

Policing with pinpoint accuracy by using GPS

By Bob Galvin

With the economy's stranglehold on nearly every police department's budget, officers are pressed to more selectively respond to incidents while maintaining their safety. However, officer safety is getting a much needed boost thanks to one solution that is proving highly effective for incident response: Global Positioning System (GPS) technology.

So, just what is GPS? Wikipedia, for example, defines it as a "space-based global navigation satellite system" that provides reliable location and time information in all weather and at all times, anywhere on or near Earth so long as there is an "unobstructed line of sight to four or more GPS satellites."

Although GPS technology has a sprawling range of applications, most law enforcement agencies tap into the mapping capability that it enables, for now. A growing trend shows that police departments are equipping their patrol units with mapping systems that GPS can support, wireless technology, mobile data communications and records management software, all tied into a dedicated or regional computer-aided dispatch (CAD) system.

To clarify, GPS does not provide maps. The maps are offered separately by vendors, and have latitude and longitude references embedded into them. Therefore, when GPS data transmitted from satellites (showing, for examples, the location of a car or an event) is overlaid on a map, the GPS references convert to a spatial reference in the form of a symbol—again, indicating a car or location.

With access to mapping in their cars, officers can more easily and quickly respond to incidents. The GPS-enabled mapping provides more precise locations of calls for service.

A big benefit of GPS-enabled mapping is that the tracking of locations for calls for service can be studied to learn a history of calls and types of incidents. Crime mapping is another significant benefit. The implication is clear—that GPS can become a pivotal crime prevention and community safety tool.

Improved Dispatching, Better Information

Most law enforcement records management software (RMS) now comes with a CAD system that often is sold



A Mobile Digital Communicator (MDC) System, like the one from Crimestar Corp. used by the Edwardsville, Ill., Police Department, dramatically boosts officer safety by being GPS and map enabled. A GPS receiver connected to the MDC allows transmission of real-time latitude and longitude coordinates back to CAD/Dispatch (top photo) so dispatchers and other MDC users can view field units spatially via the MDC or CAD map display. As a result, patrol units (bottom photo) and dispatchers can see at all times where units are and where events are occurring.

separately, but which integrates with the RMS and a mobile digital communications (MDC) system. The CAD system provides a method to efficiently track the swiftly changing details of multiple, simultaneous events or calls and activity of all patrol units in the field. The MDC system, as part of CAD, accomplishes three important functions: ❶ It gives officers instant information for each call; ❷ It cuts down on radio traffic; ❸ It enables dispatchers to update a call. Officers can place vital information into the call via MDC.

The Edwardsville, Ill., Police De-

partment has experienced firsthand the benefits of having GPS as part of its CAD system. In 2007, the department acquired the Crimestar RMS System, then later added Crimestar's Computer-Aided Dispatch (CAD) and Mobile Digital Communicator (MDC) systems.

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MDC or CAD map display. Consequently, patrol units and dispatchers can see at all times where units are and where events are occurring.

Applying The 'Closest Car Concept'

The Edwardsville Police have applied what it terms the "closest car concept" for the last 20 years. This means that regardless of what patrol area a call happens to be in, if there is another officer closer to that call than the assigned patrol unit, then that officer is obligated to respond to the call. "We have used these capabilities to see where our police backup is and how far away it is," Sergeant Gallion said.

"The idea is that we're going to provide the best service possible for our customers," Sergeant Gallion explained regarding the concept and the value of a GPS-enabled CAD and MDC system. "Crimestar's GPS makes it easier to manage this 'Closest Car Concept.'"

The GPS is crucial since Edwardsville Police have large patrol areas, with some beats covering 10 square miles. This means police backup could be a difference between being a mile away or several miles.

Officers Can Self-Dispatch

GPS can be helpful in instances where an officer did not receive a dispatch message about an incident in time. "He can look at the GPS mobile map and see where these guys (involved in the incident) are," Sergeant Gallion noted. And, he added, "Our dispatch consoles are very busy, and dispatchers may not be able to get on the air right away with details of an unfolding incident. It's just as simple to look at the map and see where the incident is located and go there."

Coupled with GPS is what's called Automated Vehicle Location (AVL). AVL is used with GPS to enable public safety agencies to more precisely focus resources in responding to incidents. Likewise, it is critical to keep dispatch operators alerted to the latest status and location of responding patrol units. This enables the dispatchers to quickly identify those patrol units that can best respond to an unfolding incident.

