

# eWEEK LABS

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## After slow start, LBS on the map

**TECH ANALYSIS:** E911 HELPS SPUR GROWTH OF COMMERCIAL APPS

By Anne Chen

HAMPERED BY THE LACK OF killer applications and primitive handheld hardware, location-based services did not take off as predicted during the technology boom of the late 1990s. However, requirements by U.S. and European governments to satisfy Enhanced 911 regulations have acted as a catalyst for increased commercial support.

LBS (location-based services) applications have the potential to, among other things, create efficiencies within the supply chain, track corporate assets and enable emergency service workers to locate victims. LBS platforms use location-sensitive technology such as GPS (Global Positioning System) or network-based solutions to deliver services or applications.

The major players in the LBS space include Environmental Systems Research Institute Inc., Autodesk Inc.,

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MARK KAVANAGH

## Location, location, location

**LABS ON-SITE:** LOCATION-BASED SERVICES INCREASE EFFICIENCY AT BART

By Anne Chen

AFTER 35 YEARS OF USING a proprietary, mainframe-based system for police dispatching, the Bay Area Rapid Transit District decided to enhance its public-safety initiatives by deploying location-based services software.

LBS applications enable BART's police department to respond to emergencies more efficiently, protecting Bay Area citizens with fewer resources, said Carissa Goldner, administrator of the CAD/Records Management System at the BART Police Department, in Oakland, Calif.

During an eWEEK Labs On-Site visit at the BART Police Department headquarters, we were impressed with how the transit system has linked schematics of its train stations, railways, administration buildings and



A map offers a view of BART assets relative to police officers' locations.

associated properties using MapInfo Corp.'s MapInfo Professional software suite. Where before BART relied on a mainframe-based system with a very simple, text-based interface, BART police officers now can visually analyze the assets they patrol.

MapInfo enables BART police to link California Highway Patrol emergency data to its maps via Web services,

allowing dispatchers to route BART officers to emergency locations along the most expedient routes.

"After only a few months, BART officials can already see how valuable the technology is for improving public safety," Goldner said. "In the near future, we hope to integrate the software with wireless and GPS [Global Positioning Sys-

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tem] technologies so that BART police will have mobile access to critical information.”

In the United States, LBS is gaining in popularity among emergency services agencies and small and mid-size businesses. For example, the ability to track drivers or route them more efficiently to emergencies enables service operators and taxicab dispatchers to save time and money—not to mention lives.

BART is a combined aerial and subway transit system that serves four counties and 26 cities in San Francisco’s Bay Area. More than 310,000 people ride BART trains daily and are protected by 280 BART Police Department employees.

Last year, Goldner won a grant through MapInfo’s eGovernment Grant Program. The grant awarded MapInfo’s Professional LBS software to the transit system. Goldner estimates the software to be worth about \$60,000.

Goldner began deploying the software in November, using it to consolidate and electronically manage docu-

mentation of engineering schematics, mile markers on railway tracks and even photographs of emergency exits. Goldner identified BART track lines in the software and geo-coded the addresses of each station. She also used information included with the software, such as census data, to provide data on area hospitals, schools and prisons.

Most BART employees access the MapInfo LBS information through a server-based application. Police officers and staff are able to access information via a Web portal as well, but they cannot manipulate any data while they’re off the network. However, if, for example, a BART police detective needed Web-based access to a map that included crime analysis or sensitive data related to an investigation, Goldner can make it available temporarily and password-protect the data.

When officers lack access

to a computer, they can get some information via Research In Motion Ltd.’s RIM 857 and 957 wireless handheld devices. The screens on these devices are black and

cessed on the laptop.

The BART Police Department plans to increase the use of LBS technologies for homeland security, Goldner said. MapInfo is used to identify

geographical liabilities, such as tunnels and subways, and assets, such as hospitals and schools, to analyze how the locations of these facilities will impact the transit system during an emergency.

Liabilities also include the Transbay Tube, a sec-

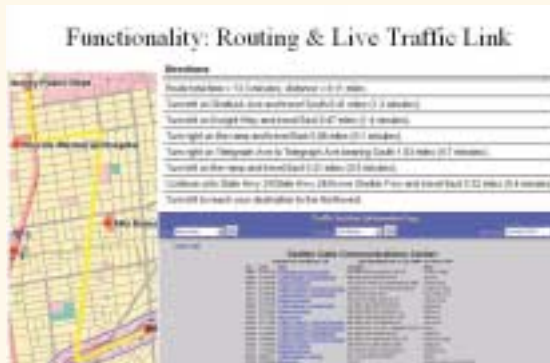
tion of the BART system that connects Oakland stations to San Francisco stations and runs underneath San Francisco Bay.

The use of LBS has been so successful at the BART Police Department that other BART departments are asking for access to the applications as well, said Goldner. For example, efforts are being made to provide BART’s engineering department with access to the application, she said, so engineers can pinpoint radio dead spots to improve telecommunications.

BART also is considering posting additional password-controlled maps to its public Web site for viewing by other law enforcement agencies and general maps for public viewing.

“We’d like to use location-based software to provide a lot of information to the public,” Goldner said. “We have the ability to do so now, but it’s a new area for BART, and we’re aware that privacy and policy issues need to be addressed first.” e

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Dispatchers use MapInfo to route officers to emergency sites.

white, however, so it can be difficult to read maps on them. Goldner said she hopes to upgrade to color RIM 7510 handhelds by next year.

**Privacy concerns**

GOLDNER ALSO PLANS TO enable GPS technologies that will let MapInfo Professional automatically determine the best route to an emergency site based on the coordinates of an officer’s location. GPS capabilities are built into the MapInfo Professional framework, but policies have to be developed to ensure the privacy of BART police officers before such technologies can be deployed, Goldner said.

