Government Matters

GIS for State and Local Government

GIS Fosters Economic Development in Asheville

The City of Asheville is the largest city in western North Carolina and serves as the regional hub for business and other community amenities. Like many cities across the country, Asheville is concerned about increasing investment and attracting new businesses, as well as retaining existing jobs and companies in the region. To do that, the city has created Priority Places, a Web-based geographic information system (GIS) tool that promotes economic development by enabling citizens, business owners, investors, and government agencies to identify optimal locations for their activities (gis.ashevillenc.gov/mapasheville/priorityplaces). The application is part of a larger suite of GIS applications know as mapAsheville.

Choosing the right location is an important decision that can ultimately determine the success or failure of any new business. To facilitate the long-term economic growth that thriving businesses can provide, several years ago Asheville began looking for an analytic approach to business siting that would leverage the city's wealth of economic development data. The ideal solution would be Web based and easy to use. Furthermore, it would allow individual businesses to select and assign weights to decision factors that they consider important, rather than simply adapting their projects to preselected sites. Most importantly, it would generate customized priority maps based on the criteria selected, highlighting those locations that best meet each business owner's requirements.

In 2006, Asheville contacted Azavea (formerly Avencia Incorporated), an Esri partner, about an application Avencia had developed for the City of Philadelphia. The Philadelphia
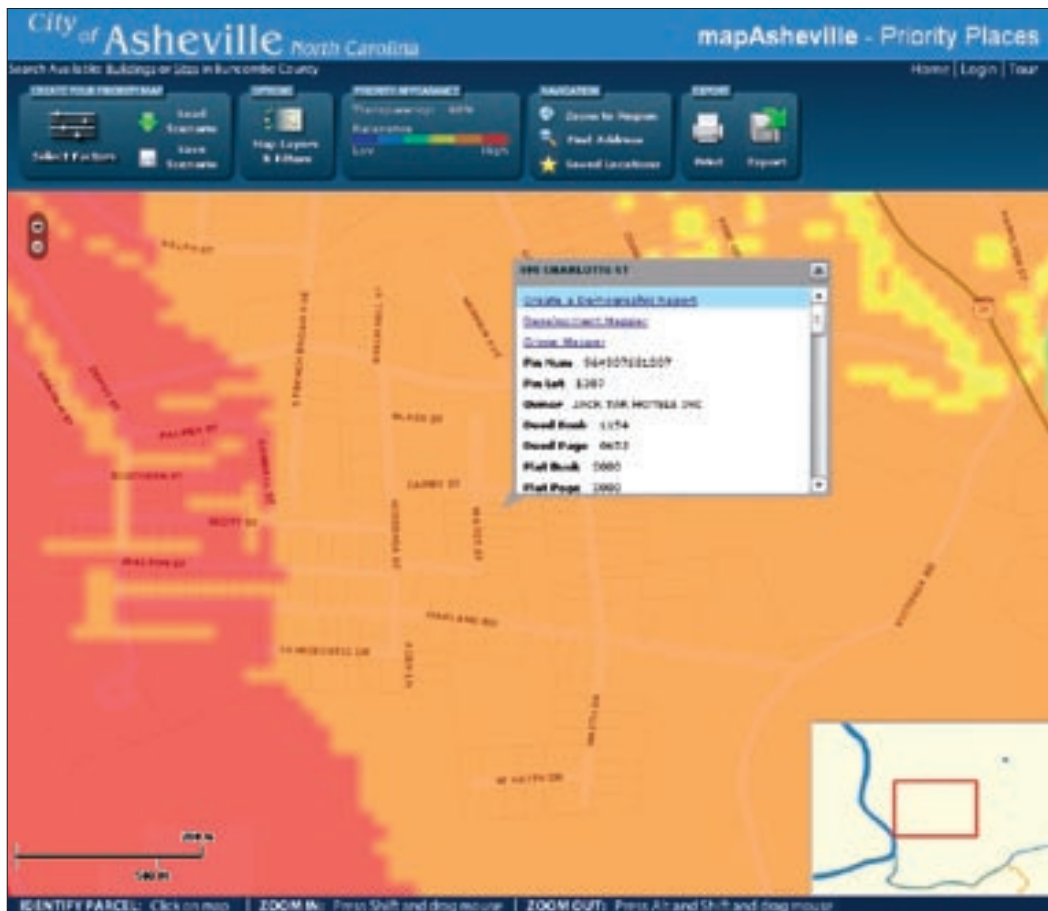
Users can produce an array of reports on demographic and economic characteristics, retail expenditures, and housing for areas surrounding their selected locations.

