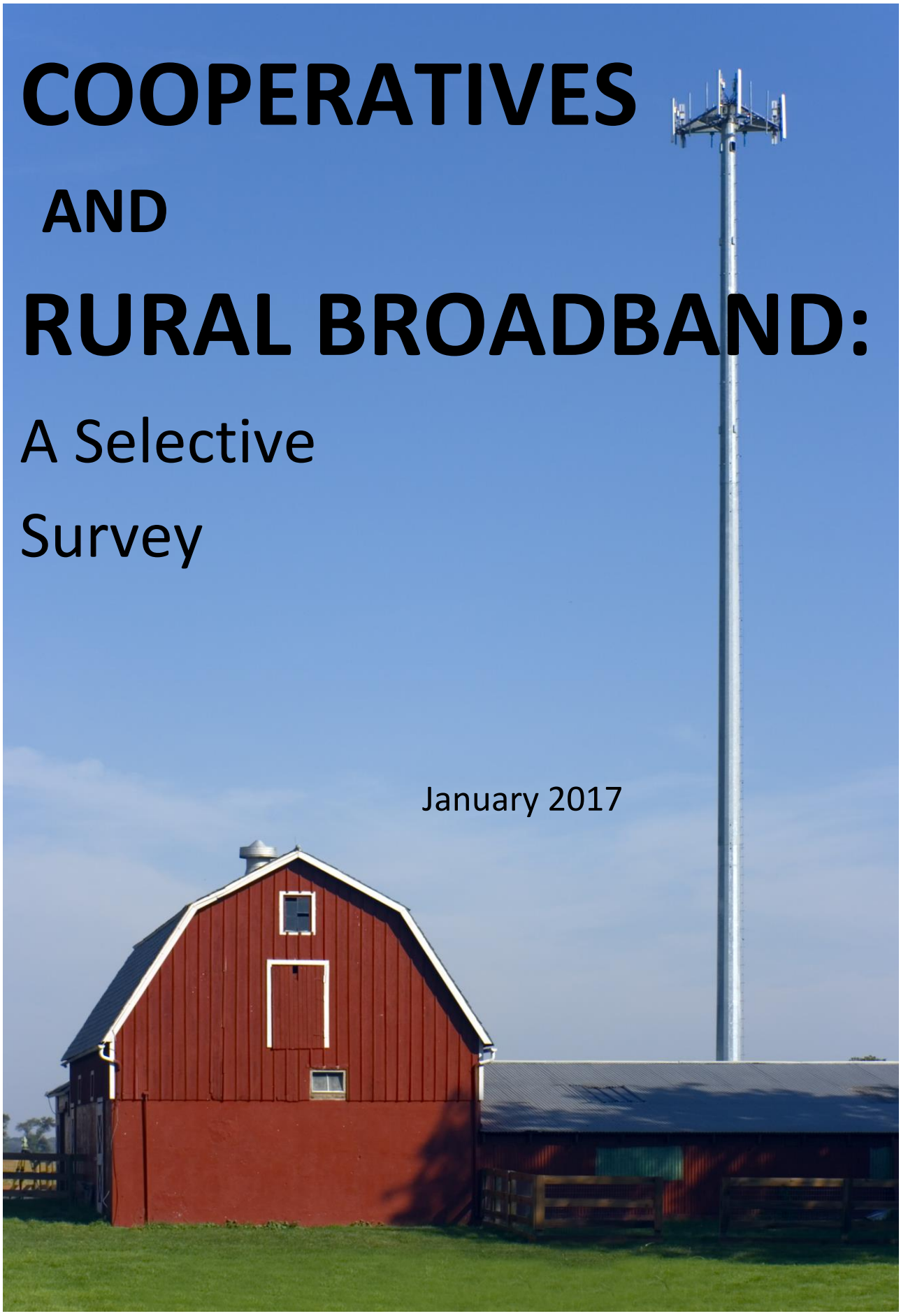
COOPERATIVES AND RURAL BROADBAND:

A Selective Survey

January 2017



This report was funded by a Rural Cooperative Development Grant awarded by the USDA to the University of Wisconsin Center for Cooperatives in 2015. The grant also funded participation in this project by the UW Extension's Broadband Education and E-Commerce Center.

Lynn Pitman, University of Wisconsin Center for Cooperatives
University of Wisconsin-Madison/University of Wisconsin Extension

Mary Kluz, Broadband and E-Commerce Education Center
University of Wisconsin Extension

January 2017

INTRODUCTION

High-speed internet connectivity has become an essential part of the business, education and health care systems that are integral to modern society. Community institutions are finding that participation in these networks is required in order to remain relevant.

Many rural areas have continued to lag behind in developing the broadband access options that allow its community institutions to participate in these networks and remain relevant. These broad systems and networks are the basis for future economic development and healthy communities; without them, the overall economic health of rural communities suffers.

Broadband access and adoption have emerged as critical issues for rural communities. However, the business case for investing in broadband infrastructure is inherently difficult, given the capital-intensive investment needed to serve sparsely distributed rural populations.

One response by rural communities underserved by the market is to use the cooperative business model. When investor-owned utilities did not extend their services to the sparsely populated parts of the nation in the first half of the twentieth century, rural groups organized cooperatives to provide the electric and telecommunications services that they needed. These cooperatives have established a long and successful history of providing rural infrastructure services that continues to this day.

Members of the cooperative own and control it. This user-member ownership structure allows the cooperative business to operate on a service-at-cost basis to deliver needed services. It allows the cooperative to take a longer-term perspective on strategic investments that can maintain and improve services into the future. In addition, because the cooperative is a provider of needed services in a community, it is embedded in the local economy, and can contribute to broader local economic development activity.

The ability of cooperatives to deliver rural broadband services has only recently gained wider attention. This report surveys some of the recent activities by cooperatives to expand or enable broadband development in rural areas across the state of Wisconsin, the region and the country. While this preliminary inquiry into approaches employed by cooperatives for broadband development is not an exhaustive investigation, it suggests ways to begin to formulate possible roadmaps for further cooperative participation in broadband expansion efforts.

FACTORS AFFECTING BROADBAND DEVELOPMENT

Broadband development is a function of an interplay of factors. To enable easier discussion, the complicated business of getting useful internet service to customers is condensed to an interaction of a three factors illustrated in Figure 1. At the core, internet service provider activity results in a certain level of available infrastructure. Customers make use of that infrastructure, paying for subscriptions, which encourages more provider activity [Figure 1].

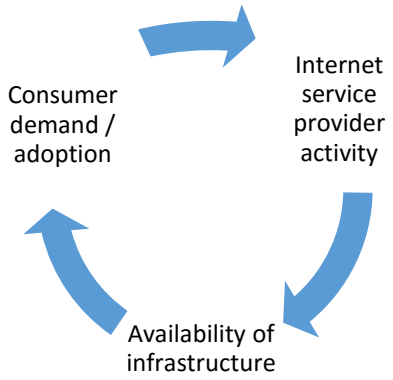


Figure 1. Core factors affecting broadband development

Different dynamics work on each of these core factors. Internet service providers are influenced by the regulatory environment, as well as their return on investment. Infrastructure availability is affected by grants and loan programs through federal and state agencies, and prior investments in existing infrastructure. Cost, skill level and online security affect how consumers choose to participate [Figure 2].

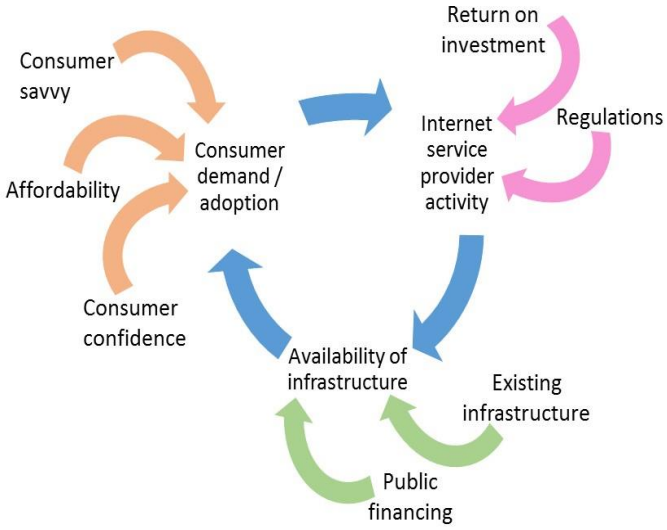


Figure 2. Core and secondary factors affecting broadband development

Rural cooperatives operate within the same system. Cooperatives investigated in this research are chiefly rural electric cooperatives, including a sampling from Wisconsin, and from outside Wisconsin, electric cooperatives that have been active in broadband development, as well as telecommunications cooperatives. Many cooperative boards have considered how they may affect broadband development in their regions. Their responses can be categorized based on the three core factors: affecting customer demand, internet service provider activity or availability of infrastructure.

RESPONSE TO A NEED

There is a perceived connection between potential for future community and economic development and access to broadband. A National Agricultural and Rural Development and Policy Center publication concluded that rural median household income grew at nearly twice the rate where broadband technology was adopted in households compared to where it was not adopted.[1]

Unmet infrastructure need in rural communities is the major reason both telecommunications and electric cooperatives were organized in the early part of the 20th century. The business model which drove investor-owned firms did not support the capital intensive investment required to develop infrastructure in sparsely populated rural areas. Cooperatives were developed to meet the demand for reliable utility services that, both then and now, are critical to modernization, innovation, and future economic development in rural areas.

This preliminary inquiry describes some of the initiatives undertaken by telecommunications and electric cooperatives to address rural broadband infrastructure needs.

Telecommunications Cooperatives

Telecommunications cooperatives are part of the independent, community-based group of providers that serve rural areas, providing broadband, voice and data communications services to over 40% of the nation's landmass to less than 5% of the nation's telecom subscribers.[2]

Background

Farmers were encouraged to establish their own telephone systems on a mutual or a cooperative basis in the early part of the 20th century as a way to bring service to their rural areas.[3] Many small mutual and private telephone companies dotted the rural landscape by the 1920's. However, telephone service deteriorated as the result of business practices and the lack of capital investments needed to maintain systems by these small enterprises[4], as well as the wider economic conditions brought on by the Great Depression.

[1] Whitacre, Brian, Roberto Gallardo and Sharon Strover, National Agricultural and Rural Development Policy Center, 2013, http://www.nardep.info/uploads/BroadbandWhitePaper.pdf
[2] http://www.ntca.org/about-ntca/about-our-members.html August 9, 2016
[3] Schmitt, Jr., Richard G., "Farmers' Mutual Telephone Companies", Journal of Farm Economics, Vol.33, No. 1, Feb. 1951, p. 135.
[4] Hadwiger, Don F., Cochran, Clay, "Rural Telephones in the United States, Agricultural History, Vol. 58, No. 3, p. 223.

A bill passed in 1949 created a federal loan program to support the development and upgrade of rural telephone systems. The federal program was administered by the Rural Electric Administration (REA), which had successfully overseen the rural electrification program using loans and cooperative development assistance in the 1930's. The REA program aimed to provide the "best possible service to the widest practicable number of rural people on a sustained basis,"[5] service that was comparable to what urban populations could access.

The new REA telephone program gave initial preference to the upgrade and expansion needs of small private incumbent companies. Many of these companies took advantage of the new loan programs[6]. The REA also provided support to mutually-owned telephone companies and to new cooperatives that would provide telephone service to unserved areas.

To meet the challenges of building and maintaining telephone systems to serve widely dispersed rural populations, the REA program supported emerging technologies and engineering solutions that could improve service but keep costs down. As a result, the cooperative and small private telephone companies that participated in the REA loan program were early adopters of technological advances such as dial service.[7]

Changing Markets

Telephone cooperatives and independent private providers have had to adapt to major changes in the market. The 1984 break-up of the Bell System and the Telecommunications Act of 1996 promoted competition into formerly regulated service areas. Federal and state regulations have also contributed to changes in the market that continue to the present.

