

**Testimony of
Susan Kalweit
On a Map-related Data Infrastructure for Homeland Security**

**Before the House Government Reform Subcommittee on Technology, Information
Policy, Intergovernmental Relations and the Census**

Chairman Putnam, Ranking Member Clay and Members of the Subcommittee, thank you for your interest and this opportunity to share with you the benefits that a map-related data infrastructure brings to homeland security.

Throughout history, the military has used map information as a key component to fighting and winning battles on land, on and under the sea and in the air. During Operation Iraqi Freedom we witnessed how mapping technology played an integral role in our war-fighting strategy. For example, the Global Positioning System (GPS) and highly precise terrain data guided precision munitions and unmanned strike aircraft to their targets. We also saw news correspondents use mapping technologies to communicate to the public on our progress during the war. Perspective scene visualization tools, Geographic Information Systems (GIS) and commercial satellite remote sensing systems combined to show the American public where battles were being fought, what areas had been secured by the US-led coalition and the terrain challenges that our marines and soldiers faced as they moved toward Baghdad. These technologies used by our military—GPS, visualization and GIS tools, and Remote Sensing—are the same technologies that can be used to aid in our ability to detect, prevent and deter terrorist activity; and to save lives and protect property in the event of all-hazards disasters. In short, geographic information technologies are as necessary to our *defense* in the War on Terrorism as they have been to our offense. In the following pages I will describe generally the state of our nation's geographic information infrastructure within the context of how such an infrastructure supports homeland security.

For background, I am Susan Kalweit. I am a 17-year employee of the National Imagery and Mapping Agency, and am currently serving as the Chief of the Interagency Geospatial Preparedness Team (IGPT), which is sponsored by the Department of Homeland Security. In this role, I have been at the Federal Emergency Management Agency since October of last year. My team and I are working on developing a National Strategy for Geospatial Preparedness. My remarks are based on my experiences as a NIMA employee and what I have learned these last eight months working as part of an interagency team in the civil community.

Introduction

The convergence of GPS, GIS, visualization tools and remote sensing technologies, combined with advances in wireless communication, grid computing, and web services present us with the opportunity to leverage “location” as *the common information*

component for homeland security. I am referring to underpinning our nation's preparedness to detect, prevent, warn against, respond to and recover from terrorist and all-hazard events with a geographic information infrastructure. This infrastructure includes the data, the hardware and software, the networking and web services infrastructure, the analytic expertise, and the policies and practices necessary to assure that current and accurate "location-based information" is available wherever, whenever and however it is needed.

The current state of the national geographic information infrastructure

The stimulus for Geospatial One-Stop is the fact that geographic information technologies are critical to many business areas in the public and private sector, and there is a tremendous need to share these information resources and eliminate redundant spending. However, each business area to be successful needs to have the best available data with the associated technology infrastructure. But, in only a few areas of our country are the best available data and the associated technology truly *the best*. That is, to be the "best" the

- (1) Data holdings are of high quality, recent currency, well-documented according to federal standards, and geographically- referenced to national standards, and
- (2) Geographic information systems implement commercially-accepted, open interfaces and standards to facilitate sharing and interoperability.

Data holdings and their stewards that comply with standards and emphasize policies to share information model what our nation needs to build and maintain the geographic information capacity critical to homeland security. When using this model as a standard to measure the current state of our national geographic information infrastructure, you will realize that across our nation the quality of the data, the use of standards and the ability to share data varies widely. Generally, jurisdictions with higher revenue have more robust geographic information holdings and systems than jurisdiction with lower revenue. States that have strong state geographic information coordination councils also tend to have fairly robust state-wide data and systems or have a plan in place to establish this capability. Unfortunately, terrorists and hazards don't look for places to strike where the geographic information capability is strong or weak—they just strike. Therefore, it is essential that the model described above be implemented nation-wide, and at all levels of government.

Finally, regardless of how much money is invested in establishing a national geographic information infrastructure, money will not overcome policy or structural barriers that inhibit information sharing. The reasons behind these barriers must be understood and appropriately addressed so we enable the most effective use of the geospatial infrastructure for homeland security. As examples, the IGPT has come across the following issues with regard to challenges in information sharing:

- The need for greater protection of certain information from public access laws when the information that needs to be shared is proprietary or provides a competitive advantage to the private sector owner;
- The need for flexible licensing agreements that protects industry's right to sell to multiple public market segments, but also quickly and easily adapts to unanticipated needs for the information to be shared;
- The need for a template Memorandum of Understanding or other legal document giving permission to use geographic data between agreeing parties; and
- The need for coordinated approaches to geographic data acquisition and management that overcomes the natural tendency toward stovepipe solutions within institutional walls.

Establishing the geographic information infrastructure for homeland security

What will it take to establish a robust and reliable national geographic information infrastructure for homeland security? This is the key question that the IGPT is tackling by developing a *National Strategy for Geospatial Preparedness*. The Federal Emergency Management Agency established the IGPT. The IGPT is now working with both FEMA and the Office of the Chief Information Officer in the Department of Homeland Security to ensure that it is an enterprise-wide approach. The inter-agency aspect of the IGPT includes personnel from The National Imagery and Mapping Agency (NIMA), the US Geological Survey, the US Department of Agriculture Forest Service, the National Oceanic and Atmospheric Administration, and FEMA. In addition, FEMA has provided funding toward conducting an emergency management needs assessment for geospatial information technologies. The IGPT also is working in close partnership with Geospatial One-Stop and the efforts of the Federal Geographic Data Committee; the National States Geographic Information Council (NSGIC); and the Spatial Technologies Industry Association (STIA) to leverage partnerships, knowledge and expertise in those organizations' activities. The IGPT is open to other mutually beneficial partnerships in the public sector, academia and the private sector. Partnerships—next to technical interoperability—are the most important ingredient for making the best use of limited resources to build the geographic information capacity necessary for our nation's homeland security preparedness.