Esri's BroadbandStat Puts Interactive Maps Online
Four States Inaugurate Maps Showing Detailed Broadband Coverage

The states of Michigan, Minnesota, Nevada, and South Carolina are now providing easy-to-use maps that show in detail each state's broadband coverage. The interactive, online maps are made possible by BroadbandStat, an application based on Esri GIS technology, and will help the states plan and improve high-speed Internet access for their residents and businesses. The BroadbandStat maps were funded by grants from the U.S. Department of Commerce's National Telecommunications and Information Administration (NTIA) and contribute to the comprehensive national broadband map that NTIA is required by the American Recovery and Reinvestment Act to create and make publicly available by February 2011.

"A complete, interactive broadband map is now available for customers, Internet service providers, and policy makers," said Orjiakor Isiogu, chairman of the Michigan Public Service Commission (MPSC), about the new map hosted on the Connect Michigan Web site. "This is an important first step as the state

seeks to target resources to those areas of the state without high-speed Internet service."

Interactive tools include the ability to identify the population density and unserved households in a selected area, link to news about broadband-related projects, and create reports and charts.

MPSC received a $1.8 million NTIA grant to launch its broadband mapping and planning initiative. Over the next 18 months, Michigan's initial BroadbandStat map will be updated and refined as additional data becomes available. Connect Michigan, Connect Minnesota, Connect Nevada, and Connect South Carolina are the entities tasked with collecting the data and producing their states' online maps. All are affiliated with the nonprofit Connected Nation organization, which partnered with Esri to create BroadbandStat.

Connect Nevada was awarded $1.4 million in stimulus funds through the NTIA for broadband mapping and planning. Nevada's broadband map includes data collected on the availability, speed, location, and type of

broadband services from more than 35 state broadband service providers.

During the inauguration of his state's BroadbandStat map, Nevada governor Jim Gibbons said, "Nevadans will now have a map that not only puts information about available broadband services at their fingertips but also defines where the state and the private sector need to focus their attention to bring high-speed Internet to every part of our state."

Connect Minnesota and Connect South Carolina worked with their state broadband service providers to accurately pinpoint remaining gaps in broadband availability across their respective states. They also collected data from community anchor institutions such as schools, universities, libraries, hospitals, and public safety facilities, which are potential sites for providing community access to broadband services.

For links to each state's interactive maps and more information on BroadbandStat, visit www.esri.com/bbstat.

This Minnesota map identifies 57 households that do not have access to broadband service.

Government 2.0

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

Johnson County, Iowa

This property information viewer provides Johnson County staff and the public it serves with quick and easy access to several years' worth of aerial photography, elevation data, flood hazard layers, and land records.


Honolulu, Hawaii

Honolulu's parcel and zoning viewer is designed to be simple and fast, utilizing cached services and no more than five dynamic layers. Reports are packed with information and a dynamic location map with links to external databases that are refreshed nightly.

Cincinnati, Ohio

By utilizing richly designed basemaps and an easy-to-use interface, this interactive site allows the general public to access up-to-date geospatial data from Cincinnati area GIS.
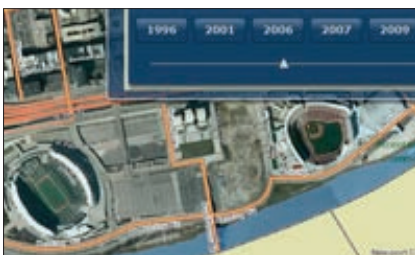
Esri Online

Watch Esri UC Videos

Plenary presentations from the 2010 Esri International User Conference (Esri UC) are now online. Visit www.esri.com/uc to watch Esri president Jack Dangermond and Technology/Entertainment/Design (TED) Conference founder Richard Saul Wurman's addresses. Also posted are videos highlighting ArcGIS 10 and award winners.

