

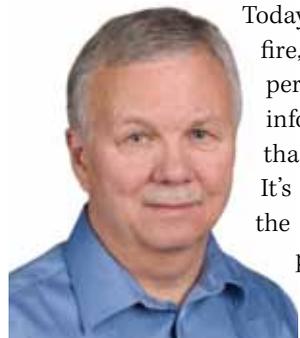
Public Safety Log

Esri • Spring 2011

GIS for Public Safety

Meet Mission Demands with the ArcGIS System

by Russ Johnson, Public Safety Director, Esri



Today, more law enforcement, fire, and homeland security personnel use geographic information systems (GIS) than at any previous time. It's encouraging to see the technology applied by people like you for mission requirements and decision support. GIS technologies are beginning

to optimize and support the challenging tasks of planning, resource deployment, incident management, and comprehensive situational awareness. As a complete system, ArcGIS provides a framework to meet every type of workflow.

The ArcGIS system enables users to meet mission requirements by providing four essential capabilities: situational awareness, data management, powerful tools for planning and analysis, and field mobility. These capabilities serve all facets of the mission and support complex workflow challenges including providing better information and decision support at the incident, the command post, or the command center. It supports complex planning and hazard analysis, which provide additional details that are accessible when needed for comprehensive situational awareness.

The ArcGIS system enables greater collaboration and information sharing with stakeholders and the public. It enables you to access dynamic data feeds (video, sensors, GIS data services) from external

systems providing you with near real-time situational awareness. Online maps and data are available from a number of sources, including worldwide datasets, imagery, topography, basemaps, aerial photography, and applications. The ArcGIS platform provides powerful data management capabilities. All types of disparate data and information (reports, photographs, floor plans, video, etc.) can be accessed from the common operating picture when needed. The system can be deployed on-site or hosted in the cloud as a secure, managed system.

Baltimore Fire Maximizes Manpower and Resources

Enterprise System Helps Staff Make Tough Decisions during Economic Downturn

Baltimore City, Maryland, Fire Department has seen its share of challenges. Staff reductions, station closures, and spending cuts have hit this agency as well as many others across the country.

To better manage through tough economic times, Baltimore Fire has begun to rely more on technology to optimize the deployment of limited resources and effectively provide fire and rescue services.

Over the last two years, the department implemented a robust ArcGIS platform with a number of successful applications that support complex mission demands.

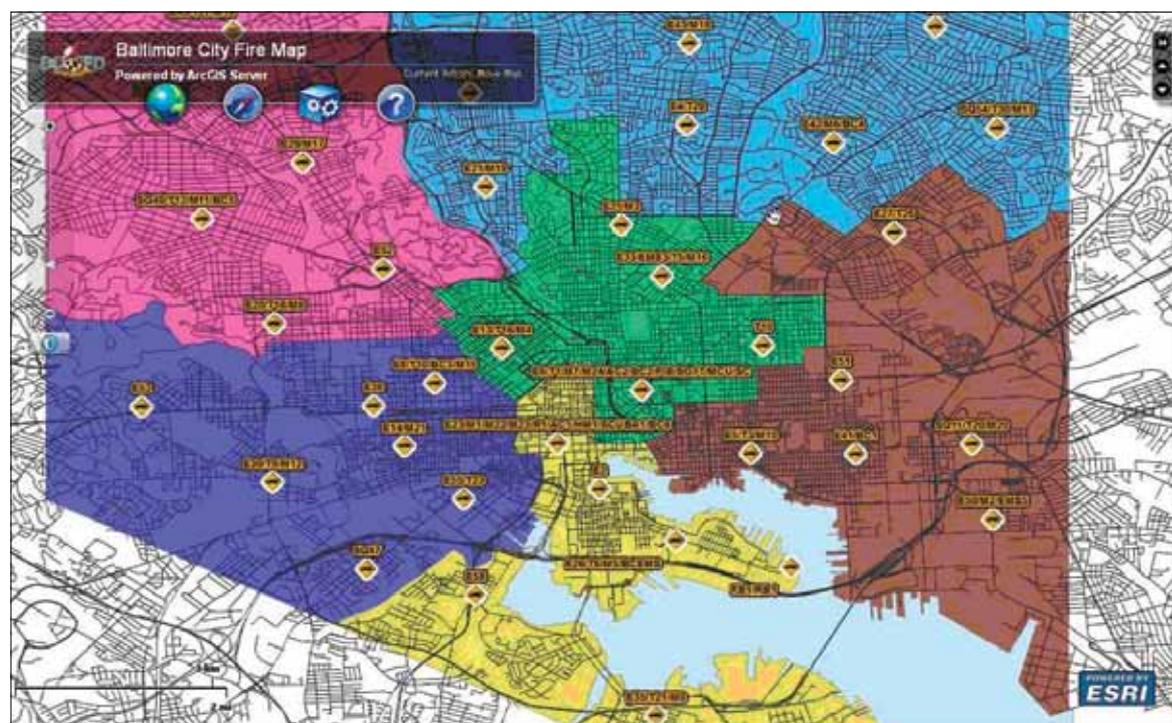
Jim Potteiger, special assistant to the chief of Baltimore City Fire Department, and Peter Hanna, firefighter/paramedic, Baltimore City Fire Department, helped lead the charge to implement GIS within the department.

