

Broadband Case Study: Guadalupe Valley Electric Cooperative



INTERNET | ELECTRIC | HOME

Cooperative Profile

Guadalupe Valley Electric Cooperative (GVEC) is one of the largest electric cooperatives in Texas, serving 85,000 members with nearly 10,000 miles of electric lines in thirteen counties in the south central part of the state as shown in Figure 1. Its service territory spans 3,500 square miles and includes rural areas as well as suburbs of San Antonio. The region is home to manufacturing and packaged-food industries, including a growing number of Fortune 500 companies for whom high-speed, high-bandwidth Internet is mission-critical.

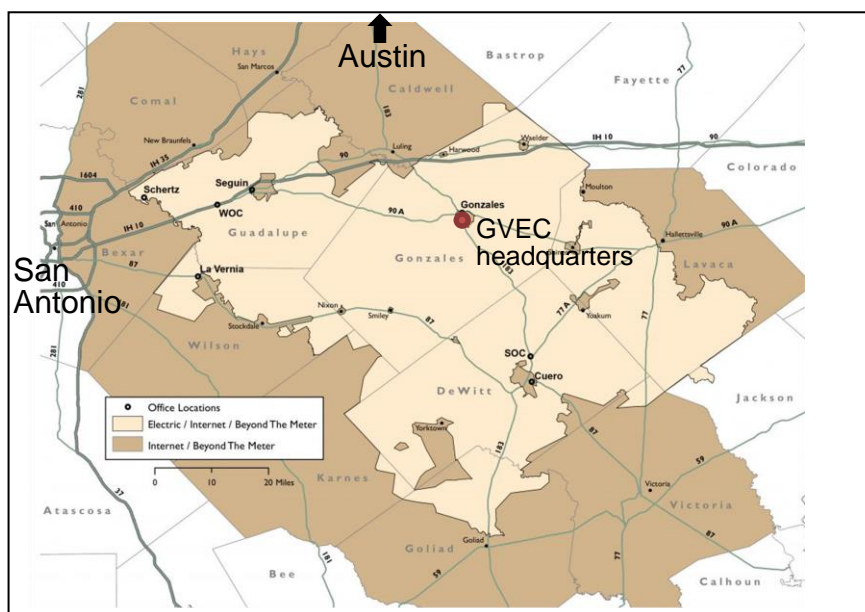


Figure 1. GVEC's electric and Internet service territories in south central Texas.

GVEC is no newcomer to the Internet access business. In 1998, a for-profit company, majority-owned by GVEC, began offering dial-up Internet access.¹ As new communication technologies were introduced, the business began to deploy wireless service to reach unserved and underserved co-op members. By 2013, however, it became apparent that wireless technology, while extending Internet access to underserved GVEC members, would be unable to fully satisfy the needs of homes and businesses seeking to utilize emerging capabilities of the Internet, such as video streaming and transfer of high-resolution imagery. GVEC itself also had a stake in a faster network. The co-op owns and operates its own transmission system and substations and as such places high value on system monitoring and control. And, unlike many of the other cooperatives featured in this NRECA series, GVEC's fiber network investment is 100 percent internally funded, having received no outside grant monies to date.^{2,3} The co-op plans to complete a self-funded, fiber loop connecting all its substations by the end of 2020.

¹ GVEC partnered with two other electric co-ops, eventually acquiring full ownership of the business.

² With the minor exception of E-rate contracts (discussed later in this case study) for which there may be government subsidies.

GVEC has a progressive vision for the future that recognizes and embraces change. It has the highest penetration of solar among Texas cooperatives and views home automation, energy efficiency, and distributed energy resources as essential elements of a new and more dynamic energy resource model that can benefit members.⁴ This combination of factors led to a 2013 decision to undertake a pilot test of fiber broadband. As a result of the pilot’s success, GVEC subsequently began deployment of a fiber network that currently passes some 18,000 homes and businesses, with a construction schedule that passes 400 more member premises each month. 13,000 of its members currently subscribe to GVEC.net-branded Internet access service, enabled by a combination of wireless and fiber networks (see Business Model section for a discussion of the evolution of GVEC.net).

GVEC general manager and CEO Darren Schauer observes, “We’ve been through it all, from 28.8k dial-up modems to broadband service as fast as 1 gigabit (per second, download speed) with fiber-optic technology. We’ve learned through two decades of experience that you need to continually reinvest in the network to keep pace with changing technologies.” And, as GVEC’s 2018 Annual Report states, “The demands for connectivity, bandwidth and dependable Internet will keep growing.”⁵

Business Drivers of the Broadband Investment

The increasingly critical need to provide high-speed Internet access to unserved and underserved members was the primary driver behind GVEC’s decision to invest in a fiber broadband network. As Schauer puts it, “Our members in rural areas must have the same level of access as folks in the city, and bandwidth requirements have increased over time.”

Communication requirements on the electric side also continue to evolve. GVEC’s peak demand program — *Rush Hour Rewards* — rolled out in April 2018, has enrolled 1,000 members, and saved over \$80,000 in transmission costs in 2018. The co-op also recently enhanced communications with downline distribution devices to improve outage restoration performance. Such programs depend on near real-time data communications with meters and end-use devices.

