

RURAL INFRASTRUCTURE BRIEFINGS

Rural America Prospers on High-Speed Internet and Connectivity

These Briefings showcase different facets of the rural infrastructure industries: power, energy, and utilities; water utilities; and communications.

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Introduction

The objective of this rural infrastructure briefing is to demonstrate just how vitally important modern telecommunications and information services are to rural communities. High-speed broadband and wireless connectivity have transformed all Americans' lives, influencing how and where they work, shop, socialize, and recreate. Rural Americans' lives have been affected as much as – and arguably, even more than – their urban counterparts. In fact, rural Americans today are generally as computer literate, Internet savvy, and technology dependent as their urban counterparts.

Rural and urban Americans, however, do differ in one critical respect – unequal access to high-speed broadband and wireless technologies. At the heart of this inequality is the drastic difference in infrastructure costs when weighed against the number of subscribers. With fewer subscribers per square mile in rural communities, the sizable capital costs associated with broadband and wireless expansion often are cost-prohibitive. Without the subsidies provided by various cost-recovery programs sponsored by the Federal Communications Commission, rural communities might not have access to high-speed broadband and wireless services at all. Similarly, CoBank has been mandated by Congress to ensure that financing is available to those telecom companies that are instrumental in providing modern telecom services to rural communities.

Securing the nation's borders

In a remote corner of southwest Texas, officers with federal, state and local agencies are closely monitoring a 485-mile stretch of the U.S. border with Mexico.

Mountainous and arid, this Trans-Pecos region is vast and sparsely populated. Here, law enforcement agencies not only oversee two Ports of Entry for legal crossings but also patrol the border for the illegal human traffic, drugs and weapons that regularly cross the U.S.-Mexico border and head for destinations farther north.

Among the guardian agencies are the Immigration and Customs Enforcement Division of the U.S. Department of Homeland Security, the Customs and Border Protection Division of the U.S. Department of the Interior, and nine separate county Sheriffs' departments.

They are all well aware that manpower alone cannot secure this lengthy stretch of border, which comprises two-fifths of the U.S.-Mexico boundary. What they also require is reliable broadband technology along with the high-speed Internet that it offers. And these agencies have it, thanks to a rural telecommunications company based in nearby Alpine, Texas.

Big Bend Telephone Company is the broadband provider serving this rural region. In all, the family-owned company counts 5,000 subscribers across 17,593 square miles of far southwest Texas – an area larger than nine other states. It's a place where population density is low – only 0.333 customers per square mile – and infrastructure costs are high. Only 12 percent of the roads in its area are paved.

Through Big Bend's broadband network, border-focused agencies can share information quickly over the Internet. They can access digital license plate readers and facial recognition and fingerprinting systems. They can share radio communications that rely on equipment piggybacked onto Big Bend's towers.

"We are an active partner in U.S. border security," says Rusty Moore, Big Bend's general manager and chief operations officer. "We help deliver the vast array of technology-centric solutions required to keep our nation's southern border secure and our country stronger as a whole."

Broadband for communication, collaboration and competition

Big Bend Telephone is just one of more than a thousand rural telecommunications providers that deploy modern broadband technology to the many communities throughout rural America. Typically operating in low-population areas ignored by national carriers, rural telecom providers serve the public agencies, private-sector businesses, and residents who live and work in the nation's rural communities.

These rural telecommunications providers are delivering the high-speed, affordable broadband service that might



Rural businesses, schools, municipalities, and families all need access to modern, high-speed broadband services to maintain and improve the quality of their lives, just as much as their urban counterparts. Yet the persistent rural/urban digital divide denies this equality to rural America.

not otherwise be available to rural communities. Through broadband – i.e., the wide bandwidth data transmission that allows high-speed Internet access – these providers are helping close the “digital divide” so that every segment of rural America can fully participate in today's mobile world.

“Without access to broadband, people in rural America cannot access the state, national or world economy,” says Bill Squires, CEO of Blackfoot Telecommunications, a Montana-based rural telecom cooperative. “They cannot communicate with government, collaborate with schools or compete with urban businesses.”

“High-speed Internet levels the playing field,” adds Alan Morse, president of Ritter Communications, which serves many rural communities in Arkansas, Tennessee and Missouri. “It allows rural business to compete for customers all over the country. These are businesses that might have had to locate in urban areas. Instead, they can take advantage of a low-cost labor force, reasonable real estate values, cost of living and quality of life in rural America.”