The result is a leading-edge GIS that grew out of the work of two firefighters with no prior software experience, training, or official budget.

Getting Response Times Right

Baltimore City Fire Department serves a geographic area of 81 square miles and a population of more than 640,000 residents. Led by fire chief James Clack, the agency has more than 1,800 members, who are divided into two management branches—Emergency Operations and Planning and Administration. Every year, the department responds to more than 163,000 emergency 911 calls.

For Baltimore Fire, prior to the use of GIS, meeting its response time standards and guidelines was difficult,



GIS supplies an intuitive method to view each battalion and fire station. Staff can then drill down to access other information.

given the number of calls it receives.

The agency wanted a more efficient method for determining whether it was meeting response time standards including National Fire Protection Association (NFPA) guidelines and, if necessary, what could be done to improve performance capabilities.

Enter geospatial technology. Hanna extracted

incident data from the computer-aided dispatch (CAD) system and geocoded it. Along with Potteiger, Hanna looked at incidents and arrival times to determine exactly which responses failed to meet standards and where improvements were needed. They could then

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More Industry News

You will find more news and information specific to GIS for the public safety industry in *ArcNews*, a quarterly magazine for the Esri community. Please visit esri.com/arcnews.

To learn more about GIS for public safety, visit esri.com/publicsafety.

To submit an article, subscribe, unsubscribe, or change your mailing address, visit *Public Safety Log* online at esri.com/publicsafetylog.

More GIS News

Keep up with breaking GIS news, watch the latest videos, access ArcGIS resources, and connect to social media outlets at the newly launched esri.com/news.

The Geographic Advantage in Law Enforcement

Geospatial technology is key for addressing problems and patterns in law enforcement. See the video that features agencies such as the Richmond, Virginia, Police Department; Broward County Sheriff's Office in Florida; and Las Vegas, Nevada, Metropolitan Police Department; and more. You'll hear how GIS provides



a complete system for law enforcement that supports all facets of agencies' increasingly diverse missions. The data management, analytic, and visualization capabilities of GIS support law enforcement operations from the command center to planning to the field.

To see this video, visit esri.com/publicsafety.

See how GIS helps law enforcement protect and serve.

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Baltimore Fire Maximizes Manpower and Resources

begin to ask the all-important question of why some responses failed to meet response time goals. An analysis looked at which specific apparatus/personnel—whether it was a fire truck, engine, or chief—met or failed the standard for each incident.

The first year the data was gathered and analyzed was 2008. The NFPA standard is 90 percent success rate for meeting response call times within the given four- to eight-minute timeline. Baltimore Fire discovered it had roughly an 85 percent success rate.

The GIS analysis—and the work of Hanna and Potteiger—led to an important discovery.