The advent of internet delivery over telephone lines provided a more recent and significant challenge and opportunity to provide service to cooperative member owners. The largest competitive threat to the telecom cooperatives has been from cell phone providers, although in some cases cable and satellite may also compete.

Small rural telecom cooperatives need to respond to market opportunity and competitive challenges in meeting demand for broadband services, but their resources for raising the needed upfront capital investment may be limited. As Universal Service Fund monies and fees from inter-carrier compensation to small rural telecommunication companies decline, they may need to rely more on the revenue from subscribers, which places pressure on subscriber rates. [8]

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[5] Schmitt, p.139.
[6] Hadwiger et al., p. 233.
[7] Hadwiger et al., p. 233.
[8] http://www.rtfc.coop/content/rtfc/news/rtfc_news_archive/rtfc-reed-talks-broadband-financing-at-senate-session.html . Accessed October 28, 2016.

Support

The Rural Utilities Service (RUS) of the United State Department of Agriculture (USDA) is the successor to the REA. RUS, through its Telecommunications programs, is committed to "ensuring that rural areas have access to affordable, reliable, advanced telecommunications services comparable to those available throughout the rest of the United States."[9]

RUS has continued to support the telephone – now telecommunications – cooperatives. Many cooperatives have been clients of RUS for 50 to 60 years, having received and paid back loans multiple times.

The RUS direct loan program is for assets that can be expensed and depreciated, and the loan term is for the life of the asset. The program also includes requirements for financial, engineering, and other planning and assessment work. Very favorable interest rates are based on the federal rate and are significantly lower than commercial bank loans. RUS will make loans in overlapping areas, but won't finance competition to existing loans.[10]

Broadband Adoption

Access to broadband infrastructure is only part of broadband deployment. Subscribers who value broadband access enough to pay the monthly subscriber fees provide the financial return which feeds reinvestment. In some areas, early adopters willing to commit are a relatively small percentage of the potential subscriber base, and may not be a sufficient subscriber base to support the ongoing costs of expanded broadband service.

Broadband adoption by a larger subscriber base is driven by a variety of factors. The perceived benefits of broadband services to a subscriber are influenced by that subscriber's skill and comfort level with technology. Increased knowledge and skill can raise a member's awareness of benefit and subsequently provide greater benefit, which will also affect the subscriber's willingness to pay, within the general affordability limits driven by household income. Households are looking for a return on their investment in their subscription charge.

Outreach efforts to increase the knowledge and skill of the subscriber are aligned with the cooperative business model. Member education has long been a part of a set of cooperative principles that differentiate the cooperative from other business approaches. [11] Member education is used to help

[9] https://www.rd.usda.gov/about-rd/agencies/rural-utilities-service. Accessed November 15, 2016.
[10] Interview with Andre Boening, General Field Representative, Wisconsin Rural Utility Programs, USDA, March 14, 2016.
[11]Cooperative Business Principles, Cooperative Information Report 45, Section 2, April 2011. http://www.rd.usda.gov/files/CIR45_2.pdf

members fully understand the benefits that their cooperative can provide to them. It is also seen as essential for the effective governance of the business by its member-owners.

Some cooperatives proactively incorporate this aspect cooperative identity into their operations, and may run retail centers to facilitate their members' purchases, help with comparison shopping, or provide help for installation.

In Wisconsin

To profile some of the broadband activities by telecom cooperatives, this report looked to Wisconsin, where there are 11 telecommunications cooperatives[12]. The cooperatives have approximately 35,000 access lines[13] that serve rural areas in the northwestern and western portions of the state.

The current Wisconsin telecom cooperatives were incorporated in 1948-1967, and were clients of the federal REA program since its inception.[14] Wisconsin telecom cooperatives have continued to be clients of RUS.

Wisconsin telecom cooperatives are typical of many nationwide, in that they have made an investment in fiber optic networks, including fiber to the premises (FTTP). Fiber offers virtually unlimited bandwidth, and uses light signals to transmit data. It is 10 to 20 times faster than 3G/4G wireless service, and offers unlimited data with no caps. Once it is installed, upgrades to the fiber network are made through updating the electronics that generate the light pulses, rather than replacing the fiber itself. These characteristics of fiber provide significantly more capacity at lower costs, but only over a long-term, 20 year cost-recovery period. Wisconsin telecom cooperatives have FTTP capabilities that provides coverage to approximately 80-100% of their service areas.[15]

Wisconsin telecom cooperatives also provide service to gigabit business parks in the rural counties in which they operate. Gigabit business parks are one of the criteria that can be used in site selection tools on the Wisconsin Economic Development Corporation (WEDC) website[16], reflecting their importance in attracting and retaining businesses in an area.

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[12] Telecom cooperatives and independent private providers serving rural areas share a blended history and common interests that are represented by the NTCA-Rural Broadband Association. Until several years ago, the association's membership was limited to telecom cooperatives. It now includes independent private provider members. As a result, its public reporting on national rural broadband service providers does not differentiate between telecom cooperatives and other providers.

[13] Wisconsin Legislative Council Information Memorandum, "Regulation of Telecommunications Services," June 2, 2011, p.3

[14] Boening, March 14, 2016.

[15] Boening, March 14, 2016.

[16] Based on http://inwisconsin.com/select-wisconsin/available-sites/locate-in-wisconsin/ Accessed and data compiled August 2016. See Appendix II.

There are at least 222 gigabit business parks in the state, with service provided by 33 telecommunication companies. Nine of those providers are telecom cooperatives, which service 29 parks in 15 rural counties.

These rural counties make up 21% of the land area of the state, but only approximately 9% of the state's population reside in those counties.

This is in contrast to the relationship between population and land area for gigabit park locations which are serviced by independent private and investor-owned providers. Parks serviced by those providers are located in counties comprising 40-44% of the Wisconsin's area, but where 67-70% of the state's population resides. The financial requirements to build and maintain the physical infrastructure required to service more sparsely populated areas can create disincentives for these types of providers. That telecom cooperatives are servicing gigabit parks in areas with lower population density overall reflects the use of the cooperative business model to effectively address rural infrastructure needs.

Type of Provider Ownership Structure	Number of Providers Servicing Business Parks	Number of Parks Served by Provider Type	Population of Counties Served	Population of Counties Served as % of State Total	Area of Counties Served (in sq mi)	Area of Counties Served as % of State Total
Telecom Cooperatives	9	29	477,662	9%	11,533	21%
Independent Private Providers	21	86	3,607,826	67%	23,656	44%
Investor-Owned Providers	3	107	3,777,738	70%	21,897	40%
Totals	33	222				
State Total Population	5,363,715					
State Total Area in Sq Miles	54,158					

Telecom cooperatives in Wisconsin are also addressing broadband adoption issues. Telecom cooperatives' website show that many provide retail services for computers and tablets, offer computer diagnosis, repair, and system design, home and business networking, and technology classes.

As an example, Citizens Connected (http://citizens-tel.net/) telecommunications cooperative has services such as a retail center, residential and business IT (information technology) services, technology classes at no charge, and help with online security available to their members[17].

[17] See Appendix for listing of Wisconsin telecom cooperatives.

Vernon Communications Cooperative provides another example of how a telecom cooperative is educating its community about how broadband can be used to accomplish business development goals, and promotes adoption of broadband services. The cooperative staff worked with the UW-Extension Broadband and E-Commerce Center to offer web and online training for small- and mid-size businesses. Using online tools for website design, social media and online marketing, 49 attendees learned how to build their businesses and enhance their bottom line[18].

The cooperative priority of service to its member-owners, as opposed to the requirements of investor-owned companies for returns to its investors, may facilitate a longer-term view that supports fiber deployment. Cooperatives need a financial return to maintain financial stability, and are subject to the same regulatory and cost environments as other telecommunications businesses. But they may also be willing to take some risk and sacrifice some profitability in order to meet member and local service needs over the long-term.

A Closer Look – Marquette-Adams Telecom Cooperative

The Marquette-Adams Telecom Cooperative provides an example of how one Wisconsin telecom cooperative has approached broadband service provision, and by expanding its system is able to pursue broadband opportunities in neighboring rural areas in need of service. [19]

The cooperative has about 5000 lines, and has been active in expanding service provision for internet and television over the last 10 years. It also provides backhaul services to other telecommunications providers. While fiber has been part of the networks since the 1970's as backbone and trunk cables, it began providing FTTP in the 1980's. The cooperative is still in the process of replacing copper lines with fiber. It also provides backhaul services to 30+ cell towers, including those of AT&T and Verizon.

Marquette-Adams recognizes that it must be competitive to gain new customers, and works to adopt a proactive and forward-thinking approach. A 2010 ARRA grant of $20 million was used for a major service area expansion, and covered 69% of the costs. The remaining piece of the project was financed through a RUS loan. The project included laying miles of fiber, allowing the cooperative to offer gigabit service to the home.

The cooperative is continuing the expansion and has invested its own equity to do so. Fiber will last "forever" in the ground. The cooperative oversized its build to its service boundaries to allow expansion. The expansion has allowed the cooperative to respond to a variety of requests for broadband service. It worked with Allied Cooperative, a farm supply cooperative, to supply the fiber Allied needed for its own network. The cooperative was also able to provide high-speed internet to a new condominium development.

[18] http://broadband.uwex.edu/blog/2016/08/web-online-training/

[19] Interview with Jerry Schneider, GM of Marquette-Adams, All Sebastiani, Board President, and Dick Wirth, Director, April 22, 2016.

Marquette-Adams is exploring partnering with the city of Adams to provide broadband service, in response to the interest that the city has expressed over the last three years. In discussions with the city, Marquette-Adams has emphasized its cooperative structure, and their focus on service. The cooperative staff is proud of its service record, and tracks customer satisfaction as a way to monitor the quality of their contracted maintenance services.

Marquette-Adams has recognized that experience and training of staff is key to future successful operations, as technology continues to change. It has taken a proactive approach in embracing new technology, and invests in staff with ongoing technical training.

The Role of the Board

As a cooperative, the board is elected from the membership, and is responsible for overseeing the cooperative's strategic direction. Expanding and upgrading broadband service is a critical issue that the boards of telecommunications cooperatives must navigate.

Marquette-Adams has worked to diversify its board over recent years, intentionally recruiting directors from different business backgrounds so that broader business perspectives can inform the cooperative's strategic planning. Initially 99% of the board were farmers; now the seven members represent a variety of sectors, and include a banker, two farmers, a machinist, a business owner, a cheese-maker, and a person with a technical professional experience.

Board decisions are decided by a majority vote. The board values diverse opinions, and unanimity is not expected: individual directors will take a minority position if that seems warranted to them.

Board approval was needed to forward with investing in the development of the ARRA grant proposal. The ARRA proposal that was developed covered major portions of their territory that was underserved. The board met to discuss and raise questions the proposal, before deciding whether to submit the proposal that was developed. Marquette-Adams was debt-free at the time, and the project proposal also included the RUS loan. There were also creative financing opportunities for construction loans. While there was risk associated with the project, the board also felt that there was a business risk associated with doing nothing and so voted to approve the project.

The board and management have decided not to go after state grants offered through the Public Service Commission. The grants are too small for any significant project, and the cash match requirements are not aligned with the current cash priorities of the cooperative.

Partnering and community engagement

Partnering is an approach that can leverage rural community assets to provide broadband services. It also can provide a wider, community-based perspective on larger economic development opportunities

and challenges. At the same time, community engagement can support outreach activities that familiarize members and others with services that the cooperative offers, and contribute to subscriber broadband adoption. Marquette-Adams has engaged in sector and local partnership arrangements, and engages with the communities it serves.

