

Broadband Case Study: Arrowhead Electric Cooperative & True North Broadband



Cooperative Profile

Arrowhead Electric Cooperative (AEC) occupies a uniquely shaped piece of territory in the far northeastern corner of Minnesota, a triangular wedge sandwiched between Ontario, Canada and Lake Superior. It is sometimes referred to as “the tip of the arrowhead.” Within it, AEC serves approximately 4,200 member electric accounts in Cook County and part of Lake County.¹ AEC owns and operates 330 miles of overhead and 270 miles of underground lines. In 2010, the U.S. Department of Agriculture awarded AEC more than \$16 million in grants and low interest loans to construct a fiber-to-the-home (FTTH) broadband network throughout Cook County. The County provided an additional \$4 million grant from its 1 percent sales tax fund. Construction began in the fall of 2011 and was completed in 2015, with over 800 miles of fiber broadband network stretching to the Canadian border.

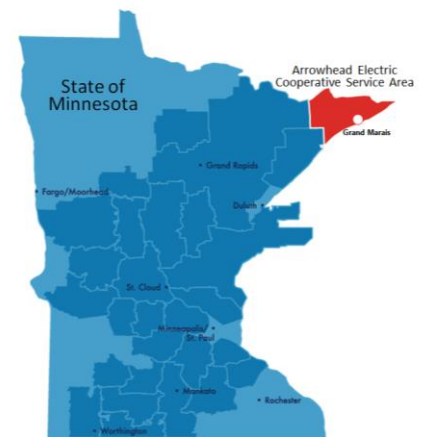


Figure 1: Service territory of Arrowhead Electric Cooperative in northern Minnesota

True North Broadband, an operating division of AEC, now offers broadband Internet service to members, as well as those living and working in the city of Grand Marais. Nearly half of the combined 5,500 accounts in the county now subscribe to True North’s broadband service. This fits well with the cooperative’s stated vision of “Connecting the Tip of the Arrowhead.”

Business Drivers of the Broadband Investment

A study performed in 2006-2007 ranked Cook County last among Minnesota counties for Internet connectivity and rated the county “underserved” insofar as broadband telecommunications is concerned. At that time, most county residents and businesses relied on satellite service or cellular/WiFi hotspots, although limited DSL was available in the higher density Grand Marais municipal area. However, the study sat on the

¹ Residents and businesses in the City of Grand Marais receive electric service from the Grand Marais Public Utilities Commission, a municipal department.

shelf for several years until AEC’s then-CEO Don Stead decided to take up the challenge as a reflection of one its core cooperative principles — concern for the community.

According to Jenny Kartes, AEC’s Interim CEO and Finance and Administration Director, the co-op did not see any other entity in the county that “had the resources, funds, or capability to build what was required” for enhanced connectivity. What AEC proposed to its board was construction of a FTTH network larger than its electric distribution system, since it would cover Grand Marais as well as the rest of Cook County. While conscious of potential risks to its membership associated with such a large, capital-intensive project, the board agreed to undertake the project with the confidence that the new division would benefit the cooperative and its members in the long-term, as AEC began taking advantage of the fiber broadband network to enhance its internal business operations.

Project Overview and Deployment Approach

AEC deployed its FTTH network between 2010 and 2015, adopting an “opt-in” approach to ensure that all of its members, as well as residents and businesses in Grand Marais, had the opportunity to gain high-speed Internet access using the new, countywide broadband network. The cooperative mailed a permission form to every resident and business in the county asking if they wanted the new service. Some in the community did in fact choose not to opt-in.² Ultimately, about 75 percent of the properties in the county had fiber delivered to their doorstep, while about 50 percent actually subscribed to the service. Available services include telephone and Internet access.

Although video was originally part of the plan in 2009, the size of the investment in “head-end” facilities (the distribution center that originates and communicates TV services to subscribers) to enable video content and the associated years-to-payback subsequently changed and AEC put that idea on hold, at least for the time being. The co-op continues to look for a viable and cost-effective video streaming solution, although it remains unclear to AEC where the video content market is headed. “We are positioning for a future in which TV and video will be streamed directly from the Internet,” says AEC’s former General Manager and CEO Joe Pandy, Jr. True North offers to assist its subscribers with streaming to the TV of video content from many Internet “channels,” including Netflix, Hulu, PBS, broadcast TV networks such as ABC, NBS and PBS, as well as a growing list of others.

AEC recognized its lack of expertise in broadband service early in the rollout of its fiber network and formed a beneficial partnership with Consolidated Telecommunications Company (CTC) of Brainerd, MN to address the deficiency. Currently, CTC handles technical service calls from broadband subscribers that AEC staff are unable to resolve. CTC also provides the telephone switch and Internet gateway, which AEC resells to its subscribers.

² Once the window for free broadband connections closed, AEC began requiring new subscribers to cover 100% of the cost of connection to their home or business.