³ Since June 2019, additional Texas laws require an electric cooperative or electric cooperative affiliate providing broadband service to maintain separate books and records of broadband service operations and the broadband service operations of any subsidiary, and to ensure that the rates charged for provision of electric service do not include any broadband service costs or any other costs not related to the provision of electric service.

⁴ For a more detailed look at GVEC’s approach to integrated distributed energy resource planning, see: <https://enervision-inc.com/portfolioentry/guadalupe-valley-electric-cooperative-integrated-distributive-energy-resource-der-planning-presented-at-the-remdc-annual-meeting/>

⁵ https://www.gvec.org/wp-content/uploads/2019/06/annual_report_2018_2.pdf

Figure 2.
GVEC employee installs a network interface device (NID) on the outside of a subscriber's home. Photo courtesy of GVEC.



Project Overview and Deployment Approach

GVEC's pilot fiber broadband project in 2013 confirmed that high take-rates for the service were likely in areas where few, if any, high-speed Internet access alternatives existed. GVEC's experience in its first eighteen months bore this out. Take-rates, the percentage of members whose homes or businesses are within reach of GVEC's fiber network and who sign up, ranged from 60 to 80 percent in these areas, an extraordinarily high rate.

GVEC, doing business under the brand name GVEC.net, began branching out into its electric service area in 2017. The cooperative uses a combination of wireless towers and fiber-optic lines to reach its members. As of August 2019, GVEC serves a total of 13,000 subscribers. Approximately 7,000 of these subscribers access the Internet through GVEC's wireless system (wireless last mile with fiber middle mile) and 6,000 through the co-op's 100 percent FTTP (fiber-to-the-premises) network. Both networks continue to expand.

GVEC views wireless as a cost-effective, mainly temporary solution while fiber reach is being extended. In fact, during 2018, GVEC upgraded thirteen of its wireless towers and built two new ones. Schauer anticipates that wireless may be the longer-term solution for less populated areas, where costs to deploy fiber are commensurately higher. Fiber broadband is being deployed primarily, although not exclusively, within GVEC's electric membership area. Cities and towns with their own electric systems outside the GVEC service area are also considered. For instance, GVEC reached an exclusive agreement with the City of Shiner, Texas in 2018 to provide high-speed Internet to over 1,200 homes and businesses, transforming Shiner into a "Gigabit City" in the process.⁶

⁶ For more information, see: <https://www.gvec.org/gvec-fiber-internet-in-shiner/>

Broadband Business Case

GVEC's broadband investment philosophy is simple. According to Schauer, "As long as we're seeing high take-rates and are able to control costs, GVEC will continue to invest in broadband." For GVEC, this translates to a payback requirement of ten years or less for fiber investments, and three to five years for wireless. GVEC plans to continue investing up to \$15 million annually as long as these thresholds are met. Broadband revenues are projected to be \$12 million in 2019 and expected to double by 2029. When asked about expected annual operating costs, Schauer replies that "margins are thin."

Broadband Business Model

GVEC's Internet service business, as mentioned earlier, was historically a for-profit entity and that corporate structure remained in place after fiber broadband deployment began. However, in 2018, the GVEC board made the decision to fully merge GVEC.net into the electric cooperative. The board's rationale for this decision was as follows:

*"Before this move, GVEC.net had been its own for-profit entity. However, the IRS recently designated rural broadband as a "like activity," subject to the same not-for-profit classification granted to electricity sold by cooperatives like GVEC. This allowed us to streamline overlapping operations, creating significant new efficiencies. The move also minimized our financing costs and greatly reduced our sales and income tax liability. We project an annual savings of around \$1.5 million as a result of this merger."*⁷

Schauer serves as chief executive officer of both electric and Internet divisions. Approximately 30 personnel (out of 320 total cooperative employees) operate the communications network for both electric and Internet divisions.

Network Architecture

GVEC's fiber-optic network is, like many of the other cooperatives featured in this broadband case study series, a GPON (gigabit passive optical network)⁸ with the technical capability to offer active Ethernet connections where needed. The cooperative engaged with fiber network solutions providers Adtran and Corning to design and engineer the system and various contractors for the build-out. While GVEC service is limited to Internet access today, the co-op is considering providing voice services in the future. Download speeds for wireless subscribers run from 8 to 25 megabits per second (Mbps). Speeds for fiber subscribers run from 100 Mbps to 1 gigabit per second (Gbps).

⁷ 2018 GVEC Annual Report. https://www.gvec.org/wp-content/uploads/2019/06/annual_report_2018_2.pdf

⁸ GPON uses passive splitters in the fiber distribution network, enabling one fiber strand from the network mainline to serve multiple homes and businesses.

Market Setting

GVEC's plan is to provide high-speed Internet access to co-op members in areas that lack alternative providers of comparable, high-quality service. In the suburbs of San Antonio, for example, broadband services are available from companies like Time Warner/Spectrum (cable / fiber in some areas) and AT&T (DSL / fiber). However, this is not the case in many of the rural areas GVEC serves, where Internet access options are limited to a handful of small, wireless providers.