Marquette-Adams is part of Wisconsin Independent Network, the largest independent fiber network in Wisconsin. It is owned by 31 independent telecom providers in the state, including the telecom cooperatives. It provides services to accessing and managing networks and network security, and for data storage.

In the past, the Marquette-Adams has partnered with three rural electric cooperatives and two telecom cooperatives to deliver satellite TV services to members.

The board makes small, local economic development grants using monies from unclaimed capital credits. These grant requests are reviewed and approved by the board. The cooperative is interested in working more closely with economic development groups to leverage the capacity that they have and explore additional expansion possibilities. Expansion out of the cooperative's original incumbent territory has provided valuable experience as well as opportunities for cost-sharing and member-base expansion.

Marquette-Adams engages in a variety of community outreach activities that highlight cooperative services of interest to its members. The cooperative distributes cameras to schools so that students can produce content, and broadcasts sports team events from surrounding high school districts. It has provided free wireless connectivity at local events such as the Marquette County Fair.

Rural Electric Cooperatives

Electric cooperatives currently are less visible players in the rural high speed internet system. But the internal needs of the sector, coupled with the cooperative orientation toward local economic development, is pushing the sector to become more active.

According to the National Rural Electric Cooperative Association, 42 percent of the nation's electric distribution lines are owned by electric cooperatives. These lines cover 75% of the U.S. land mass to reach just over 12 percent of the nation's meters, an average of 7.4 customers per line mile. This is much lower than investor-owned utilities, which average 34 customers per line. Public owned utilities, or municipals, average 48 consumers per line mile.[20] Because electric cooperatives are organized and operated to provide service to member-customers rather than a return to investors, they have been able to develop and maintain the infrastructure to serve rural, sparsely populated rural areas.

[20] http://www.nreca.coop/about-electric-cooperatives/cooperative-facts-figures/ August 9, 2016.

Background

The parallels between the current broadband access issues and the lack of electricity in rural America during the 1930's has been frequently noted. Given the success of the rural electrification program that was created to address the problem, aspects of that program's development may be relevant in discussions about promoting broadband access and adoption in rural areas. [21]

The REA was created in 1935 to "initiate, formulate, administer, and supervise a program of approved projects with respect to the generation, transmission, and distribution of electric energy in rural areas". It was originally conceived of as a program to stimulate employment during the Depression, although there were others who saw rural electrification in larger public interest terms and had long supported a more proactive stance to its development.

It was initially expected that the REA would follow patterns established by other agencies and use grants and subsidies, as well as a loan program, to stimulate commercial activity and employment in the manufacture and construction of new electric infrastructure. However, the REA considered rates and costs a critical factor in the development of a successful electrification program, and called for planning on an area basis so that economies of scale could be realized.

To support these goals, the program became an interest-bearing, self-liquidating lending program, making loans for the construction of rural electric systems at interest rates based on Treasury bills. In 15 years, the number of farms that were electrified increased from 11% to 78%[22].

The loan program did not exist in isolation. The REA provided technical assistance to emerging cooperatives that including organizing, legal and incorporation work, financial planning, cost-effective engineering and negotiating wholesale power contracts. The level of assistance provided reflected the fact that the loans were 100% secured by the physical assets, necessitating the proper construction and operations of the financed facilities.

As borrowers became established, the REA responded to changing needs with programs and policies that emphasized the importance of member education, community relations, and effective business management practices.[23]

A Spectrum of Response

Throughout our research interviews, we discovered that many electric cooperative boards are considering what part, if any, they could play in broadband development in their communities. The

[21] Person, H.S., "The Rural Electrification Administration in Perspective", Agricultural History, Vol. 24, No. 2, April 1950. http://www.jstor.org/stable/3741056
[22] Person, pg. 73
[23] Person, pg. 84

interviews disclosed a dynamic tension between several of the cooperative principles and values that govern the boards' deliberations.

Electric cooperatives' primary mission is to deliver electric service to member-owners in a financially responsible manner. Boards setting the strategic direction for the cooperative have the fiduciary responsibility to assure that mission can be met into the future. However, as the necessity of broadband access grows, the lack of high speed internet is increasingly a problem for members.

In addition, technological changes that are affecting the architecture of the electric grid increasingly are making questions about broadband access more directly relevant to the electric cooperative's own future operations. By upgrading the communications technology that is part of the cooperative's electric infrastructure, a "smart grid" will allow cooperatives and their members to better manage energy demand and distributed energy functions that allow customers to contribute to the grid.[24]

Other values may also drive a cooperative board to explore providing broadband access. Many cooperatives are guided by seven cooperative principles, one of which embraces a concern for the community. In the case of electric cooperatives, management or boards often participate on local economic development boards and committees. The cooperative's electric infrastructure is critical to community economic activity, which in turn maintains the cooperative business and supports future growth. The overlap between the electric cooperative membership and the community aligns the service goals to members with a service orientation to community.

Management and board directors have begun to ask: how can the need for improvements to their communication infrastructure also contribute to meeting the needs of their members and communities? What role is appropriate for them to take on while they maintain their focus on delivering electric service?

The response from electric cooperatives to these needs falls across a spectrum (Figure 3).

[24] http://www.electric.coop/nreca-tapped-develop-transformational-grid-technology/ Accessed November 30, 2016.

Figure 3. A spectrum of response by electric cooperatives

At the top of the graphic, on the relatively low end of investment, electric cooperative directors or management are participating in community discussions concerned with economic development in their regions. Broadband deployment and utilization has become a topic of interest among economic development committees and coalitions. In some areas, coalitions focused exclusively on broadband adoption and/or deployment have formed.

In the next level of response, a cooperative enables their members' ability to subscribe to high speed internet access, often by negotiating special member pricing through an independent internet service provider. The organization may or may not directly benefit from these arrangements and invests in partnerships to make service available. The investment involves the benefits and risks of being associated with another business whose service to the membership and reputation may reflect on the

cooperative. The cooperative staff spend time investigating potential partners to develop a level of trust in the provider to deliver services that will be perceived positively by members.

Toward the middle of the spectrum, cooperatives are investing in broadband-related infrastructure to support their own needs as electric utilities. As with other industries, high-speed internet is changing operation standards for electric utilities. Opportunities for improved efficiency and customer service has led to an increase in the amount and frequency of data collected by utilities; data transfers are facilitated by improved broadband-capable infrastructure. Cooperatives have invested in wireless and hard-wire infrastructure that improve communication between their facilities.

Taking this investment a step further, some cooperatives leverage their investments and their unique funding structures to strategically develop more infrastructure in ways that serve their community's or region's overall internet needs. This entails entering into business relationships with other entities to carry signals over a regional backbone and/or enable members' subscription to an internet service. The electric cooperative's infrastructure may facilitate access to a separate internet service provider for member benefit.

The most robust response electric cooperatives have taken comes after a board decision to take active steps to provide internet service. The board may elect to form a separate organization or enlist other partners to accomplish some of the tasks required, but the electric cooperative takes a committed role in creating the structure which allows members to access high speed internet.

Examples to illustrate this spectrum follow below. It should be noted that cooperatives are often engaged in more than one of these responses; these examples are selected case studies and not an exhaustive survey of what has been accomplished by electric cooperatives or by any individual cooperative.

Pierce Pepin Electric Cooperative Services[25]

Electric cooperatives are often involved in local economic development initiatives. The Pierce Pepin Cooperative Services narrative highlights a leadership role in a locally driven effort to better understand the current state of broadband service in their area.

Pierce Pepin Cooperative Services board and staff started to become aware of the community's increasing internet needs over 10 years ago, as members shared frustrations with lack of adequate internet service getting in the way of doing business. In the meantime, the board has refocused on their core business of providing electric service, and has phased out the cooperative's involvement with appliance retail sales and service, propane sales and home security services in recent years. In the past, the cooperative had offered members satellite internet service through an agreement with another company, but no longer does so.

[25] Interview with Jeffrey Olson, VP, Engineering, Pierce Pepin Cooperative Services, May 20, 2016

Wary of potential financial risk for the cooperative in a domain where the rules keep changing, Pierce Pepin is exploring broadband possibilities as an active member of a wider community effort. Jeff Olson regularly participates in efforts through the Ellsworth Area Industrial Council. In 2014, the Council conducted a survey of Pierce County residents and businesses to assess broadband service in the county and determine opportunities for residents and businesses. The cooperative provided staff time for development of the survey, administrative support for the survey, as well as GIS analysis and mapping assistance.

Pierce Pepin Cooperative Services has an eye on the future of broadband in the community because there are mutual benefits to this communication technology. Pierce Pepin is experiencing exponential growth in data and in upgrading their communications infrastructure there may be opportunities to work with local businesses to add broadband services for the surrounding area. Wireless is considered a bridge technology to fiber optics, which is a more 'fail safe' approach. The staff are looking ahead to generate more cooperation in construction projects where fiber could be added, and building partnerships with local businesses to provide adequate broadband to Pierce County as a whole.

Central Wisconsin Electric Cooperative[26]

Another electric cooperative involved with local economic development is the Central Wisconsin Electric Cooperative. The cooperative board has a track record of monitoring and responding to the changing needs of members. In the past, it formed partnerships to extend satellite television access to members. The satellite television experience grew into the cooperative and these partners offering satellite internet. The satellite internet business was subsequently sold. The board's position is that member services outside of electric service cannot compromise their ability to provide electric service.

On a broader level, Central Wisconsin Electric Cooperative invests time in local economic development and quality of life of the community. Staff participate in several economic development group meetings at the municipal and county level, at which broadband is discussed as a development issue. Staff have noted great business and residential interest in improved internet service through their participation in local discussions. They are actively seeking opportunities for expanded access in their service area as they look for ways to meet their members' needs.

Adams-Columbia Electric Cooperative[27]

Adams-Columbia Electric Cooperative serves member customers in south central Wisconsin. The cooperative currently helps to provide internet service by acting as an agent for Bug Tussel, a wireless internet provider, to provide services to interested customers. This was a spin-off from agreements made with the provider to meet the cooperatives own service needs for a number of its substations. Cooperative members

[26] Interview with Mark Forseth, Vice President of Customer Relations and Economic Development, July 29, 2016
[27] Interviews with Marty Hillert, CEO of Adams-Columbia Electric Cooperative, December 21, 2015, January 22, 2016, February 18, 2016.

can learn more about internet service plans and sign up for wireless service at the cooperative's showroom or by contacting their cooperative. This has been a win-win for both parties; by servicing the cooperative, the provider has been able to expand its markets.

Adams-Columbia Electric Cooperative

Bug Tussel, a wireless internet provider, wanted to place towers in Adams-Columbia service territory. Adams-Columbia needed the internet services for metering functions at its substations and had the right-of-ways in place. The two parties worked out an agreement that allowed Bug Tussel to place its towers near substations so that they would meet the cooperative's needs as well as its own. Five or six substations in the northern part of the Adams-Columbia service area are now covered in this way, and another substation project is scheduled. Adams-Columbia and Bug Tussel have worked out a mutually beneficial financial relationship which allows both to reduce their potential costs.

More on the Adams-Columbia Electric Cooperative story can be found the narrative in the following section, "A Closer Look: Two Wisconsin Rural Electric Cooperatives".

Richland Electric Cooperative

Richland Electric Cooperative serves about 3500 members in and around Richland County, Wisconsin. Richland Electric partnered with two telecom cooperatives to form a competitive local exchange carrier, Genuine Telecom, and compete as a local service provider in the city of Richland Center. Richland Electric worked out an arrangement with the city to build and lease the fiber network. More on the Richland Electric Cooperative story can be found in the narrative in the following section, "A Closer Look: Two Wisconsin Rural Electric Cooperatives".

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Gibson Electric Membership Corporation[28,29]

Gibson Electric Membership Corporation is headquartered in Trenton, TN and serves members in western Tennessee and western Kentucky. In 2015, Gibson Electric expanded their fiber transport business. Initially installed to serve Gibson's substations and member service centers, the fiber network has expanded to enable internet service to members such as schools, banks and commercial businesses located along the fiber route to access state of the art telecommunication services.

