Government Matters

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GIS for State and Local Government

City of Fontana Uses GIS-Enabled Asset Management System to Meet New FHWA Requirement

Adhering to Sign Reflectivity Standards Will Improve Roadway Safety

In response to a new requirement on minimum standards for sign reflectivity that the Federal Highway Administration (FHWA) established in December 2007, the City of Fontana, California—appropriately named the "City of Action"—has a plan well under way to meet compliance deadlines that are still years away.

In 1935, the newly formed Joint Committee on Uniform Traffic Control Devices released the first volume of the Manual on Uniform Traffic Control Devices (MUTCD). The committee, now known as the National Committee on Uniform Traffic Control Devices, still contributes to revisions of the manual, but since the 1971 edition, the Federal Highway Administration has been responsible for administering the manual.

In 2007, the 2003 MUTCD received its second revision. For the first time, the MUTCD established minimum retroreflectivity levels for traffic signs. This standard requires that by January 2012, government agencies must establish and implement a sign assessment or management method to maintain minimum sign retroreflectivity levels. January 2015 is the compliance date for regulatory, warning, and ground-mounted guide signs.

The new sign reflectivity requirement is meant to make roads safer and reduce roadway fatalities. Though only about a quarter of travel occurs at night, approximately one-half of traffic fatalities occur during nighttime travel.

To measure reflectivity, agencies can use either of two assessment methods: a visual assessment method or measured sign reflectivity with a portable retroreflectometer. The City of Fontana had previously monitored the reflectivity of signs visually with headlights or flashlights but wanted to adopt a more scientific approach.

Since late 2007, the city has been gathering data on the reflectivity of regulatory signs with a RetroSign retroreflectometer gun enabled with GPS. Starting with stop signs, field crew members are measuring location and reflectivity of assets with one click of the gun and managing that data with a geographic information system (GIS)-enabled asset management system from ESRI business partner GBA Master Series Inc.

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In this image, green stop signs indicate signs that have been inspected and replaced, red signs are for those that have been inspected, and black stop signs are for unresolved cases.

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"This was an ideal time to begin working with the retroreflectometry device—well in advance of the compliance deadline," noted Joseph Field, GIS administrator for the City of Fontana.

Efficiency in the Field

Using a retroreflectometer gun that is GPS enabled allows city field staff, with one click of the trigger, to collect two types of data at once. The gun contains a record for a sign's reflectivity reading and coordinates, and that record number corresponds to the same record number in the GBA Master Series asset management database.

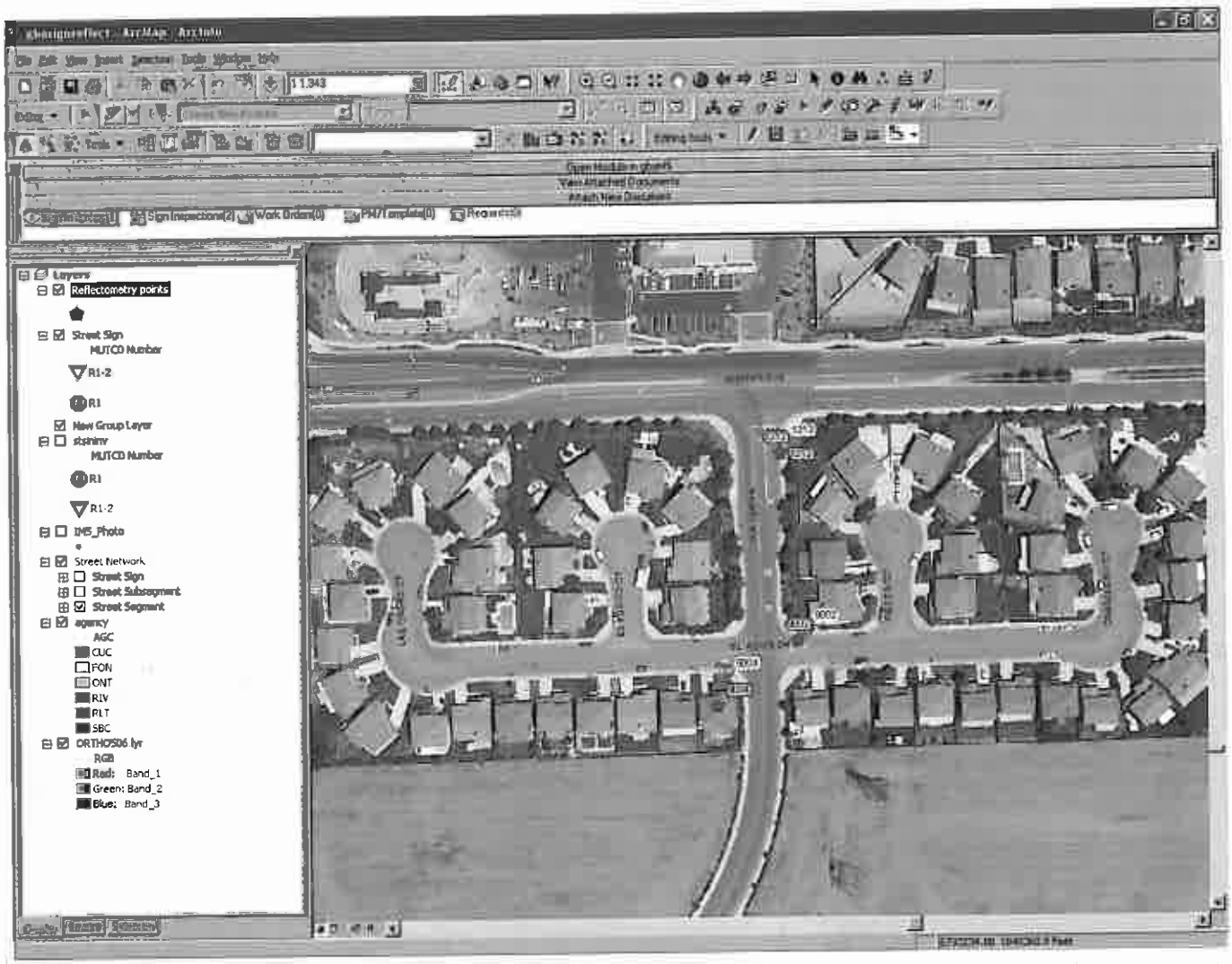
"We thought this would be the easiest way to bring our inventory into compliance," said Rogelio Matta, senior administrative analyst of the public works department. "We're also incorporating this into our workflow to improve our inventory management. Our crew is out there measuring reflectivity, but they are also collecting data such as orientation, material type, and condition of the signs and replacing signs on the spot when necessary. All of that data is quickly uploaded to our GIS-enabled asset management system."