Esri President Jack Dangermond

TED Conference Founder Richard Saul Wurman

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Follow Twitter conversations with
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Listen to New Podcasts

Visit www.esri.com/podcasts to see the latest offerings. A new format makes searching for podcasts easier.

Recommendations

The Imagery Acquisition Program at Los Angeles County

Nick Franchino, GIS manager for the Department of Regional Planning in Los Angeles County, California, talks about how remotely sensed data integrated with GIS brings departments together.

Delivering 2010 Census Data for Redistricting

At the 2010 Esri UC in San Diego, California, U.S. Census Bureau Redistricting Data Office chief Cathy McCully explains how GIS-enabled census data is being delivered to states for use in their redistricting processes.

Learn about Esri's Community Maps Program

Esri's ArcGIS Online team discusses Esri's Community Maps initiative, a program that gives the GIS community the ability to contribute its own data to a global basemap.

GIS Fosters Economic Development in Asheville

application used a weighted map overlay process to support business site selection. Users assigned weights to various factors including proximity to public transit, locations within tax incentive zones, proximity to waterfronts or parks, and areas with a high density of college graduates. The application enabled users to create heat maps of the sites that best met their choices.

The Philadelphia prototype evolved into Avencia's DecisionTree, which had just been completed when Asheville contacted Avencia.

The city chose to move forward with this high-performance processing component that is capable of making complex site optimization calculations in less than one second. Leaders in the Office of Economic Development selected the business siting factors integrated into the application, including proximity to interstate exits, regional airports, existing utility infrastructure, and state incentive areas.

Priority Places was officially launched in 2008 and provides an interactive user interface that displays each decision factor as a slider

bar. The application was recently updated with the ArcGIS Server API for Flex, which incorporates a new user interface with the rich, interactive features made possible by the Adobe Flex toolkit.

On the site, users choose the importance of each decision factor by moving the appropriate slider bar from the neutral (0) position to a preference value ranging from -5 (avoid proximity) to 5 (prefer proximity). Decision factors can be selected and valued in any combination
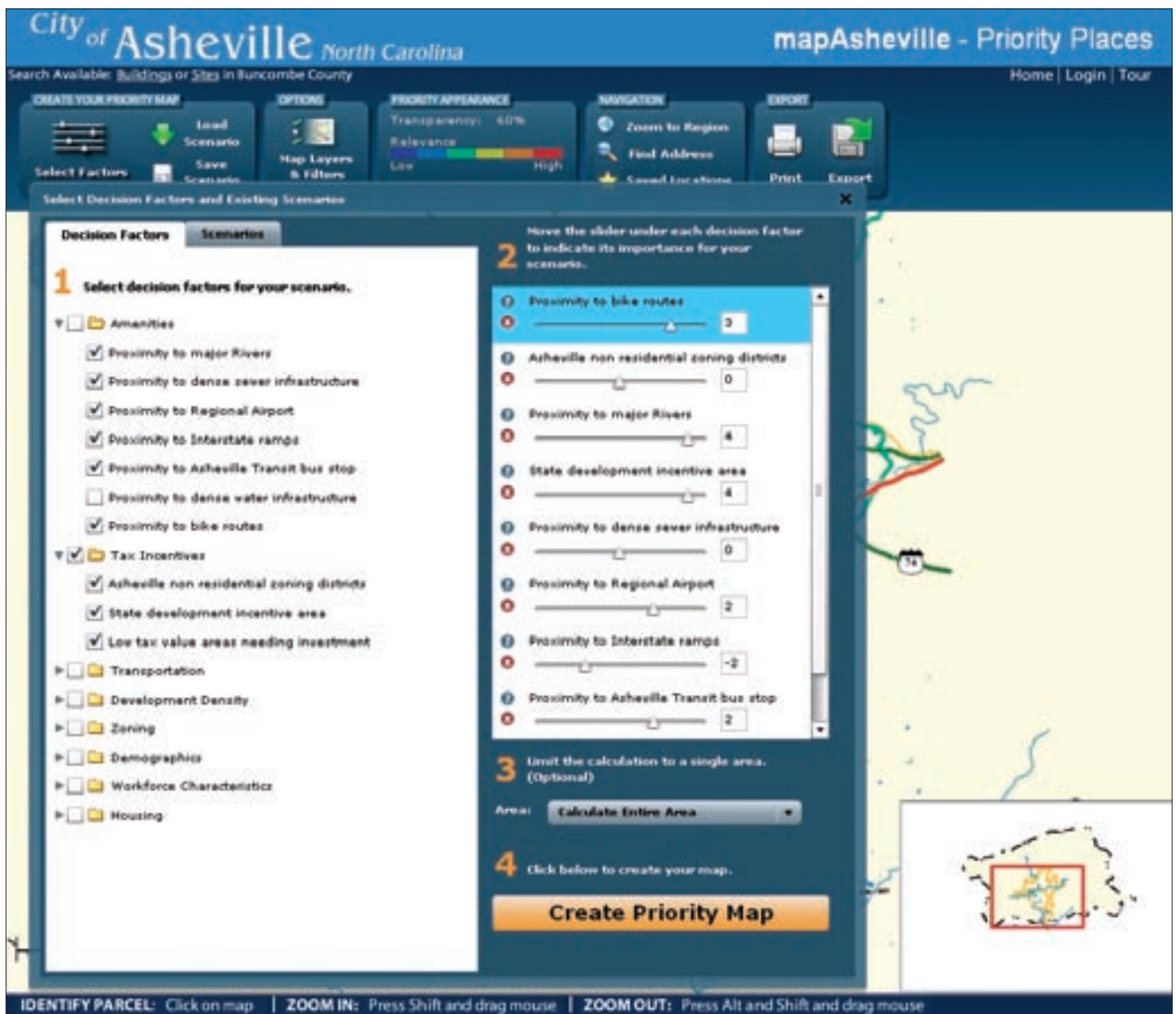
The City of Asheville's Priority Places application enables users to create and save customized heat maps of sites that best meet their preferences by using sliders to weight their siting criteria.

