relocating to the community. If all of the 673 vulnerable hospitals were to close, rural America would lose 99,000 direct health care jobs and 137,000 additional community jobs. Over 10 years, rural communities will lose $277 billion in GDP.[3]

Both the physical health of patients and the fiscal health of local economies are hurt when rural hospitals close. Therefore, it is imperative to fortify this key aspect of the health care infrastructure in rural communities. To help stabilize rural hospitals, Medicare bad debt cuts must end. Under the ACA, Medicare bad debt reim-

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[1] *81 Rural Hospital Closures: January 2010–Present.* (n.d.). Retrieved July 21, 2017, from *http://www.shepscenter.unc.edu/programs-projects/rural-health/rural-hospital-closures/*.

[2] Thomas, S.R., MPP, Kaufman, B.G., BA, Randolph, R.K., MRP, Thompson, K., MA, Perry, J.R., & Pink, G.H., Ph.D. (2015). *A Comparison of Closed Rural Hospitals and Perceived Impact* (Rep.). Chapel Hill, NC: NC Rural Health Research Program.

[3] *http://www.shepscenter.unc.edu/wp-content/uploads/2015/04/AfterClosureApril2015.pdf.*

bursement to rural hospitals was cut. Unfortunately, for those hospitals with a large pool of dual-eligible patients, bad debt cuts can spell financial disaster.

Bad debt cuts hurt the rural health infrastructure in particular because rural areas have a higher proportion of dual-eligible patients than urban areas. Bad debt cuts have been partially responsible for the closure of one rural hospital per month since 2010. In order to stem this closure rate and avoid the serious economic and health-related implications of more rural hospital closures, cuts in bad debt reimbursement must be reversed. Enactment of such a policy would empower rural hospitals to not only treat the poorest, sickest patients in its community, but also to remain operational and provide access to care to rural Americans.

Rural Transportation

In rural America, transportation infrastructure is dilapidated. Traffic crashes and fatalities are 2½ times more likely to occur on rural non-interstate roads.[4] Over ⅓ of rural America's roads are in poor or mediocre condition.[5] Due to such poor conditions, farmers may have difficulty transporting crops to market. Small business owners may be unable to attract customers. Logistics can be more expensive. And in the health sector, patients face barriers to care that can range from inconvenient to insurmountable.

Rural transportation infrastructure can encumber—or, with improvement, expedite—travel to medical care providers. Patients who must travel long distances to providers and those who lack readily-available methods of transportation are more likely to be late to or altogether miss appointments, face disruptions in care for chronic diseases, and forego preventive care because of transportation costs. The regularity with which patients use some medications, like insulin for diabetes patients, decreases the further the patient lives from his or her provider.[6]

The transportation infrastructure of rural America can be a key barrier for accessing health care. For those that cannot afford to miss work hours, do not own a car or another mode or transportation, or live considerable distances from the nearest clinic or hospital, poor transportation and inadequate roads cause unnecessary difficulty that discourages patients from seeking primary and preventive care. If patients utilize primary and preventive care, then health outcomes improve. Additionally, such utilization of primary and preventive care helps reduce health care costs.[7] Therefore, improvements in transportation contribute directly to making health care more accessible.

Increasing access to care via infrastructure improvements requires public funding and leadership. The public maintains roads and bridges; therefore, public funds are required to renovate them. Rural America faces a unique challenge in this regard: only 44% of rural road mileage is eligible for Federal grants. Expanding eligibility requirements for Federal funding will allow more rural roads to become eligible for Federal funds,[8] thereby increasing opportunities for refurbishment.

Other measures should also be taken to improve rural transportation infrastructure. Developing a system of block grants for investment has significant upside. Block grants would allow states and local communities to assign priority to certain infrastructure projects. If rural stakeholders are involved in setting priorities, Federal block grants can both fund rural infrastructure improvements, while limiting the cost to the Federal Government and incentivizing an efficient use of government resources.