Gibson's investment in infrastructure has allowed them to develop relationship with five internet service providers. Leveraging the infrastructure necessary for their business, the corporation is also part of an aggregated network between 20 utilities.

[28] Personal communication, Charles Phillips, Vice President of Engineering and Technical Services, April 5, 2016.
[29] Gibson Electric Membership Corporation, 2015 Annual Report.
http://www.gibsonemc.com/sites/gibsonemc/files/Annual%20Report%202016.pdf

Lumbee River Electric Membership Corporation[30]

Lumbee River Electric Membership Corporation (LREMC) is a member-owned utility serving Cumberland, Hoke, Robeson and Scotland counties in North Carolina. With the help of an ARRA (American Recovery and Reinvestment Act) award, LREMC created infrastructure to deliver internet service to its members. The corporation built for open access, but internet service providers did not show the interest for which they were hoping.

It took searching and negotiation to build a relationship with a provider. LREMC chose to create a separate business entity to manage the service, Blue Wave Communications (http://bluewavenc.net/). In a presentation at the Broadband Communities Summit in April 2016, LREMC executive Steven Hunt shared lessons learned for commitment at this level. The entire organization needs to be on board to make this kind of leap; alignment at all levels is necessary. He also stressed that working in broadband requires quite a different approach and skills, as the market is very different from the electric distribution business.

Arrowhead Electric Cooperative[31,32]

Located at the northeast corner of Minnesota, Arrowhead Electric Cooperative serves rural members along the Lake Superior shoreline. Arrowhead became involved when a local coalition began to build their capacity as a Blandin Broadband Community. The coalition conducted a survey to assess existing internet service and potential customer interest. This background work prepared community champions to apply for ARRA grant funding, and they were successful with their second application.

In 2010 the United States Department of Agriculture (USDA) awarded Arrowhead Cooperative over $16 million in grants and low interest loans to build a FTTP broadband network throughout Cook County. In addition, Cook County awarded Arrowhead Cooperative a $4 million grant from the 1% sales tax fund. These financial resources allowed Arrowhead to build infrastructure and capitalize on a business partnership with CTC, a telephone cooperative located 200 miles away in Brainerd, Minnesota. CTC handles billing and much of the customer support.

During the project's construction phase, customers were informed of building phases and invited to use internet service at the cooperative headquarters.

[30] Panel presentation, Broadband Communities Summit, *Strategies for Electric Cooperatives to Deliver FTTP Services*, Austin, TX, April 5, 2016.
[31] Interview with Joe Buttweiler, Arrowhead Electric Cooperative, February 26, 2016.
[32] Arrowhead Electric website, http://www.aecimn.com/

Co-Mo Electric Cooperative[33]

Co-Mo Electric Cooperative's investment in broadband started with 600 letters from members, asking for the cooperative to do something about their internet service. Co-Mo's service area extends from the Missouri River in the north to the Lake of the Ozarks in the south, comprised of 2300 square miles. The board's response to the members' request started with a pilot project in 2011. The board found the pilot so successful they decided to extend the project to their full territory. The cooperative created Co-Mo Connect, a service of Co-Mo Cooperative, as a subsidiary to the cooperative.

Co-Mo used various methods to build support and subscribership, including updates on their own YouTube channel and yard signs to encourage neighbor to neighbor marketing. The cooperative averages 7.8 meters per mile. While the cooperative tackled the project without grants, loans or subsidies, they met their break-even point in three years, even though they had planned for seven years.

A Closer Look – Two Wisconsin Rural Electric Cooperatives

There are 24 rural electric distribution cooperatives (RECs) in Wisconsin, covering rural areas in central and western parts of the state.[34] Eight of those cooperatives offer internet services to their members through arrangements with wireless or satellite providers.

In an informal survey of general managers of Wisconsin electric cooperatives[35], two of the cooperatives expressed interest in making high speed internet available throughout their service territory. Both already provide access to wireless or satellite internet service providers. The cooperative that sent out the survey was also interested in exploring the issue, while also offering a high-speed internet option through a wireless provider. While three of the cooperative CEOs indicated no interest in providing broadband, they also made comments that reflected continuing board interest about this issue.

Other survey comments noted that at least portions of their service areas were already being served by providers that included telecom cooperatives, independent private providers, and investor-owned companies.

Interviews with two electric cooperative CEOs, summarized below, reflected the unique set of factors and perspectives that each cooperative brings to questions about broadband access.

[33] Panel presentation, Broadband Communities Summit, *Strategies for Electric Cooperatives to Deliver FTTP Services*, Austin, TX, April 5, 2016.

[34] http://psc.wi.gov/utilityinfo/maps/documents/largeElectricMap.pdf

[35] Informal email survey sent by Marty Hillert, CEO of Adams-Columbia Electric Cooperative, on December 21, 2015.

Richland Electric Cooperative[36]

Richland Electric Cooperative serves the southwest region of the state. It serves approximately 3.5 households or farms per route mile, the lowest ratio in the state. The CEO, Shannon Clark, is very knowledgeable about the issues surrounding electric cooperatives and broadband. He serves on the board of the National Rural Telecommunications Cooperative (NRTC), which was founded by electric cooperatives, the National Rural Electric Cooperative Association (NRECA), and the Cooperative Finance Corporation (CFC).

Clark sees a strong need for broadband for the cooperative to manage its infrastructure internally, for its members to access the cooperative's energy efficiency programs. He also sees the benefits that broadband access brings to the community by supporting economic development and area educational institutions.

Three telecom cooperatives and one independent company serve half of the county in which Richland Electric Cooperative operates, and provide FTTP. The remainder of the county receives coverage from two price-cap carriers which have received CAF II grants for building and delivering broadband service.

Clark discussed the difficulty in developing economically feasible approaches to providing broadband in rural areas. While many see broadband access as a necessity, there is still a percentage of rural residents that do not see its value. He pointed out that virtually all households passed would opt to connect to a new electric distribution line being built. In contrast, a new fiber line build-out must contend with lower adoption rates that are affected by rates, affordability, and lack of perceived need.

Richland actively considered a buildout to cover the rest of the county to serve 5000 to 8000 subscribers, which would cost $22 million. While the low rural density made it challenging, the adoption rates at the rate necessary for financial feasibility seemed attainable. However, Connect America Fund (CAF) II grant funding has changed the competitive landscape. With the right partner, Clark thought that the buildout was possible. Partnerships work when the parties are willing to take a piece, rather than the whole, of the potential success of the project.

Clark sees partnerships as key to expanding broadband access, and has partnered with two telecom cooperatives to bring broadband to the adjacent city of Richland Center. Clark commented that rural electric cooperatives need broadband and are agnostic about who provides it. They only require that their member investment not be subject to extreme levels of risk. In particular, members who already have broadband access from a local telecom cooperative may view new ventures into broadband as an undue risk. While cooperatives need some return on investment, it is not at the level required by investor owned firms.

[36] Interview with Shannon Clark, CEO of Richland Electric Cooperative, February 9, 2016.

Partnerships with other utility cooperatives have challenges that are unique. Boards are respectful of the autonomous nature of each cooperative, and would like to avoid comparisons that would cause disagreement among members.

Adams-Columbia Electric Cooperative[37]

Adams-Columbia Electric Cooperative is the largest electric cooperative in the state. It spans seven counties, and crosses into five additional counties serving areas near the adjacent borders.

Broadband access, the need for services, and how the cooperative might participate in delivery was identified by the board as a strategic issue for the cooperative. This has been primarily driven by the membership. Some of the members are already well-served; others have minimal or substandard service. Marquette Adams Telecom Cooperative is located in the center of the cooperatives service area, and its fiber network also provides service to Adams-Columbia. The cooperative currently provides a link to its wireless internet provider for its members.

The cooperative has also been involved in community-level conversations about the need for broadband access. As CEO of the cooperative, Hillert sat on the economic development committee for the county, and chaired the group.

Internal Broadband Needs and Smart Metering

Adams-Columbia has considered an approach to increase accessibility for its members by working with Bug Tussel to expand on the towers that are currently being built. This type of expansion is broadly estimated at $40 million and would involve a lease arrangement with a payback period of 10 years. Members would see higher costs for some years, but they would have needed service.

The cooperative promotes member use of new technologies to monitor their energy usage, but this is dependent on broadband access. Bug Tussel collects large amounts of data for smart metering, but there is not the broadband capabilities to collect data from all of the cooperative's 35,000 meters. The smart meters are 1st generation and depend on power lines for transmission. Bug Tussel's infrastructure and radio might allow the cooperative to go with the 2nd generation of smart meters.

While the "internet of things" takes this a step forward, it relies on broadband availability. The cooperative also sees some opportunities to partner with Marquette-Adams Telecom Cooperative, which received a significant grant to invest in fiber (described earlier in this report). While its service area is smaller than that of Adams-Columbia, there might be some areas where an expansion by Marquette-Adams would benefit the electric cooperative's members.

[37] Conversations with Marty Hillert, CEO of Adams-Columbia Electric Cooperative, December 21, 2015, January 22, 2016, February 18, 2016. Hillert retired on July 1, 2016.

Partnering and Community Engagement

As chair of the county's economic development committee, Hillert saw the need for broadband access. The economic development committee supported exploratory conversations between Marquette-Adams Telecom Cooperative and the city of Adams. He also had conversations with three county board chairs about county needs, and ideas and possibilities for broadband access and delivery.

Adams-Columbia has experience with partnerships around issues other than broadband. The CEO felt that although the cooperative was on a learning curve on the broadband issue, it already was skilled in partnerships. Partnerships have been used in the past to deliver satellite TV, coordinate with LP gas business, a tree-trimming operation with seven other cooperatives, and healthcare arrangement with 10 other cooperatives.

Besides Richland Electric Cooperative, there is not much involvement by rural electrics in the state to provide broadband. There is overlay of telecom and electric cooperative service areas, and the board of Adams-Columbia tries to respect those boundaries. Hillert commented that this is probably typical of board thinking in other electric cooperatives, and some are letting the telecom cooperatives take the lead.

The board recognizes that there is not an incentive for investor-owned firms to invest in rural broadband, so there is a social or community component in its discussions about providing broadband to its members. The cooperative business model has an advantage in delivering services over the investor-owned firm model, which doesn't work as well in low-density rural areas.

There is also a place for cooperatives to help in supporting technology use by the membership. This is reflective of the cooperative principle of member education, to help people make effective use of the services offered by the cooperative.

However, the business case ultimately must drive the internal discussion within the cooperative, since board must evaluate to what extent the resources of the electric side of the business are committed to this effort.

HIllert suggested that it is more challenging to identify potential partnering opportunities because of the lack of public information about existing hard assets. This can lead to projects that duplicate fiber. Projects that would be feasible by building off of existing assets cannot be identified.

Potential partnerships also can be developed around funding opportunities. Hillert observed that there is disappointment that federal CAF grants have not been made to cooperatives, and concern that the funding that has been awarded will be used to build out services closer to populated areas. He expressed concern that there is not better recognition at the national level about rural needs that are not being met.

The Role of the Board

In the past the cooperative board has looked into providing broadband to its membership. There was some disappointment that there wasn't more interest in pursuing this, but preliminary cost/benefit analyses indicated that it was too expensive to get into the business. The core electric distribution business might be required to subsidize the venture, which was not acceptable.

The impression of management was that broadband services offered by electric cooperatives was not widespread, and that there was not an economic model that worked. If there was not the required density in a service area, a slow wireless connection was the option that was made available to membership. There were concerns about even with federal grant funding, FTTP projects might struggle to achieve a subscription rate needed for project feasibility.

Interest in the issue remains. The board considers the high-speed access question a "back burner" issue and has continued to periodically revisit it.