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to provide truly customized site selections. The system then returns a heat map highlighting the areas that best match the specified criteria, and users can zoom in to view additional layers of data that can further enhance their decision-making powers. These layers include railways, flood hazard areas, zoning districts, and city-owned surplus and sale-pending properties. Additional features include geocoding, customized map color palettes, transparency controls, and the ability to create bookmarks of specific map views that can be quickly returned to at a later date.

Priority Places has also been integrated with Esri Business Analyst Online API, enabling users to produce an array of reports on demographic and economic characteristics, retail expenditures, and housing for areas surrounding their selected locations.

For businesses looking to establish themselves in Asheville, Priority Places provides access to information and analysis that might otherwise be out of reach. The city re-

ports that in the past months, the user base for mapAsheville has increased by 20 percent, while maintenance costs have decreased.

In light of its innovative work, leading organizations are acknowledging the city's achievements. In 2008, the City of Asheville won the prestigious Excellence in Economic Development Award in the New Media Initiative category from the International Economic Development Council (IEDC) for Priority Places. And in March 2009, mapAsheville won the G. Herbert Stout Award for Visionary Use of GIS, awarded by the North Carolina Geographic Information Coordinating Council.

For more information about Priority Places, contact Jason Mann, GIS manager for the City of Asheville, at JMann@ashevillenc.gov.