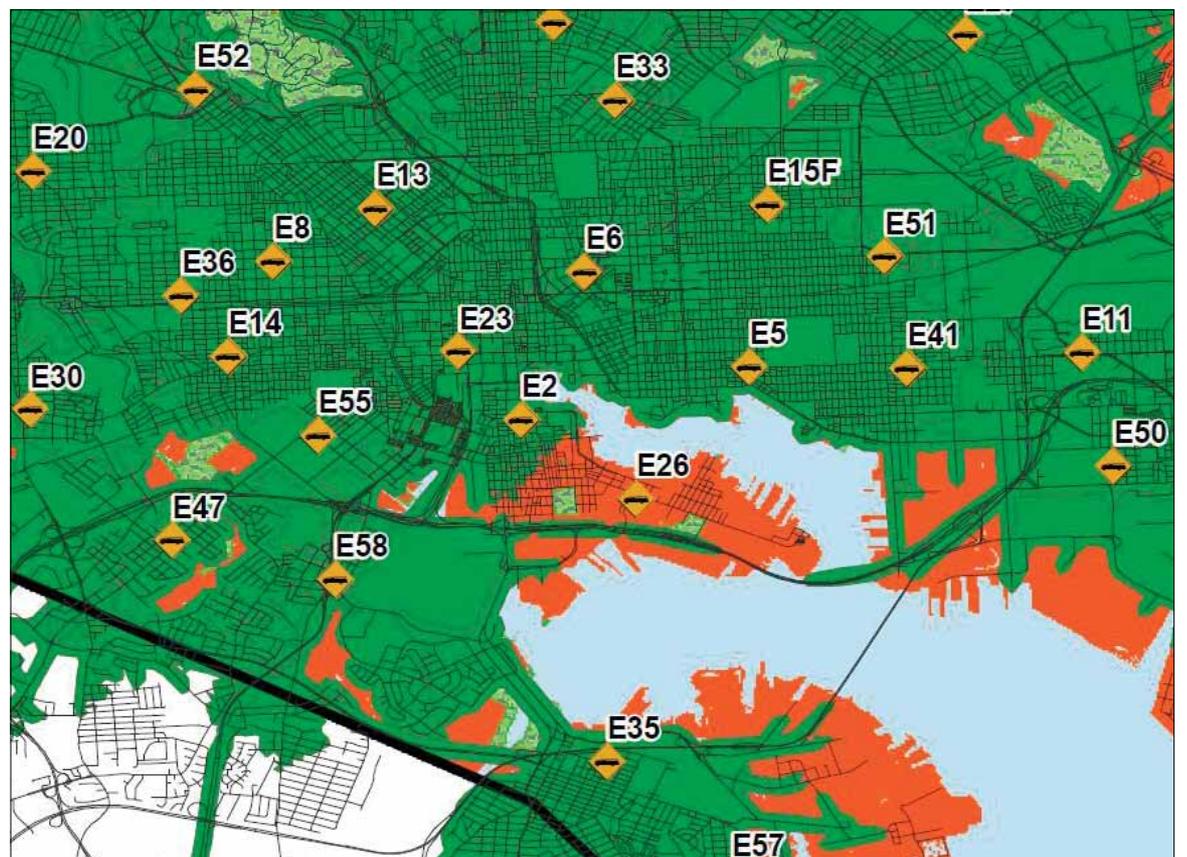
“When we closed a company for preventive maintenance, we lost coverage if it was the only one for that area,” explains Hanna. “We identified the problem based on real information derived from our own analysis.”

Baltimore Fire quickly implemented a new policy. If it took the only available company out of service for maintenance or repair, the agency would move another company unit from a double-coverage station to protect that area. Having mapped all the firehouses, types of vehicles, and their response times and areas of coverage, Baltimore Fire now had the information visualized to identify when and where this need occurred. The agency could also identify which company unit could provide coverage.

Digital Pegboard

The result of the analysis and vehicle tracking led to an important application: the digital pegboard, a geoenabled PDF used by shift commanders to determine response capabilities. The pegboard shows a map of fire stations, their service districts, and their coverage areas, using color-coded polygons that are based on a four-minute response time.

It became a tool that shift commanders used to understand the impacts of closing or “browning out” a station during any given shift; they can quickly compare volume of service in each area against a potential station closure. In 2010, Baltimore Fire began doing this type of analysis



Looking at the location of fire companies allows Baltimore Fire to accurately assess coverage based on different criteria. In this map, areas in green show adequate response times. Areas in orange show insufficient response times.

since the agency and the city were in a budgetary crisis. A new policy—rotating closures—significantly reduced overtime and actually forced the city to curtail the total number of man-hours the fire department would work without sacrificing service capabilities. This was no easy task.

