

Application Note

Radio Replacement Project brings Reliable Solution to Public Works

Elevate Wireless was commissioned by Wonderware California to test the viability of replacing IP radio communications for a municipal public works department in the San Joaquin Valley of Northern California. The legacy radios, originally installed by a systems integrator, had been experiencing communications failures and less than desired reliability. The network was comprised of nine sites: the Access Point and eight End Points.

The Public Works wanted reliable connectivity results and training on how to test, monitor and maintain the devices.

Given the inconsistent communication of the legacy equipment, an onsite radio path study was recommended in order to test the paths, gauge environmental noise and see comparable results using our radios. This would give the Public Works peace of mind in moving forward with a new radio solution.

After the path study, we supplied the Ethernet radios, onsite radio commissioning service and training. This allowed the Public Works to optimize their radio network and confidently move forward with a better understanding of their network connectivity.



Path Study Procedure

The scope of the onsite radio path study was to set up a Xeta9-EL 900 MHz ISM-band Ethernet radio as the Access Point and then test each End Point individually, using pre-programmed settings. Once the link was brought up at each End Point, signal, noise, throughput and communications success rates were tested and recorded.

Signal and noise levels were measured using the radio's built in "RF ping" tool.

Over the air speeds and success rates were measured using the built in "RF Throughput" tool which is accessed from the diagnostics section of the radio configuration. The test measures radio-level throughput.

Signal levels at all sites were excellent, ranging from -59 to -70 dBm (excellent results are expected to be achieved with signal levels above -80 dBm on the Xeta9-EL radio platform). Noise levels ranged from -74 to -115 dBm. Stable radio performance is expected when SNR (signal to noise ratio) exceeds 10 dBm, which was achieved in all locations.

The noisiest location was at the Access Point radio, which is to be expected given the height of the tower and relatively flat surrounding geography in the Central Valley. The higher elevation makes for more favorable paths to the end points, but also increases the level of received noise from the surrounding valley.



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Path Study Results

Based on the results during our onsite testing, the Public Works radio sites looked like excellent candidates for a Xeta9-EL radio network. Signal and noise levels were well within the range of values desirable for reliable radio communications. This was reinforced by throughput tests and success rates, which were excellent. All communications success rates were in excess of 90%.

Onsite Commissioning

When the Public Works decided to move forward, radio commissioning service was provided to assist with the configuration of the radios and optimization of the radio links.

While onsite, we took numerous test measurements at every site in order to optimize performance and reliability, using diagnostic tools built into the XetaWave radio platform.

We also evaluated the state of existing radio infrastructure (antennas and RF cables) and identified a site with infrastructure issues that needed to be remediated. With the extra cabling and antennas we had on-hand and available for install, we were able to troubleshoot the issue and provide a temporary solution while a permanent replacement was sourced. This was found to enhance reliability and prevent downtime at that site while maintenance was being scheduled.

Upon completion of our time onsite, we also provided an hour-long demonstration and training on the radio hardware to the Public Works staff. This helped their team have a clear understanding of the equipment, including how to utilize diagnostic tools, troubleshooting tips, etc. By providing this training session, we strive to create a better understanding of the overall network setup, making maintenance easier for all involved.

Conclusion

This case study serves as an example of best practices to ensure a smooth network replacement from start to finish. The Public Works have successfully maintained the network with optimal results and virtually no stress throughout the process. They were able to move forward confidently, with full knowledge of the expected results and a clear understanding of how to monitor and maintain the network after final installation. Because the project plan was clearly defined from the start, Elevate Wireless was able to deliver on the client's expectations and provide a reliable network at the finish.

For additional information on how we can help you with your communications challenges, please call us at 408-642-5458 or email info@elevatewireless.com.

About Wonderware California

Wonderware California is the exclusive sales, support, and training organization in California for Wonderware—the world market leader in real-time operations management software. Since 1990, Wonderware California has been helping customers across many industries to architect and maintain Wonderware based systems and to utilize and grow those systems to address the varied needs that exist in their industrial operations. Additionally, Wonderware California can draw upon thousands of integration partners to help you implement your Wonderware project.