

ePMP 3000 Dual-Horn MU-MIMO Antenna Allows Mountain West Technologies to Leverage the Benefits of Superior Noise Rejection and Improve Uplink SNR



“The dual-horn antenna allows us to take advantage of a narrower beamwidth while leveraging the benefits of superior noise rejection of a horn. This helps us get a better signal to a tighter grouping of users in high-noise areas.”

TIM MEADS,
NETWORK/INFRASTRUCTURE MANAGER,
MOUNTAIN WEST TECHNOLOGIES



Overview

BASED IN WYOMING, UNITED STATES, Mountain West Technologies is an internet provider known for the high speeds they deliver to their residential and business customers.

They have provided dependable wireless internet services for over a decade in the Casper, WY area, reaching speeds of up to 500 Mbps on wireless. Their customers experience incredibly smooth streaming and gaming on their broadband network thanks to these speeds.

Mountain West Technologies uses wireless technologies from industry-leading partners like Cambium Networks to reduce infrastructure costs and offer a cutting-edge service to their customers. Cambium Networks’ ePMP 3000 MU-MIMO solution is one of the latest technologies that Mountain West Technologies decided to deploy in their network.

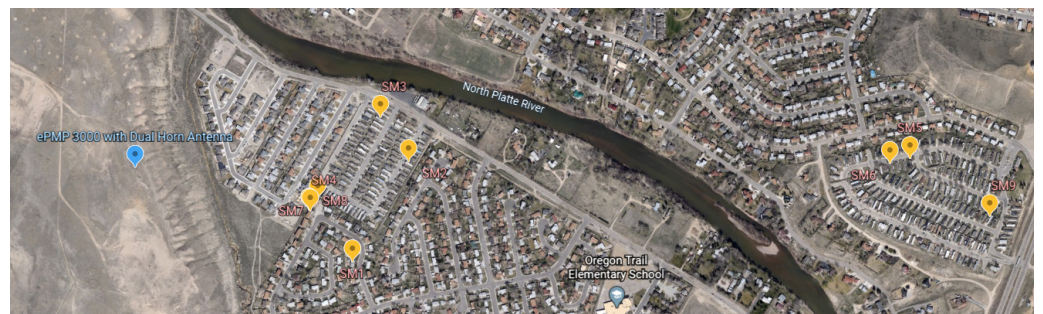
The Challenge

MOUNTAIN WEST TECHNOLOGIES USES a 90-degree sector antenna but dealt with poor signal-to-noise ratio (SNR) on the uplink direction. They searched for a better solution that would improve the uplink throughput. Eventually, they started looking for an antenna solution which would attract less noise from all sides except the intended direction.

The Solution

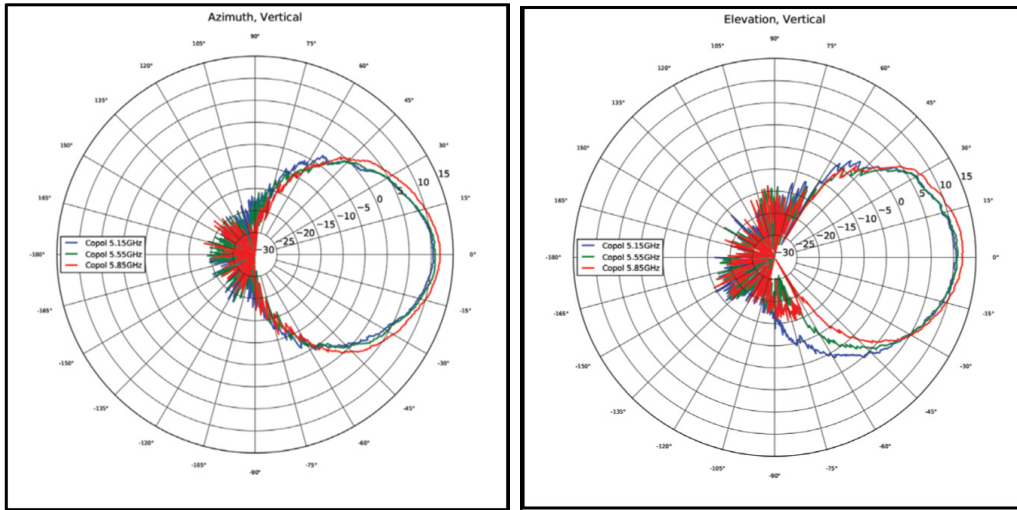
CAMBIUM NETWORKS’ NEW SOLUTION, ePMP 3000 Dual-Horn MU-MIMO sector antenna, proved to be a good choice for such conditions. Horn antennas have the key advantages of focusing higher gain in the main boresight while minimizing side lobes in the propagation pattern. These side lobes further reduce the generation and susceptibility to noise. A small form factor dual-horn sector antenna also simplifies installations at the base station site.

Their approximate total subscriber base of 10 is expected to grow in the near future. Most of these subscribers are within two miles of the base station. Mountain West Technologies was less concerned about high antenna gain, but high radio throughput in noisy environments was critical.



