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MANAGING EMERGENCY COMMUNICATIONS

HOMELAND SECURITY
DISASTER PLANNING &
INTEROPERABLE
COMMUNICATIONS

**CHICAGO'S
NEW UNIFIED
COMMUNICATIONS
VEHICLE**



VOIP & 9-1-1: CONTINUAL CHALLENGES • KENTUCKY TORNADO • LANGUAGE ISSUES

Emergency Management Goes **MOBILE**

Chicago's New EOC Vehicle BY PATTI TRIPATHI

Chicago's Office of Emergency Management Communications (OEMC) is considered to be the most sophisticated and comprehensive municipal public communications system in the nation. Under one roof, it coordinates police, fire, and EMS resources to 9-1-1 calls and is equipped to provide means of communications, response, and recovery in the event of a natural disaster or terrorist attack. Emergency management and dispatching, homeland security, and traffic management all have been brought together. The agency even owns its own telephone company – hundreds of miles of fiber and copper – and the ability to produce its own dial tone.

But, all of that wasn't enough. Even more was necessary to improve and enhance the city's preparedness. Or, as OEMC Executive Director Andrew Velasquez, put it, "We needed to take the next logical step." The city needed to go mobile, to essentially transport the capabilities and functions of the OEMC to the actual site of an emergency situation, and even provide a replacement for such functions if it came to that.

That was accomplished last September when the city purchased a unique, state-of-the-art unified Communications vehicle, an emergency operations system on wheels. Designed and built by MorganFranklin Corp., which is based in Washington (DC) and West Chicago (IL), the multimillion dollar vehicle,



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Built on a 28-foot Freightliner commercial chassis by E-One and operated by the Chicago Office of Emergency Management Communications (OEMC), the Unified Communications Vehicle is designed to provide a rapidly deployable, interoperable, stand-alone communications system to support incident command during major incidents and homeland security events.

among its varied functions, allows state, federal, and local officials to coordinate rescue efforts and keep residents informed when an emergency occurs – even if such an emergency damages or otherwise affects the communications infrastructure.

Chicago is the first US city to purchase a vehicle with such an array of technologies.

"In the event of a catastrophic event that hinders operations in the city and in the event that redundant locations are also impacted, we have a vehicle that can

provide emergency response, management, and recovery as well as continuity of government from a remote location," said Velasquez, who has run the agency since 2005. "We will have sustained operations."

As demonstrated by the terrorist attacks of Sept. 11, 2001, and the devastation of Hurricane Katrina in 2005, communications is the most fundamental asset of response and rescue coordination. In the wake of Katrina, in particular, communication failure between various rescue agencies was repeatedly cited

as a significant roadblock to first responders. Now Chicago has the ability to avoid such scenarios. First responders now have a rapidly deployable, interoperable, stand-alone communications system with satellite uplink capabilities that provides high assurance telephony, network and radio connectivity that can be used to support local infrastructures and replace them should they go down.

"It really solves a lot of problems first responders have been facing for years,"

said MorganFranklin CEO Robert Morgan, whose firm has designed mobile communications units for federal agencies. "This allows us to do what's been done at the federal level, to get more involved at the local level with the first responder community. It has a much closer tie to the general population."

That, said Morgan, was evidenced by an evacuation drill performed last September in Chicago, the first of its type in

the nation. About 3,000 workers were evacuated from four West Loop office buildings, including the Chicago Mercantile Exchange, during rush hour.

And even when something less than a major disaster occurs, the vehicle's communications capabilities have varied and important uses. "We can go from one end of the spectrum, a doomsday scenario, to the other," said Jim Argiropolous, deputy director of information services for the OEMC. "Fire,

The Nation's Interoperability Scorecard

The Department of Homeland Security released its Nationwide Interoperable Communications Assessment in January, which graded public safety communications interoperability in America's metropolitan cities since September 11, 2001. [See p. 30] Surprisingly, only six of 75 nationwide urban areas received a passing score. Industry expert, Chris Herndon, vice president and chief technologist at MorganFranklin Corp., offers his insight and analysis of what it will take for all the identified cities to get a passing grade by the end of 2008.

Q. Is America ready for another 9/11 or Katrina?

Chris Herndon: The 9/11 Commission identified interoperable communications as a major challenge, and many communities listened by taking the sometimes-difficult steps necessary to close communication gaps among first responders, according to Secretary Michael Chertoff. Major investments have been made in interoperable communications systems since 9/11. We see multi-agency systems being implemented across the country. This is a major step forward in the preparedness of the nation.

Q. Why is communications important?

Chris Herndon: Communications is critical, period! Every aspect of response relies on some form of communications. Interoperable communications adds an additional layer of value and complexity. Interoperable communications provides support in both multi-agency (police, fire, EMS) and multi-jurisdictional (neighboring cities and counties) situations. This is key during responses such as a large-scale terrorist attack or natural disaster.