Boosting rural education, healthcare and more

Rural telecom providers serve a remarkably diverse customer base beyond the agricultural sector typically associated with rural America.

Thanks to their broadband deployment, residents in places like Trout Creek, Montana, can stream online videos and use smartphones. Students in communities like Searcy, Arkansas, have the opportunity to participate in distance-learning language classes. Businesses in areas like Louisiana's St. John the Baptist Parish can communicate with customers thousands of miles away.

Nearly 700 school locations in rural Arkansas have access to the Internet, distance learning and more through the broadband services of Ritter Communications. Based in Jonesboro, Arkansas, the company provides 57 communities and 47,500 customers with high-speed Internet, digital cable and phone service.

"Students in rural America need the same access to material and the same quality of information for homework and research as urban students," Morse says. "Broadband allows them to have that."

Rural telecom providers also deliver critical communications services that help in the day-to-day operations of outlying hospitals, firefighters and other vital organizations. Blackfoot Telecommunications is one such rural telecom provider. It delivers phone, data and Internet technology to 16,200 customers in western Montana and eastern Idaho. Its service territory covers more than 7,900 square miles. The largest of the 25 rural communities it serves is home to just 2,000 residents.

Blackfoot's network allows medical facilities to transfer large data files, such as X-rays and MRIs, from remote hospitals to specialists in larger cities like Missoula and beyond. It enables doctors, patients and clinicians in separate locations to convene online with each other for consultations or second opinions.

Blackfoot also serves schools, banks, lumber mills, sheriffs' departments, emergency service companies and many small family-owned businesses. Among them



In its Broadband Progress Report for 2015, the Federal Communications Commission reported that only 41 percent of rural elementary and secondary schools are linked to the Internet with high-speed broadband fiber whereas nearly 70 percent of urban schools enjoy modern, high-speed broadband access.

is The Sweet Palace of Philipsburg, Montana, which depends on the Internet to sell its candy worldwide.

"Broadband is critical to all of them," says Squires. "We're investing in local technology infrastructure to help our customers connect and compete, and to spur economic growth in our communities."

Empowering commerce in rural regions, isolated communities

Many rural telecom providers serve communities that used to be isolated by their terrain. Case in point: Reserve Telecommunications of Reserve, Louisiana, founded in 1935. Much of its service territory is dominated by swamps, including areas once accessible only via the nearby Mississippi River. Before Reserve Telecommunications stepped up, "no one wanted to lay fiber here," says CEO William Ironside.

Today, this full-service, "hometown" telecommunications provider serves 11,000 subscribers in the River Parishes and Northern Lafourche Parish with telephone, video and high-speed Internet. Many of Reserve's customers operate businesses in the oil and gas industry. One such customer is Diversified Well Logging, which relies on broadband

to monitor oil rigs and wells all over the world, including China – all from its headquarters in Reserve, Louisiana.

Sugarcane producers regularly link to their customers via smartphones and tablets that rely on signals from Reserve Telecommunications' cell towers. Other Reserve customers conduct online shipping and transportation business with the busy Port of South Louisiana, which stretches for 54 miles along the Mississippi River. And when hurricanes hit, local police and first responders depend on the interconnected network that Reserve Telecommunications built and maintains.

“Even smaller local businesses, like auto dealerships or optometrists, need broadband,” Ironside says.

“Big or small, all that activity results in tax revenues, employment, better-paying jobs and the ability to afford better homes.”

But it's not just local storefront businesses that benefit from leveraging broadband technology. So do the rapidly growing number of people who work out of their homes.

“More people work from home than you would think,” says John Colbert, CEO of Fidelity Communications Co. The 75-year-old telecom provider serves 100,000 customers in many rural parts of Missouri, Oklahoma, Arkansas, Texas and Louisiana.

Serving the underserved

Rural telecom providers insist that without their presence, many rural areas would be underserved.

“For most rural areas, we are the only provider that can provide speeds above 10 megs,” Fidelity's Colbert says. “Without us, there would be no broadband for them. And without broadband, rural communities would have a hard time existing.”

“National carriers tend to have a very keen focus on areas with high population density – that's where the efficiencies lie and subsequent profitability,” adds Mark Naze, chief financial officer for Nsight in Green Bay, Wisconsin. The company, which includes subsidiaries Cellcom and Nsight Telservices, serves a mostly rural section of Wisconsin and Upper Michigan.



