

Emergency Display Sensor System (EDSS) Secure Wireless Video Surveillance

NASA (with Anne Arundel County EMA / Annapolis Police & Naval Academy)

The Challenge

NASA was seeking ways to improve management capabilities during emergency situations and to facilitate better tracking and communications between the first responder teams and Emergency Operations Center (EOC) personnel. A mechanism allowing the EOC and the Mobile Command Center Unit (MCCU) to monitor the physical location of responders on the scene and to know their status to better manage and improve the response to emergency situations was needed.

Comprehensive knowledge of the situation is critical for both the EOC and the MCCU. Live video display of the scene was needed at both locations to allow operations managers to visualize the scene, rather than simply interpreting verbal communications describing unfamiliar geography, critical assets, and environmental threats present. In addition, there needed to be a way to measure the dangers of CBRNE threats without having an individual be exposed during data collection.

Knowing responder locations, being kept abreast of a situation, and having a means to collect data from a remote sensor to improve reactions and response times is vital. Video displays from the location are crucial for evaluation of the scene. The solution had to provide real-time, actionable information.

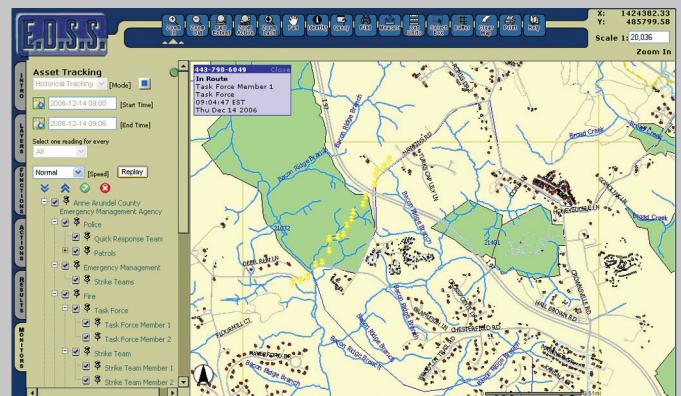
The Solution

3eTI provided a solution combining wireless technologies and Web-based software to deliver an improved centralized perspective for emergency situations. 3eTI's Emergency Display Sensor System (EDSS) software was installed on the MCCU to provide a comprehensive viewing perspective of the situation. The specialized Web-based Geographic Information System (GIS) application enables a spatial real-time perspective of responder locations, sensor alerts, and video views relative to the scene.

Responders were provided GPS-enabled cell phones to send and receive coordinate data and status messages. The responder's locations are displayed dynamically on the EDSS display screen. Responder icons reflect the organization they represent — such as fire, rescue, police, or canine — with

Products Used

- FIPS 140-2 Outdoor Wireless Interface (3e-523-3)
- FIPS 140-2 / 802.11i Video Server and Wireless Mesh Access Point / Bridge (3e-525V-3)
- Emergency Display Sensor System (EDSS) / InfoMatics® Integrator Middleware



Emergency Display Sensor System (EDSS) tracking display



Anne Arundel MCCU (left); vehicle mounted with camera (right)

colors indicating the status of the individual, including in route, on-site and off duty.

To collect the information, a number of secure wireless video cameras and video servers were installed at locations of potential threat (Annapolis City Dock), on the MCCU and on the captain's battalion vehicle for advance viewing of the situation as the first vehicle arrives at the scene.

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The battalion vehicle sends wireless video back to the MCCU to provide expanded surveillance beyond where the MCCU can physically travel. A pan / tilt / zoom camera is mounted on the mast of the MCCU; when raised, the camera provides a panoramic view.

Another camera mounted on the roof of the battalion vehicle provides video viewable from the MCCU via the 3e-525V-3 video servers installed on both vehicles. 3eTI wireless video servers are installed on each vehicle to pass the video streams to the EOC and MCCU. 3eTI's wireless bridges were installed to extend line-of-site distances.

An ADP2000 CBRNE sensor with a bridge attachment was provided for mounting on the Annapolis police robot for use in collecting advance air quality measures. 3eTI's InfoMatics® Integrator middleware receives the sensor and GPS data, interprets and translates the data, then forwards it to the EDSS in the MCCU, resulting in real-time critical data. The EDSS is used to aid in the control, analysis, prediction, and management of various types of events and occurrences. Then, the data can be forwarded to the appropriate first responders via a GPS-enabled cell phone or vehicles to respond to situations needing attention.

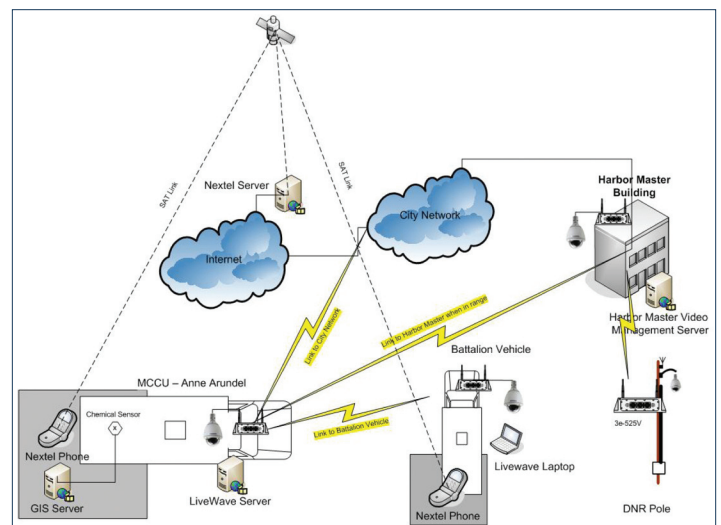
The overall EDSS system configuration is a wireless solution that empowers the end user to pull information from any available source — with minimal latency — to support the mission. The solution meets Open Geospatial Consortium Sensor Web Enablement (OGC-SWE) standards for Web-accessible sensor networks and archived sensor data that can be discovered and accessed using standard protocols and application program interfaces (APIs).

The Benefits

3eTI created a specialized, yet non-proprietary application that is easily implemented and essentially plug and play for the customer. Information can be sent wirelessly and monitored in real time by the EOC and quickly disseminated to field personnel, allowing for immediate reaction and response, before a situation might escalate. In collaboration with Anne Arundel County EMA, the Annapolis Police and the Naval Academy established their own systems based upon the same technology, enabling video to be shared between their



3e-525V-3 video server (mounted on the bottom shelf)



EDSS configuration

systems and expanding video coverage while still operating in a secure environment. The solution is highly scalable — enabling additional sensor monitoring to be added as needed — and is highly secure, meeting NIST's IEEE 1451 standards for connecting smart transducers to networks.