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## Location intelligence: The next trend in mapping technology

By Greg Donahue

As the challenges facing public safety communications and emergency response professionals continue to grow, location intelligence technology empowers public safety professionals with the data and tools to make more informed decisions. Geographic information system (GIS) technology has been in use in a variety of public safety applications for many years but relies on the need for a trained GIS expert to provide analysis and answers. Now the options are available for public safety and emergency response organizations to move beyond the traditional GIS mapping and enhance their work using location intelligence solutions on their own.

Location intelligence solutions are comprised of a combination of software, data and expert services that help public safety organizations leverage spatial capabilities to uncover patterns and risks not visible through traditional methods, and all without the need for a GIS expert. Using location intelligence, agencies can implement mapping technology to bring the power of location analysis capabilities to many more areas and bolster efforts during the planning and execution of communications and response tactics.

Before reviewing the numerous ways location intelligence is helping to improve the achievements of public safety professionals, let's take a moment to clarify the differences between these solutions and GIS. GIS is a technical specialty with a steep learning curve and requires a dedicated person or even department with a high level of domain knowledge. On the other hand, location intelligence is standards-based, intuitive, and designed to be usable and adaptable by everyone in the organization for decision making during emergency scenarios and crime analysis. Additional differences include:

- Within the organization, GIS resides in a special department that is called upon when an agency needs answers to location questions. Location intelligence does not require its own department of people. Rather, a location intelligence solution integrates seamlessly into existing applications and IT architecture, making it usable by everyone who needs it - when they need it.
- GIS applications create a separate, proprietary and expensive database to store the spatial data. Because location intelligence integrates so well into IT departments, users do not need a separate, special database, only an extension to their existing standard database.
- GIS focuses on offering toolsets with specialized functionality and technical capabilities. Location intelligence offers capabilities that integrate into existing processes, enabling the organization to answer specific questions. For example, with time-based analysis, law enforcement can analyze crime patterns based on time of day, and emergency response can understand emergency vehicle response times based on traffic and time of day.
- With GIS, spatial is considered special; with location intelligence, spatial is not special. Rather, it is a tool that fits into business processes to help solve particular location needs.
- GIS is expert user oriented. Location intelligence is integrated into processes and organizational applications for use by everyday people who only need to use location when appropriate.

In short, location intelligence advances geospatial capabilities into more areas for public safety and emergency response tactics, and delivers valuable information to organizations, helping to protect residents and property in emergency situations. Here are a few examples of public safety organizations currently using location intelligence.

### **Improved emergency dispatching**

In an emergency dispatch center, time is critical and a variety of information is needed at a moment's notice. This includes information on the 911 call, responding unit(s) status, history on the address, notification of any hazards and mapping. Notice that mapping is but one piece of the information required. In situations like this, the mapping component needs to integrate seamlessly with other streams of data and databases. And it needs to be intuitive - the dispatcher is not a GIS specialist.

The Piscataway Township (New Jersey) Police Department implemented a dispatch system designed by Malden, Massachusetts-based Queues Enforth Development Inc. The system allows the police to respond more quickly to calls. Prior to the dispatch system, if a domestic problem got called into the Piscataway PD's dispatch center, only the address of the location would be dispatched. In these cases, the officer would have to determine where the building is located and the best way to get there. The extra time in mapping out a route may increase the critical time it takes to arrive at the location.

With the new dispatch system, the officer doesn't have to refer to maps or second guess directions. Once the center receives the call, the dispatcher punches in the address data and a map of the location pops up on the screen. With many businesses, apartment and condo complexes, and new construction in the 21-square-mile township, the system enables the dispatcher to guide the officer to the front door of the location. For example, the dispatcher may say, "You are going to Eighth St. between Seventh and Ninth St. It will be the fourth house on the left."

The system also integrates with other critical tools used for dispatch. For example, the system indicates all live instances going on at any given time within the jurisdiction. Although systems are individualized for each jurisdiction, typically, each dispatch category is color shaded by priority. An assault in progress would be coded red, while a request for serving papers may be colored green because it is not of a high priority. In all, the system enables dispatchers to provide officers with the most up-to-date information and directions to the address.