Member broadband access was again on the agenda for the board's annual strategic planning meeting in March 2016. Hillert and management thought that a case study illustrating the investment and adoption rates required for successful implementation would be helpful to the board. RCDG project staff presented at the meeting. Besides two examples of cooperative delivery of broadband, the presentation also included a framework and questions that the board might consider in further exploring the issue.[38]

[38] Powerpoint presentation available at: http://www.slideshare.net/WI_Broadband

GOING FORWARD

Interviews uncovered some consistent threads as cooperative boards and staff consider how their organizations could be contributors to broadband development. One strong thread that recurrently appeared was the strong commitment by the board to their core mission of delivering electricity to their members, while seeking solutions which did not jeopardize their core mission. Considerations about the financial strength of the cooperative took a high precedence; it was repeatedly communicated that board directors take their fiduciary responsibility very seriously.

Another thread in the narratives was a desire to be responsive to membership. In whatever ways the board and staff responded, there was an underlying intention to deliver value to members. Board directors are also members of their respective cooperatives, make decisions with the objective of preserving the interests of the members. Woven into this intention to maintain member benefit was the thread of trust.

Maintaining members' trust leads the cooperative representatives to develop business relationships that generate trust. The cooperatives' staff communicated the desire to create partnerships that work for all parties and protect the reputation of the cooperative.

Part of the larger narrative of cooperative involvement with broadband includes community service. The stories collected highlighted cooperative interest and skill in community development, and knowledge of how the cooperatives' success depends upon the communities' success. All along the spectrum of response, one of the recurring considerations was whether or not their effort would make the surrounding, broader community stronger.

A Framework for Change

Individual communities have unique needs and challenges to address, yet there are patterns common to how sustainable, systemic change happens, supported by formal and informal leaders. Systemic change such as broadband development typically begins with building awareness of the issue, proceeds to methods of gathering community support, and follows through with actions taken to create positive, enduring transformation.

For an electric cooperative or other cooperatives to respond to a community need for increased broadband development in a more active manner requires organizational change. To choose an

appropriate role for their cooperative, a board may consider how change happens in an organization with a framework for change developed by John P. Kotter.

Kotter outlined an eight-step change framework after analyzing changes failures in companies and organizations for more than 15 years.[39] He identified patterns of errors that create barriers, and from those, crafted a roadmap for an organization to overcome those barriers.

Kotter describes the process to create significant change in eight stages. Formulating how these eight stages would be addressed in their particular organization helps leaders sort through barriers and identify which barriers suggest an alternative course, or perhaps, a different level of response.

Complicating the decision-making is the reality that a broadband development response affects and is dependent upon the broader community. Leaders outside of the cooperative are often engaged with the issue and affecting outcomes. Case study interviews emphasized the need for partnerships and networks to build solutions. How can a cooperative balance their own needs for service and stability with the community needs?
What may be helpful are parallel tracks of inquiry, in sequential order, along the eight accelerators of strategic activity. A method for each track follows, one intended for reflection internal to the organization and another to manage thinking about broader community efforts outside of the cooperative.

To take advantage of a big opportunity, Kotter describes best practice within an organization as a series of steps. Kotter advocates that a big opportunity presents a chance to create a dynamic where people become more active change drivers and where fluid, creative networks can be implemented to work with the established and necessary

It's a fast-moving world

In 1996, John P. Kotter authored the book, *Leading Change*, in which he outlined an eight-step change framework for organizations. Kotter identified patterns of errors that create barriers, and crafted a roadmap for transformation to overcome these barriers.

Kotter expands on these ideas in his 2014 book, *Accelerate,* in which he describes the advantages of a more fluid strategy network; this model applies more readily to change beyond the organization, such as between partners and in the broader community. The parties who collaborate for change are not bound by the rules and structures that one finds in organizations. Leadership is often informal; authority comes in the form of knowledge sharing and relationship.

Kotter's eight stages for strategic change are:

1. Create a sense of urgency
2. Build the guiding coalition
3. Form a strategic vision and initiatives
4. Enlist a volunteer army
5. Enable action by removing barriers
6. Generate (and celebrate) short term wins
7. Sustain acceleration
8. Institute change

[39] Kotter, John P. *Accelerate: building strategic agility for a faster moving world*. Harvard Business Review Press, 2014.

hierarchy. These process steps are intended to foster innovative thinking and structures, to use a big opportunity to create changes which allow the organization to respond quickly to a rapidly changing world.

The case studies document many opportunities: efficiencies gained by use of the internet in the industry, individual member access and adoption, involvement in partnerships and community. Organizations have the chance to choose which is the "big opportunity" for them.

Two tracks of inquiry are presented here:
Internal Considerations: an organization considers the role of broadband within their own sphere, for functioning, service delivery and member benefit;

External Considerations: an organization's role in community, as a player in local economic and community development. Organizations and communities that have already engaged in the issue may want to first explore where they are along the eight steps.

These inquiries can add to a strategic planning process engaged by cooperative boards and management. The directors are members who have been democratically elected to assure that the cooperative continues to meet the needs of its members. They are responsible for articulating the mission and vision, goals, and strategic direction for the cooperative. Management works to develop the strategies that move the cooperative forward to meet those goals.

Assessing the broadband environment and the implications for the cooperative and its members presents challenges and opportunities for change.

Internal Considerations

Step 1-Create a Sense of Urgency
Awareness of the potential for responding to members' desire and need for internet access has come to the attention of cooperative boards, management and staff through a variety of means. In some cases, the members have brought a message to the board that high speed internet access is a service they would like their cooperative to provide. In other cases, this issue has been tracked by staff, who recognize the electric industry's own need for infrastructure and the prospect for collaboration. Presentations and discussions at industry conferences at the regional and national level have highlighted broadband development opportunities.
Questions to consider:

- What evidence do we have that broadband development is an important issue for cooperative operations? How critical is it for supporting future innovations in our sector?
- What evidence do we have that broadband development is an important issue for cooperative members? Is it required for them to take advantage of future innovations in cooperative operations? In opportunities at the community level?

- What is happening at local, regional and national levels with cooperatives related to broadband?
- What other information do we need to understand the current state and relative urgency for our cooperative? Have we considered our potential role in member access and adoption?
- What sources of information might we have overlooked?
- Within our cooperative, who is not aware of broadband adoption opportunities who should be?

Step 2-Build and Evolve a Guiding Coalition

Pulling the right people together allows an organization to fully explore the opportunity presented by broadband. As business and industry operations rapidly evolve, directors, management and staff at every level have experience with how high-speed internet is affecting how they get things done. While broadband deployment and utilization require knowledge and skills about technical, financial and relationship matters, the most effective guiding coalitions also include those who want to lead, who embrace change and who help others see the opportunity. A coalition of employees from up and down the ranks can productively challenge the tendency toward hierarchical information flows. Participation across levels also promotes the cross-fertilization of ideas and accelerates information sharing.

Questions to consider:

- Who in our organization has the knowledge, skill and interest to consider the technical aspects required to make informed decisions regarding broadband deployment? Who has the financial background? Who has invested in relationships important to broadband? Who has shown interest?
- How do we want to bring these people together to explore a role for our organization in broadband deployment? How much time do we want to dedicate, to answer what question?
- How might some members be involved in an internal coalition?
- How will the coalition communicate with the board, management, and staff?
- Where does the decision-making authority reside around each of these matters (technical, financial, relationship)?

Step 3-Form Strategic Vision and Initiatives

By developing and refining a strategic vision around the potential of broadband, the guiding coalition helps the organization understand the advantages they see from investing in the opportunity. The coalition has a key part to play in designing initiatives which take the organization closer to the vision. A clear vision will help the executives and board understand the reasoning behind the initiatives.
Questions to consider:

- What urgent stories inspired us, as awareness about broadband grew in our organization? What evidence convinces us to take action?
- How do we paint a picture of the future, enabled by broadband, which is exciting, compelling AND concrete?
- What does our organization look like, to be capable of maximizing the opportunity?
- What resources are available?

- What is working well in our organization? How can be our best attributes be used to our advantage in making progress?
- What are the first steps we can take toward this future? Which initiatives excite us?

Step 4-Enlist a Volunteer Army

The guiding coalition does not work alone. The board, management and members of the coalition convey the vision and initiatives to the whole organization, and cooperative members as appropriate. Effective communication of the opportunity and related initiatives around broadband allows individuals to align and adjust so that they can contribute, either in teams or with their own contribution.

Questions to consider:

- What practices do we use to communicate this opportunity to the whole organization?
- How can we help employees (and members, as appropriate) understand how the key initiatives help us create our desired future?
- How can we make best use of employees' excitement about possibilities, support them and recognize their contributions?

Step 5-Enable Action by Removing Barriers

The organization is asking people to do things differently, and the impact of this ask depends upon the broadband initiatives chosen and people's capacity to adapt. Some of the barriers can be anticipated, but almost certainly, the organization will get bogged down at one point or another. When that happens, recognize it as progress; the fact that barriers have been uncovered is an indication of movement.

Questions to consider:

- What do the challenges teach us about what is in the way?
- What do we hear from colleagues and others about why the broadband initiatives aren't working or why they predict initiatives won't work? Are these the same challenges we see?
- What kind of challenges are these: technical? financial? relationship/communication?
- What can we do to eliminate roadblocks and remove barriers?

Step 6-Generate Short Term Wins

Along the way, the coalition can grab some of the low hanging fruit and relish the small wins. Celebrating the small, and big, wins helps people within the organization notice the mile markers they have passed. Communicating the wins to the whole organization provides a psychological boost by pointing out that together they are moving closer to the strategic vision incorporating broadband.

Questions to consider:

- Which low hanging fruit can move us closer to our vision? Are there partial goals within initiatives that are logical points to mark?
- How are we backing employees to innovate in support of the long term vision?
- In what ways do we celebrate progress, even small steps?

Step 7-Sustain Acceleration

Taking steps toward a strategic vision which incorporates broadband technology can provide a chance to develop an innovative culture. The small wins are steps along the way, not the final destination. As they have moved the organization down this path, the guiding coalition and all involved have more knowledge than when the process started. Celebrations help to mark the milestones, but are only one strategy for encouraging a mindset of innovation and improvement using broadband.

Questions to consider:

- How can we use our small wins to encourage more innovation?
- How do we incorporate what we have learned along the way?
- How have our organizational structures encouraged or discouraged people who want to make a difference?

Step 8-Institute Change

The organization is closing in on the strategic vision with each step forward. Developing broadband infrastructure and capacity for learning has the potential to bring value to members and create a new workplace for employees. Establishing systems to take full advantage of the technology positions the organization for the future.

Questions to consider:

- How can we incorporate smaller wins into the standard operating procedures?
- How are members benefitting from our new way of functioning? How can they gain more benefit as we incorporate new ways of bringing them service?
- What can employees do to find value in a new resource? How does it become part of 'business as usual'?

External Considerations

Working on broadband adoption and access in collaboration with the broader community requires a more flexible approach. The parties who work together for larger, community change are not bound by the rules and structures that one finds in organizations. Leadership is often informal; authority comes in the form of knowledge sharing and relationship. For those who are able to navigate negotiable, less structured circumstances, these community networks can accelerate activity around a big opportunity like broadband.

Rural electric cooperatives can be an important participant in these community collaborations. As infrastructure service providers, they may be already participate in community economic development arenas. The cooperative mission to provide service to its member-owners is aligned with other community based development efforts, making it a natural partner in coalitions exploring broadband development options.

Step 1-Create a Sense of Urgency

Community leaders across all sectors have become more aware of the potential benefits of broadband access and adoption. Health care, education, business, recreation and government have all been

dramatically impacted by the internet. Learning more about how broadband is affecting multiple sectors facilitates working in collaboration.
Questions to consider:

- What evidence do we have that broadband development is an important issue for the broader community?
- Who among our partners are concerned about broadband development? Which issues does our organization share with other community partners?
- What other information do we need to understand the current state and relative urgency for our community? Have we considered the interaction between access and adoption?
- Which sources of information might we have overlooked?
- Who is not aware of the opportunities broadband adoption can bring who should be aware?