It is significant to note that the *National Strategy for Geospatial Preparedness* under development is not a blank slate. Data being acquired and provided through the many federal programs participating in Geospatial One-Stop, and state and local initiatives spurred by the NSGIC and the Office of Management and Budget Implementation Teams represent some of the ways and means of contributing to the needed geographic information capacity. Fundamental to this capacity, however, are partnerships and commitments to implementing open interoperability standards as Geospatial One-Stop promotes.

All that being said, efforts in the geospatial community alone are not enough to sustain a national geographic information capacity. Robust state and local systems that are spatially-enabled for local fire, police, health, first responders and day-to-day operations not only contribute to building our national capacity, but also to sustaining it. The users of geographic data and systems drive the demand for those of us responsible to acquire and maintain the data and systems. In the end, it is the business practitioners and their dependence on spatially enabled business practices that will make our vision a reality.

Extended benefits of a geographic information infrastructure for homeland security

The graphics I have provided demonstrate the significant advantage homeland security planners, managers and emergency responders have when they incorporate “the best” geographic information technologies in their business processes.

Graphic 1 shows the results of tying the above ground infrastructure to the below ground infrastructure in New York City during the weekend of the September 11th memorial services in 2002. This graphic depicts the proximity of the VIP riser to the Brooklyn Battery Tunnel passing beneath the park, highlighting a potential physical vulnerability at the site. While mitigation of the tunnel's general vulnerability was included in the event security operations plan, NIMA analysis of the area as depicted here resulted in additional security precautions being taken to ensure the safety of attendees.

Graphic 2 depicts the damage created by a tornado that swept through La Plata Maryland in 2002. No one in that local jurisdiction expected such an event, which in its aftermath had a tremendous emotional as well as financial impact on the city. The imagery in this graphic and others like it were used by the State of Maryland to assess the damage for transportation signals, general structures, and forests. In addition, it helped to settle some insurance claims quickly. The imagery also was used as the best available base map to plan the reconstruction of the town .

Graphic 3 depicts how local responders use geographic information technologies as part of their incident management capability. This example was taken directly from the E-Government initiative, Disaster Management, which located and pulled the imagery into its system using the technical interface standards promoted by Geospatial One-Stop. These screenshots are from the recently completed TopOff II exercise in Seattle. They show the enhanced value of the use of Geospatial One-Stop products (in this example, imagery from the US Geological Survey's *The National Map* server) interoperating with incident management applications. The incident managers found the image background more informative and useful than the sparse map background of the area. The users of the Disaster Management system have stated "this is the interoperability picture we have been wanting for years," and "Disaster Management/Geospatial One-Stop services will work together to save lives, property, and businesses."¹

Graphics 4 and 5 depict the utility of geographic information technologies for keeping the public informed in the aftermath of a national disaster. These examples were taken from

¹ See webcast discussion at www.emforum.org for more information.

the web site, NYC.gov established by the city of New York in the aftermath of 9-11. The information provided by the web site and the interactive application, Emergency Management Online Locator Service (EMOLS) helped local citizens stay informed on the status of their working, commuting and living conditions in lower Manhattan. Information provided included geographic representations of water, gas, electric, steam and subway outages, as well as the status of river crossings, building condition and various access zones in lower Manhattan.

There also are many examples of how government is using geographic information to provide improved service to citizens outside the homeland security and emergency management business areas. In an article from last month's CIO magazine, Information Technology experts in the city of New York explain how the city's use of geographic information technologies has reduced crime, as well as enabling city managers to analyze how well they are providing services (to include garbage collection) and make improved resource allocation decisions.²

However, it is not only the public sector that sees the benefits of employing geographic information technologies in its business processes. In the same article from CIO magazine, Roto Rooter is highlighted as a company that incorporated geographic information technologies into its business processes to create a competitive advantage. To Roto Rooter what is most important is arriving to a customer's home or business in a timely manner, followed by the ability to fix the problem. GPS-enabled phones tied to a map-based dispatch system assure the timeliest arrival of help to customers in need of Roto Rooter's services. This may be useful for our emergency service dispatch systems.

Summary

In summary, it takes a nation to be prepared to detect, defend against, respond to and recover from all hazards that are natural or man-made and threaten our lives and way of life. The urgent need to underpin that preparedness with a geographic information infrastructure is what building the capacity to support geospatial preparedness is all about. It is also about all of us contributing to building and sustaining our nation's geographic information capacity through partnerships and through the use of open standards to ensure interoperability, and information and services reuse.

Mr. Chairman, Ranking Member Clay and members of the Subcommittee, I thank you for allowing me to testify on this very important issue.

² "Putting IT on the Map," Alice Dragoon. CIO, May 15, 2003.