

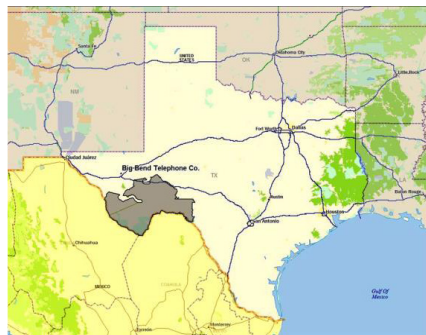
Grow Revenue by Expanding Coverage



Overview

BIG BEND TELEPHONE (BBT) IS A FAMILY-OWNED, INDEPENDENT TELEPHONE COMPANY located in Alpine, Texas that provides telephone service and high speed broadband to subscribers spread over approximately 18,000 square miles in the Big Bend region of Texas. BBTC utilizes the most cost-effective strategies, equipment, and technology to provide voice and broadband service to this rugged terrain. Due to its massive size, low density, topography, and geological characteristics, service to this area poses many unique challenges not found in other parts of the state.

In business since 1960, BBT takes pride in the quality of services they provide to all of their customers. Today, customers want streaming video and VoIP in addition to data transfer. Broadband is popular with business and residential customers, and tiered service offerings have driven upgrades in the fiber and copper network to meet demand.



BBT Coverage Area

Requirements

TO OFFER ONE CONSISTENT SERVICE OFFERING TO all of their customers regardless of the technology, BBT needed the wireless solution to provide performance that is consistent or better than the performance of their fiber or DSL solutions. The wireless solution needed to provide:

- High throughput to support 3, 6, and 12 Mbps downstream, and up to 3 Mbps upstream throughput
- Low 5 msec latency so that video and voice services are consistently clear
- High reliability to perform even in harsh summer or storm conditions

In short, BBT needed a solution that enables them to sell the same services to the customer regardless of the transport technology.

Solution

BBT USES CAMBIUM NETWORKS PRODUCTS TO REACH EVEN THE MOST REMOTE subscribers with equivalent or better broadband speeds than they offer from their fiber/DSL

“We have hung our hat on being innovative and creative. We are not afraid of finding a new way to do things. You can’t solve problems if you are locked onto a particular discipline of thought.”

- RUSTY MOORE, GM AND COO OF BIG BEND TELEPHONE

network at a fraction of the cost equipment and installation of wired technology.

Their solution includes:

- Backhaul
 - o Licensed PTP 800 microwave links that operate in the 6 - 38 GHz bands with Line of Sight (LOS) connectivity.
 - o Unlicensed PTP 600 links operating in the 5 GHz band that provide up to 300 Mbps of connectivity in LOS, near Line of Sight (nLOS) and non-Line of Sight (NLOS) conditions.
- Access
 - o Unlicensed 5 GHz PMP 450 access networks that provide up to 125 Mbps of throughput with low latency needed to support sensitive video and voice services.
 - o An Outdoor Residential Gateway from Thinroute Technologies to provide power and the Analog Telephone Adapter (ATA) device to support VoIP services and battery backup.



Tower with backhaul and Access Points



Subscriber Module at Customer Location

Results

BBT'S PARTNER THINROUTE USED THE LINKPlanner software to design the network backhaul infrastructure. This provided a detailed prediction of the performance of the licensed and unlicensed links using coordinates of the source and destination points. LINKPlanner identified obstacles and factored in terrain conditions to provide a view of the path and performance of the RF propagation.

The wireless access network was installed quickly, and performed well from day one. "We

have one PMP 450 shot that extends 23 miles. That is not the usual, but it is fairly common to have connectivity out to 18 miles."

Customer satisfaction remains high. Network wide, 93% of their customers in the town of McCamey have signed up for the highest speed tier broadband plan which offers 12 Mbps of download speed, and half of the customers in the town of Alpine are receiving their 12 Mbps via the wireless network. Pat Seawell, a professor at Sul Ross State University says, "As an instructor who has been teaching online courses at SRSU for several years, BBT's wireless broadband service has been invaluable. I live outside the city and, prior to acquiring BBT's wireless broadband service, teaching my online classes from home was not possible. Now I can connect to my courses and reach my students from home anytime night or day without disruption."

About Big Bend Telephone (BBT)

Established Service Provider in Texas with 5,000 business and residential customers.

SOLUTION

- Point to point (PTP) licensed and unlicensed wireless backhaul to transport broadband to an unserved area
- Point to multipoint (PMP) fixed wireless broadband access network to distribute connectivity.

As more customers leave cable and stream video over broadband, BBT is providing a clean streaming service that works consistently with no buffering.

Expanding out of Region



HAVING PROVEN

wireless broadband technology within their certificated area, BBT seized the opportunity to expand beyond its traditional service area. BBT has broadened their business plan by launching a

Fixed Wireless Broadband offering to create a competitive high speed broadband offering for to the subscribers of the neighboring incumbents, basically any underserved area that touched their network. In recent months, they have won over 1,000 new customers by offering services that are superior in bandwidth to the DSL offering of the incumbent. They have also updated their service offerings to include streaming video, VoIP and cloud services.

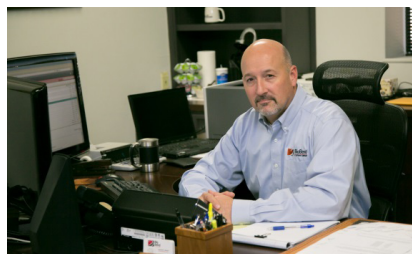
BBT now has a proven solution that enables them to grow outside of their certificated area. “With the uncertainty of impending regulatory changes, we need to be diligent to make sure we are managing the business as efficiently as we can,” says Rusty Moore, General Manager and COO. “We do that by maximizing the ability of our own network, cutting costs and extending our business plan to include new markets. Our future is not secure if we choose to stay within our own borders. The key to growth and future success is to extend our reach to underserved areas outside of our certificated area.”

Next Steps

CAMIUM'S PRODUCTS PROVIDE BBT WITH A CARRIER CLASS, COST

effective option to support both their remote in-region and out-of-region subscribers and provides a new and growing business by expanding out of their traditional wired footprint.

As is the case in any network deployment, out of region builds must provide a positive ROI, independent of any government funding support. Fixed Wireless Broadband has proven to meet BBT's business goals for out of region expansion.



Rusty Moore, General Manager and COO, BBT



Thinroute Residential Gateway for VoIP Services

Why Community BBT chose Cambium Networks:

Established Service Provider in Texas with 5,000 business and residential customers.

- **High Throughput** – with up to 300 Mbps for high speed backhaul, and 125 Mbps from an Access Point.
- **Scalability** – GPS synchronization reduces access network self-interference and enables frequency re-use in selected areas.
- **High Reliability** – maximizes customer satisfaction, reduces system down time, and reduces maintenance costs.
- **Low Latency** – for clear transmission on sensitive VoIP and streaming video applications.
- **Proven Performance** – to provide data transfer, VoIP services and streaming video services.
- **Easy Installation** – for rapid and cost effective deployment.