Step 2-Build and Evolve a Guiding Coalition

Communities are taking varied approaches to tackling broadband development across sectors. In some communities, economic development committees are leading an effort; in others, it may be health care or educational coalitions. In other cases, new coalitions are formed to focus solely on broadband. Regardless of where the coalition begins with membership, coalition members will need some specialized knowledge to explore options for the community. Individuals with a long term view, a community perspective and a willingness to learn and change - and help others learn and change – help build effective coalitions. The coalition will benefit from members with technical, financial and relationship skills and connections.
Questions to consider:

- Which groups are already discussing improvement of broadband adoption and access?
- What experiences does our cooperative have partnering with other organizations?
- Who in the community has the knowledge and skill to help others learn regarding broadband deployment?
- Who has invested in relationships important to broadband? Who has shown interest and understanding?
- How do we want to bring these people together?
- How much time do we want to dedicate, to answer what question?

Step 3-Form Strategic Vision and Initiatives

The guiding coalition has the chance to formulate a strategic vision for broadband development in the community. Developing a shared vision provides an opportunity to raise awareness more broadly in the community and to clarify the community interests, and involving others outside of the coalition will help encourage those to be a part of future initiatives. Considering resources, relationships and challenges, the coalition can design initiatives to bring the community closer to where it wants to be.
Questions to consider:

- What common interests do coalition members share? Who is willing to explore creative options?
- What urgent stories inspire us? What evidence convinces us to take action?

- How do we paint a picture of the future, enabled by broadband, which is exciting, compelling AND concrete?
- What does our community look like, to be capable of maximizing the opportunity?
- What resources are available?
- What is working well in our community? How can be our best attributes be used to our advantage in making progress? What might get in the way?
- What are the first steps we can take toward this future? Which initiatives excite us?

Step 4-Enlist a Volunteer Army

Progress on broadband development to benefit the wider community is aided by extensive engagement. Community members beyond the coalition have valued skills and resources to bring to the effort; how will they imagine how they can contribute in their own way to progress toward a vision for broadband development? Effective communication ties the chosen initiatives to an inspiring vision.

Questions to consider:

- What methods do we use to communicate the vision and important initiatives to our members and the broader community?
- How does our vision for broadband in the community intersect with other future-building and visionary community efforts?
- How can we help other community leaders understand how the key initiatives help us create our desired future, and how broadband development meets their interests?
- How can we make best use of any community member's excitement about possibilities, support them and recognize their contributions?

Step 5-Enable Action by Removing Barriers

Developing broadband initiatives for progress, the coalition will try to forecast challenges, whether they are technical, resource or relationship challenges. Unanticipated challenges are also likely to arise. Part of the coalition's work is to develop means to identify and remove barriers to progress. The coalition needs to find ways to work with the existing community hierarchy. The barriers may show up as attitudes, policies, or lack of information and/or financial resources.

Questions to consider:

- What do the challenges teach us about what is in the way? Are the challenges internal to our community or external?
- Are the external barriers at the local, regional or national level? What means do we have to effect change to remove or lower these barriers?
- What kind of challenges are these: technical? financial? relationship/communication? regulation/policy?
- What do we hear from colleagues and others about why the broadband initiatives aren't working or why they predict initiatives won't work? Are these the same challenges we see?
- What can we do to eliminate roadblocks and remove barriers?

Step 6-Generate Short Term Wins

The wins along the way are important milestones for marking progress and maintaining enthusiasm along the way of developing broadband in the community. Celebrating the short term wins helps to raise awareness in the wider community and holds potential for more involvement. The coalition membership may also adapt as shorter term initiatives wrap up and new ones are begun, with renewed communication about the long term vision.

Seeking small wins can also be an opportunity to work with a partner. Smaller projects may lead to new, trusting relationships, or alternatively, expose areas where deeper commitment is not warranted, if there are concerns.

Questions to consider:

- Which low hanging fruit are moving us closer to our vision? Are there partial goals within initiatives that are logical points to mark?
- How are completed initiatives bringing benefit to different audiences and leaders in the community?
- In what ways do we celebrate progress, even small steps?
- Which small victories provide an opportunity to remind the community about the long term vision?
- How are we supporting others to innovate in support of the long term vision?

Step 7-Sustain Acceleration

Taking steps toward a strategic vision which incorporates technology can provide a chance to develop an innovative culture. The small wins are steps along the way, not the final destination. The guiding coalition and all involved have gained knowledge. Celebrations help to mark the milestones, but are only one strategy for encouraging a mindset of innovation and community development using broadband.

As trust develops, seek ways to expand the impact for your cooperative, members and the broader community. Use prior successes to explore further negotiations; who is willing to seek a “win-win” with the cooperative and for other key organizations which benefit the community?

Questions to consider:

- Which relationships have brought benefits and contributed to trust?
- How can we use our small wins to encourage more innovation within community organizations, between coalition partners and beyond?
- How do we incorporate what we have learned along the way?
- How have our community structures encouraged or discouraged people who want to make a difference? How can our coalition influence a positive difference?

Step 8-Institute Change

Developing broadband infrastructure and capacity for learning changes the community in fundamental ways. Establishing systems to take full advantage of the technology positions the community for the future. Within the coalition, specific initiatives will lend themselves to ongoing commitment. This is the time to follow through on promises made and hold others accountable for their commitments.

Questions to consider:

- Which relationships lead to ongoing partnership?
- How can coalition member organizations model the way in incorporating broadband technology into standard operating procedures?
- Are there specific sectors of the community who are lagging in adoption of technology? What is the coalition role in helping them adapt to a new “business as usual”?
- How are community members benefitting from coalition initiatives? How can they gain more benefit, and how do we let them know about the benefits?
- How has technology changed relative to when we developed our vision? Have we created an innovative culture that is capable of adapting to ongoing change?

SUMMARY

Cooperatives have a history of effectively meeting the demand for rural infrastructure services through a service-oriented, member-owned business model. Wisconsin telecom cooperatives provide an example of how populations in sparsely populated rural areas can be well-served with broadband access and adoption services.

Rural electric cooperatives are also becoming more active in examining possible broadband access solutions for their members and communities. Interviews and research have shown that the responses to broadband deployment by electric cooperatives cover a spectrum. There is no "one size fits all" approach, and cooperatives must evaluate a range of factors in making decisions about broadband:

- technology continues to change, presenting differing opportunities for upgrades and innovations to existing communications infrastructures;
- the unique geography of a region creates technological and engineering constraints;
- the requirements of grant and loan programs that could make a project feasible can change, or present challenges;
- the learning curve about broadband deployment can be steep, and varies among cooperative management and boards;
- boards must decide what factors are the most relevant to their particular cooperative as they balance the need to protect the cooperative's core electric service mission with the opportunities to respond to broader member and community needs;
- the shared mission between electric and telecom cooperatives to meet infrastructure needs of their rural member-customers can support the development of potential partnerships;
- electric and telecom cooperatives may have different cooperative cultures that reflect the degree of sector regulation, and may present challenges in developing partnership opportunities.

Each cooperative must strike the right balance among competing local member and community interests. The member-owned and controlled cooperative structure, with its orientation toward service, supports a decision-making process that is uniquely suited to balance those inherently local interests.

RESOURCES

Broadband E-Commerce Education Center

http://broadband.uwex.edu/
Broadband Reference Guide
Broadband Policies and Regulations

University of Wisconsin Center for Cooperatives
http://www.uwcc.wisc.edu/

Blandin Foundation

http://broadband.blandinfoundation.org/programs/

Community for Local Internet Choice (CLIC)

Library on Broadband Public-Private Partnerships
http://www.localnetchoice.org/ppp-library/

The Emerging World of Broadband Public-Private Partnerships, A Business Strategy and Legal Guide
https://www.benton.org/sites/default/files/partnerships.pdf

Gig.U and Benton Foundation: The Next Generation Connectivity Handbook: a Guide for Community Leaders Seeking Affordable Abundant Bandwidth
http://www.gig-u.org/the-handbook/

Institute for Local Self Reliance

Broadband Resources
https://ilsr.org/initiatives/broadband/

RS Fiber: Fertile Fields for new Rural Internet Cooperative
https://ilsr.org/report-mn-rural-fiber/
This in-depth case study describes a different type of cooperative approach: a new cooperative created to provide broadband services through a local government-community-agricultural cooperative coalition

October 2016 Listing of 63 Gigabit Deployments by Cooperatives
https://ilsr.org/ilsr-researchers-find-63-gigabit-deployments-by-cooperatives/

Kotter, John P. *Accelerate: building strategic agility for a faster moving world*. Harvard Business Review Press, 2014.

APPENDIX I

Wisconsin Telecom Cooperatives:

Chequamegon Communications Cooperative/Norvado
Citizens Telephone Cooperative, Inc.
Cochrane Cooperative Telephone
LaValle Telephone Cooperative
Marquette Adams Telephone Cooperative
Chibardun Telephone Cooperative/Mosaic Telecom
Ntec (Nelson Communications Cooperative)
Richland-Grant Telephone Cooperative
Tri-County Communications Cooperative
Vernon Communications Cooperative
West Wisconsin Telecomm

Wisconsin Electric Distribution Cooperatives:

Adams Columbia Electric Cooperative
Barron Electric Cooperative
Bayfield Electric Cooperative
Central Wisconsin Electric Cooperative
Chippewa Valley Electric Cooperative
Clark Electric Cooperative
Dunn Energy Cooperative
Eau Claire Energy Cooperative
East Central Energy Cooperative
Jackson Electric Cooperative
Jump River Electric Cooperative
Oakdale Electric Cooperative
Oconto Electric Cooperative
Pierce Pepin Cooperative Services
Polk Burnett Electric Cooperative
Price Electric Cooperative
Richland Electric Cooperative
Riverland Energy Cooperative
Rock Energy Cooperative
St. Croix Electric Cooperative
Scenic Rivers Energy Cooperative
Taylor Electric Cooperative
Vernon Electric Cooperative
Washington Island Electric Cooperative

APPENDIX II

The table on page 8 of this report is based on data compiled by UW Center for Cooperatives staff in August 2016, using the map on the Wisconsin Economic Development Corporation's webpage promoting site selection in Wisconsin: http://inwisconsin.com/select-wisconsin/available-sites/locate-in-wisconsin/.

The "Businesses" and "Gigabit Parks" search function generated 222 locations on the map. Requests to WEDC for the data listing behind the map were unsuccessful. Staff then compiled data from each location indicator on the map in a spreadsheet:

- The provider for each gigabit listing was assigned an entity type.
- The county in which the gigabit park was located was identified through online searches.
- Data on county population and area in square miles were added to each listing from two online resources that used 2010 U.S. Census data:
    - County population:
        - http://www.doa.state.wi.us/Divisions/Intergovernmental-Relations/Demographic-Services-Center/Wisconsin-Population-Projections/
    - County area:
        - http://www.doa.state.wi.us/Divisions/Intergovernmental-Relations/Demographic-Services-Center/Wisconsin- Population-Projections/
- Population and area data by county were aggregated by provider type. County data were only counted once for each provider type, regardless of the number of parks in a county served by that provider type. If more than one provider type served a gigabit park in a county, the data for that county was included in the totals for both provider types.

Data compilation tables are included on the following pages.