Hanna generated four-minute response polygons for each fire station using ArcGIS Network Analyst to compare against incidents imported from the CAD records database. They were then exported into individual shapefiles. In essence, there was one polygon for each fire station.

Then the shapefiles were put into the digital pegboard where each station's four-minute response coverage area could be easily turned on or off to illustrate the impact of any closure, taking incident frequencies into account. It was an application that was perfect for the

designated users: fire officers, pressed to make life-and-death strategic and tactical decisions. These professionals are busy meeting mission demands. They do not have time to become hands-on software users.

“Everybody knows how to open PDFs,” explains Hanna. “Fire officers were pleased because they could quickly identify where a problem existed.”

The digital pegboard was quickly adopted by agency fire officers. With the success of these and other applications, Baltimore Fire has been recognized with an Esri Special Achievement in GIS Award as well as other industry accolades.

“We’ve done a lot in a short amount of time,” says Potteiger. “Chief Clack has been very supportive. Without him, this would never have taken place.”

To learn more about how GIS is used in the fire service, visit esri.com/fire.

2011 Homeland Security GIS Summit and User Conference Preview

The future of GIS mapping for public safety will be on display at the 2011 Esri Homeland Security GIS Summit and the Esri International User Conference (Esri UC). These events promise to be the largest, most successful public safety user experience ever. The Esri public safety team and other staff will share the latest GIS innovations, which can help you whether you work in law enforcement, fire, homeland security, computer-aided dispatch, or a related industry. This year's summit will have an executive track for decision makers and senior staff as well as a technical track for practitioners of GIS in public safety. In addition, specialized focus will be on showing the return on investment gained from using GIS in homeland security.

The 2011 Esri Homeland Security GIS Summit will be held July 9–12 at the Hilton Bayfront in San Diego, California. The Esri UC, to be held July 11–15 at the adjacent San Diego Convention Center, will feature the Public Safety Showcase area, including the ever-popular Operation SafetyNet demonstration area.

The summit is designed specifically for homeland security and public safety users. The goal is to help

attendees learn how to use GIS to meet their missions and bridge the gap between finite resources and constantly increasing expectations. Attendees will discover best practices from actual users that they can apply in their own work. Panel discussions, user presentations, and high-tech demos



The Homeland Security GIS Summit and Esri UC allow attendees to see the very latest innovations.



The Public Safety Showcase provides a specialized focus on industry needs and best practices.

will feature the latest innovations that are tailored to the public safety industry.

The Esri UC Public Safety Showcase will feature Esri's leading industry partners and public safety

organizations. The Operation SafetyNet demo area will once again highlight effective GIS deployments for the four public safety workflow capabilities—data management, planning and analysis, field mobility, and situational awareness.

To learn more or register for the 2011 Esri Homeland Security GIS Summit, visit esri.com/hss.