Pictured is the Roan Mountain Medical Center, the primary medical facility for this rural mountain community in northeast Tennessee. Broadband connectivity links rural patients and their primary care doctors to the diagnostic skills and consultations of medical specialists who practice in big city hospitals. However, not all rural medical centers have access to the high broadband speeds required by these new technologies.

Rural communities are Nsight's niche. Naze says that the company takes great pride in delivering the same high-quality services found in major metropolitan areas to small rural communities.

“Technology is evolving at a staggering pace, bringing new opportunities and options that weren't previously possible,” he says. “We're committed to continually reinventing ourselves to meet these rural communities' changing needs. High-speed broadband is as essential to rural markets as it is to large urban areas.”

Challenges of deploying broadband in rural America

Serving rural America, however, is challenging. Similar struggles among rural telecom providers underscore the difficulties of delivering affordable broadband to their customers.

Most of these communications providers, for instance, operate in areas where population densities are much lower than urban areas, making it hard to recoup infrastructure investments.

“An urban area might have 100 customers per mile of fiber, so you can spread the cost of upgrading or expanding a high-speed network,” says Ritter’s Morse. “But in rural areas, you may only have five households per mile, so the economics are more difficult and the payback longer.”

Monthly subscriber costs matter, since rural communities often struggle with a shortage of quality jobs and low family incomes. In parts of Montana served by Blackfoot Telecommunications, for instance, per capita median income is below \$20,000 a year. Unemployment rates surpass 10 percent in some of those same areas. In the service territory of Louisiana-based Reserve Telecommunications, 30 percent of the homes fall below the poverty level, now at \$24,000 for a family of four. Limited disposable income can make it hard for many households to afford broadband service that might cost \$110 per month.

Moreover, rough terrains and aging infrastructure impede efforts to modernize and expand. Several rural communities in the Ozark Mountains depend on tourism, hunting, fishing and canoeing activities for their economic survival. It’s not easy building out broadband infrastructure in those rolling hills, where rocky outcrops make burying fiber optics a challenge.

“To pull a mile of fiber in the river delta terrain of northeast Arkansas, where the ground is flat and soft, costs \$35,000,” says Ritter’s Morse. “In the Ozarks, it’s \$155,000.”

The need for speed

Spurred by customer demand for ever-faster speed, rural telecom providers also face increasing broadband requirements. The Federal Communications Commission (FCC) has set a broadband speed benchmark of 25 megabits per second (Mbps) for online downloading and 3 Mbps for uploading. To augment their networks to boost broadband speed, rural telecom providers must invest in expensive, new equipment, which raises their costs. And in areas already sensitive to cost, those increases can have a big impact.

“*Telecommunications are the engine for growth and opportunity in rural areas.*”

“That higher speed is where the push needs to be,” acknowledges Blackfoot’s Squires. But to get there, his 62-year-old cooperative must replace its aging copper lines with fiber optics. That venture will cost Blackfoot more than \$200 million, an expense impossible for the rural telecom to handle on its own.

That’s why Squires and other rural telecom leaders look to the FCC’s Universal Service Fund (USF). Long used to subsidize telephone service to low-income households and high-cost areas, the USF was expanded and codified under the landmark Telecommunications Act of 1996. Today, the USF helps balance the cost of bringing modern, high-speed telecommunications services to rural communities. USF’s much-needed capital helps rural telecom providers offset the cost of upgrading and building out their rural broadband infrastructure.

Another challenge facing rural telecom providers is the competition with national carriers in purchasing more spectrum. Licenses to own a piece of the airwaves are purchased through an FCC bidding system. And, like new equipment and technology, they’re pricey.

“There’s only so much spectrum available,” Nsight’s Naze says. “Our challenge is bidding against the big nationwide carriers, who have way deeper pockets than we do.”

Larger carriers typically seek spectrum specifically for metropolitan areas, but rural licenses are often bundled with the package. The carriers end up with spectrum that falls outside of their niche, and which they don’t plan to use.

“We want to buy and build out rural spectrum, but it is difficult to afford when it’s bundled with large metro areas,” notes Naze. “The packaging makes the system

inefficient for both small and large companies, and simply is not set up to benefit rural consumers.”