KEY	
Telecom Cooperatives =	
Independent Private Providers =	
Investor-Owned Providers =	

Name of Park	Size	City	county	Provider
New Auburn TIF District	10 Gbps	New Auburn	Barron, Chippewa	Citzen Telephone Cooperative
Westfield Business Park	10 Gbps	Westfield	Marquette	Marquette-Adams Co.
Endeavor Business Park	10 Gbps	Endeavor	Marquette	Marquette-Adams Co.
Adams County (South) Industrial Park	10 Gbps	Oxford	Marquette	Marquette-Adams Co.
Adams City (South) Industrial Park	10 Gbps	Adams	Adams	Marquette-Adams Co.
Regional Sustainable Business Park	1 Gbps	Turtle Lake	Barron, Polk	Mosaic
Turtle Lake Industrial Park	10 Gbps	Turtle Lake	Barron, Polk	Mosaic
Washburn Business Park	10 Gbps	Washburn	Bayfield	Norvado
Ashland Business Incubator	10 Gbps	Ashland	Ashland	Norvado
Ashland Industrial Park	10 Gbps	Ashland	Ashland	Norvado
Bayfield County Business Park	10 Gbps	Town of Eileen	Bayfield	Norvado
Willow Run Industrial Park	10 Gbps	Iron River	Bayfield	Norvado
Iron River Landing	10 Gbps	Iron River	Bayfield	Norvado
Barnes Business Park	10 Gbps	Barnes	Bayfield	Norvado
Cable Business Site	10 Gbps	Town of Cable	Bayfield	Norvado
Mondovi Industrial Park	10 Gbps	Mondovi	Buffalo	Ntec-Nelson Group
Town Commercial District	10 Gbps	Durand	Pepin	Ntec-Nelson Group
City Commercial Group	10 Gbps	Durand	Pepin	Ntec-Nelson Group
Waubeek Industrial District	10 Gbps	Waubeek	Pepin	Ntec-Nelson Group
Soldiers Grove Industrial Park	1 Gbps	Soldiers Grove	Crawford	Richland Grant Telephone Cooperative
Gays Mills Industrial Park	1 Gbps	Gay Mills	Crawford	Richland Grant Telephone Cooperative
Osseo Industrial Park	1 Gbps	Osseo	Trempealeau	Tri-County Communications
Independence Industrial Park	10 Gbps	Independence	Trempealeau	Tri-County Communications
Arcadia Industrial Park	1 Gbps	Arcadia	Trempealeau	Tri-County Communications
Cashton Greens Energy/Industrial Park	10 Gbps	Cashton	Monroe	Vernon Telephone Corp.
Westby Industrial Park	10 Gbps	Westby	Vernon	Vernon Telephone Corp.
Viroqua Industrial Park	10 Gbps	Viroqua	Vernon	Vernon Telephone Corp.
Viola Business Park	10 Gbps	Viola	Richland, Vernon	Vernon Telephone Corp.
Gateway Business Park	10 Gbps	Eau Claire	Eau Claire	West Wisconsin Telecome Cooperative
Lake Wissota Business Park	10 Gbps	Chippewa Falls	Chippewa	AT&T
East Park Commerce Center	10 Gbps	Stevens Point	Portage	AT&T
Evansville Business Park	10 Gbps	Evansville	Rock	AT&T
Willowbrook Business Park	10 Gbps	Beloit	Rock	AT&T
Gateway Business Park	10 Gbps	Beloit	Rock	AT&T
STH 11 Business Park	10 Gbps	Janesville	Rock	AT&T
Midlands Office Park	10 Gbps	Janesville	Rock	AT&T
East Side Business Park	10 Gbps	Janesville	Rock	AT&T
Delavan Business Park	10 Gbps	Delavan	Walworth	AT&T
Lake Geneva Industrial Park	10 Gbps	Lake Geneva	Walworth	AT&T
The Corporate Ridge Business Park	10 Gbps	Genoa City	Walworth	AT&T
Lakeview Corporate Park West	10 Gbps	Pleasant Prairie	Kenosha	AT&T
Lakeview Corporate Park East	10 Gbps	Pleasant Prairie	Kenosha	AT&T
Business Park of Kenosha	10 Gbps	Kenosha	Kenosha	AT&T
Haag Industrial Park	10 Gbps	Union Grove	Racine	AT&T
Enterprise Business Park	10 Gbps	Sturtevant	Racine	AT&T
Renaissance Business Park	10 Gbps	Sturtevant	Racine	AT&T

Grandview Business Park	10 Gbps	Sturtevant	Racine	AT&T
Mount Pleasant Commerce Center	10 Gbps	Mount Pleasant	Racine	AT&T
F.M Young Business Park	10 Gbps	Racine	Racine	AT&T
Caledonia Business Park	10 Gbps	Franksville	Racine	AT&T
Franklin Business Park	10 Gbps	Franklin	Milwaukee	AT&T
Mitchell Industrial Park	10 Gbps	Cudahy	Milwaukee	AT&T
Brown Deer Business Park	10 Gbps	Brown Deer	Milwaukee	AT&T
Germantown Business Park	10 Gbps	Germantown	Washington	AT&T
Jackson Northwest Business Park	10 Gbps	Jackson	Washington	AT&T
Trenton Industrial Park	10 Gbps	Trenton	Washington	AT&T
River Road Industrial Park	10 Gbps	West Bend	Washington	AT&T
West Bend Industrial Park	10 Gbps	West Bend	Washington	AT&T
West Bend Coporate Center	10 Gbps	West Bend	Washington	AT&T
West Bend Industrial Park - East	10 Gbps	West Bend	Washington	AT&T
Soutwest Industrial Park	10 Gbps	Fond Du Lac	Fond Du Lac	AT&T
Aeronautical Business Park	10 Gbps	Fond Du Lac	Fond Du Lac	AT&T
West Industrial Park	10 Gbps	Fond Du Lac	Fond Du Lac	AT&T
Northgate Business Park	10 Gbps	Fond Du Lac	Fond Du Lac	AT&T
Sheboygan Business Center	10 Gbps	Sheboygan	Sheboygan	AT&T
Sheboygan Southside Industrial Park	10 Gbps	Sheboygan	Sheboygan	AT&T
Kohler Company Industrial Park	10 Gbps	Kohler	Sheboygan	AT&T
Willow Creek Business Park	10 Gbps	Sheboygan	Sheboygan	AT&T
Sheboygan Falls Forest Avenue Industrial	10 Gbps	Sheboygan Falls	Sheboygan	AT&T
Town of Sheboygan Business Center	10 Gbps	Sheboygan	Sheboygan	AT&T
1-43 Technology and Enterprise Campus	10 Gbps	Manitowac	Manitowac	AT&T
Racine Street	10 Gbps	Menasha	Winnebago, Calumet	AT&T
Midway Business Park	10 Gbps	Menasha	Winnebago, Calumet	AT&T
Southwest Industrial Park	10 Gbps	Appleton	Outagamie	AT&T
Province Terrace	10 Gbps	Menasha	Winnebago, Calumet	AT&T
Southpoint Commerce Park	10 Gbps	Appleton	Outagamie	AT&T
Kimberly	10 Gbps	Kimberely	Outagamie	AT&T
Central Business District	10 Gbps	Kaukauna	Outagamie, Calumet	AT&T
Commerce Crossing	10 Gbps	Kaukauna	Outagamie, Calumet	AT&T
Industrial Park South	10 Gbps	Kaukauna	Outagamie, Calumet	AT&T
Agricultural Development Center	10 Gbps	Kaukauna	Outagamie, Calumet	AT&T
New Prosperity Center	10 Gbps	Kaukauna	Outagamie, Calumet	AT&T
Granite Rocky Industrial Park	10 Gbps	Lawrence	Brown	AT&T
Hobart Industrial Park	10 Gbps	Hobart	Brown	AT&T
Lawrence Business/Industrial Park	10 Gbps	Lawrence	Brown	AT&T
West Business Park	10 Gbps	De Pere	Brown	AT&T
De Pere Business Park	10 Gbps	De Pere	Brown	AT&T
Ashwaubenon Business Center/Industrial	10 Gbps	Ashwaubenon	Brown	AT&T
Millenium Park	10 Gbps	Bellevue	Brown	AT&T
Lime Kiln Bellevue Industrial Area	10 Gbps	Bellevue	Brown	AT&T
Bellevue St. Industrial Area	10 Gbps	Bellevue	Brown	AT&T
1-43 Business Park	10 Gbps	Green Bay	Brown	AT&T
Packerland Industrial Park	10 Gbps	Green Bay	Brown	AT&T
Centenial Centre at Hobart	10 Gbps	Hobart	Brown	AT&T
Brookfield Industrial Park	10 Gbps	Green Bay	Brown	AT&T
Howard Industrial Park	10 Gbps	Green Bay	Brown	AT&T
Deer Field Business Park	10 Gbps	Suamico	Brown	AT&T
Woodfield Business Park	10 Gbps	Suamico	Brown	AT&T

South Deerfield Business Park	10 Gbps	Suamico	Brown	AT&T
Eagle River Tamarack Business Park	10 Gbps	Eagle River	Vilas	Frontier Communications
Rhinelander Business District - Hwy 8 We	10 Gbps	Rhinelander	Oneida	Frontier Communications
Crandon Industrial Park	10 Gbps	Crandon	Forest	Frontier Communications
Tomahawk North Industrial Park	10 Gbps	Tomahawk	Lincoln	Frontier Communications
Tomahawk South Industrial Park	10 Gbps	Tomahawk	Lincoln	Frontier Communications
Antigo Industrial Park	10 Gbps	Antigo	Langlade	Frontier Communications
Neenah	10 Gbps	Neenah	Winnebago	TDS
Grand Chute	10 Gbps	Grand Chute	Outagamie	TDS
North East Business Park	10 Gbps	Appleton	Outagamie	TDS
New Way Industrial Park	10 Gbps	Greenwood	Taylor	TDS - Badger
Neillsville Industrial Park	10 Gbps	Neillsville	Clark	TDS - Badger
Burlington Manufacturing & Office Park	10 Gbps	Burlington	Racine, Walworth	TDS - BB&W
Bonduel Business Park	10 Gbps	Bonduel	Shawano	TDS - Bonduel
Necedah Industrial Park	10 Gbps	Necedah	Juneau	TDS - Central State
Dickeyville Industrial Park	10 Gbps	Dickeyville	Grant	TDS - Dickeyville
Lancaster Industrial Park	10 Gbps	Lancaster	Grant	TDS - Farmers
Fennimore Industrial Park	10 Gbps	Fennimore	Grant	TDS - Granland
Mineral Point Road Business Park	10 Gbps	Middleton	Dane	TDS - Mid-Plains
Old Sauk Trains Business Park	10 Gbps	Middleton	Dane	TDS - Mid-Plains
West Univesity Ave. Industrial Park	10 Gbps	Middleton	Dane	TDS - Mid-Plains
Schneider Road Business Center	10 Gbps	Middleton	Dane	TDS - Mid-Plains
Middleton Industrial Park East of Beltline	10 Gbps	Middleton	Dane	TDS - Mid-Plains
Medford Industrial Park 2	10 Gbps	Medford	Taylor	TDS - Midway
Medford Industrial Park	10 Gbps	Medford	Taylor	TDS - Midway
Dorchester Industrial Park	10 Gbps	Dorchester	Marathon	TDS - Midway
Iola Business Park	10 Gbps	Medford	Taylor	TDS - Midway
Mosinee Industrial Park & Paper Plant	10 Gbps	Mosinee	Marathon	TDS - Mosinee
Central Wisconsin Business Park	10 Gbps	Mosinee	Marathon	TDS - Mosinee
New Glarus Industrial Park	10 Gbps	New Glarus	Green	TDS - Mt. Vernon
Nine Mounds Industrial Park	10 Gbps	Verona	Dane	TDS - Mt. Vernon
Liberty Business Park	10 Gbps	Verona	Dane	TDS - Mt. Vernon
Scandanavia Industrial Park	10 Gbps	Scandanavia	Waupaca	TDS - Scandanavia
Elkhorn Business Park	10 Gbps	Elkhorn	Walworth	TDS - State Long Distance
Other Elkhorn Industrial Park	10 Gbps	Elkhorn	Walworth	TDS - State Long Distance
Honey Creek Industrial Park	10 Gbps	Monroe	Green	TDS - UTELCO
North Industrial Park	10 Gbps	Monroe	Green	TDS - UTELCO
Waunakee Business Cener	10 Gbps	Waunakee	Dane	TDS - Waunakee
Stout Technology and Business park	10 Gbps	Menomonie	Dunn	24-7 Telecom
Miller Junction	10 Gbps	Menomonie	Dunn	24-7 Telecom
New Richmond North Industrial Park	10 Gbps	New Richmond	St. Croix	Amery Telecom
Clayton Industrial Park	10 Gbps	Clayton	Winnebago	Amery Telecom
Amery North Industrial Park	10 Gbps	Amery	Polk	Amery Telecom
Amery South Industrial Park	10 Gbps	Amery	Polk	Amery Telecom
Somerset Industrial Park	10 Gbps	Somerset	St Croix	Amery Telecom
Amherst Business Park	10 Gbps	Amherst	Portage	Amherst Telephone Co.
Portage County Business Park	100 Gbps	Plover/Stevens Point	Portage	Amherst Telephone Co.
New Richmond Business & Technical Park	1 Gbps	New Richmond	St. Croix	Baldwin Telecom
Thompson Industrial Park - Woodville	1 Gbps	Woodville	St. Croix	Baldwin Telecom
Baldwin 1-94 Industrial Park	1 Gbps	Baldwin	St. Croix	Baldwin Telecom
Hammond Industrial Park	1 Gbps	Hammond	St. Croix	Baldwin Telecom
Hammond - St. Croix Business Center	1 Gbps	Hammond	St. Croix	Baldwin Telecom

