



CASE STUDY: SONOMA COUNTY, CALIFORNIA, USA



CUSTOMER

Sonoma County, located in a mountainous and coastal region of Northern California, spans over 1,700 square miles. The county's challenging terrain, including mountains and ocean proximity, can complicate communications and infrastructure. Despite these challenges, Sonoma County has developed a comprehensive communication solution to ensure 95% county-wide coverage. This solution involved establishing 17 communications sites with Tait Solutions to overcome connectivity issues caused by topography.

SITUATION

Sonoma County's earliest system was built on TaitNet Quasi-Sync 1 (QS1) in 1997 and upgraded to QS2 in 2008. This analog simulcast system served the county's law, fire, and medical agencies effectively throughout the years. In an effort to address future forecasts not being able to support analog circuits because of costly TDM, T1 links and the associated channel banks, Sonoma County was introduced to Tait's TB9400. The technology was such a success that by 2023, all channels had been converted to the new TB9400 ASIP radios.

The county had been eyeing the possibility of converting their 12-system ASIP analog simulcast channels to P25 Phase II trunking. Preliminary tests showed significant destructive overlaps in highly populous areas, which soured the idea of a P25 simulcast system. Tait was approached by the county to develop a DMR Phase II simulcast system for their Public Infrastructure Department. The system was such a success that developing a countywide P25 simulcast system was back on the table for consideration.

RESPONSE

The Sonoma County team took several key steps to address these challenges:

- ▶ **Transition to IP-Based System:** Transitioning to an ASIP simulcast network required a replacement of outdated microwave systems with IP-native units, which allowed for a transition to a switched WAN. This change significantly improved latency, reducing recovery times from 20 seconds to just 50 milliseconds.

APPLICATIONS

- ▶ 196 Tait TB9400 base stations
- ▶ Conversion from existing 12-stem ASIP analog simulcast channels to P25 Phase II trunking

BUSINESS BENEFITS

- ▶ Overcome connectivity issues due to Sonoma County's challenging topography that limits radio wave travel.
- ▶ Tait's new system has improved voice communications and operation efficiency
- ▶ 95% radio communications coverage for key public safety agencies such as Fire, Emergency, and other first responders



- ▶ **Testing and Validation:** In 2013, Dailey Wells Communications, an authorized One Tait Dealer, provided the Sheriff's radio system with two demo ASIP radios. During testing, an unexpected configuration error revealed that Tait Radios' remarkable performance, highlighting their superior quality compared to the existing QS2 system. This experience validated the potential of the ASIP network and identified areas for improvement in latency and quality of service.
- ▶ **Upgrading Equipment:** Sonoma County upgraded to 196 TB9400 radios across 17 communication sites. This equipment change will facilitate the transition from analog simulcast to a P25 conventional system.
- ▶ **Constructing a DMR Phase II Simulcast:** 196 TB9400 Analog Simulcast repeaters with P25 licensing and integrating into a Phase II trunking system.
- ▶ **Emergency Communications Tower:** Developed a deployable emergency communications tower capable of operating as an extension of the simulcast system or to replace a fallen tower in their seismically active area. The TB9400 was found to be successful in traversing a satellite connection while maintaining simulcast integrity of their ASIP systems.

OUTCOMES

The new ASIP system has delivered substantial benefits:

- ▶ **Improved Performance:** Subscribers and dispatchers report increased satisfaction with the system's performance, including improved voice communication quality.
- ▶ **Fire Community Success:** The fire departments, which previously struggled with two separate fire channels, have seen significant improvements to fire station paging with the ASIP simulcast system, which has become integral to their operations.
- ▶ **Regional Impact:** The success of Sonoma County's new communication system has influenced neighboring counties, such as Mendocino and Napa. Now they are pursuing similar upgrades, demonstrating the system's effectiveness and reliability.

Sonoma County's investment in Tait's IP-based communication system has addressed its unique geographical and technical challenges, resulting in enhanced coverage, improved system performance, and increased satisfaction among users. The innovative solutions implemented not only support current needs but also position the county for future growth and technology upgrades, such as P25 Phase 2.

SOLUTION OVERVIEW

- ▶ 196 TB9400 ASIP base stations, supporting the transition to an IP-based network
- ▶ Emergency communications tower with satellite successfully connected to Tait's TB9400 base station
- ▶ 12 simulcast channels, spanning 17 sites, equipped with TB9400 radios making the transition to P25 Phase 2 a simple next step

"Because of the successes we've had with the (Tait) system, we've got neighboring counties that have made the same transition."

Vince Hurst

Senior Communications Technician
Sonoma County Sheriff's Office