On the Importance of Partnering

“We found out quickly that there is a large learning curve especially related to phone and the assets you need for providing phone service. We found Consolidated Telecommunications Company out of Brainerd, Minnesota, which as a cooperative really had our same values and had been doing this for a very long time. We did indeed need that partnership and still rely heavily on it. Plus, we know the people there—in fact, that is where a former Arrowhead Electric co-manager works now. Our relationship is unique and it’s become a national partnership model.”

AEC Interim CEO / Finance and Administration Director Jenney Kartes

Broadband Business Case

The cost of AEC’s broadband network was \$20.1 million, with \$11.3 million funded by the federal grant, \$4.8 million in the federal loan, and \$4 million from the county grant. The grants, which AEC applied for in 2009, covered roughly 75 percent of the total investment cost. AEC plans to recoup its net share of the investment and pay off its low-interest loans out of revenue from its broadband business. Extensive business plans were developed and financial modeling done by AEC for its RUS application. Initial projections targeted 1,648 Internet subscriptions and 1,000 phone subscriptions. Those targets have been largely met. While take-rates in Grand Marais are somewhat lower than in areas without DSL Internet service availability, signups in all areas have exceeded projected take-rates. AEC’s long-term goal is to have its broadband division be financially self-sustaining.

Broadband Business Model

True North Broadband is an operating division of AEC, which owns the entire broadband network. Six dedicated staff persons work in the broadband division: three handle customer service and billing, and another three outside plant personnel perform maintenance, construction and in-home installations. As noted, calls from broadband subscribers are handled jointly with CTC.

Network Architecture

AEC’s fiber broadband network was slightly less expensive to deploy than a more conventional splitter-based network. The technology architecture AEC adopted is described by Operations Manager John Twiest as a GPON distributed tap system. It is important to understand the choice AEC made since this technology can help make rural broadband deployment more affordable. According to a white paper by Tom Anderson of COMMSCOPE, *“In extremely dense populations of more than 350 homes passed (HP) per mile, traditional splitters are an economical solution. However, for rural areas, splitter-based architectures are*

more expensive than tap architectures.”³ With an average density of roughly ten customers per mile of line, electric co-ops should pay close attention to the choice.

Regulatory Issues

When asked about regulatory issues, Kartes reminds readers of this case that, as a tax-exempt entity, cooperatives must pay special attention to all revenue sources. She adds that grants and gross revenues from non-electric services or non-members have the ability to trigger significant tax consequences.

Market Setting

AEC’s is reportedly the only broadband Internet access offered in rural portions of Cook County. Market response by competitive service providers to AEC’s entry has, in Kartes’ opinion, largely been to withdraw from the rural areas. However, there has recently been a marketing push by one of the other Internet providers. Initial marketing by True North itself was low-key, with most leads initially generated by word-of-mouth and the community’s anticipation of the project. More recently though, the co-op has shifted to direct marketing to businesses and community members.

Challenges and Surprises

AEC is frank and honest about surprises and unexpected issues it has encountered during its ambitious move to county-wide fiber broadband:

- Kartes readily acknowledges that the project took longer to complete than originally expected, saying *“the installers were not from this area and did not anticipate the short construction season – and all the rock.”* AEC changed some of its contractors and vendors midway through the project.
- Not having detailed maps and accurate plant records contributed to construction delays. Moreover, AEC admits it *“did not realize the importance of on-site engineering, on-site contractor management and quality assurance throughout the project.”* The co-op now has these elements in place.
- AEC’s initial budget projection underestimated the cost to complete rollout of its fiber network by several million dollars.

Why is this Case Important?

With approximately seven customers per mile of electric line, AEC is the epitome of a *rural* electric cooperative. The ultra-low population density of Cook County also goes a long way toward explaining why the area was not high on telecommunications companies’ priority lists for high-speed Internet connectivity. The scenario is reminiscent of the 1930s when electricity service was equally hard to get in such remote areas.

³ Tom Anderson, COMMSCOPE, *“Choosing the Right Network Architecture Can Make Rural Broadband Deployment easy and Profitable,”* May 11, 2012. <https://www.commscope.com/Blog/Choosing-The-Right-Network-Architecture-Can-Make-Rural-Broadband-Deployment-Easy-And-Profitable/> This article contains an easy-to-follow explanation of major, fiber network architectures.

AEC's soul-searching questions in 2008 and 2009 amounted to "If not us, who?" and "If not now, when?" The answer they arrived at was "us" and "now." As a result, the entirety of Cook County, MN is today blanketed by a fiber broadband network capable of reaching every household and business premise. The project that delivered this advanced communications infrastructure is a story of public/private partnership for the good of the community. Thanks to its new, fiber-optic network, AEC has largely succeeded in connecting the tip of the arrowhead to the rest of the world.

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