Roberts Business & Rail Park	1 Gbps	Roberts	St. Croix	Baldwin Telecom
Commerce Park - Hudson	1 Gbps	Hudson	St. Croix	Baldwin Telecom
Hudson St. Croix Business Park	1 Gbps	Hudson	St. Croix	Baldwin Telecom
Sterling Ponds Corporate Park	1 Gbps	River Falls	Pierce	Baldwin Telecom
Whitetail Ridge Corporate Park	1 Gbps	River Falls	Pierce	Baldwin Telecom
River Falls Industrial Park	1 Gbps	River Falls	Pierce	Baldwin Telecom
Ironhorse Industrial Park	10 Gbps	Bloomer	Chippewa	Bloomer Telephone Co.
West Industrial Park	10 Gbps	Bloomer	Chippewa	Bloomer Telephone Co.
South Industrial Park	10 Gbps	Bloomer	Chippewa	Bloomer Telephone Co.
Bruce Industrial Park	1 Gbps	Village of Bruce	Rusk	Bruce Telephone
Coon Valley Business Park	1 Gbps	Coon Valley	Vernon	Coon Valley Farmers Tel.
Burlington Manufacturing & Office Park	1 Gbps	Burlington	Racine, Walworth	Ethoplex
Westerra Business Campus	1 Gbps	Waterford	Racine	Ethoplex
Norway Industrial Park	1 Gbps	Wind Lake	Racine	Ethoplex
Union Grove Industrial Park and Annex	1 Gbps	Union Grove	Racine	Ethoplex
S. F Olsen Industrial Park	1 Gbps	Racine	Racine	Ethoplex
Phoenix Park	1 Gbps	Mount Pleasant	Racine	Ethoplex
Wieczorek-Wright	1 Gbps	Racine	Racine	Ethoplex
Park 94 Business Park	1 Gbps	Mount Pleasant	Racine	Ethoplex
Land & Lakes @ Mount Pleasant Business	1 Gbps	Mount Pleasant	Racine	Ethoplex
Blackhawk Industrial Park	1 Gbps	Franksville	Racine	Ethoplex
Raymond Business Park	1 Gbps	Caledonia	Racine	Ethoplex
MKE Regional Business Park	1 Gbps	Oak Creek	Milwaukee	Ethoplex
Franklin Industrial Park	1 Gbps	Franklin	Milwaukee	Ethoplex
North Cape Business Park	1 Gbps	Franklin	Milwaukee	Ethoplex
MKE Regional Business Park	1 Gbps	Oak Creek	Milwaukee	Ethoplex
Endeavor Business Park	1 Gbps	Richfield	Washington	Ethoplex
Dodge Industrial Park	1 Gbps	Hartford	Washington, Dodge	Ethoplex
Wingate Creek Business Center	1 Gbps	West Bend	Washington	Ethoplex
Grantsburg Industrial Park	10 Gbps	Grantsburg	Burnett	Grantsburg Telcom
Enterprise Drive Industrial Drive	1 Gbps	Hillsboro	Vernon	Hillsboro Telephone Co
Frederic Industrial Park	1 Gbps	Frederic	Polk	Lakeland Communications
Luck Industrial Park	1 Gbps	Luck	Polk	Lakeland Communications
Milltown Industrial Park	1 Gbps	Milltown	Polk	Lakeland Communications
Centuria Industrial Park	1 Gbps	Centuria	Polk	Lakeland Communications
Balsam Lake Industrial Park	1 Gbps	Balsam Lake	Polk	Lakeland Communications
St. Croix Falls Industrial Park	1 Gbps	St. Croix Falls	Polk	Lakeland Communications
Osceola Industrial Park	1 Gbps	Osceola	Polk	Lakeland Communications
Airport Industrial Park	1 Gbps	Osceola	Polk	Lakeland Communications
Mauston Industrial Park	10 Gbps	Mauston	Juneau	Lemonweir Valley Telecom (DBA Lynxx)
New Lisbon Industrial Park	10 Gbps	New Lisbon	Juneau	Lemonweir Valley Telecom (DBA Lynxx)
Camp Douglas Industrial Park	10 Gbps	Camp Douglas	Juneau	Lemonweir Valley Telecom (DBA Lynxx)
Tomah Industrial Park	10 Gbps	Tomah	Monroe	Lemonweir Valley Telecom (DBA Lynxx)
Sparta Industrial Park	10 Gbps	Sparta	Monroe	Lemonweir Valley Telecom (DBA Lynxx)
West Salem Industrial Park	10 Gbps	West Salem	La Crosse	Lemonweir Valley Telecom (DBA Lynxx)
Industrial Park	10 Gbps	Prairie Du Sac	Sauk	Merrimac Communications LTD.
Industrial Park	10 Gbps	Sauk City	Sauk	Merrimac Communications LTD.
Barneveld Business Park	10 Gbps	Barneveld	Iowa	Mount Horeb Telephone
Blue Mounds Business Park	10 Gbps	Blue Mounds	Dane	Mount Horeb Telephone
North Cape Commons	10 Gbps	Mount Horeb	Dane	Mount Horeb Telephone
Niagara Business Park	1 Gbps	Niagara	Marinette	Niagara Telephone
Sturgeon Bay Industrial Park	10 Gbps	Sturgeon Bay	Door	Nsight Teleservices

Pulaski Industrial Park	10 Gbps	Pulaski	Brown, Oconto, Shawano	Nsight Teleservices
Pulaski North Industrial Park	10 Gbps	Pulaski	Brown, Oconto, Shawano	Nsight Teleservices
Bay Lake Industrial Park	10 Gbps	Shawano	Shawano	Nsight Teleservices
Raasch Acres Industrial Park	10 Gbps	Shawano	Shawano	Nsight Teleservices
Sharon TIF #4	1 Gbps	Sharon	Walworth	Sharon Telephone Company
Webster Business Park	10 Gbps	Siren	Burnett	Siren Telephone
Siren Business Park	10 Gbps	Siren	Burnett	Siren Telephone
Air Park	10 Gbps	Marshfield	Wood, Marathon	Solarus
Mill Creek Business Park	10 Gbps	Marshfield	Wood, Marathon	Solarus
Rapids East Commerce Center	10 Gbps	Wisconsin Rapids	Wood, Marathon	Solarus
Biron Business Park	10 Gbps	Village of Biron	Wood	Solarus
Woodlands Business Center	10 Gbps	Wisconsin Rapids	Wood, Marathon	Solarus
West Side Industrial Park	10 Gbps	Wisconsin Rapids	Wood, Marathon	Solarus
Nekoosa Industrial Park	10 Gbps	Nekoosa	Wood	Solarus
Alpine Village Business Park	10 Gbps	Rome	Adams	Solarus
Banbury Place	100 Gbps	Eau Claire	Eau Claire	WIN
University Research Park	100 Gbps	Madison	Dane	WIN (Wisconsin Independent Network)
American Center Business Park	100 Gbps	Madison	Dane	WIN (Wisconsin Independent Network)
Whitewater University Technology Park	100 Gbps	Whitewater	Walworth, Jefferson	WIN (Wisconsin Independent Network)
Wittenberg Business Park	10 Gbps	Wittenberg	Shawano	Wittenberg Telephone

SUMMARY

	Number of Entities Servicing Business Parks	Number of Parks Served by Entity Type	
Telecom Cooperatives	9	22	
Independent Private Providers	21	86	(counting WIN)
Investor-Owned Providers	3	107	
Total	33	215	

Counties served by telecom cooperative	Net population-2010 census	Area in sq mi-US census
Adams	20,875	646
Ashland	16,157	1,045
Barron	45,870	863
Bayfield	15,014	1,478
Buffalo	13,587	672
Chippewa	62,415	1,008
Crawford	16,644	571
Eau Claire	98,739	638
Marquette	15,404	456
Monroe	44,673	901
Pepin	7,469	232
Polk	44,205	914
Richland	18,021	586
Trempealeau	28,816	733
Vernon	29,773	792
Total	477,662	11,533
State Population	5,363,715	54,158
%	9%	21%

Counties served by private independent providers	Net population-2010 census	Area in sq mi-US census
Adams	20,875	646
Brown	248,007	530
Burnett	15,457	822
Chippewa	62,415	1,008
Dane	488,073	1,197
Dodge	88,759	876
Door	27,785	482
Dunn	43,857	850
Eau Claire	98,736	638
Iowa	23,687	763
Jefferson	83,686	556
Juneau	26,664	767
La Crosse	114,638	452
Marathon	134,063	1,545
Marinette	41,749	1,399
Milwaukee	947,735	241
Monroe	44,673	901
Oconto	37,660	998
Pierce	41,019	574
Polk	44,205	914
Portage	70,019	801
Racine	195,408	333

Rusk	14,755	914
Sauk	61,976	831
Shawano	41,949	893
St. Croix	84,345	722
Vernon	29,773	792
Walworth	102,228	555
Washington	131,887	431
Winnebago	166,994	434
Wood	74,749	793
Total-Counties served	3,607,826	23,656
State Population	5,363,715	54,158
%	67%	44%

Counties served by investor-owned providers	**Net population-2010 census**	**Area in sq mi-US census**
Brown	248,007	530
Calumet	48,971	318
Chippewa	62,415	1,008
Clark	34,690	1,210
Dane	488,073	1,197
Fond Du Lac	101,633	720
Forest	9,304	1,014
Grant	51,208	1,147
Green	36,842	584
Juneau	26,664	767
Kenosha	166,426	272
Langlade	19,977	871
Lincoln	28,743	879
Manitowac	81,442	589
Marathon	134,063	1,545
Milwaukee	947,735	241
Oneida	35,998	1,113
Outagamie	176,695	638
Portage	70,019	801
Racine	195,408	333
Rock	160,331	718
Shawano	41,949	893
Sheboygan	115,507	511
Taylor	20,689	975
Vilas	21,430	857
Walworth	102,228	555
Washington	131,887	431
Waupaca	52,410	748
Winnebago	166,994	434
Total counties served	3,777,738	21,897
State Population	5,363,715	54,158
%	70%	40%