GIS WORKS BEHIND THE SCENES

SALT LAKE WINTER OLYMPICS SET NEW SAFETY STANDARD

Each day during the 2002 Winter Olympics in Salt Lake City, Utah, many athletes competed in different activities at the same time at separate venues, but in the public safety arena the playing field was the same for all the agencies monitoring the Olympic activities. For the people at the Utah Olympic Public Safety Command (UOPSC), GIS was the tool that delivered the same accurate, relevant, and up-to-date data to all the people keeping an eye on the situation.

Functioning 24 hours a day, seven days a week, the Command Center brought together representatives from approximately 60 agencies from federal, local and state government, including the FBI, CIA, Utah State Police, and Salt Lake City Police. In addition to the seats at the Command Center, there were users at security centers at each competition venue and at remote centers in federal offices across the country.

GIS software from ESRI played an instrumental role in the implementation of the single network event management program running at UOPSC. Several ESRI Business Partners supplied technical assistance and software applications at the Command Center including Science Applications International Corporation (SAIC) and NC4, who provided E Team, the leading incident management software for government agencies, nonprofit organizations, and critical infrastructure sectors. The E Team software, a Web-based application, and SAIC's Consequences Assessment Tool Set (CATS) run in tandem and are integrated with ESRI's ArcIMS and ArcView software, respectively.

This software system, which had more than 3,000 users during the Olympics, dramatically improves the ability of public safety agencies to prepare for, respond to, and recover from disasters and major events. The suite of tools enables emergency and event management personnel to share critical information that is required for accurate and timely situational awareness.

Getting Everyone the Same Data at the Same Time

According to Jay Creutz, SAIC project manager, when SAIC started development of the system in 1999; the goal was to create a common operating picture.

"What that means is everybody is looking at the same maps. All the active incidents are shown on a map, and everybody is looking at the same information. If there are five incidents occurring in downtown Salt Lake City, but the rest of the area is quiet, that helps us judge where we can deploy resources from," said Creutz.

The E Team software has a dynamic mapping capability powered by ArcIMS that is delivered to users via the Internet,

which gives it the flexibility to be able to connect data to an unlimited number of agencies. Users enter information about events into the E Team system, which distributes it throughout the network. Enhanced with ArcView and its extensions—ArcView Spatial Analyst, ArcView 3D Analyst, and ArcView Tracking Analyst—the Consequences Assessment Tool Set (CATS) enables users to generate predictive models and do casualty and damage assessments.

Developed for the Defense Threat Reduction Agency, the focus of CATS was on military uses such as modeling explosions and natural hazards. "But we came to realize that there were a lot more things we could do with the GIS mapping in modeling than we originally intended," says Vic Subia, SAIC public safety consultant. "Now, only 16 years later, we're modeling crowds and parade routes. What hasn't changed is that GIS mapping is the basis for everything we're doing here."

With so many potential users, it knew it "needed an easy-to-use, robust, secure, software application," Subia said. "We needed this system to work and work well." The system went through several trial exercises before the Olympics. Within two hours, users who had no prior training were using the system. "GIS mapping as a visual tool and the E Team format that essentially asks you to fill in the blanks helped users who didn't have any experience understand quickly how to carry out their jobs," said Subia.

Data Acquisition

The SAIC team collected in excess of 1,000 different databases for use in the planning and consequence management of the events. "We had databases that give us daytime and nighttime event population," said Subia. Much of the data they collected came from federal, state, and local agencies that were using ESRI products. "Probably just about every extension from ESRI has been used to develop data or to use the data for analysis," said Paul Clausen, SAIC GIS analyst.

"Determining which data was pertinent and useful to their operations and response plans and then standardizing the data set format were some of the biggest obstacles," said Subia. "A large part was identifying what data is available, in what format, and how difficult it would be to get it into our database."

To facilitate the data acquisition and sort through it, they set up a GIS working group, which helped to make sure the data was accurate, relevant, and up-to-date. The group consisted of representatives from organizations such as federal, state, and local government; commercial entities; and Comprehensive Emergency Management, the team responsible for Utah's homeland security.

As the operation went into full swing, real-time data streamed in via remote sources such as satellite imagery. Depending on the information, the original response plans might be altered.

The Role of GPS

UOPSC personnel also tracked more than 500 athlete transport shuttles and a fleet of emergency vehicles with software from another ESRI Business Partner, CompassCom of Denver. This software package creates athlete bus routes and buffers around the routes in ArcView and uses the ArcView layers with ESRI's MapObjects to monitor the locations of vehicles. The buses have GPS units with wireless modems. If a driver deviated from the route, the system was programmed to send an alert, and drivers could trip an alarm to notify the Command Center if there was a problem.

A Legacy System

When fans and athletes packed up to go home after the Winter Olympics, the system remained in Utah as part of the State's Office of Homeland Security. Subia speculates, "This is quite possibly the largest public safety effort in the history of the United States."

This large-scale effort required cooperation and coordination from public agencies at federal, state, and local levels. The system bridged jurisdictional barriers and will be able to serve as a model for homeland security for other regions.

Lessons learned: Data Standardization

Subia believes that one of the most pressing issues that needs to be addressed, especially as regional homeland security models are being formulated, is one of data standardization. "If we walked out of here with some idea of what we need to do, it's that the GIS process needs to be standardized—standardize how we collect the data and distribute it."

"When you have to prepare for events that will require coordinated responses from different agencies," says Russ Johnson, ESRI public safety/ homeland security manager, "a distributed GIS provides a common view of the situation for everyone. These tools save time, money and, most importantly, lives."

By Jim Baumann, ESRI