“There are some concerns at the staff level about what location information will be used for,” Goldner said. “Officers are worried about the Big Brother effect and having people watch where they’re eating lunch or how much time they’re spending at stations.”

One way to alleviate concerns, according to Goldner, is to deploy the technology locally to laptops in police cars and allow only police officers to know their location coordinates when LBS applications are ac-

**Case file**

- ▶ **Organization** BART
- ▶ **Location** Oakland, Calif.
- ▶ **Issue** Find a way to electronically manage 35-year-old documentation to enable BART police officers to quickly respond to and resolve homeland security and public-safety issues, as well as to efficiently route BART police officers to emergency locations
- ▶ **Solution** Deploy LBS software to provide electronic access to documents, including engineering schematics and train timetables; use LBS software to create Web-enabled maps for the BART Police Department’s intranet, allowing officers to visually analyze key information
- ▶ **Tools** MapInfo’s MapInfo Professional; Research In Motion’s RIM 857 and 957 wireless handhelds
- ▶ **What’s next** Expand LBS capabilities to other BART departments; work with BART engineering personnel to pinpoint radio dead spots to improve telecommunications

Source: eWEEK reporting

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MapInfo Corp. and Intergraph Corp. Microsoft Corp. is also gaining ground in the marketplace with its MapPoint platform.

All these vendors participate in the Open GIS Consortium, a standards body for geographic information systems that is working on the development of the OpenLS (Open Location Services) specification. (See related story, below.)

Worldwide revenue from LBS is expected to increase to more than \$3.6 billion by 2010, from \$500 million today, according to technology research company ABI Research, in Oyster Bay, N.Y.

Commercial applications are already beginning to appear. Just last month, Mi-

crosoft and two European mobile phone operators announced plans to deliver real-time LBS platforms that will allow enterprises to deploy business applications that can track assets for a mobile work force. Dispatchers for taxis and delivery services, for example, will be able to use the technology to track drivers carrying cell phones and direct them along the most expedient routes.

In the United States, mobile phone operator Verizon Wireless Messaging Services LLC is using the LocationLogic software platform from Autodesk to build applications that will enable its cell phone customers to receive personalized traffic information based on their location. LocationLogic is

essentially middleware that provides content-processing capabilities and offers tools and services to help deliver applications to a handset or other portable device.

LBS systems are also taking off within enterprises. At the Bay Area Rapid Transit District in the San Francisco Bay area, for example, LBS is being used by BART Police Department dispatchers to route officers efficiently to emergency situations (see story, Page 55).

One big concern with LBS usage is privacy. Efficiencies gained through LBS may be offset by a work force that takes issue with being constantly "watched."

AT&T Wireless Services Inc. allows its cell phone subscribers to opt out of LBS

capabilities that enable a user to determine the location of a colleague or business.

For most enterprises deploying LBS to their employees, however, the situation is different.

Enterprises generally have a right to know where their mobile workers are during working hours, but it's also important to address the privacy concerns of those employees.

Organizations that utilize LBS should develop policies that dictate how mobile location information will be used and when an end user's location can and will be tracked by his or her employer. ☛

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## Open standards will evolve location-based services

LOCATION-BASED SERVICES HISTORICALLY were built as stand-alone applications that didn't communicate easily with other applications and systems. Open standards, therefore, will be a necessary catalyst for LBS growth.

"Standards are always very important to us, for several reasons," said David Maguire, director of products at Environmental Systems Research Institute Inc., in Redlands, Calif. "Standards allow ESRI to leverage other people's technology, such as the Java platform, in our products. They are also important because they allow our technology and products to integrate into IT infrastructure."

The impetus for LBS standards development stemmed from a need to satisfy Enhanced 911 requirements. The E911 service, promoted by the Federal Communications Commission, will make it possible for emergency service personnel answering a 911 cell phone call to locate, within 50 feet, the phone used to make the call.

Mobile phone carriers in the United States have until next year to enable E911, and the development of open LBS standards provides a basis for evolution toward commercial location services support.

More than 30 vendors—including ESRI, Autodesk Inc., MapInfo Corp., Oracle Corp. and Webraska Mobile Technologies S.A.—are working together through the Open GIS Consortium to develop the OpenLS (Open Location Services) specification.

OpenLS is significant because LBS solutions require multiple vendors and vendors of multiple kinds of products—including location technology, GISes (geographic information systems) and application development frameworks—to integrate with the telecommunications infrastructure of a wireless service provider.

Getting all these parties to work together has been difficult because carriers are forced to use expensive and proprietary software for integration. As standards that support interoperability through open interfaces and protocols emerge, interoperability will be much more seamless, Maguire said.

OpenLS ([www.openls.org](http://www.openls.org)) is designed to support interoperable solutions that "geo-enable" the Internet, wireless and location-based services, and mainstream IT via XML and Web services. The specification defines routing, directory and gate-

way services, as well as presentation of, for example, map images and a location utility for geo-coding and reverse geo-coding.

The Open GIS Consortium ratified OpenLS 1.0 last year and is now working on Version 1.1, which is expected to be released next year. Will Wilbrink, chief solutions architect at MapInfo, in Troy, N.Y., and chairman of the consortium's OpenLS revision group, said Version 1.1 will include compliance testing scripts so companies can validate their servers against the specification.

Other standards bodies are also developing specifications for providing geographic and location information. For example, with the XML and SOAP (Simple Object Access Protocol) standards playing such a large role in LBS interoperability, vendors are also working with OASIS (Organization for the Advancement of Structured Information Standards) and the W3C (World Wide Web Consortium) on the development of those standards.

In addition, vendors such as ESRI and Autodesk are working with ISO (International Organization for Standardization) on standards for navigation that Wilbrink said could eventually be merged with OpenLS. —Anne Chen