

Anti-graffiti program tags the taggers

—by Matt Keeling

In the southern California city of Riverside, GIS technology has become the most effective weapon in stopping the spread of graffiti. The weapon is a custom application built with ArcGIS Server, ArcSDE, and several other technologies by the city's partner, Dallas-based Affiliated Computer Services (ACS), working closely with Riverside's chief IT architect. The graffiti abatement tool, or GAT [www.youtube.com/watch?v=nWhWA3HZsLI] stores images of graffiti with other data and uses them to track graffiti vandals.

When graffiti is reported in Riverside, a public works crew is quickly dispatched. Along with the typical graffiti cleanup materials, they're armed with a GPS-enabled camera to take pictures of the graffiti and use a digital form to input information about the incident. The images and data are uploaded to a server which automatically adds the data to a spatial layer in ArcSDE.

There are more than 200,000 images with associated metadata in Riverside's central police database, with more than 500 added each week. The Police Department's Graffiti Task Force uses the images in an ArcGIS Server interface to search for other instances of graffiti by the same vandal or "tagger." The search is done using monikers with which taggers sign their work.

Having a spatial layer for graffiti gives the Police Department a number of advantages, including the ability to perform several GIS analyses to find tagging trends and identify problem areas. If the graffiti is associated with a street gang or tagging crew, police can determine where the groups are active.

Every step is documented in the GAT and can be used to determine total costs of graffiti vandalism—from the cleanup, to the investigation, to prosecution—for possible collection in a civil lawsuit. Since 2007, when the GAT was developed, the city has collected more than \$110,000 in restitution.



The graffiti abatement tool allows for the construction of a proper chain of evidence by providing evidence of the graffiti with timestamps, digital images, and locations. However, because of the sensitivity of criminal evidence, the system has partitions to separate the data. Riverside's public works segment includes images of the graffiti, the graffiti location, and their removal costs, while the Police Department's portion has information on the tagger, moniker, and the victim.

The graffiti abatement tool combines a number of technologies. Its input devices are Ricoh GPS cameras which include customized, digital forms for reporting graffiti. These forms are easy to fill out and require minimal training. ArcSDE stores the graffiti data, including geometry, raster data, and attribute information, while ArcGIS Server provides the user interface. Several Microsoft technologies, including SQL 2005 and Reporting Services, are used by the application.

GAT's key feature is its global architecture. The City of Riverside and ACS hope the tool will eventually power a regional graffiti/tagger tracking and abatement system shared between jurisdictions, which would only need to provide their own server and GPS-enabled cameras. Other features under consideration include automated moniker recognition software, building more complex analysis into the application, and functionality for wireless upload from the cameras—all taking advantage of free wireless Internet service. —Matt Keeling is GIS Analyst at Affiliated Computer Services.

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SmartGeometry 2010 focuses on innovative design tools, technologies, and methodologies enabling new forms of architectural and structural expression. The conference theme is "Working Prototypes." All attendees will receive, upon its release next fall, a complimentary copy of *SmartGeometry: The Evolution of Computational Design and Practice*. In keeping with the theme, the focus of SmartGeometry in 2010 is on new design agendas based on the production of working prototypes. The architecture of the 21st century is widely believed to be defined by digital 3D systems; hence, digital manufacturing, which currently can only be demonstrated in rapid prototyping, will increasingly require well trained "digital craftsmen." SmartGeometry 2010 explores the freedom implicit in the development of manufacturing as a creator of digital realities, said one of the conference organizers. This results in manufacturing reality becoming just another output, thus revolutionizing the nature of architecture. [www.SmartGeometryConference.com/2010—Christine Byrne, Bentley Systems, Inc.]