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GPS & AVL Help Track Assets

So, AVL is a technology that automatically notifies the dispatcher of the location of patrol units. The GPS tells the mobile data terminal in the patrol unit where it (the car) is via a latitude/longitude position. When GPS data is combined with RF data transmissions to send that latitude/longitude position back to the dispatch center, the dispatcher knows where the patrol unit is, too.

The application of GPS technology is one area of major study under way within the Office of Science and Technology at the National Institute of Justice (NIJ). According to William Ford, division director for the Office of Science and Technology and who oversees that office's Information and Sensor Technologies Division, "GPS for mapping (in law enforcement) is extremely important because an officer is not always in his patrol unit. He could be on a foot pursuit or just walking the neighborhood performing community policing. The idea of how we can improve situational awareness is important," Ford continued. "It's critical to know where your assets, such as personnel, vehicles and incident command staff, are."

Ford further noted that his Information and Sensor Technologies Division has a cooperative agreement with the Police Foundation, whereby a model is being developed to show how GPS information can be used more widely. "They (the Police Foundation) are working with the (law enforcement) practitioner community, and the method for using GPS will apply to officer patrol, but also looking at how GPS can be used to accomplish crime statistics and crime mapping," Ford said. The foundation is expected to issue its findings in a study to come out in 2011.

How GPS Ties 50 Agencies Together

The Office of Unified Communications (OUC) for the Government of the District of Columbia, in Washington, D.C., has consolidated emergency and non-emergency 9-1-1 and 3-11 calls and dispatching since it was formed in 2004. The OUC serves the Metropolitan Police Department and Protective Service Police Department, comprising 50

different law enforcement agencies, and handles dispatching, radio communications, and first responder command and control functions.

All of these functions are handled

through use of software that combines GPS and AVL. "Before this move, mobile communications and AVL were not seamlessly integrated with CAD," explained James Calla-

han, CAD and technology manager for the OUC.

The OUC adopted the Intergraph I-Mobile Dispatch System, which eliminated multiple layers of log-in

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required by patrol units for various application layers tied to an older dispatch system. As a result of the older system, "We didn't communicate well with CAD," Callahan recalled.

The Intergraph I-Mobile System has improved incident response by providing first responders access to the same mapping interface that dispatchers have in the OUC's command center.


"This helps with the synergy between the officer on the street and the dispatcher in the command center because they're looking at the same thing," Callahan said.

The result from this more streamlined marriage of GPS and AVL in one standardized software program is higher officer productivity. "More metropolitan police department officers are now able to self-dispatch for lower priority calls, which really cuts down on radio traffic," Callahan said.

pushed out to other related applications. For example, he said, "It's important to look at where officers are in the field in relationship to where crime has happened. Do we have proper patrol distribution or routing?" Ford posed.


Ford also argued that due to the current, horrendous public safety budget crunch, "It's essential to ask how we can reduce our total cost ownership for position location technology." Developing standards, such as what DOJ is attempting to accomplish with the Police Foundation, will help accomplish this need.

In the short term, police departments can achieve higher efficiency for patrol units by using GPS/AVL for mapping since it has been tested



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Through the use of Intergraph's AVL (Automatic Vehicle Location) technologies, call takers and dispatchers at the Washington, D.C., Unified Communications Center are able to allocate the closest resources when responding to emergencies.

Match GPS/AVL Needs and Funding

Although there is a large number of providers of mobile dispatch software solutions that have GPS and AVL, be careful to choose the right one for your dispatching and mapping needs, and in these financially turbulent times in public safety, for your budget.

Crimestar's Computer-Aided Dispatch and Mobile Digital Communicator systems, for example, best fits the needs of small- to mid-size police departments, although much larger departments can benefit, too, provided there is not extensive customization needed. Likewise, for much larger metropolitan agencies, software solutions such as that offered with the Intergraph I-Mobile package may be more appropriate.

As mentioned earlier, mapping is the most logical application for which police departments see an immediate need to adopt GPS- and AVL-enabled mobile-data communications software that is tied into their dispatching centers.

Expanding GPS To Other Uses

Still, Ford feels these technologies can be

and proven valuable in many ways. For a relatively low-cost investment, GPS/AVL can yield these benefits: Faster incident response times; More precise identification of locations of calls for service; Ability to list call histories and to indicate crime trends or potential threats at specific addresses; Increased officer safety; Ability to pinpoint every vehicle on the road; and Higher officer productivity in the field. ■

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