

KENWOOD NEXEDGE® System Solves Interference and Coverage Issues for Downey Unified School District



Downey High School. Photo courtesy of Mobile Relay Associates.

PROJECT OVERVIEW: Downey Unified School District solved issues with interference and lack of coverage by switching to the Mobile Relay Associates NEXEDGE System. This has enabled clear and reliable radio communications across twenty-two campuses and even beyond the district's borders. The District primarily uses KENWOOD NX-3300 portables and NX-3820 mobile radios.

Radio interference is annoying and inconvenient, but it can rapidly escalate to a safety issue when you rely on communications to ensure the safety and security of thousands of students. That's the problem faced by Downey Unified School District (DUSD) in Downey, California. As Chris Nezzer, Chief Technology Officer for DUSD explained, "We started noticing an inability to communicate," which led to inconsistencies in two-way radio coverage over DUSD's multiple campuses.

The Downey Unified School District is comprised of 22 schools, with over 22,000 students, and is located in Downey, CA, in the southeast corner of Los Angeles County, only 13 miles from downtown LA. Being surrounded by LA County, which is the most populated county in America, means that there are always a lot of people using a lot of mobile devices in the vicinity of DUSD. All of those devices are constantly vying for the same limited radio frequencies. This congestion causes what's called "spectrum crunch", which leads to interference.

Two-way radio interference shows up as disrupted communications and degraded voice quality, which is what DUSD was experiencing. In

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looking at options to solve the interference issues. The original proposed solution was a district-owned trunking system. A trunking system is where multiple users share a pool of communications channels rather than every user being assigned a dedicated channel. This is the best solution when users have different responsibilities, like in a school district when multiple departments including security, operations, maintenance, administration, transportation and other departments all must use radios to coordinate across departments.

A district-owned trunking system, however, would have required the purchase of exclusive radio spectrum. When Mobile Relay Associates, a KENWOOD authorized dealer, presented options to the district, it was clear that the cost to obtain the spectrum could be in the millions of dollars, which was not a viable solution.

"When we bid on their system, we included a white paper, explaining the problems with operating on non-exclusive spectrum and the realities of obtaining exclusive spectrum in LA. The solution we proposed was to offer coverage on the Mobile Relay NEXEDGE SMR network," said Mark Abrams, President, Mobile Relay Associates.

Abrams explains exclusive spectrum with a race car analogy, "Let's say you're running the Indy 500, when you need your race car to achieve speeds up to 270mph. But, what if the racetrack has bumps and potholes and every time you hit one of those, you lose control of your vehicle. Even if you have a very fast race car, you can't achieve maximum speed on a racetrack with bumps and potholes. If you try to run a trunking system on shared channels, it might work in a small

town with only a few other users, but not in LA, when you're sharing frequencies with 30-100 other organizations."

"In a less populated area, you can try changing to another frequency when you encounter interference, but that's not going to work in Los Angeles County. That lack of exclusive spectrum becomes just like potholes on a racetrack. Your radios aren't going to work and you will experience interference issues."

"I just have to push the button and I can reach everyone on the campus simultaneously."

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Recess time at Sussman Middle School. Photo courtesy of Mobile Relay Associates.



Sussman Middle School Library. Photo courtesy of Mobile Relay Associates.

As Chris Nezzzer describes it, "Mobile Relay Associates came in and presented their solution, and proved that they could provide coverage on their NEXEDGE SMR system and that it would be free of interference. The promise of lack of interference has proven to be 100% true, and that has been tremendously valuable to us."



Downey Unified School District has students on 22 campuses.

NEXEDGE operates on the NXDN™ protocol, a highly spectrum efficient digital two-way radio technology, effectively doubling the spectrum efficiency of analog FM systems. NXDN utilizes very narrow bandwidths (6.25kHz and 12.5kHz) and the Frequency Division Multiple Access (FDMA) protocol, which enables more users to use the same bandwidth. This makes it ideal for users with limited spectrum availability. NEXEDGE offers enhanced voice quality, expanded range and encryption.

The DUSD system has thirty (30) different talk groups including security, a talk group for each of the twenty-two (22) schools, as well as the mechanics crew, IT department, maintenance, administration, transportation and an emergency channel that can be monitored from headquarters.

The DUSD community has 35,000 students, faculty and staff members. The two high schools have around 8,000 students, each of the four middle schools have approximately 1,300 students each, and the thirteen elementary schools have a total of 9,100 students. Nezzzer said,

"We have about 70 radios at each high school. Our middle schools have about 25 radios. And then at our elementary school, we typically have between three and five."

"Downey Unified has radios in all of their buses," said Abrams. "The original concept was to provide communications in the buses to cover the district and nothing more. With the NEXEDGE system they can communicate with their buses even well outside of their district. We put GPS on the buses and DUSD can find out where the buses are at anytime they want to know."

Nezzzer added "The biggest benefit of being on the Mobile Relay NEXEDGE network is the extended coverage, which we didn't expect. I've used my radio throughout Southern California, even when I'm off site. We send teams to Malibu, Oxnard, way north of us, even into San Diego, which is way to the south and into Riverside County."

"We're able to communicate with transportation and they're able to communicate with the district staff and their school site staff in the event of anything that does go on. I just have to push the button, and I can reach everyone on the campus simultaneously," Nezzzer continued.

DUSD uses KENWOOD NEXEDGE NX-3300 portables, with NX-3820 mobiles as base stations and in vehicles. A few NX-5300 portables are used by key district personnel to be compatible with the Interagency Communications Interoperability (ICI) System used by the Downey Police Department. The system uses KENWOOD NX-5820 repeaters at two sites on DUSD buildings within the network, installed by Mobile Relay to improve coverage.

"We're in a really great place with our radios. It definitely has enhanced our security and safety in the school district by giving us a communications platform that, if all else fails, we still have our radios. I would definitely recommend NEXEDGE," said Nezzzer. "Mobile Relay Associates has been phenomenal in their support of the system and supporting Downey Unified."

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