### **Quicker fire response**

The Town of Wethersfield, Connecticut's Emergency Operations Center (EOC) is using location intelligence to place maps in both fire and police vehicles for quicker response to events. The EOC creates maps showcasing where commercial businesses, private homes, water lines and power lines are located. These maps link to data, such as number of tenants, routes to the street and dimensions.

Emergency responders can easily search, zoom in and out, share, and manipulate this information. In the event of an emergency, EOC administrators can view the layout of the disaster scene to determine what roads lead to it, the area's population density, and which homes and businesses need to be evacuated.

While in transit to an emergency, fire personnel can see the fastest route and locate the closest fire hydrant before getting to the site. This helps them make better decisions when life and property are at risk. Using location intelligence, Wethersfield can address "what if" questions on the fly for planning purposes or access the most up-to-date information about town residents, businesses and geography during an emergency.

### **Predictive crime analysis anticipates criminal moves**

When trying to identify a suspect's next step, it may be difficult to discern if there are any trends or patterns by just viewing a spreadsheet of the data collected from crime reports. However, by converting the data into readable maps, more people who are part of the investigation can leverage and easily access the information across multiple platforms. Through a map, the agency can see crime analysis metrics in an intuitive, graphical fashion. This view offers a visual of patterns and relationships that can help focus the investigation.

Using only a partial license number, description of the vehicle and composite picture of the suspect, the Toronto (Ontario, Canada) Police Service had little luck identifying and locating a sex offender who had been targeting young children at area schools for more than a year. The investigative teams needed to use additional information to help escalate the search.

By using location intelligence solutions in the agency's GIS and Geographic Profiling Analysis application, Det. Constable Manny San Pedro was able to formulate crime pattern graphs to visually show the individual's anchor points, as well as predictive analysis identifying where and when the offender may strike again. After adding the locations of schools in the area, selecting a five-minute walking buffer for children walking to and from school, and layering in the days and times the suspicious van had been spotted, the location intelligence map narrowed the probability of where the individual may appear again.

The Geographic Analysis Report was shared during a briefing with the Sex Crimes Unit investigators and tactical teams from two police divisions working on the case. By eliminating the peripheral information and processing the critical information in multiple formats, San Pedro and the geographic profiling analysis team picked up on common trends and patterns that may not have stood out using traditional tabular analysis.

Armed with the predictive crime analysis maps, the police strategically set up in the locations where the suspect would likely return. Within 33 minutes of targeting the focus areas, the suspicious van appeared and the suspect was arrested.

The Toronto police have been using GIS solutions since the early 1990s to plot crime locations for preventative analysis. Two years ago, the agency began to leverage location intelligence methodologies. Using location intelligence the Toronto Police Service can use calls for service and criminal incident data to strategically make better decisions on where to deploy resources and ultimately map out a criminal's next move.

### **Improving emergency preparedness**

The Louisiana Department of Health & Hospitals' Bureau of Primary Care and Rural Health is responsible for monitoring and developing access to health care services throughout Louisiana. When Hurricanes Katrina and Rita struck the Gulf Coast in 2005, the state's population dramatically shifted from the region, raising numerous questions regarding health care services and resources.

Realizing that location intelligence technology could enable the bureau to visually assess and analyze the status of the department's employees, health care facilities and providers, the organization applied location intelligence technology to survey and visually represent health care data. The bureau also was tasked with comparing health care facilities with the new altered populations.

The organization generated maps identifying where health care employees had relocated to, as well as where they moved from, helping to administer aid where residents needed it most. The maps illustrated which facilities were functional, partially functional or destroyed. Working side by side with

emergency response teams, the bureau tackled additional projects, such as mapping New Orleans flood zones by neighborhood and overlaying this information with existing health care facilities.

These real-life examples are situations where non-GIS trained people are able to take advantage of location intelligence when it counts most. These organizations have adopted geographic capabilities and strategically implemented predictive mapping to heighten their work with location intelligence solutions.

With the ability to package software, data and expert services, public sector organizations can enhance their public safety and emergency response tactics. This is the essence of implementing location intelligence to play a crucial role in disaster and emergency management.

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