

Broadband Wireless Network Brings High-Speed Internet to Mountainous Rural Area

A bid to bring wireless Internet service to the Seneca Nation of Indians had been stalled for three years. The rural area's geography posed too great a challenge for the construction of a wireless broadband network. After the Nation engaged Seneca Telecommunications and RESOLUTE Partners, the project took off and within a few months, several hundred Seneca households were enjoying the benefits of broadband Internet.



The Challenge: A Remote, Wooded and Hilly Location

The Cattaraugus Territory of the Seneca Nation lies in the mountainous and densely forested parts of western New York State. The region's deep ravines, high spots and thick vegetation make it difficult to build a wireless network that can span the "last mile" from the Internet backbone to residents' homes.

"The Internet is "not just a nice to have, it's" a necessity in today's world," says David Herbst, Program Manager for Seneca Telecommunications, Seneca Nation's Broadband provider. "But the only way to get service to our outlying territories was via satellite, which is very expensive."

In 2013, after three years of unsuccessful attempts to bring wireless Internet to the Territory, the vice president of operations for Seneca Telecom, Al Trujillo, asked RESOLUTE Partners to prepare a site survey and cost estimate. These were presented in a proposal to the Nation. Before the proposal could be approved, however, an unforeseen hurdle arose.

"We had to prove they had clear title to the land on which we wanted to build," Al says. "We went through numerous maps and boundaries, some of which had been handed down for the past 200 years. It was an unusual challenge, but we met it."

Once title ownership was established and the proposal accepted, RESOLUTE Partners proceeded to design and engineer the network.

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Program Manager for Seneca Telecommunications

The Solution: Achieving the Right Balance of Technologies

The plan called for three towers that would take the signal from the Internet point of presence and broadcast it across 24 square miles of Nation territory using point-to-point wireless.

The towers were designed to enable customers to receive the wireless signal as much as 18 miles from the point of presence. To increase throughput speed and signal strength and quality, all towers were built to heights of 100 feet or more so they would extend above the tree line. One tower was placed on top of the local water tower, and another was built to support wireless Internet as well as the EMS organization's radio communication needs.

On each tower, RESOLUTE Partners used a combination of frequencies and technology to ensure optimal performance while balancing conflicting needs. For example, engineers:

- Used a frequency that allowed the signal to pierce tree foliage but still maintain a high throughput speed
- Controlled signal strength so that when the leaves fell, the signals wouldn't be so strong as to cause interference for other wireless operators in the vicinity

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The backhaul throughput was engineered to achieve speeds of 300 Mbps to 1 Gbps. This would allow the Nation to increase bandwidth without having to build more towers as it signed up more customers.

In addition to the topography and vegetation, the local weather also proved to be a challenge. Construction of the towers was scheduled for December, when the ground was frozen and there were several feet of snow on the ground. Still, RESOLUTE Partners put up the towers on schedule.

By May 2014, the project was complete and Seneca Telecom started delivering wireless Internet service to customers' homes.

Client Benefits

Some 300 Seneca homes and a residence for the disabled elderly are receiving wireless Internet at speeds of 2 Mbps free, or at 5 Mbps for a \$29.95 monthly charge – a far cry from the \$150-per-month cost of a satellite link. Another 550 homes and the area's small business association have requested connections. The Seneca Nation government and EMS are using the wireless service. Meanwhile, RESOLUTE Partners continues to monitor and support the network, ensuring the Nation's residents receive trouble-free Internet delivery.

"Wireless Internet has had a huge impact on the quality of life," Al says. "Kids are using it at school and for homework, it's being used for medical and security purposes, and the local utility monitors its sewage points and pump stations wirelessly. It has been such a success, the Nation is considering adding wireless Internet in another one of its territories."

He adds: "RESOLUTE Partners was the right vendor with the right equipment for this difficult rural terrain."

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Al Trujillo

Vice President of Operations for Seneca Telecom

Contact us to learn more about our portfolio of wireless networks, professional services or to arrange a VersiWorks demonstration.

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