Q. What does interoperability mean?

Chris Herndon: In the years following 9/11, interoperability was defined as having either compatible radio systems (like manufacturer or compatible waveforms) or cross-banding systems, which allowed incompatible radio systems to communicate. For example, a VHF radio could be cross-banded to a UHF radio, allowing the agencies to communicate over their existing radios. It was quickly realized that it is significantly more than the technology. Interoperable communications involve policies and training that enable law enforcement, fire, and emergency medical services, from multiple jurisdictions in a common community, to effectively communicate.

Q. What are the six cities of the 75 examined by DHS doing right to win a passing score card?

Chris Herndon: In my opinion, these cities have not only implemented technological solutions but have made significant investments in the "people" aspect of interoperability.

Q. What do the cities that ranked at the bottom have to do to get a passing score card?

Chris Herndon: In many cases, the cities with lower rankings are lacking nothing more than standard operating procedures or periodic training events. The procedures and exercises are crucial to creating proficiencies with the communications systems.

Q. Is it possible to have all the right technology and yet still not be able to tackle a terrorist attack or a natural disaster? If so, why?

Chris Herndon: Of course. The answer relates to the one above about procedures and training. Even the cities that had high scores, if faced with an event that is something no one planned for or trained for, would have hampered response efforts. This point emphasizes the need for constant training. Quite often when I speak at events, I do a quick survey in the room. I will ask police officers, for instance, "How many hours a month do you train with your weapon?" Ten hours or more, perhaps. Then, "How many hours a month do you train with your radio?" None! Then I ask, "How often do you use your weapon, and how often do you use your radio?" It's usually a thought provoking discrepancy.

Q. What does "governance" entail, and how does it lead to a power struggle or a communications gap?

Chris Herndon: In many cases, governance is nothing more than the authority and responsible party during a crisis. Much of the "people" aspect of interoperability is centered on which organization is in charge during a response effort. Quite often the authority is different, depending on what type of event has occurred. Many cities have appointed a CEO, chief emergency officer, who has clear roles and responsibilities over any emergency response. This CEO can direct police, fire, department of public works, etc.

Q. DHS has awarded \$2.9 billion in funding to enhance state and local interoperable communications efforts? Shouldn't it expect better results?

Chris Herndon: The country as a whole has made a substantial investment since 9/11. The building blocks are being laid to meet DHS's goals. In the past few years, we have seen extraordinary investment in technology. It is clear that the future now requires additional investment to deal with the non-technical issues including training, policy, procedures, and authority. There is a very good chance that the costs associated with these issues will be substantially less than that of the technology that supports them.

civil unrest, any type of activities where multicity agencies come together. It's geared with the mindset of OEMC. We gear everything to the optimum, and everything else is downhill from there."

In other words, the OEMC is prepared for anything and now has the means to deal with it. "It's literally an extension of the 9-1-1 Center in Chicago. It allows them to put this truck at the point of any incident in or around the city and do all the command and control necessary to manage incidents as minor as crowd control to something major, like a terrorist attack or contaminant release," MorganFranklin Chief Technologist Chris Herndon said. "This truck is unlike any other that exists today."

Added Herndon's colleague, Dave Beering, "If you ever encountered a day when you had to turn every system in on the truck, that's a pretty bad day."

Beering, vice president of Advanced Network Solutions for MorganFranklin in Chicago, said a key role of the vehicle is to provide a back-up to the 9-1-1 center, one of the largest in the country. Should there be a power outage or the backup fails or the building is destroyed, he said, the truck could generate as many as 115 wired telephones or cell phones and connect 96 of those lines to outside telephones simultaneously to set up an alternate command center capable of receiving 9-1-1 calls.

Another important capability, said Beering, is to provide constant telephone communication in case the city's land-line system and cellular systems are compromised. This happened on 9/11, he said, when the flood of calls to and from New York City all but shut down the city's entire telephone system. The vehicle has a private cellular network and two satellite terminals. OEMC staffers can actually break out their own cell phones and provide them to first responders. Unlike other vehicles, this one is not limited to leased satellite time. The city has actually leased dedicated satellite capability for use at a moment's notice, hooked up with a 6,000-pound earth station. "We have instantaneous connectivity," Argiropolous said. "It's a very high-level military model."

"No matter what happens, everyone coordinated in response has the means to communicate," said Beering.

