Government Matters

Esri • Fall 2010

GIS for State and Local Government

Encouraging Citizen Engagement

The City of Glendale, California, a large suburb of Los Angeles, is pioneering deployment of the latest geospatial technology to increase civic engagement, improve government efficiency, and generate new knowledge and information for the city. Recently, it became one of the first jurisdictions to adopt a cloud-based citizen reporting platform, procured through Esri partner CitySourced, that will improve public involvement while streamlining and automating the public service request business process.

The city has a vision for delivering a wide breadth of Gov 2.0 services and experiences to its citizens. A multifaceted strategy has established sensor networks to improve city hall's exposure to the health of the city. In return, the city can work more efficiently and provide citizens with transparency in its operations. The city's sensors include smart meters for utility customers and video cameras that support public safety efforts. Now, the city is encouraging citizens to be sensors with a new mobile application from CitySourced that allows them to report service request issues with smartphones.

In Glendale, California, citizens can report service requests directly to the city via smartphones.

The City of Glendale cast about for a system that would enable its citizens to use the most common smartphones already deployed (iPhone, Android, BlackBerry) to easily and efficiently report community issues such as graffiti, potholes, and broken streetlights "on the spot." The CitySourced mobile applications platform uses a Global Positioning System (GPS) to allow residents to capture a photo of a service request, categorize it, comment on it, and send the notification to the local government along with the GPS location of the event. Subsequently, the citizen

continued on page 4

In This Issue

Manager's Corner

ROI with an ELA

Emily Norton, GIS Manager, Woodstock, Georgia, and Timothy Poe, GISP, GIS Coordinator, Bartow County, Georgia, and Former GIS Manager, Woodstock, Georgia

The City of Woodstock, Georgia, purchased the Esri Small Municipal and County Government enterprise license agreement (ELA) at the beginning of the 2008–2009 fiscal year. Since then, the ELA has played a crucial role in the success of the city's geographic information system (GIS) division by enabling it and other departments to accomplish more work with fewer resources while also improving the overall quality of spatial data.

The ELA has been critical in improving the accuracy of the city's storm water utility billing process and updating the mapping of the storm water and sanitary sewer systems. Rather than employ consultants to complete the work, the City of Woodstock decided to take advantage of its newly purchased

continued on page 2

Explore the Geographic Approach for the Nation

January 19–21, 2011, in Washington, D.C.

Leaders and GIS professionals at all levels of government are invited to discover new ways to leverage GIS technology to accomplish their missions at the Esri Federal User Conference (FedUC). As the largest geospatial event dedicated to federal government, FedUC offers every resource possible to assist attendees in using GIS to solve problems and make quicker, more informed decisions.

Learn about the latest trends and policies driving GIS projects throughout government and find out how your colleagues are using the geographic approach to improve accountability, cut costs, manage data, support research, and streamline operations.

Learn more and register at esri.com/feduc.

Esri president Jack Dangermond at the 2010 FedUC plenary.

continued from page 1

ROI with an ELA

ELA and the GIS division's close relationship with Kennesaw State University's geographic information science degree program. The city hired highly motivated and skilled interns from Kennesaw State University and Gainesville State College to complete the projects. The GIS division was able to recycle 18 legacy workstations into 4 functional workstations. The ELA enabled the city to deploy ArcGIS Desktop software on each workstation, which allowed the interns to take advantage of the versioning capabilities of the enterprise geodatabase.

The projects involving the use of geospatial technologies were twofold. First, the interns reviewed the storm water billing process and corrected errors in impervious surface measurements and parcel classification. During the process, they found 348 tax parcels within the city that were not being assessed city property taxes. As a result of the project, the team discovered approximately $700,000 in missed revenue for fiscal year 2008 and approximately $1 million in additional annual revenue for subsequent years. The entire project was accomplished in less than three months at a total cost of less than $25,000. Second, to update the storm water and sanitary sewer systems infrastructure, ArcGIS Desktop was deployed on an Xplore tablet coupled with Leica's MobileMatriX and GPS gear to allow the intern team to collect survey-quality data for future development of a flow network model. Overall, the utility billing project and infrastructure project were highly successful, and both projects represented a huge cost savings for the city and provided excellent educational experiences for the interns.

The ELA has also enabled the city to cut costs significantly by deploying ArcGIS Server software-based Web mapping applications to internal customers. For example, when a police crime mapping application malfunctioned, the GIS division deployed a fully functional Web editing application within five hours. Over the next week, the police crime analyst made several requests that the GIS division implemented and in turn enhanced the police department's mapping capability. The ability to edit versioned data through Web applications has met the data integrity and security needs of the GIS division as well as the practical usability needs of the police department's crime analyst. Additionally, zone commanders and other police management have ongoing access to up-to-date crime maps.