Nsight recently invested a hefty \$1.5 million to purchase a license for a comparatively small 10 megahertz of spectrum in four Wisconsin counties. But it was necessary. “Customers want faster and faster service, and we need to have enough spectrum to provide that,” Naze says.

The struggle to remain in the public consciousness

Faced with such challenges, rural telecom providers today continue to push for greater recognition of the needs of their customer base. High on their list is continuing to educate policymakers about the expense of delivering broadband technology to distant but vital regions. It’s an ongoing effort.

“I contend that as our nation has urbanized, many politicians are out of touch with rural America because of the smaller voter block, and they fail to see its vital importance to the economy as a whole,” says Delbert Wilson, CEO of Hill Country Telephone Cooperative.

This telecom co-op, based in Ingram, Texas, serves 9,500 customers in 14 counties and employs 100 people. Its territory covers 2,900 square miles northwest of San Antonio, much of it rolling hills and rock. Like so many other rural telecom providers, Hill Country delivers broadband services to ranching, farming, healthcare, education and business customers. Other customers are involved in tourism and recreation along the Guadalupe and Frio Rivers.

“We’re working hard to get fiber to our customers because telecommunications are the engine for growth and opportunity in our [rural] area,” says Wilson. “Jobs are scarce here so broadband infrastructure can help create and expand business.”

With just 4.3 people per square mile, Hill Country Telephone depends heavily on USF money to help recoup its investment in broadband infrastructure. But regulatory uncertainty and concerns about future USF allocations make it hard to plan for the future, Wilson asserts.

Looking past today’s challenges

Despite their challenges, many rural telecom providers remain optimistic about the future. Like Hill Country Telephone, they are expanding their fiber networks into new territory, hoping to add more business and residential customers. Others are purchasing companies that can help them grow.

Great Plains Communications of Blair, Nebraska, did just that in February 2016. It acquired Pinpoint Network Solutions and the Pinpoint Broadband business units of the regional fiber company, Pinpoint Holdings. The acquisition added 1,200 fiber miles, including 135 additional miles in the greater Omaha metro area, to Great Plains’ fiber optic network of more than 6,000 miles. The result is a grid that encompasses Nebraska and extends into Colorado, Illinois, Iowa, Kansas, Minnesota, South Dakota and Wyoming.

“These additional fiber assets will bring new opportunities for growth and help us do things like connect rural healthcare facilities with hospitals in Omaha,” says CEO Todd Foje.

Great Plains, along with its 200 employees, provides broadband Internet, wireless backhaul and other communications services to 90 communities across the Cornhusker State. In all, the company serves 30,000 residential and business subscribers over 14,000 square miles. While it serves its communities with a minimum 10-Mbps connection, Foje knows that’s inadequate. Parts of the Great Plains network, he says, are capable of 100 gigabits.

“There is a tremendous amount of change in our industry,” he says, “all driven by the habits of consumers. As their demands increase, we are constantly looking to upgrade our services to the level they want.”

A persistent digital divide

In their mission to serve rural America, rural telecom providers are acutely aware that broadband technology underpins today’s globally connected economy. They know that rural America supplies many of the goods the

rest of the nation needs – from food and fiber, to timber and minerals, and to energy and recreation. They also recognize that today’s rural residents are as computer literate, Internet savvy and technology dependent as their urban counterparts.

“Broadband is needed to keep rural communities viable,” Blackfoot’s Squires says. “Without it, we would see the demise of many rural communities. Schools, healthcare, businesses – those are the heart of rural areas. Without them, communities would die a slow death because people would move away.”

Yet, according to USDA Rural Utilities Service Administrator Brandon McBride, “too many rural Americans are still living on the wrong side of the digital divide.”

Likewise, in its 2016 Broadband Progress Report, the FCC acknowledges that broadband is not being deployed to all Americans in a reasonable and timely fashion. While the U.S. has made significant progress in broadband deployment, the FCC reports that 39 percent of rural Americans, or 23 million people, lack access to the FCC’s speed benchmark of 25 Mbps/3 Mbps. By contrast, only 4 percent of urban Americans lack that same access.

It’s clear that more work needs to be done by the private and public sectors to expand robust broadband to all Americans in a timely way, as the FCC report concludes. For rural telecoms across the U.S., this goal remains both an opportunity and an ongoing challenge. ■

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