Regulatory Issues

Recent legislation in Texas made it easier for electric cooperatives to provide broadband services. Senate Bill 14, signed into law by the governor in June 2019, created a less cumbersome path for electric co-ops like GVEC to extend their fiber-optic networks. Texas Electric Cooperatives touted the new law in a press release, saying, "Previously, Texas law required co-ops to sign new right-of-way agreements with landowners to add fiber to existing utility infrastructure. The new legislation allows co-ops to use existing easements to provide broadband."⁹ This is especially important in low-density, rural areas, where GVEC relies mainly on FTTH, because distances can be great and many property owners are absentee landlords. Obtaining permission for easements before the new law took effect was onerous, time consuming, and expensive.

Measurable Community Support

Support for the community matters to GVEC as a cooperative, and its broadband initiative has opened-up new opportunities to make an impact. For example, the co-op completed its first E-rate contract in 2018, providing discounted, high-speed Internet access to schools and libraries based on financial need. The sidebar compares the school systems' costs for broadband service under its prior contract versus GVEC's E-rate contract.¹⁰

⁹ <https://www.texas-ec.org/about/news/detail/tec-reviews-86th-legislative-session>. See also NRECA article on this topic at: <https://www.electric.coop/easement-clarity-would-help-texas-co-ops-deliver-broadband/>

¹⁰ E-rate is a universal service program created by the Federal Communications Commission. For further information, see: https://www.fcc.gov/sites/default/files/e-rate_universal_service_program_for_schools_and_libraries.pdf

Greater Value at Lower Cost: Two Texas School Districts Before and After GVEC

GVEC's provides discounted, high-speed Internet access to schools and libraries based on financial need under the FCC's E-rate program. Cost savings under this program can be dramatic, as seen in before-and-after comparisons for two, participating school districts below.

Stockdale Independent School District (contract signed with GVEC in 2017)*

B E F O R E	Pre-GVEC monthly cost	\$ 15,245 for 45 Mbps service
	Annualized cost	\$182,940
	Effective monthly cost per 1 Mbps	\$ 338.78
A F T E R	GVEC monthly cost	\$ 2,300 for 500 Mbps service
	Annualized cost	\$ 27,600
	Effective monthly cost per 1 Mbps	\$ 4.60
	Annual cost savings	\$155,340 (-84.9%)
	Savings per 1 Mbps/month delivered	\$ 334.18 (-98.5%)

*Stockdale ISD was required to pay \$33,949 of the \$360,000 construction cost associated with its fiber broadband connection.

Moulton Independent School District (contract signed with GVEC in 2019)

B E F O R E	Pre-GVEC monthly cost	\$ 3,000 for 100 Mbps service
	Annualized cost	\$ 36,000
	Effective monthly cost per 1 Mbps	\$ 30.00
A F T E R	GVEC monthly cost	\$ 1,900 for 750 Mbps service
	Annualized cost	\$ 22,800
	Effective monthly cost per 1 Mbps	\$ 2.53
	Annual cost savings	\$ 13,200 (-36.7%)
	Savings per 1 Mbps/month delivered	\$ 27.47 (-91.6%)

Explanatory note:

The FCC's E-rate program makes telecommunications and information services more affordable for schools and libraries. With funding from the Universal Service Fund, E-rate provides discounts for telecommunications, Internet access, and internal connections to eligible schools and libraries. Through this program, GVEC has been able to provide cutting edge speeds at a significantly reduced price to participating schools. The cost to the school is offset by the Universal Service Administrative Company. <https://www.usac.org/about/>.

Lessons Learned

GVEC has been in the Internet service business since 1998, experiencing firsthand the evolution in communication network technologies, from dial-up modems to wireless to fiber-optic, whose Internet download speeds are almost 35,000 times faster than dial-up. Because of this, Schauer has gained many insights. Here are his key reflections on GVEC's experience, in his own words:

- “Broadband is a completely different business than the electric side. It has a much higher rate of technology change than the electric business. In some ways, it may prepare us for what is likely to occur in our core electric business in the future.”
- “Providing broadband Internet services requires a totally different skillset than what you typically find in an electric cooperative. You have to have a team around you that understands the network, security, routing, switching, how to manage the data, and more.”
- “With broadband you are always investing to increase capacity. You also need to reinvest to keep up with technology change, which likely in the future will include upgrades on the ends of the fiber, the electronic control points.”

Why is this Case Important?

On the surface, GVEC may seem similar to many of the electric cooperatives that preceded it in this NRECA broadband series. However, there are several important aspects of GVEC's experience:

- The co-op has launched its broadband Internet business without the help of major grants.
- It deploys both wireless and fiber-optic networks to meet the needs of its members with diligent attention to a set of investment fundamentals.
- It is selective in its targeting, avoiding areas that have existing options for broadband Internet access.
- Its Internet business has lived on “both sides of the fence” insofar as corporate structure is concerned — starting life as a for-profit entity and later merging with the electric cooperative to become an operating division.

GVEC is about a long stream of deliberate decisions that serve the needs of member-owners, control cost, and minimize risk. Theirs is an everchanging story.

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