Similar Web mapping applications have been deployed to further enhance public safety and deliver additional cost-saving solutions to city departments. For instance, the GIS division has developed a Web mapping application to aid the fire department in tracking hydrant location and maintenance records. This has helped the fire department uphold public safety and maintain its excellent Insurance Services Office (ISO) Public Protection Classification (PPC) rating, resulting in cheaper insurance rates for Woodstock's residents and business owners. Additionally, a multidepartment task force has been able to remotely edit and track vacant buildings to aid in city planning, development, firefighting, policing, and code enforcement. The ability to remotely edit a single versioned data source has eliminated the extensive data duplication and associated systemic bottlenecks to data acquisition and distribution common under the old paper-based systems.

The ELA has helped the City of Woodstock in producing and maintaining high-quality data while minimizing both labor and capital costs. Not only has the ELA improved work processes and lowered overhead costs within the GIS division; the Web mapping capabilities have significantly increased data access and usability and have simplified processes for nearly every department in the city.

For more information, visit esri.com/ela or contact Emily Norton at enorton@woodstockga.gov.

Gov 2.0

Visit esri.com/liveusersites to see how governments use GIS on the Web to support open government.

Texas

The Texas Beach Watch Program online mapping application from the Texas General Land Office shows levels of *Enterococcus* bacteria from sewage or storm runoff along the coast. People can also sign up for e-mail updates or subscribe to the RSS feed to learn about status changes.

St. George, Utah

The SGCityMaps application allows residents to access property, recreation, and public services information including Wi-Fi hot spots, bus routes, tax IDs, and trails.

Vermont

The Renewable Energy Atlas of Vermont helps visitors identify, visualize, and analyze data about existing and promising renewable energy projects for the state's towns and counties.

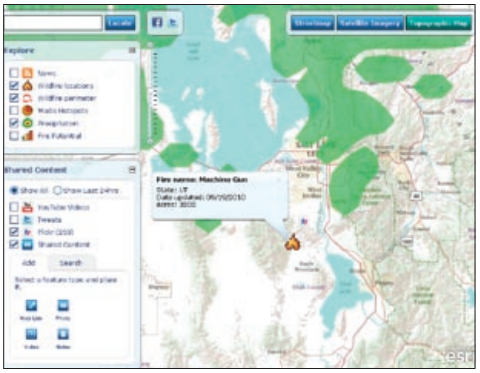
Esri Online

Videos

Watch an interview with Jack Dangermond at the Gov 2.0 Summit as well as his presentation at the event with Bern Szukalski. Learn how geoservices and online mapping apps make government information easily discoverable and open access to new users. Visit the esri.com/gov20 home page and the Government Professionals section.

Contribute to the Wildfire Map

When wildfires start in the United States, Esri's interactive Wildfire map (esri.com/wildfiremap) brings you the latest data including perimeter, hot spots, and fire potential. Location-based feeds include news, Twitter, and YouTube. We encourage you to add your own content to this trusted resource.



Visit the Local Government Resource Center

Access the resources you need to support your GIS implementations in the Local Government Resource Center (resources.arcgis.com). You will find maps and apps as well as a forum and blog.

Listen to New Podcasts

Visit esri.com/podcasts to hear the latest Instructional Series and Speaker Series recordings.

Recommendations

- **NAVTEQ Serves State and Local Governments**—Skip Parker, enterprise sales manager at NAVTEQ, explains how the company serves road and traffic data to state and local governments.
- **Migrating from a Single-User Geodatabase to a Multiuser Geodatabase**—Discover reasons to migrate from Microsoft Access personal or file geodatabases to multiuser geodatabases. This podcast also covers concepts you should know before migrating as well as GIS data migration methods.

continued from page 1

Encouraging Citizen Engagement

receives a confirmation when the item has been received by the city and later resolved. Once the issue is reported, the citizen sees a map showing the location of the report. Glendale worked with CitySourced to integrate its system into the city's existing customer request system, which ensures that the request is routed to the appropriate city service, it is tracked and resolved, and the originating citizen is informed of the progress.

"In the not-too-distant future, in addition to all traditional means of communication and common electronic forms, I believe we will see increasing use of mobile devices, especially smartphones, as the preferred means of resident-to-government communications and transactions," said Ed Fraga, IT director for the City of Glendale and former vice president of state and local government for Gartner.

> "As we move forward, we see in our future the delivery of more GIS capabilities to city residents and the public in general."
>
> Ed Fraga, IT director for the City of Glendale

Glendale rolled out the CitySourced service in three phases. Phase one included the initial integration into Glendale's existing service request and asset management system via Web services and launching to the city's department heads for sponsorship, feedback, and debugging. Phase two expanded the project to the entire city staff for further feedback and testing. Phase three was the official launch to the public in October 2010. Though residents can go to citysourced.com; search for Glendale, California; and see a map showing all reported incidents in the city with details, including a photo, phase three launched a customized map on Glendale's Web site that zeroes in on the city.