Finally, widespread adoption of the public-private partnership (PPP) concept could achieve results like those of block grants. As private companies vie for the government's business, competitive economic forces drive the prices of their services down. Additionally, private corporations promise high quality in order to compete. Value engineering, emphasis on rapid project completion, innovation, and utilizing economies of scale are advantages of PPPs.[9] Thirty states and the District of Columbia have drafted or passed legislation allowing PPPs to undertake infrastructure improvements. If the Federal Government can do the same to bring PPPs to more of

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[4] *Rural Hospital Closures Decimating Rural Health Care Delivery* (2016). National Rural Health Association; Washington, D.C.

[5] *Rural Transportation Facing a Rough Road.* (2017, June 30). Retrieved July 26, 2017, from *https://www.infrastructurereportcard.org/rural-transportation-facing-a-rough-road/*.

[6] *Transportation Fact Sheet* (Rep.). (n.d.). Washington, D.C.: Rebuild Rural.

[7] *Rural Health.* (n.d.). Retrieved July 24, 2017, from *https://www.ruralhealthinfo.o/topics/transportation#consequences*

[8] Syed, S.T., Gerber, B.S., & Sharp, L.K. (2013). *Traveling Towards Disease: Transportation Barriers to Health Care Access.* JOURNAL OF COMMUNITY HEALTH, 38(5), 976–993. http://doi.org/10.1007/s10900–013–9681–1.

[9] Written Testimony on *The State of Infrastructure in Rural America,* 115th Cong. (2017) (testimony of Richard R. Calhoun).

the country's infrastructure improvement projects, the result could be infrastructure that helps facilitate, rather than deny, patients' access to health care.

Telemedicine to Bridge Infrastructure Gaps

Telemedicine can serve as a method of circumventing the challenges of physical infrastructure. It has, for some time, experienced growth in popularity and capabilities. For the physician, telemedicine eases the consultation process. All physicians can benefit from consultation, but the practice is particularly relevant to younger, inexperienced doctors. Especially for young doctors working in rural and health professional shortage areas, ease of consultation may encourage them to remain in their respective communities. This would help reduce the ongoing physician shortages in rural America.

Last, telemedicine can help diminish the need to see patients in person for preventive appointments or education sessions. Of course, in many cases physicians have no choice but to call a patient into the office or venture to a patient's home, for example, to perform a physical examination. However, for those cases in which the physician does not need to see the patient in person, he or she can visit with the patient virtually, eliminating the need for travel on the part of the physician or the patient.

To encourage the implementation and use of telemedicine, the Federal Government must lead on two fronts. First, geographic site restrictions in Medicare must be lifted to encourage the widespread realization of the benefits of telemedicine. Restrictions like these inhibit adequate reimbursement for rural providers that use telemedicine services to see patients.[10] Second, the licensure process for telemedicine providers must be streamlined. Current licensure restrictions can be cumbersome and limiting to providers for whom telemedicine would be hugely beneficial. Encouraging uniformity among state regulatory bodies that handle licensure is imperative. These bodies should be encouraged to collaborate to allow rural telemedicine users to obtain licenses efficiently and effectively care for their patients.[11]

Rural Broadband

Before expansions in telemedicine can become widespread, steps must be taken to shore up the rural broadband infrastructure. Internet access in rural America is poor compared to access in urban areas. Thirty-nine percent of rural Americans lack access to appropriate broadband Internet speeds (as defined by the FCC). In urban America, only 4% lack access to Internet of these standard speeds.[12] Internet access for health care providers is worse in rural areas than in urban areas as well: 7% of providers in rural America lack access to appropriate Internet speeds. The national average is 1%.[13] Last, even when the appropriate speed is available, it can be three times more expensive in rural areas than in urban areas.[14] Before health outcomes can significantly improve in rural America, comprehensive broadband access is needed.

The ramifications of lacking appropriate Internet are manifold. Without reliable Internet connections, modern telemedicine is impossible. Timely consultations are made more difficult. Patient education and access to provider information is limited.

There would be significant benefits to the rural health care system from improving rural broadband access. Rural areas can be equipped with cutting-edge telemedicine services. Rural patients can be empowered to seek education regarding their medical care. Patients and providers can benefit through access to electronic health records.