The various technologies and equip-



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The UCV's two dispatch consoles, one intended for police and the other for fire. Located side-by-side, dispatchers can receive calls and issue assignments to police and fire units by radio, all of it through the vehicle's satellite link. Each console features a full version of the city's CAD system, an IP-based phone, three video monitors and a video switch controller that can assign any video signal to any of the three monitors, an intercom panel that provides full access to the digital matrix intercom system (from this panel the dispatcher can key any radio on the vehicle and can also cross-band multiple radios).

ment that go into and even on top of the vehicle, which was built on an M-2, 28-foot Freightliner commercial chassis by E-One out of Ocala (FL), are almost endless, packed into what essentially is a box measuring 20 feet by eight feet, and standing seven feet tall. Not only does the vehicle come equipped with cameras and full broadcast capability, if Chicago Mayor Richard Daley, for example, needed to go on CNN, it could be done in a matter of seconds. "We could go to an undisclosed location and place the mayor live to the nation," said Argiropolous.

There are 30 video screens, including a 46-inch LCD monitor. Radio cross-banding makes it possible for various radio frequencies to operate at once and allow all rescue entities to remain in full communication with one another. The interior contains two positions for dispatchers (complete with three wrap-around LCD displays) and three other seats for technical personnel. A total of 18 subsystems are interconnected – video distribution, a cellular system, land mobile radio systems, core IT networks, satellite systems. "It's a fairly compact space and literally every cubic inch of space is utilized in some way," Beering said.

On the exterior is a 42-foot pneumatic mast, a remote control camera with a 30-power zoom lens, dual-band

antennas, cellular antennas, a wireless Internet access point and two remote-controlled spotlights. The truck can also receive pictures from the many surveil-

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The tech control area in the UCV has seating for three operators. Each seat has an IP phone, a control panel for the digital matrix intercom, and three small LCD monitors identical in function to those at the dispatch stations. Above the monitors, the technical hardware is separated into functional areas, from left-to-right: land mobile radios, satellite system control, video reception, and audio control. Below the countertop resides 18 KVA of UPS, all of the Cisco IP routing and switching hardware, a broadcast video encoder, two Cisco Call Managers, the ClearCom digital matrix intercom, and five computer servers that support all non-CAD applications.

lance cameras distributed throughout the city.

“Everywhere you look, there’s something happening,” Beering said. “It was an incredible technical challenge to put all of those things together in that compact a space. We got every radio frequency we could get our hands on. Marine radio, air band radio, HF radio. You could take a jet fighter radio system and connect it to a fire truck. You could connect a United 757 to a police car. It has extensive interconnectivity to all voice assets.

Beering, along with Chris Herndon, was one of the key players in the vehicle’s development, from conception to completion. As founder and owner of Infinite Global Infrastructures, a small Chicago-based company that specialized in the integration and implementation of specialty high-performance satellite systems, Beering was pressed into service following the 9/11 attacks with Herndon, who at the time was working for the Naval Research Laboratory. Their immediate task was to restore the dial tone to New York City.

Beering learned Herndon was working on a mobile command vehicle design at NRL. Beering said he “stayed pretty close to the process,” and then joined Herndon on the project. Chicago was interested. But after a couple of years of

work, it became apparent that bureaucratic problems and what Beering called “legal machinations” between the city and the navy could not be worked out. Chicago decided to pursue the project through the private sector. Beering worked with the City of Chicago to take over the project through his company, IGI. He said it took “nine months of rather persistent and intensive effort” to get the project structured and defined, and then presented to the city council.

“When it was evident that Chicago and the navy couldn’t find the mechanism to work together, Dave did,” Herndon said. “I hate to call it a personal crusade, but it was. It wasn’t about trying to make a buck. It was about trying to get the capabilities, to the leading city in the country in terms of technologies, to come together. Dave went on a personal crusade for two years trying to make the city realize how important this was.”

The council approved the project in September 2005 and the contract was signed on February 1, 2006. “All of a sudden it was off to the races,” Beering said. “Literally.” All the technical subsystems needed to be built, and the logistics, financial management and the phasing of all deliverables had to be worked out. Meanwhile, Morgan-Franklin bought IGI in April, bringing

Beering and his eight full-time employees aboard. The truck chassis showed up in early June, and the integration process began. The vehicle was delivered by E-One to MorganFranklin on August 6, with a month remaining to complete testing and final integration. “We burned something like 2,000 man-hours to put the whole system together,” Beering said. “Nearly 24 hours a day.”

But the effort was worth it, and serves as a lesson to other municipalities about the value of persistence and surmounting bureaucratic red tape to achieve a goal.

“This thing exists; it works,” Beering said. “It’s very capable. It’s very incredible.”⁹⁻¹¹

Patti Tripathi is the President of TriPath Media, a public relations and media strategy company based outside Washington D.C. Before starting her company, Tripathi was a news anchor for CNN. She has also worked as a local news reporter for ABC affiliates in North Carolina, Indiana, and Arizona. Before moving to radio and television news, she began her career working for The Arizona Republic right after she graduated from the University of Notre Dame.

For more information on Chicago’s OEMC, see the feature story in our June, 2006 issue.