As Glendale staff members move forward with providing residents with alternative and progressive means of communicating with city hall, they will be looking for more ways to

continued on page 6

Residents can also go online to report issues and see other reported service requests.

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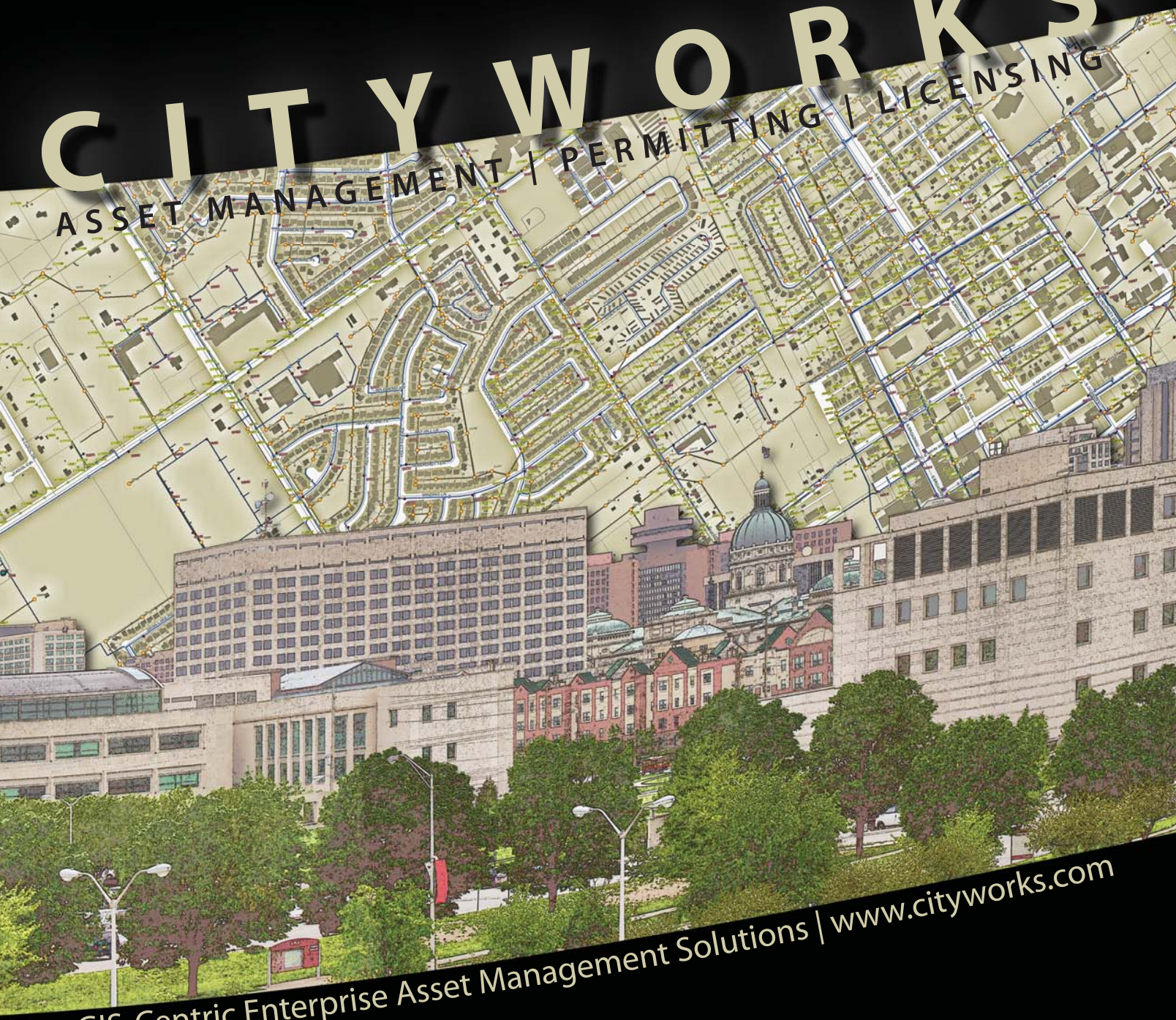

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continued from page 4

Encouraging Citizen Engagement

A simple user interface facilitates quick reporting.

unite analysis of common geography with service delivery. "GIS can be both an analysis tool and a navigation tool for city staff," noted Fraga. "As we move forward, we see in our future the delivery of more GIS capabilities to city residents and the public in general."

GIS has increasingly become a data anchor for the analysis and delivery of city services throughout Glendale's business processes. Though city departments focus on different areas, they share a common geography and the need to understand their customers and their services in terms of location and proximity. Further, each department needs to have information about issues related to the customers and services of other departments to ensure coordination and collaboration.

Fraga looks forward to more deeply integrating the citizen reports into the city's GIS. He envisions a process where use of the latest GIS software allows a resident to send a service request via a smartphone regarding, for instance, a damaged power pole. Then the application could identify the pole in question, ask the citizen to confirm that asset as the object of the request, and automatically enter the request into a city work order process. Alternatively, the system could notify the resident if the pole in question is on private property and is not city owned.