The Federal Government can support broadband Internet access for rural America through a few courses of action. First, it must continue funding for the Universal Service Fund (USF). Cuts have diminished the USF budget considerably. Sufficient funding is a prerequisite to adequate broadband access in rural areas. Additionally,

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[10] Stitt, C. (2017, March 3). *Infrastructure Spending and Public-Private Partnerships—by Charles.* Retrieved July 26, 2017, from *https://www.hudson.org/research/13407-infrastructure-spending-and-public-private-partnerships*.

[11] Daniel, H., BS, & Sulmasy, L.S., JD. (2015). *Policy Recommendations to Guide the Use of Telemedicine in Primary Care Settings: An American College of Physicians Position Paper.* ANNALS OF INTERNAL MEDICINE,787–789. doi:10.7326/M15–0498.

[12] Giger, J., & DeVany, M. (2013). *Streamlining Telemedicine Licensure to Improve Rural America* (Issue brief). Washington, D.C.: National Rural Health Association.

[13] *2016 Broadband Progress Report.* (2016, January 29). Retrieved July 19, 2017, from *https://www.fcc.gov/reports-research/reports/broadband-progress-reports/2016-broadband-progress-report*.

[14] Kaushal, M., Patel, K., McClellan, M.B., Darling, M., & Samuels, K. (2016, July 28). *Closing the rural health connectivity gap: How broadband funding can improve care.* Retrieved July 19, 2017, from *https://www.brookings.edu/blog/health360/2015/04/01/closing-the-rural-health-connectivity-gap-how-broadband-funding-can-improve-care/*.

continued support of the Rural Utilities Service's (RUS) Broadband Loan Program can help to finance the high up-front cost of developing a broadband network in a rural area, thereby removing barriers to implementing broadband networks in rural areas.

Finally, like the case of transportation infrastructure improvement, PPPs and public-private cooperation (PPC) can drive down the cost of network implementation and improve quality through competition and shared risk. A public entity, whether on the local, state, or Federal governmental level, can lower barriers like regulation and taxation of private companies to incentivize the extension of broadband Internet services to rural communities.

Again, the permeation of broadband Internet access into rural communities can work to improve or encourage patient engagement in care, patient education, the convenience of provider consultations, and the adoption of telemedicine. Each of these areas can translate into enhanced health care access and improved health outcomes.

Conclusion

Rural infrastructure could be improved to better provide the health care services that rural Americans need. Rural hospital closures, poor transportation, lack of telemedicine services, and insufficient broadband coverage inhibit patients' access to care, worsen health outcomes, and increase health care costs. Increased funding for infrastructure in rural health can improve access to health services and stimulate economic growth in rural America.

The National Rural Health Association appreciates the opportunity to provide our input to the Committee. We greatly appreciate the support of the Committee and look forward to working with Members of the Committee to continue making these important investments in rural America.

SUBMITTED QUESTIONS

Response from Curtis Wynn, President and Chief Executive Officer, Roanoke Electric Cooperative; Vice President, Board of Directors, National Rural Electric Cooperative Association *

Questions Submitted by Hon. Vicky Hartzler, a Representative in Congress from Missouri

Question 1. When traveling around my district and talking with everyone from school teachers to farmers, the need for access to high speed broadband is always on the top of my constituents' minds. I joined my colleagues in a letter to President Trump earlier this year in asking for rural broadband to be included in the infrastructure package, and I have been working diligently with state and local partners to address the challenges facing the rural portions of my district.

I have found there is inconsistency with the definition of rural broadband across the country and throughout various Federal programs. Currently, the FCC defines broadband speed at 25 megabits per second download and 3 megabits per second upload while various programs within the Rural Utilities Service at USDA have different minimum speed definitions for broadband.

Would a unified definition of broadband across Federal agencies create a more equitable environment for rural Americans? How would a unified definition of broadband impact infrastructure investment decisions on companies?

Question 2. Is the FCC the best suited Federal agency to set the Federal benchmark for high speed Internet?

