This video surveillance and wireless mesh project utilizes new technologies through a myriad of security experts to safeguard the Carlsbad Municipal School campus.

Carlsbad faced considerable design issues for their security project including excessive bandwidth usage with Internet Protocol (IP) cameras, poor video stream recording, and cumbersome video retrieval. The school district also needed a way for their security personnel to be mobile while utilizing the video security system around campus.

IP Cameras have been known to utilize too much bandwidth and although they always have had excellent resolution, were not as stable as conventional CCTV cameras. The IP cameras in the market today are designed much better than current digital technology used to record video streams. Most recording technologies available for IP based cameras tend to not be very user friendly making the collection of video evidence impossible to pull up in an efficient manner. Accessing video evidence had become increasingly, time consuming for the school.

Energy Control worked with manufacturers to determine proper types of IP cameras and IP video, which would best meet the district's needs. Cameras were custom configured for the district so they still had an excellent video stream output quality without utilizing too much bandwidth on the schools' network. IP Network Video Recorders were used which contain a user-friendly intuitive interface that allows end users to pull up video evidence on a moment's notice. These recorders are excellent in their efficient use of disk space as well.

Energy Control offered Video Analytics technology to meet additional objectives. Pure IP video surveillance systems are not capable of detecting multiple types of security threats in real time. In collaboration with one of the oldest companies in the Video Analytics, Intrusion Detection and Facial Recognition Industry, ECI engineered and deployed a Behavior Watch System that can track students, faculty and vehicles based on dynamic rule sets applied to the video stream. The system can determine whether there is a viable threat to campus security and alert users or take a multitude of actions such as sound alarms, notify law enforcement, or send emails to key personnel in charge of the campus. The system is self-learning of the video scene and can tell the difference between real and false alarms. The software is also capable of "People Counting" and can alert administrative staff should too many students be gathered in a particular area, which could indicate a fight or a medical emergency.

A Wi-Max capable, self-healing wireless mesh network and a tri-mode wireless military grade tablet PC were custom designed for the District. Wi-Max is a standards-based wireless technology that provides high-throughput broadband connections over long distances. Wi-Max can be used for a number of applications, including "last mile" broadband connections, hotspots and cellular backhaul, as well as high-speed enterprise connectivity for business. The tablet is very rugged and dependable for rough handling by security and includes "all-vue" screen technology for viewing in the sunlight. ECI worked with a technical engineer to aid in the design of the Wi-Max self healing topology.

Energy Control worked with a telecommunications partner to provide Power over Ethernet to the access points and dual-band antennas that are capable of 1-mile wireless range. At any given time on the wireless mesh, Carlsbad will be connected to 2 to 3 access points at once for increased bandwidth and redundancy as well as a smooth roaming experience even within a moving vehicle. Because the network is a Wi-Max self-healing mesh, if any one of the access points experience interference or hardware failure, the 2 neighbors of the access point will increase their power output to compensate for the compromised point. It works extremely well and the system can be expanded to the rest of the district in the near future. The system also included additional abilities for first responders and local law enforcement to

come on campus during a situation and pull up important video streams from the Mesh wireless network using any of three different wireless protocols available around the campus. This leads to better response time in a fire, school emergency or in catching students who are committing crimes on campus.

The system has the ability to pay for itself over time by saving the school valuable dollars in vandalism and insurance claim fees. The district can also feel relieved knowing their campus is safe for students and staff alike.