When asked why Glendale chose CitySourced, Fraga noted that it wanted a system that integrated with the city's existing service request management process and one that also shared its vision that GIS capabilities could dramatically enhance efficiency, knowledge sharing, and transparency. In trying times, he noted, this is another example of how GIS technology can help agencies do more with less in a way that works for their customers.

For more information, contact Kurt Daradics at kurt@citysourced.com. GM

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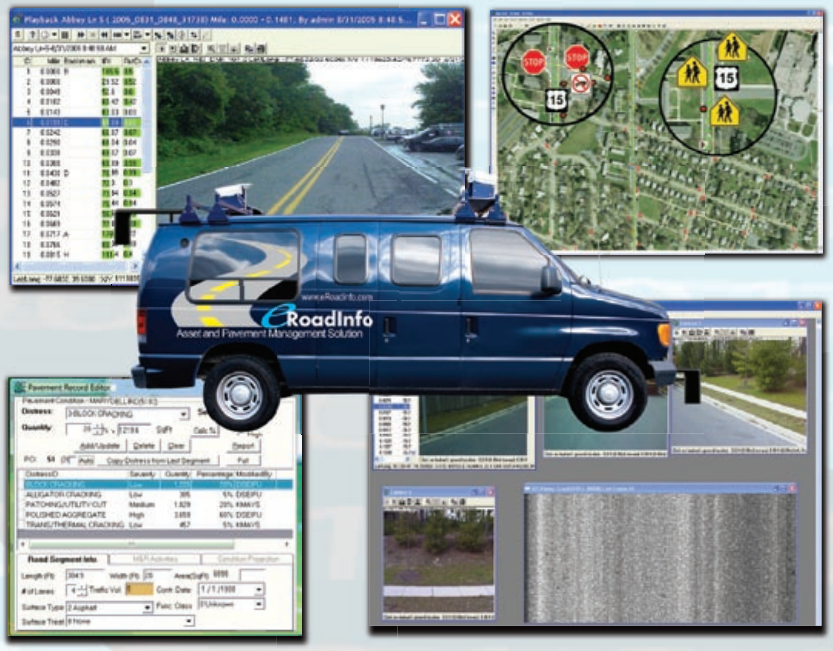

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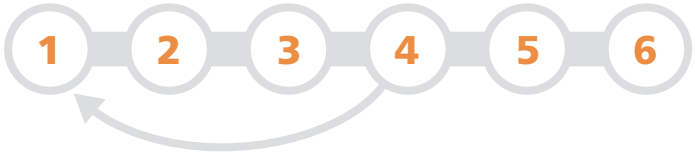
Anatomy of a Gov 2.0 Solution

Citizen Engagement

Local governments have realized the value of using GIS and Web 2.0 technology to make their work more transparent and demonstrate accountability. Maps promote citizen engagement and show constituents how government is working for them.

To encourage bidirectional communication, governments are increasingly encouraging citizens to provide feedback through Web and mobile mapping apps. Citizens can instantaneously report graffiti, potholes, and other concerns while pinpointing an exact location. Government can integrate that data into workflows for increased operational awareness.



1

Begin with Authoritative Data

Governments maintain high-quality, reliable data that serves as a foundation for Gov 2.0 initiatives.

2

Push Data to Citizens

Web maps put data into context for improved transparency and accountability.

3

Allow Citizen Analysis

People engage with online maps to understand initiatives and see how government is serving them.

4

Create a Citizen Feedback Loop

Through Web and mobile apps, citizens can report information including locations of incidents like graffiti.

5

Update Authoritative Data

Governments can validate crowdsourced data and incorporate it into their workflows.

6

Increase Operational Awareness

Better visibility into communities from crowdsourced data provides a more robust operating picture.

esri.com/gov20

Chesapeake Bay Restoration Made Transparent to Public

Esri and Chesapeake Bay Program Build Web-Based Accountability Tool

More than 10,000 years ago, melting glacier ice caused the Atlantic Ocean's sea level to rise and form the largest estuary in North America. The Algonquin Indians who lived in the once pristine regions of the watershed called the bay *Chesepiooc,* meaning "Great Shellfish Bay." Today we know it as Chesapeake Bay. An estimated 2,700 species of plants and animals, including 200 species of fish, live in the estuary.

In recent times, bay communities have been concerned with pollution in the watershed. The results of a five-year, federally funded study begun in the late 1970s identified excess nutrient pollution as the main source of the bay's degradation. These nutrients, mostly from animal waste and nitrogen used in farming and livestock management and phosphorus used in detergents, find their way into tributaries to the bay and create conditions harmful to aquatic life such as clams, blue crab, and underwater grasses.