Response from Jennifer L. Otwell, CPA, Vice President and General Manager, Totelcom Communications, LLC; on behalf of NTCA—The Rural Broadband Association

Questions Submitted by Hon. Vicky Hartzler, a Representative in Congress from Missouri

Question 1. When traveling around my district and talking with everyone from school teachers to farmers, the need for access to high speed broadband is always on the top of my constituents' minds. I joined my colleagues in a letter to President Trump earlier this year in asking for rural broadband to be included in the infrastructure package, and I have been working diligently with state and local partners to address the challenges facing the rural portions of my district.

* There was no response from the witness by the time this hearing was published.

I have found there is inconsistency with the definition of rural broadband across the country and throughout various Federal programs. Currently, the FCC defines broadband speed at 25 megabits per second download and 3 megabits per second upload while various programs within the Rural Utilities Service at USDA have different minimum speed definitions for broadband.

Would a unified definition of broadband across Federal agencies create a more equitable environment for rural Americans? How would a unified definition of broadband impact infrastructure investment decisions on companies?

Answer. A unified definition of broadband would only impact rural broadband investment to the extent it helped identify areas in need and then directed sufficient funding through the USF High Cost program to meet the Communications Act principle of reasonably comparable services and rates in urban and rural America. The High Cost program is what helps rural carriers make the business case to serve territory where the customers gained cannot begin to cover the enormous capital and operating expenses of rural network deployment.

The FCC decided over 2 years ago that a 25/3 Mbps broadband connection represented "table stakes" for modern communications. Many reports on the state of the Internet today report average speeds that are relatively close to this figure as well. And yet the FCC's High Cost program is not designed or funded to ensure rural Americans can receive at least such speeds. Instead, most components of the High Cost program only aim to promote the deployment of 10/1 Mbps service, apparently because the High Cost program lacks the resources to support more robust, efficient, and future-proof deployments.

Thus, even if there were a "unified definition" of broadband across Federal agencies, in the absence of resources to back that definition up, a definition—assuming it were set at speeds comparable to what most urban Americans enjoy—would only serve to highlight the failure of our universal service policies to help rural America keep pace. In fact, the High Cost program has been under the same overall hard cap since 2011, and the underlying budget that helps enable investment and operations specifically by smaller operators based in rural America is predicated upon the same 2011 funding levels as well.

As a result, an additional $110 million per year is needed to fully fund an alternative model that the FCC created to promote broadband deployment—this shortfall will leave 71,000 rural locations with lower-speed broadband and nearly 50,000 may see no broadband investment at all. And just as troubling if not more so, the outdated budget level dictates that small carrier recipients of High-Cost USF that could or did not elect model support will, from July 1, 2017 through June 30, 2018, be affirmatively denied recovery of $173 million in actual costs for private broadband network investments that these carriers have already made.

A recent survey of non-model NTCA member companies revealed that the average respondent estimates charging $126 per month for standalone broadband under the budget control—far more than most rural consumers could afford. Further, the average response predicted charging only $70 per month for standalone broadband if the budget control were not in place and carriers received support for investments under program rules. These numbers reveal that the hard cap on the High Cost budget that has been in place since 2011 is preventing the High Cost program from helping rural providers offer reasonably comparable services and rates as called for in the Communications Act.

Thus, to summarize, a Federal definition of broadband, if revisited regularly to keep pace with technology developments to ensure true reasonable comparability, could create a more equitable environment for rural Americans. But such a definition is only as good as the underlying programs designed to achieve it—and in the case of universal service policy, such a goal must be tied to sufficient resources in the form of USF support to support deployment of networks capable of delivering broadband at the "Federal speed."

Question 2. Is the FCC the best suited Federal agency to set the Federal benchmark for high speed Internet?

Answer. The FCC—with the expertise and data the agency has at its disposal—is well situated among Federal agencies to set a Federal benchmark for broadband. But again, setting one Federal benchmark will only be helpful if matched with resources to finance and support broadband deployment in the highest-cost areas of the nation. It is also worth noting that RUS, which continues to help finance in the first instance construction of many of the networks in rural America just as it did in wiring rural America for electricity, can and should play a useful role in any such exercise, particularly as (in its financing role) it takes a unique and well-informed

long-term perspective on the sustainability of rural infrastructure, rather than merely thinking of short-term objectives that might quickly become outdated.

