



Ave Maria University Brings Cellular Services Indoors

CASE STUDY

Ave Maria University is a vibrant Catholic university located in Southwest Florida, an hour west of Fort Lauderdale and 45 minutes east of Naples. Ave Maria's professional staff, challenging curriculum and academic foundation provide students with training that empowers them to step out into the working world with confidence.

The university began in 2004 with a temporary campus housing some 300 students, and opened its permanent campus in 2007 with an increase in enrollment to 500 students. Today, there are 700 students, and the university has a long-term plan to reach an enrollment of 6000 students. Even during initial construction at the permanent campus, university operations manager Wally Hedman realized that cellular coverage was poor.

"Due to our location, the best we could do was two bars of coverage outside the buildings, with no coverage at all inside them," says Hedman. Although there were four major service providers operating in the area (Alltel, T-Mobile, Sprint, and Verizon) the nearest cell towers were 2.5 and 6 miles away. Compounding the mobile coverage problem, campus buildings are constructed to withstand a hurricane, with many walls that are almost two feet thick. Many buildings have concrete outside walls plus a concrete interior bearing wall, preventing radio signal penetration.



Searching for Signals

“For us,” says Hedman, “cellular coverage was a safety issue. We needed cellular service inside the library building, and we needed to be able to reach resident occupants via cell phone in each of our dormitories in case of an emergency.” As a result, the university decided to purchase in-building cellular equipment itself.

The first priority was to cover buildings that would be open for the students’ relocation from temporary quarters in the Fall of 2007. Other priorities included the main campus buildings; the Canizaro Library containing the data center, a central facilities building, the academic building, and student center and three dormitories of approximately 40,000 square feet each.

Initially, Ave Maria University purchased a small in-building system that transmitted signals from a main distribution point in the data center to remote antennas throughout the library building via thick coaxial cabling. However, this system didn’t offer the scalability required to cover the entire campus. “The problem was that the signal attenuated too much,” Hedman says. “At the end of a 100-foot cable run, the signal was useless unless you were standing right underneath the antenna.” If the system couldn’t adequately cover the library, it would clearly not work for the existing dormitories or the university’s long-term construction plan. “We have about 1000 acres of land here,” says Hedman, “so we will be building new facilities for the next twenty years, and we needed a system that could scale.” In fact, the university has already broken ground on a new, 120,000 square-foot dormitory that is scheduled for completion in July of 2009.

Scaling Coverage Across the Campus

Based on further research into other in-building distributed antenna systems (DAS), Hedman discovered ADC’s InterReach Fusion® system, which delivers consistent signal strength to every remote antenna through a system of hubs and remote antenna units (RAUs).

“I liked the ADC system because it actively distributes the signal, and we can utilize the single-mode fiber on our campus providing predictable and strong signal strength at any and all antenna locations in the library and the dormitories,” Hedman explains. “That architecture gave us high signal output at every antenna no matter how far it was from the signal source. After that, it was only a matter of deploying the antennas in a logical manner.”

To cover the 3-story Canizaro Library, Hedman’s team deployed an InterReach Fusion Main Hub in the data center, and then placed 2 Remote Access Units (RAUs) and antennas on each of the first two floors, and one RAU and antenna in the center of the third floor. To bring the cellular signals in from the outside, he deployed outdoor antennas on the roof of the building and fed the RF down to broadband distribution amplifiers in the data center.

“Even though the building floors are concrete,” says Hedman, “we had plenty of signal penetration to cover the whole space. We overcame the structural challenges and the project was completed and went live in December of 2007.” The installed system supports 850 and 1900 MHz frequencies.

Since each Fusion Hub supports four Expansion Hubs, Hedman was able to cover all three of the dormitories in January of 2008 by adding Expansion Hubs in a wiring closet on the main floor of each of those buildings and feeding their signals to the two upper floors through a utility riser. “We have 144 single-mode fibers running all over the campus property, so it is easy to use the fiber to transport the wireless signals from the Main Hub in the library to each of the dormitories,” he says.

Most recently, Hedman's team has deployed a second Main Hub in the library data center to feed an Expansion Hub in the new 44,280 square-foot dormitory. The university just broke ground on a 120,000 square-foot "super dormitory" that will also receive support from the system. "To finish that job," says Hedman, "I'll just need to add a couple of Expansion Hubs off the second Main Hub and buy some more RAUs and antennas to cover that building."

Another advantage of the Fusion system's architecture is that it offers centralized management and monitoring. Hedman monitors the entire system, from the Main Hubs to the antennas, from the data center. He also monitors electricity levels. "We're the lightning capital of the world," he says, "but I can monitor all my incoming voltages from the utility. We probably took 25 lightning hits that affected our buildings last year, but all the buildings are on emergency generators, and we have UPS backups on the critical equipment, including the Main Hubs and the Expansion Hubs."

Since it went live, the Fusion system has had no problems. Hedman is very happy with his choice of ADC in-building equipment, and is confident that it will support Ave Maria University's growth over the next decade. "Everything we have built here has been done on a 20-year plan, so we wanted to have a lot of scalability in the cellular distribution system. I'm confident that the InterReach Fusion system will give us the coverage and reliability we need to grow."



Challenges

- No cellular coverage inside hurricane-proof campus buildings
- Enable support for four carriers
- Support future scalability over twenty-year building plan

Solution

- High-performance in-building wireless system delivers consistent coverage in every building
- One system supports services for four carriers
- Easy expansion via fiber links to new buildings and thin cabling inside buildings
- The system is manageable
- System does not require large capital expenditure

CASE STUDY



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