In the 1980s, Congress recognized the bay's pollution crisis. Thus, Chesapeake Bay became the nation's first estuary targeted by Congress for restoration and protection. Restoration of the Chesapeake Bay watershed is a collaborative effort among stakeholders including federal agencies, six states, the District of Columbia, and NGOs.

The watershed is 64,000 square miles and affects approximately 17 million people. In 2009, President Barack Obama signed Executive Order 13508 that recognizes Chesapeake Bay as a national treasure and calls for an unprecedented federal effort to ensure the bay's restoration and protection. In response, the Federal Leadership Committee for the Chesapeake Bay released strategies and goals for reducing nitrogen, phosphorus, and sediment pollution; restoring 180,000 acres of wetlands; conserving another two million acres in undeveloped land; and reducing farm runoff on four million acres. The goal is to complete these tasks within 15 years.

The Chesapeake Bay Program (CBP) ChesapeakeStat team worked with Esri and others to build the online Web mapping application that allows the public, congress, restoration stakeholders, and project managers to follow the program's progress, status, and funding allocations.

"ChesapeakeStat is a geoaccounting tool," explains John Wolf, USGS, GIS team leader of CBP. "Esri has been instrumental in developing the successful StateStat and BayStat models that were implemented under the leadership of Maryland governor Martin O'Malley. It was a natural step to work with Esri staff in the design of our project. GIS is a useful tool for showing people what agencies are doing and how they are spending money. But our project takes it a step further. People can see in a geographic context how an agency's goals, strategies, and outcomes are being accomplished."

> "GIS is a useful tool for showing people what agencies are doing and how they are spending money... People can see in a geographic context how an agency's goals, strategies, and outcomes are being accomplished."
>
> John Wolf, USGS, GIS team leader of CBP

ChesapeakeStat is built, in part, on Esri's ArcGIS Server and the ArcGIS API for Flex. This makes it easy for site visitors to zoom in to an area and locate restoration activities, then examine smaller watershed units to see what is happening in a specific area. The Web site is the first one-stop GIS project to improve accountability for all partners in this restoration effort. Eventually, the public will be privy to all bay and watershed restoration activities, funding levels, and progress toward goals.

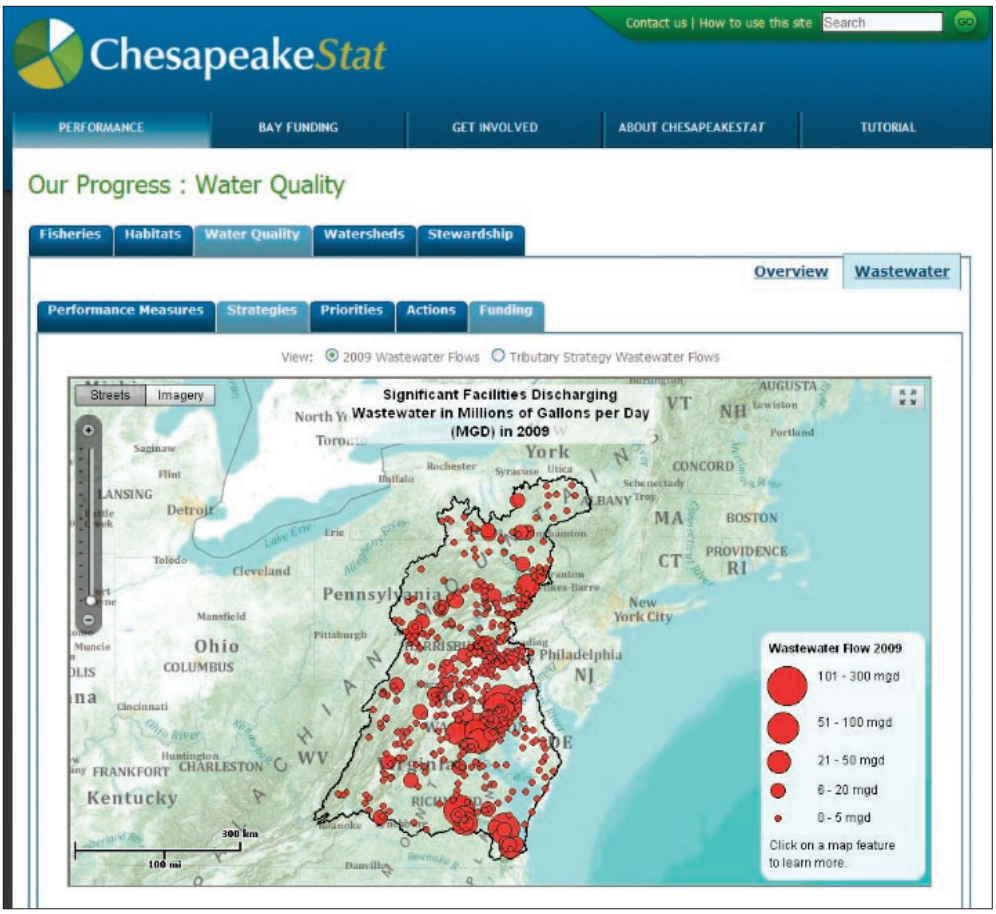
ChesapeakeStat's design is closely related to the CBP Strategic Framework and describes how federal, state, and other partner funding will be used during each fiscal year; it also includes a database that contains restoration activities, spending, and progress status. GIS has made this database user-friendly so that the public can visualize this information geographically. ChesapeakeStat organizes information around the CBP goal areas of sustainable fisheries, healthy habitats, water quality, healthy watersheds, and Chesapeake stewardship. Each category contains a suite of environmental and performance indicators.