For more information about DecisionTree, contact Tamara Manik-Perlman, DecisionTree project manager at Avencia, at tmanik-perlman@avencia.com. **GM**
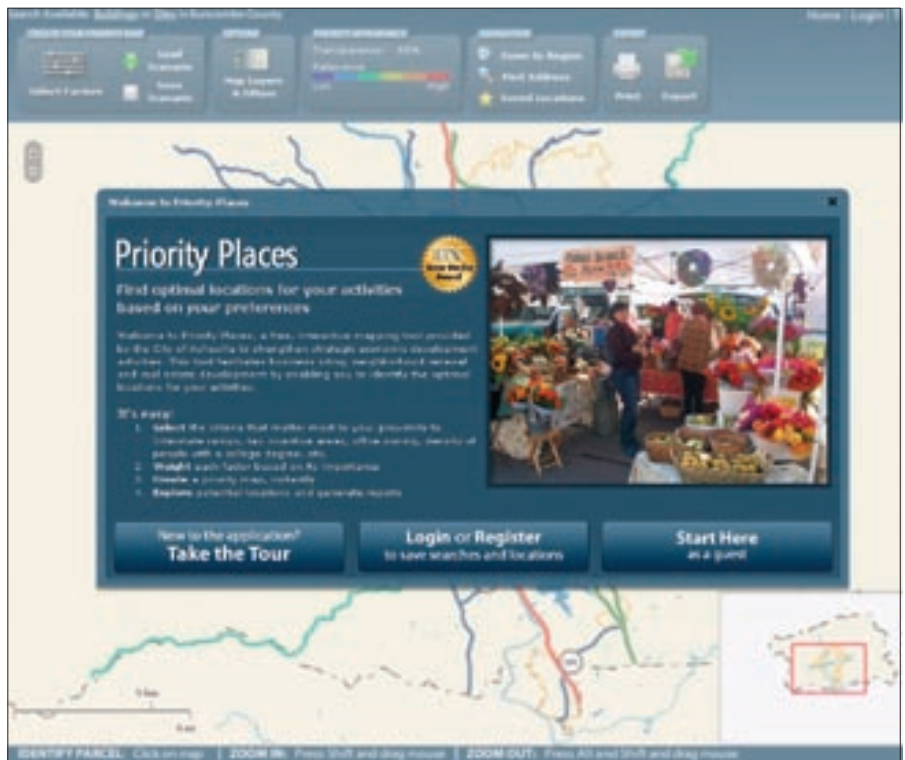
The City of Asheville's Priority Places home page shows images relevant to economic development and provides helpful application use guidelines.

Leveraged GIS Improves Health Assessment Process

By Riju Stephen, Mark Perry, and Beverly Nichols

Houston, the largest city in Texas, has many neighborhoods where living standards fall well below national standards. The Houston Department of Health and Human Services (HDHHS) reaches out to these communities with a program, Assessment Intervention and Mobilization (AIM), that tries to connect needy households with appropriate service providers. During an AIM project, hundreds of HDHHS employees and volunteers visit every household in a neighborhood, interview residents, and connect those in need with service providers. In 2009, HDHHS leveraged existing city GIS resources to plan, allocate resources, and execute an AIM project in the Greater Fifth Ward neighborhood.

"GIS was the key element in the planning process," said Dr. Faith Foreman, assistant director of HDHHS. "It improved efficiency by making it easier to create division/team boundaries for better management of the operations. The maps provided the ground truth about the neighborhood prior to visits by the team members."

Esri's ArcGIS software was used in project management to aggregate census blocks and section the neighborhood into divisions with approximately the same number of households. The divisions were further subdivided into team areas, which served as the basic units for manpower allocation. Each team was assigned a team lead and had several members.

In addition, location-based selection of staging areas for each division provided a strong foundation for project planning and logistics. The City of Houston's Department of Planning and Development provided the neighborhood boundary files. U.S. Census Bureau TIGER/Line files (census blocks) and 2000 Census data (number of households) were used to determine the spatial distribution of households in the neighborhood.

