

## Mapping Homeland Security

*High-tech tool improves incident planning and response for emergency management officials.*

BY JANE M. SANDERS

“Command staff could immediately get a snapshot of what was going on without relying solely on traditional voice communications.”

— **Ralph Reichert**, director of GEMA's Terrorism Emergency Preparedness and Response Division, commenting on the use of the Geographic Tool for Visualization and Collaboration during the G8 Summit

An enhanced high-tech, collaborative mapping tool is helping law enforcement and emergency management officials better coordinate event and incident planning and real-time response.

In its most significant deployment to date, the Geographic Tool for Visualization and Collaboration (GTVC) developed by the Georgia Tech Research Institute (GTRI) proved its usefulness during the G8 Summit of world leaders at Sea Island, Ga., in June 2004. The Georgia Emergency Management Agency (GEMA), which is funding GTVC development and deployment, made the tool available to state and federal law enforcement agencies during the event to coordinate their combined resources and responses in real time.

While extensive state planning and tight security prevented any significant law enforcement problems during the G8, GTVC's developers

and users were pleased with the enhanced system, which was originally developed for military use, says Kirk Pennywitt, a GTRI senior research engineer. After nine months of work by Pennywitt's 10-member research team, GTVC provided many new features for its G8 use — including maps with 6-inch resolution for G8 areas of interest. Researchers also boosted GTVC's reliability and robustness, and added secure encryption for communications.

“GTVC proved to be an extremely useful tool,” says Ralph Reichert, director of GEMA's Terrorism Emergency Preparedness and Response Division. “Using GTVC, law enforcement teams were able to monitor and track activities in a manner that kept them one step ahead of protestors. Consequence-management staff also used the system to make sure key resources were available at the right place at the right time. Furthermore, and probably most importantly, command staff could immediately get a snapshot of what was going on without relying solely on traditional voice communications.”

Besides GEMA, other agencies using GTVC during the G8 were the Georgia Bureau of Investigation, Georgia State Patrol, Federal Bureau of Investigation, the National Guard and the U.S. Secret Service. Users

were able to share information simultaneously, keeping officials informed and coordinated, Pennywitt notes.

GTRI researchers provided technical support during the event, training users and configuring laptop computers for field agents. Researchers also demonstrated the system's features, including high-resolution imagery available at 1-meter resolution for the entire state, and even higher resolution for certain areas. The maps scale with each view and maintain all the markings made on them electronically.

Pennywitt and his colleagues also derived numerous lessons from the G8 experience, Pennywitt adds. They are prioritizing work on 130 potential new features and requirements for the next version of GTVC software. For example: They want to make network connectivity easier; create better information reporting capabilities that include both icons and text or other details; display real-time GPS-based tracking of vehicles and personnel; and add more powerful geographic search capabilities, such as showing all the hospitals within a 50-mile radius.

Also in development are other enhancements and applications of GTVC. For one, the system may lend its mapping capabilities to the Joint Regional Information Exchange