Another unique characteristic of the ChesapeakeStat tool is that it supports an adaptive management approach, which progresses from setting goals, defining strategies, setting priorities, taking action, monitoring results, and making management adjustments. This means that beginning from the overall goal level, users will ultimately be able to access detailed scientific data and analysis that supports decision making.

The CBP's goals and strategies are included in the design of the Web site dashboards that interactively present performance and environmental information organized by strategic topics. The database includes management activities for conservation and restoration throughout the watershed and in the estuary. The ChesapeakeStat application accesses a geodatabase that contains the spatial and tabular information visualized on the Web site. Content is organized by operational stages of measuring progress, taking action, and developing priority areas for targeting activities.

Topic-based navigation includes five major program areas that relate directly to the business goals of CBP:

1. Sustainable Fisheries (crabs, oysters, striped bass, etc.)
2. Healthy Habitats (fish passages, bay grasses, wetlands)
3. Water Quality (wastewater treatment, agriculture, storm water)
4. Healthy Watersheds (land conservation and protection)



GIS applications give ChesapeakeStat users insight into pollutant and remediation activities. A wastewater application built with the Flex API accesses and displays wastewater discharge data.

5. Chesapeake Stewardship (public access, environmental education, citizen and community action)

Starting at these program areas, users can drill into the level of detail they need to see. These CBP business goals are categorized in the application. For example, a resource manager can select the Water Quality goal category, select the topic Wastewater, and quickly understand the collective issues and initiatives dealing with this topic in the partnership.

A performance measure tab leads to a tool that allows the user to see how well restoration efforts are meeting the goals set by the CBP partnership. A goal may be a stated level in terms of nitrogen or phosphorus pollutant load reductions achieved basinwide. In many cases, goals are attached to geography. In the future, the user will be able to look closely at a geographic area on the map to get a more comprehensive understanding of pollution source sectors. The person will be able to access one indicator measure for the entire bay area, such as dissolved oxygen, then compare this same indicator among other watersheds or, for a single watershed, explore different pollution indicators for that particular geographic area.

The ArcGIS Server capabilities of ChesapeakeStat support scale dependency. As one drills into a selection, the accompanying map interface can change as it is related to the user-selected topic. For example, by selecting the Strategies tab, a user can see nitrogen pollution from wastewater sources throughout the bay watershed. Facilities that contribute more nitrogen to nearby receiving waters are shown with a larger symbol, regardless of the map scale selected.

A Priorities tab opens up a map that geographically shows priorities for several programs focused on pollution reduction. An Actions tab opens a page that shows activities and progress associated with each of the jurisdictions in reaching short-term interim goals, or two-year milestones.

Finally, a Funding tab accesses information about the financial investments the partners are making to control pollution from various sources. The funding information can be sorted by year, state, source, goal, and topic.

ChesapeakeStat accesses other systems for data and information through Web services. For instance, CBP is leveraging EPA's Enforcement & Compliance History Online (ECHO) data to tell part of the story regarding wastewater facilities. In the future, ChesapeakeStat will be pulling data directly from Maryland's BayStat as well as other partner data resources.

Chesapeake Bay recovery prospects are not hopeless. Regulation, enforcement, best management practice (BMP) implementation, education, citizen engagement, and a watchful eye can bring the estuary back to the state it was in 50 years ago.

Read more about Esri's solutions for environmental management at esri.com/environment. Access the ChesapeakeStat tool from the Chesapeake Bay Program Web site at stat.chesapeakebay.net/.

Planning 2.0 in Montgomery County, Maryland

Online Forest Easement Map Provides Transparency and Supports Feedback

In Montgomery County, Maryland, both government and citizens value the environmental benefits forests provide, including sheltering wildlife and improving air and water quality. Forests make up more than 93,000 acres of the county's land cover on both public and private property. Forest conservation easements, legal agreements that limit activities to safeguard forests, protect about 10 percent of Montgomery County's forests.

The Montgomery County Planning Department has been responsible for monitoring the condition of a growing number of easements for the past 20 years. Recently, department leaders decided to digitize the easements, as it was becoming impossible to monitor the condition of so many easements using individual paper maps. It was also difficult to communicate easement information with landowners.

It took two years for the staff members to build a geodatabase that included exact locations, individual easement requirements, and an estimated condition of the land. They used ArcGIS Desktop and ArcGIS Server to manage, analyze, and visualize this data.

