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THE NEED FOR SPEED

Feb 1, 2008 12:00 PM, By Glenn Bischoff

In the early 1990s, ambulances dispatched by the Richmond (Va.) Ambulance Authority, or RAA, were arriving at incidents 10 to 11 minutes after a 911 call was placed — which wasn't nearly good enough, according to city officials, who wanted response times down to nine minutes or less, 90% of the time.

Two minutes might not seem like much of a difference, but don't tell that to someone who has just suffered a heart attack, said Jerry Overton, who today is RAA's executive director. "This affects a lot of outcomes," he said. "For instance, there's more evidence that suggests myocardial infarction must be treated within 90 minutes or there's irreparable damage to the tissue."

Clearly then, every minute, every second counts. So Richmond officials recruited Overton from a public safety agency in Kansas City, Mo., to improve ambulance response times. He had found some success in K.C. in terms of aggregating dispatch data and then crunching the numbers to create predictive models that not only aided in the deployment of equipment and personnel, but also in routing them more efficiently so they'd arrive faster to a scene.

But Overton believed he could do better. One of his problems was that the tools at his disposal were comparatively primitive. "The data we were using for our research was being generated by several different software programs, and we were using Excel spreadsheets to keep track of everything," he said. "Any time there's a lot of data entry, you encounter delays and errors."

There also was a need to know exactly where ambulances were located at any given time and where they were heading. As much as 45 seconds were eaten up because the dispatcher would first have to place a radio call to determine where ambulances were situated before a decision could be made as to which was best suited to take the call. Often, another minute or so was lost as ambulance drivers consulted maps to determine their routes.

That had to change, and Overton was determined to find a solution. That determination eventually led him to launch an initiative dubbed "High Performance EMS," which really got its legs when the RAA, in the second half of 2005, decided to employ a platform developed by In Motion Technology of New Westminster, British Columbia, a partnership that Overton and Kirk Moir, In Motion's CEO, will discuss at length during a session at next month's IWCE 2008 in Las Vegas. (The session, "Mobile Communications Technology for High Performance EMS," will be held Feb. 27 from 4:30 to 5:45 p.m.)

The initiative is getting a lot of attention in the U.S. and internationally. Recently, for instance, public safety officials from the Republic of Singapore visited Richmond to get a closer look at what Overton and Moir are doing.

According to Moir, In Motion fully understands what is at stake in the field of emergency medicine. "Real-time data is critical to getting things done," Moir said. "And whatever we did had to be reliable and secure. The team [in the field] can't worry about the communications. It just has to work."

One of the keys to In Motion's solution is a mobile gateway — currently installed in 30 RAA ambulances — that establishes a vehicle area network that lets any IP-enabled device — such as a ruggedized in-vehicle laptop or personal digital assistant — connect to a public safety agency's operations center over any wireless network.

The connection occurs via a proprietary VPN client or a wireless networking application. The mobile gateway leverages the IEEE's 802.11i encryption standard developed to secure wireless local area networks. (Transmissions between the ambulance and operations center travel over an IPsec tunnel.)

Security is a big issue because the solution lets emergency medical personnel transmit vital information about the patient's condition to emergency room doctors in real-time, either from the scene or en route. "HIPPA [Health Insurance Portability and Accountability Act] says we have to protect patient-history data, so we had to work closely with In Motion to make sure the data goes where it needs to go," Overton said.

The platform's ability to enable two-way data communications between the dispatch center and ambulance is another big plus. A management application monitors network coverage, upgrades the mobile gateway over the air, and analyzes data collected from the ambulance and exports it to the appropriate spreadsheet application. This data — which includes GPS-generated location information and the speed at which the ambulance was traveling en route to an incident — is

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analyzed to help determine the best route for the ambulance to travel based on time of day, the location of the ambulance and the destination.

"The best route isn't always the shortest route," Overton said, adding that the GPS data — which is graphically depicted on the dispatchers' screens via a mapping application — also helps to ensure that ambulances are where they're supposed to be and lets officials strategically position them.

In addition, the platform lets the RAA's emergency medical personnel file electronic incident reports from the field in real-time, a big improvement according to Overton. For starters, legibility problems — people tend to scribble when in a rush — have been erased, which not only is a plus for emergency doctors and nurses, but also for the RAA's billing department.

There's also a fail-safe aspect of the electronic report interface. "It won't close until all of the fields are completed properly," Overton said.

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