

# ESRI GIS Solutions for EMERGENCY RESPONSE

SIDE

**The Business Challenge:** Wireless telephone carriers around the United States are scrambling to meet a two-phased FCC mandate issued in 1996 requiring them in Phase I to provide a caller's 10-digit phone number and cell site location to 9-1-1 dispatch centers. "Most customers assume this can be done now, but, in fact, it requires new technologies," explains Ken Arneson, president of XYPOINT Corporation, a privately held company in Seattle, Washington.

**Finding Solutions:** XYPOINT, an advanced network services company, was created specifically to bring low-cost, user-friendly location-enhanced services to mobile people. The company was incorporated in August 1993 and operated until February 1996 as Sentinel Communications. In 1996, it was renamed XYPOINT (pronounced zy-point) to reflect its commitment to delivering information based on a mobile location—an x,y point.

Using ESRI's Spatial Database Engine™ (SDE™) software, XYPOINT has marketed the industry's first location-based E9-1-1 emergency response system. The system uses signals from cell sites to quickly match a caller's location to the closest address or landmark for emergency dispatch. It's also a versatile platform for adding future services like providing directions to a nearby



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## Faster, More Precise Emergency Response for Wireless Customers



Italian restaurant or real-time traffic data.

**Using the System:** To activate E9-1-1, subscribers simply dial 9-1-1 on their wireless phones. As the voice calls travel to the emergency dispatcher, XYPOINT's system uses a separate server in its 24-hour Network Operations Center (NOC) to process the callers' 10-digit cellular phone numbers and determine their general locations and forward the information to the 9-1-1 emergency center.

The voice and data arrive simultaneously. On a single screen, the emergency dispatcher sees the 10-digit wireless phone number and a geographic description of the caller's

location based on the nearest cell tower and numbers for the closest emergency response agencies (such as police, fire, or medical).

Since wireless callers nationwide make 50,000 to 100,000 9-1-1 calls each day, the system is expected to speed response and improve subscriber safety. With current technologies, it's impossible for emergency dispatchers to trace dropped calls or locate callers who don't know where they are or can't speak to them. Now the wireless phone, rather than the customer, can supply location data and signal emergency services that help is needed.

"This system clears the technology hurdles that have until now prevented

wireless carriers from providing location services including emergency response," Arneson says.

**Optimizing Technology:** One of the key components at the heart of the XYPOINT system is ESRI's SDE, which enables millions of spatial features to be stored and managed in a commercial database. SDE has the ability to integrate

125 meters (about half a block).

The E9-1-1 system also searches an Oracle database of 5,500 Public Safety Answering Points (PSAPs), routing emergency calls to the appropriate agencies in seconds. Says Arneson: "SDE's ability to rapidly access locations is a fundamental part of our application.... We can't be responsible for slowing these types of calls down. SDE is an



with other information technology products used in mapping applications or other applications that require geometric analysis without the mapping component. That is, with SDE, developers can embed spatial analysis in an application without having to invoke traditional geographic information system (GIS) technologies.

SDE works behind the scenes in the Gateway Platform to match call-origin locations to the closest address or landmark, and positions providers to meet Phase II requirements of locating the caller's location more precisely, within

important technology, giving us a competitive advantage."

XYPOINT's Call Center staff maintains close contact with the 9-1-1 centers, also using SDE for data retrieval to ensure accurate boundary information and emergency numbers are entered into the system.

**Bottom-Line Advantage:** As the wireless market becomes increasingly more competitive, carriers will rely more heavily on "value added" services like E9-1-1. "New applications for cell phones, PCS phones, and two-way

paggers will need to take advantage of locating the customer on the planet—GIS provides the platform for this rapid response and can be used in many more ways as new applications are developed," Arneson says. "We're looking for a very aggressive ramp-up for this service as cellular carriers race to meet the FCC's requirements."

For more information on E9-1-1, contact XYPOINT's Ken Arneson at 206-674-1000. Information on SDE can be found at ESRI's Web site ([www.esri.com](http://www.esri.com)), or contact ESRI at 1-800-447-9778.

**SDE at a Glance:** SDE is a high-performance, object-based spatial data application server implemented in several commercial DBMSs providing open access in a client/server architecture.

Software engineers can use the SDE open C-API to develop focused market-specific application using rapid application development environments such as Tcl/TK or Visual C++®.

Because ARC/INFO, ArcView GIS, and MapObjects software have been integrated as SDE clients, developers can also choose from ARC/INFO Open Development Environment (ODE), ArcView GIS, Avenue, or Visual Basic® as development environments.



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