Once the project was complete, the Planning Department created an online easement map at montgomeryplanning.org/easements. Now property owners can easily view aerial imagery of their easements and learn about protecting them.

"We were getting criticism from the public about lack of access to the data associated with the program, including comments that we weren't taking care of the easements dedicated to our organization," said Katherine Nelson, planner/coordinator with the Montgomery County, Maryland, Planning Department. "Now that we are providing transparency to the data, that criticism has evaporated. In fact, it's turned around, and we're getting compliments from our elected officials and the general public for this application."

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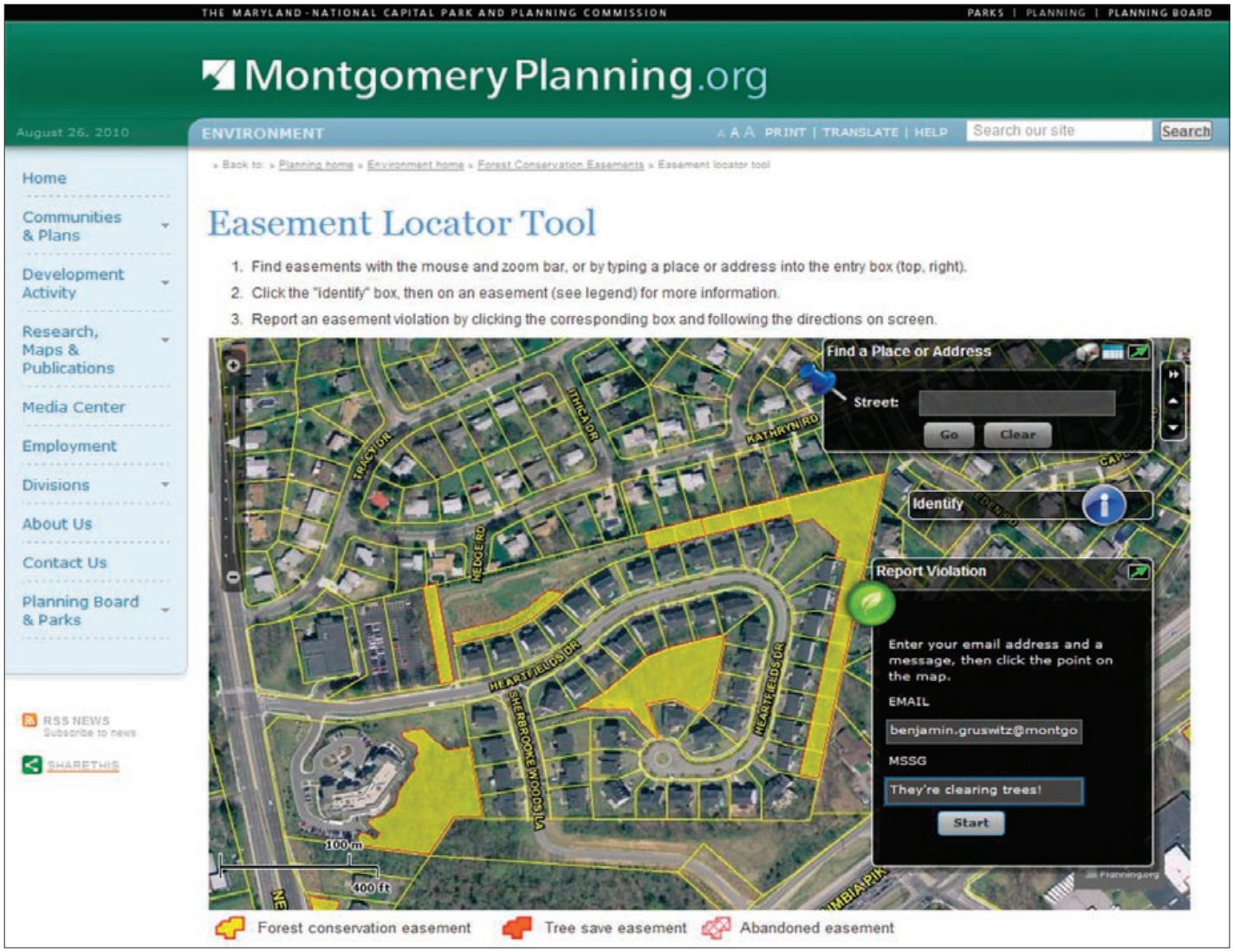

Visitors to the site can click a forest conservation easement (yellow) and report a violation directly to the planning department.

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continued from page 12

Planning 2.0 in Montgomery County, Maryland

Visitors to the site can also report a violation by clicking an easement in the map and providing a comment. The location and comments are sent to the department's tracking system, which generates a return confirmation, streamlining the process for both government and the public. Once a violation is reported, the easement is placed on the top of the list for inspection.

