



Motorola's Point-to-Point Wireless Solutions Come to the Rescue for the City of Santa Barbara Fire Department

Santa Barbara, California



Station 4

Santa Barbara relies on eight different fire stations within the City limits to respond to natural and man-made emergencies. In 2005, city officials decided to upgrade the data communications network that was used to connect seven of its fire stations and a training facility with city government. Recently the City needed to increase data communications bandwidth and throughput to support planned video conferencing and Voice over Internet Protocol (VoIP) applications.

Customer

Situated between the Santa Ynez Mountains and the Pacific Ocean, Santa Barbara is often referred to as the "American Riviera" because of its Mediterranean climate. Widely known for the Santa Barbara Mission, the City is located about 100 miles north of Los Angeles and encompasses a total area of nearly 42 square miles. The Santa Ynez Mountains rise dramatically behind the City, with several peaks exceeding 4,000 feet, making the east-west trending range a scenic backdrop to the downtown. Founded in 1782 and incorporated in 1850, more than 90,000 residents call Santa Barbara home.

Solution Provider

The project's design, installation and training was handled by San Diego-based Sun Microwave, dba Sun Wireless, a systems integrator that specializes in turnkey microwave (wireless) high capacity, point-to-point systems. Sun Wireless is a Motorola Point-to-Point Solutions Provider.

Situation and Challenge

The City was particularly interested in adding more bandwidth for a video conferencing application that would be used to train 90 fire personnel twice a month. The required Community Emergency Response Training (CERT), which typically is held once a week, costs a tremendous amount of money to support because the City must pay to back-fill those firefighters that attend the courses in order to ensure all service response areas are covered. The City also wanted to upgrade its T1 network to at least 10 Mbps each way to prepare for future VoIP applications.

Additionally, Santa Barbara presented a challenging geography: the network had to sustain reliability over a number of rolling hills, through a downtown skyline and across 10 miles to the Santa Barbara airport. For business continuity purposes, the data communications network was expected to withstand any disruption of service in the event of a natural disaster, such as an earthquake. Plus, the network had to overcome a significant amount of interference caused by several hospitals and universities in the area.



Station 1 (Headquarters)

Technical Requirements

- High-bandwidth data rates of up to 10 Mbps each way to provide for video conferencing and future VoIP applications
- Maximize premium space on top of a regional radio tower
- Mitigate interference that was caused by several medical and university buildings in the area
- Reliable connection that would not be compromised in the event of a natural disaster, such as an earthquake

Deployment Detail and Interoperability

To increase bandwidth at an affordable cost, the City of Santa Barbara decided to deploy eight Motorola wi4 Fixed Point-to-Point (PTP) 58400 Wireless Ethernet bridges. The City's current system was fiber, and it was too expensive to install this same technology again. Furthermore, the fire station at the airport posed too many terrain challenges for this type of network to be deployed successfully. While the City evaluated other point-to-point wireless products, none were able to mitigate the area's high interference as well as Motorola's.

The deployment required the City to establish communications between an existing radio tower on La Cumbre Peak, a regional mountain top, and the seven fire stations and training facility. The radio tower already housed several other antennas, so space was at a premium. In addition, the antennas had to be six feet apart in order to work effectively. As a result, Sun Wireless made use of the flexible and small form factor of the PTP 58400 bridges and used multiple masts to initiate and maintain the connection.

Each location's sluggish T1 network was successfully upgraded. Now six of the fire stations enjoy 22 Mbps of throughput with built-in antennas. Because the airport and training facility required more bandwidth, these locations made use of Motorola's PTP 58400 Connectorized radios that support external antennas in order to gain 45 Mbps.

In addition to overcoming high interference from the populated area that consisted of several universities and hospitals, the PTP 58400 bridges had to establish connectivity for one non-line-of-sight fire station. The design team was able to overcome this obstacle by connecting that fire station to the training facility that was eight blocks away. In addition to the close proximity, the training location received a greater amount of bandwidth to handle the video training application.

During the installation, Sun Wireless had to be sure to stay within the City's strict ordinance on preserving the historic downtown for some of the fire stations. To that end, some of the antennas were painted to look like they were part of the buildings.

Results

As a result of deploying Motorola's 5.8 GHz PTP 58400 bridges, the seven Santa Barbara fire stations and the training facility now enjoy a much faster and more cost-efficient data communications network. After some initial fine tuning to establish solid connections with the La Cumbre radio tower, the network has experienced 100 percent uptime. In fact, the connection is so reliable that the City decided to disconnect its leased vendor-supplied fiber optic network that was in place at the airport fire station and rely solely on Motorola's fixed wireless network for all of its data communications needs. From a cost perspective, the City has estimated that it will save approximately \$6,000 per year by using its own point-to-point wireless network.

One of the City's key objectives was to use the new Motorola wireless network to provide CERT training via a video conferencing application. In fact, this innovative way to train Airport Fire/Rescue Fire Fighting (ARFF) station crews has eliminated the need to back-fill positions with other personnel because all fire fighters can remain onsite and be able to respond to an emergency. As a result, the City forecasts that they will save an estimated \$100,000 per year.

“Our new Motorola MOTOwi4 Point-to-Point wireless network is incredibly reliable. In fact, we had so much confidence and trust in its stability that we have removed our existing leased vendor supplied fiber optic cable, and now solely rely on Motorola for all our data communications to the Santa Barbara airport fire station. Furthermore, the increased amount of bandwidth we have gained has allowed us to begin to implement new applications, while saving us money on fire fighter training. Finally, we had tremendous support from Sun Wireless, and we truly benefited from their expertise and leadership.”

— Perry Blacken, Information Systems Supervisor-Infrastructure

Finally, the City also enjoys having full remote control management so problems can be addressed from any location.

Why Motorola

- Motorola offered the best broadband wireless solution to establish reliable connections across a busy cityscape full of high interference and challenging terrain
- Motorola’s flexible wireless bridges made use of premium space and fit easily on an existing radio tower in the City
- Implementation is seamless as a result of good path planning and installation support
- The Motorola point-to-point Ethernet bridges are easily monitored from anywhere, and the network operator can troubleshoot problems remotely
- The Motorola wireless network saved costs associated with monthly leased lines and fire-fighter training

MOTOwi4™

The wi4 Fixed Point-to-Point Wireless Ethernet Bridges are part of Motorola’s MOTOwi4 portfolio of wireless broadband solutions and services that help customers improve communications, increase efficiency, and enhance customer and public service. Delivering IP coverage to virtually all spaces, the MOTOwi4 portfolio includes wi4 Fixed, wi4 Mesh, wi4 Indoor and wi4 WiMAX solutions for high-speed connectivity over private and public networks.

About Motorola

Motorola is known around the world for innovation and leadership in wireless and broadband communications. Inspired by our vision of seamless mobility, the people of Motorola are committed to helping you connect simply and seamlessly to the people, information, and entertainment that you want and need. We do this by designing and delivering “must have” products, “must do” experiences and powerful networks – along with a full complement of support services. A Fortune 100 company with global presence and impact, Motorola had sales of US \$42.9 billion in 2006. For more information about our company, our people and our innovations, please visit <http://www.motorola.com>.



Motorola, Inc., 1303 E. Algonquin Road, Schaumburg, Illinois 60196 U.S.A. +1 877 515-0400 • www.motorola.com/ptp

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