Getting Emergency Information Out when It Matters Most

Internet Portal Aids Responders and the Public following New Zealand Earthquake

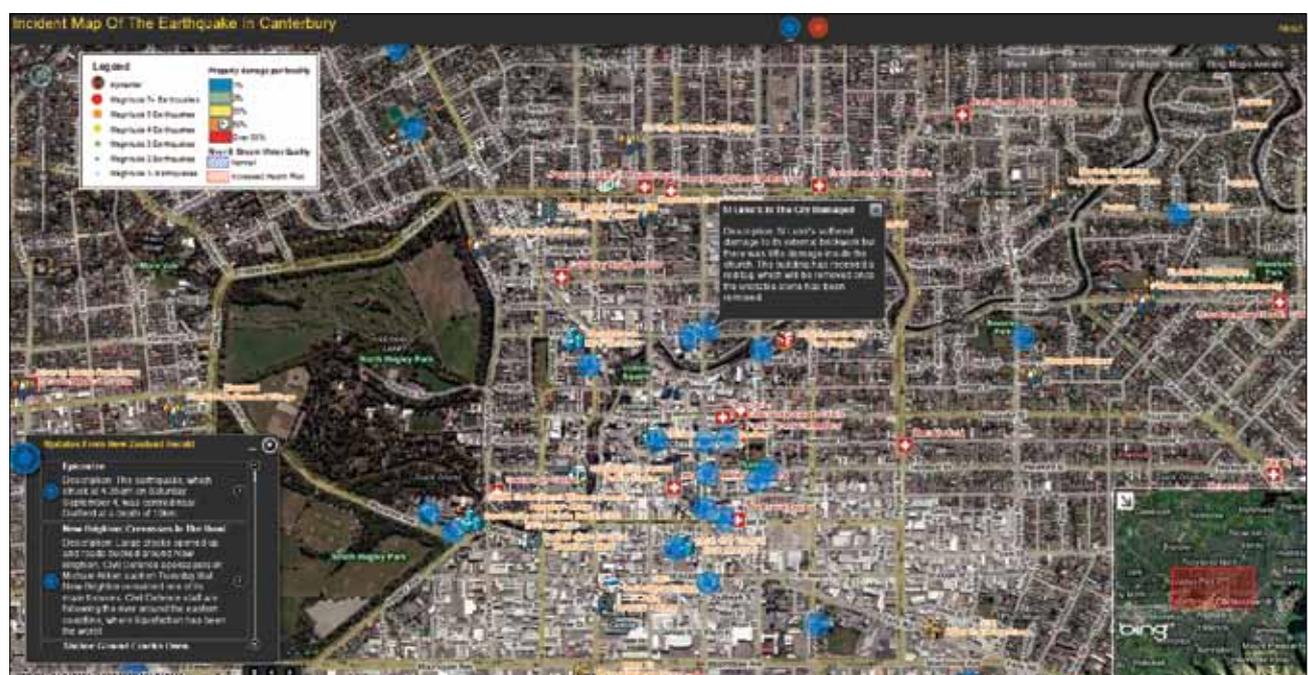
A magnitude 7.1 earthquake that struck the South Island of New Zealand on September 4, 2010, caused widespread damage throughout eastern Canterbury, particularly in Christchurch, New Zealand's second-largest city.

The earthquake struck during the night, when most people were asleep at home. As response personnel moved into the affected areas, getting an inventory of injuries, building damage, downed infrastructure, and available services became a top priority. Information was a vital resource for helping both the public and emergency staff.

One government agency, Environment Canterbury, used its technology resources to integrate disparate information from several GIS Internet sites into a central GIS web portal.

Environment Canterbury first reached out to its GIS partner, Eagle Technology Group, Ltd., to support the launch of the portal and help with the potential increased Internet traffic. Then two Internet sites were made available: one secure site for government agencies and partners with critical, sensitive data and another site for public use.

The internal site provided a secure location to show damaged areas, emergency callouts, postearthquake satellite imagery, aerial photos, and other data. This information could be easily shared among all agencies involved in the response by simply uploading it to the Internet site. For example, for personal safety reasons, emergency workers needed to know the condition of a



The public web portal showed damaged areas, cordoned-off areas, road closures, welfare centers, and other information.

particular building and whether there was structure damage before entering it. Information from building inspections and reports was uploaded and available for any worker or person to view via the Internet site.

The external secure Internet site helped the public see where damage occurred as well as where available assistance, such as shelter, was located. In the first three days of the emergency, the public site attracted more than 6.5 million hits.

Many emergency agencies and their own information systems were impacted by the earthquake; therefore the Internet site and its availability via wireless service helped supply information when

staff and resources were displaced from their normal operation locations.

“Our GIS team worked in shifts 24/7 to support the emergency response,” says David Lewitt, information services manager, Environment Canterbury. “These were a vital component in assisting with the emergency response and recovery. Working collaboratively with Esri distributor Eagle [Technology] and other organizations made the system rich with important information.”

To learn more about how GIS is used in emergency management, visit esri.com/emergencymanagement.