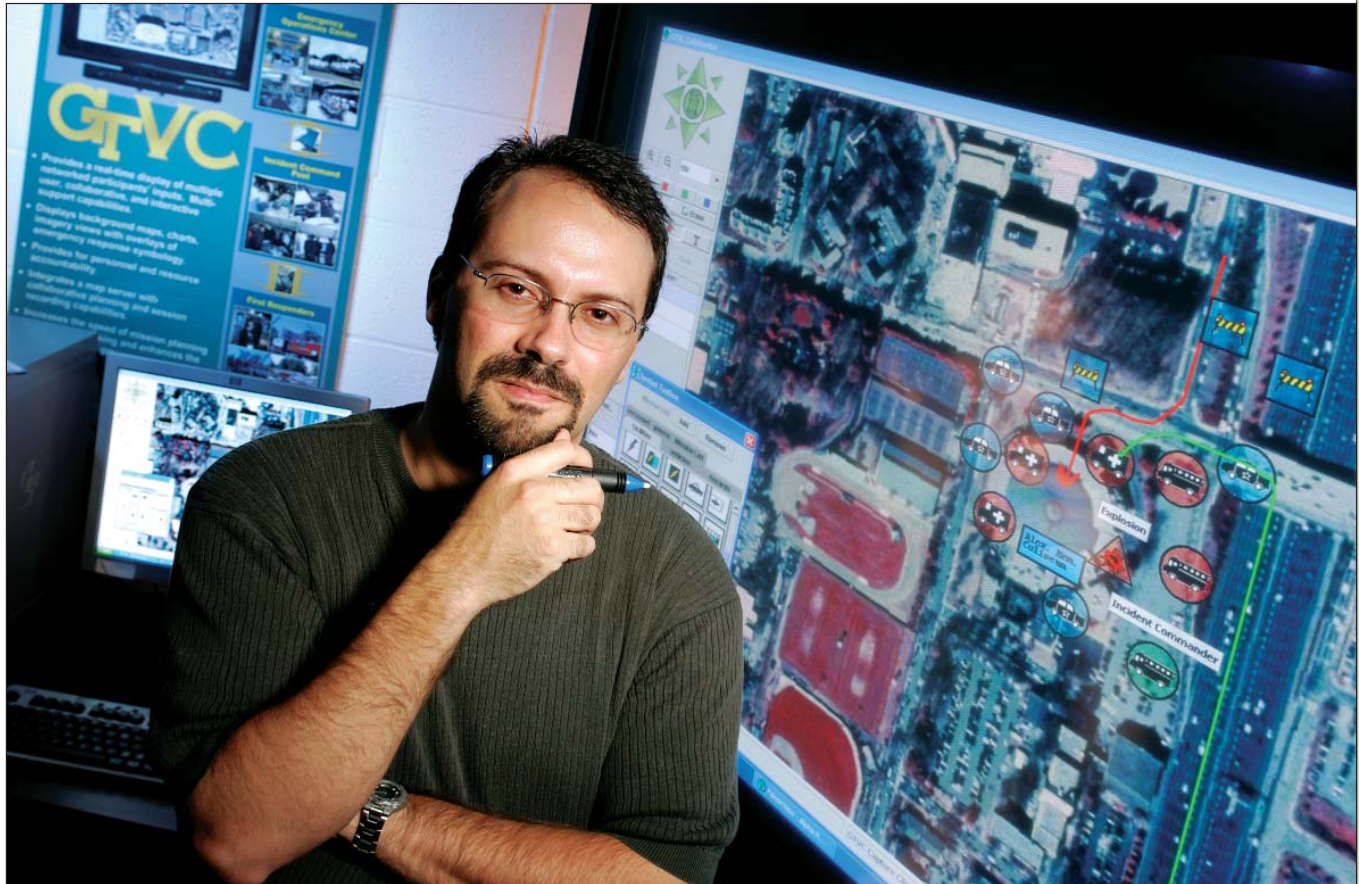
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“Looking at the entire supply chain is critical because a solution that might work well for one partner could cause problems for another. . . . Innovation requires a number of partners with different technologies and perspectives.”

— **Page Siplon**,  
director of the Maritime Logistics  
Innovation Center in Savannah, Ga.

PHOTO BY GARY MEEK



System (JRIES) if it joins this partnership of law enforcement agencies. Through JRIES, officials can request information on suspects and/or events.

Pennywitt and his colleagues expect to deploy a new version of the GTVC software within the next year to support a statewide infrastructure for wider use.

“This system is very useful,” Pennywitt says. “You get out of it what you put into it. The more experienced users get a lot from it. We believe the new version of the GTVC software will provide an easier interface for users who only want to observe situations, rather than enter information into the system. We know GTVC works, and we hope it

will be more widely distributed in the future.”

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*Georgia Tech Research Institute engineer Rick Presley, one of the lead developers of the Geographic Tool for Visualization and Collaboration, notes the software’s easy-to-use planning features.*

“ Some of these sensing technologies under development will prove to be more effective with certain agents than others, while some will be more integrated than others. There will be a tradeoff between selectivity, sensitivity and cost. **So there's not just one solution,** but many depending on the application.”

— **Stephen Ralph**, the Georgia Tech School of Electrical and Computer Engineering associate professor who is collaborating with researchers from several universities on the development of integrated micro-optical sensing systems