An ArcIMS site named simply GIS Browser is used throughout the city, including in the field, for this initiative. Public works crew members access the asset management system application in real time on a Panasonic notebook computer.

Via the ArcIMS application and GBA Master Series, crew members can remotely reference data related to existing signs, such as a sign's record number and its location and orientation, and create a record for a new sign.

This method for data collection has the added benefit of allowing the city to retain institutional knowledge, the information that staff members know but which had not traditionally been documented.

"Institutional knowledge is one of the big things for us, and how we convey that institu-



In an ArcGIS Desktop interface, data such as reflectometry points, MUTCD number, and street network can be seen together to support improved asset management and decision making.

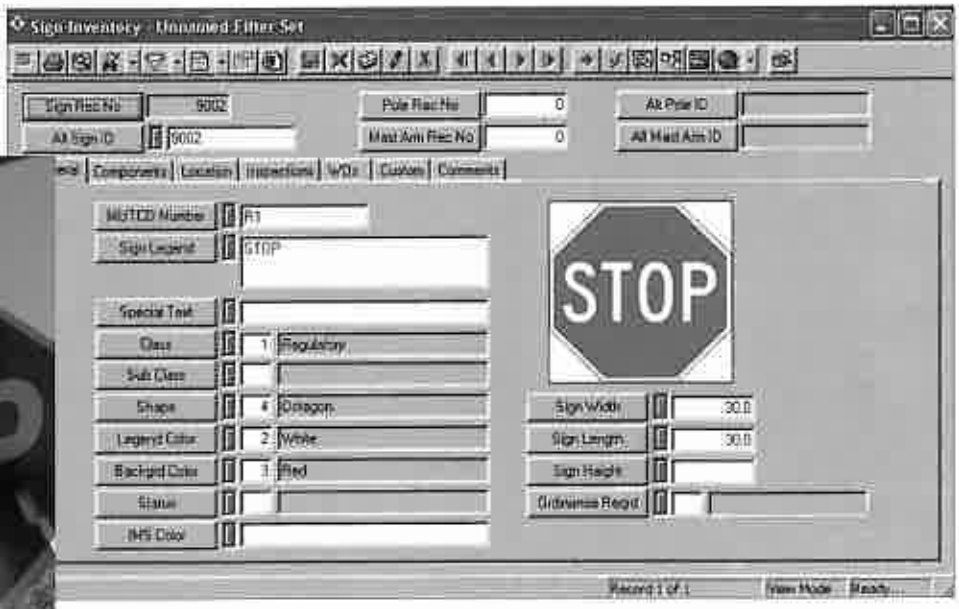
tional knowledge is through these databases. We don't want to just know that there is a stop sign there, we want to know what the field crew who is working with it knows about it," said Matta. "GIS allows all of us to see the data. Being able to see, for example, where all of the stop signs are located in the city and their conditions is powerful. It helps us quickly make decisions about asset management and relate information to field crews about the work they need to do."

Back in the office, ArcGIS Desktop is used to visualize and analyze the collected data and generate reports. ArcSDE technology manages the geodatabase. Reports can be accessed via the ArcGIS Desktop application interface or via the GBA Master Series application.

"I encourage other governments to utilize GIS and GPS to capture and maintain data whenever possible, because it cuts down on confusion and also makes for a more efficient operation," Field noted.

For more information, contact Joseph Field, GIS administrator, City of Fontana, Information Technology Department, at jfield@fontana.org. GM

In the field, public works crew members can access the city's GIS Browser via an ArcIMS Web site. In this browser, they can view and input data such as sign orientation and condition.



With the GIS-enabled GBA Master Series asset management system, users can view asset data such as a sign's condition and location.

A RetroSign retroreflectometer gun enabled with GPS allows public works staff to collect sign location and sign reflectivity at once. That data is then managed in a GIS-enabled asset management system.