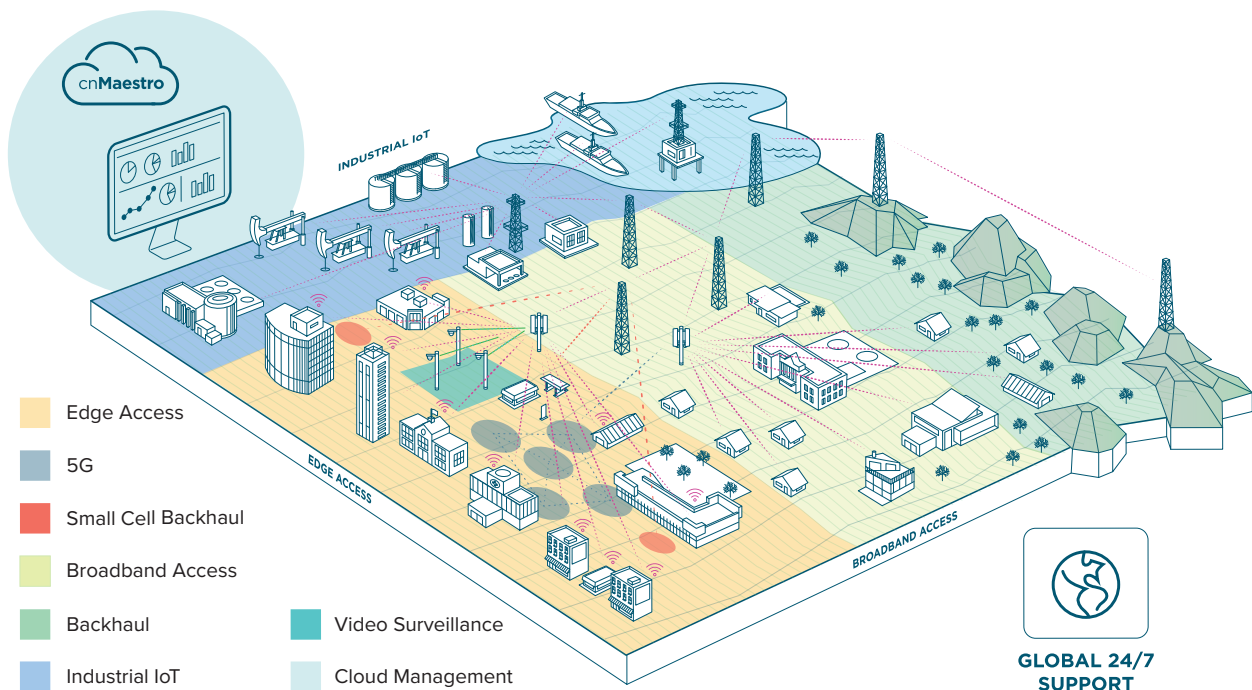
A view of the base station and customers

In this case, the MU-MIMO feature of ePMP 3000 ensures high throughput operation. On the other hand, low side lobes of the 4x4 dual-horn 60-degree sector helps to avoid noise.



ePMP 3000 Dual-Horn Antenna's symmetrical pattern with low side lobes

A normal horn antenna or a combination of two separate horns cannot consistently generate a MU-MIMO beam pattern. The ePMP Dual-Horn MU-MIMO Sector Antenna's mechanics and construction were designed to precisely align the horns, while the ePMP 3000 Access Point (AP) software has been optimized to match this antenna and maximize MU-MIMO performance. In the unlicensed 5 GHz spectrum, the ePMP 3000 Dual-Horn Sector Antenna is unique as it is the only product in the market using MU-MIMO in a horn configuration.

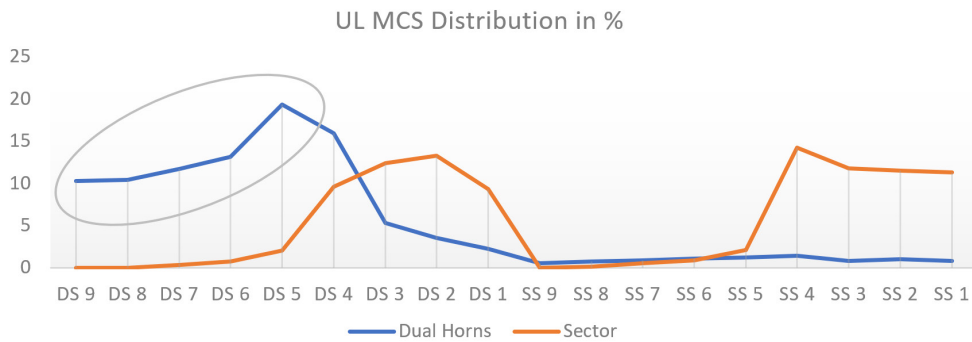


Cambium Networks' gigabit wireless solutions enable municipal, enterprise and service provider operators to tailor connectivity to meet exact requirements and grow as needs evolve.

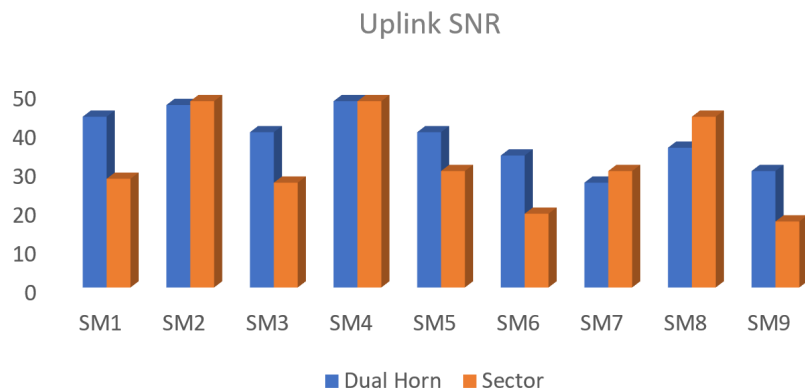
The Results



A small form factor dual-horn antenna uses less tower space



With a dual-horn antenna, the AP's uplink modulation and coding scheme (MCS) distribution improved significantly compared to a 90-degree sector antenna as highlighted in the above figure.



Uplink SNR is another key performance indicator to highlight. With the ePMP 3000 Dual-Horn MU-MIMO Sector Antenna, the majority of the subscriber modules' uplink SNR considerably improved and can push more uplink traffic.