"The map application gives citizens the opportunity to alert us to something happening on the ground in real time and pinpoint where that violation is occurring," said Benjamin Gruswitz, senior planner, Montgomery County Planning Department. "It was very difficult when someone would call us, while looking out their back door, and try to verbally communicate a violation while we were looking at aerial imagery."

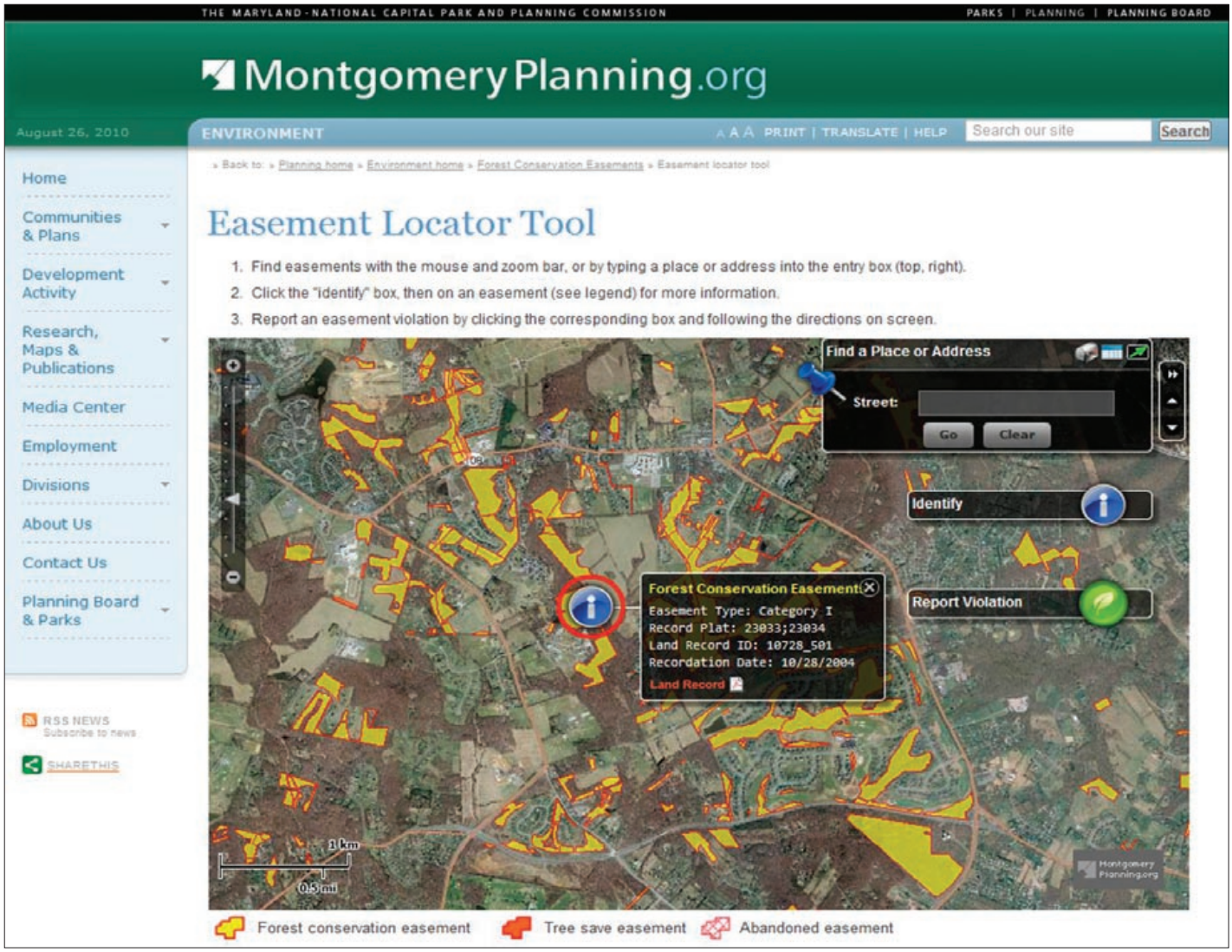
In addition to viewing easements and reporting violations, site visitors can click an easement using the Identify tool and select a hyperlink to the land record. This will bring up PDF documents including the legal record of the conservation easement agreement. The information includes boundaries and details about what the owner can and can't do within the easement.

"This is like having the records office tied to the easement map, so it's honing down information searches for everybody," said Gruswitz.

Nelson and Gruswitz have been surprised to find that in addition to citizens, other government agencies, such as the department of permitting services, and businesspeople like real estate agents have become frequent visitors to the site.

The site has also inspired other departments to create similar applications including an interactive map for historic preservation and one to track park encroachment.

To learn more about the development of this application, contact GIS manager Chris McGovern at Christopher.McGovern@mncppc-mc.org. GM



Selecting a forest conservation easement (yellow) with the Identify tool reveals important parcel information including a PDF of the land record.

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