On the Road

Fire Department Instructors Conference (FDIC)

March 21–26, 2011
Indianapolis, Indiana, USA
Booth #801

Navigator 2011

April 20–22, 2011
Las Vegas, Nevada, USA
Booth #110

International Association of Law Enforcement Intelligence Analysts (IALEIA)

May 2–6, 2011
Nashville, Tennessee, USA

Metropolitan Fire Chiefs Conference 2011

May 15–19, 2011
Charlotte, North Carolina, USA

International Association of Chiefs of Police (IACP)— Law Enforcement Information Management (LEIM) Conference

June 13–15, 2011
San Diego, California, USA
Booth #325



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esri.com/Australia

Since December 2010, floods have been hitting Australia, particularly in Queensland. This site provides several applications that allow you to access the latest news feeds, view the common operating picture response map, and analyze the trends.

esri.com/psresources

This website is for the public safety user community.

You can access templates, best practices, applications, and more. Discover better ways to plan and analyze, assist in mitigation efforts, provide comprehensive situational awareness, and support response and recovery operations.

esri.com/psfacebook

Connect with your fellow community members online and join the conversations. Follow us on Facebook at Esri—GIS for Public Safety.

MedStar EMS Improves Response Times, Cuts Costs

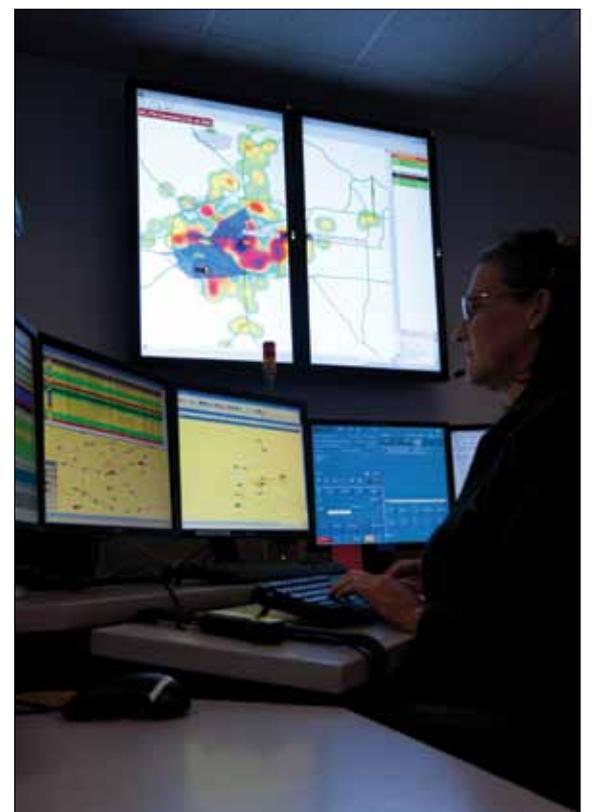
MedStar Emergency Medical Services (EMS) has improved response times to critical incidents by nearly 5 percent by deploying geographic information system software in its 911 call centers and ambulances. The mapping and analysis solution puts vital information at the fingertips of the dispatch and field personnel. It enables emergency 911 centers to use real incident data to predict where and when critical calls are likely to take place. The mapped intelligence then allows an ambulance to be put in a better location prior to a call so it can get to the incident in the fastest possible time.

“We invested in the system to improve our response times to a level that our patients deserved and that we expected of ourselves,” says Bob Strickland, MedStar. “We now have faster response times for our patients. We’ve also reduced costs because we can provide better coverage and service using fewer resources.”

The GIS software solution MARVLIS helps optimize the dispatch mission with better resource management, asset tracking, real-time situational awareness, and in-vehicle mapping. MARVLIS is a family of integrated applications from Esri partner Bradshaw Consulting Services.

Previously the Fort Worth, Texas-based agency had struggled to reach in-house response standards for priority one calls. In the 14 months leading up to the implementation of its GIS, the reliability for meeting preestablished response times averaged 86.2 percent, with no month reaching or exceeding 90 percent. Since implementation, the agency has maintained an average of 91 percent reliability without any months below 90 percent.

MARVLIS, including Deployment Monitor, integrates with the agency’s computer-aided dispatch (CAD) system and analyzes previous 911 call data



MedStar dispatchers make accurate decisions using Deployment Monitor.

to predict areas where future calls will occur. The solution displays unit status and location and plots the location of incoming 911 calls. It provides visual feedback to the communications center controller on the amount of area that each unit can respond to within targeted response times. It also shows which units should respond to a call based on the predicted drive times.

To learn more about how GIS is used in computer-aided dispatch, visit esri.com/cad911.