Using the census data, the Greater Fifth Ward neighborhood was separated into divisions of approximately 1,000 households each. This was achieved by spatially selecting contiguous
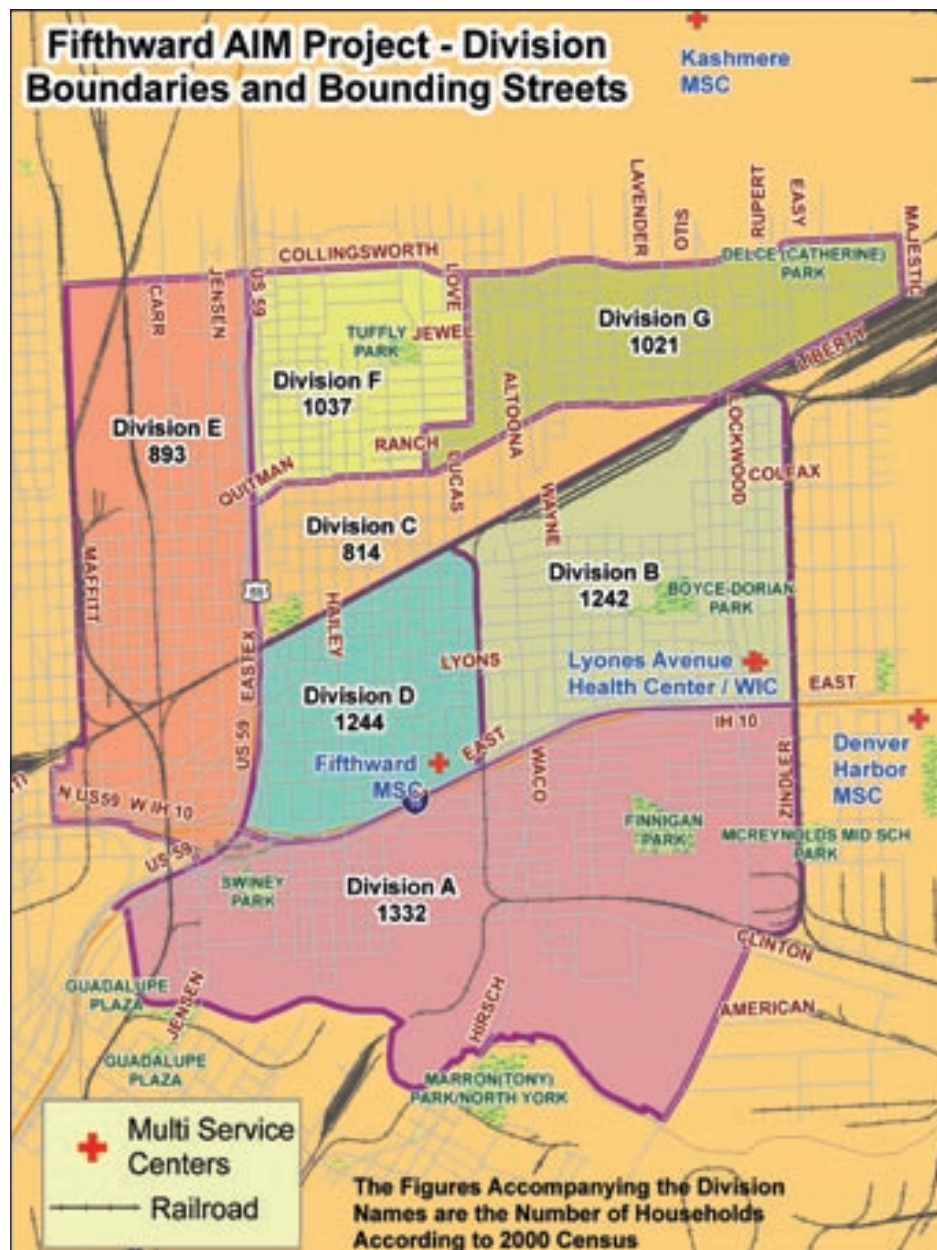
Census information was used to section the neighborhood into divisions with approximately the same number of households.

blocks and using the statistics tools in ArcGIS to obtain the total number of households in the selection. Divisions were subdivided into groups of at least 500 households. Physical contiguity, geometry of the division boundaries, and accessibility were also taken into consideration. Team members were allocated to teams based on the area, size, and number of households.

Land parcel data available from the Harris County Appraisal District (www.hcad.org)

was used to generate maps showing residential households, large apartment complexes, and commercial real estate. For on-site navigation, maps were generated from this data at the parcel level, showing street numbers.

The maps ensured that the team members targeted only those households within the division/team boundaries.

"[The maps] were instrumental in successfully targeting the specific locations as well as

tracking the progress made," said Solly Diaz, division manager, HDHHS.

"The maps were the best way to organize things in the field," noted Carlos Bustamante, a public health investigator supervisor who worked as a team lead in the latest AIM project. "We could mark on the maps all the houses we had visited, and we could plan the movement of the teams in the field."

"Having the same large map at the command center and in the respective secondary staging areas was very helpful," added Diaz. "They greatly helped in ensuring that the teams stayed within the targeted area as well as in making better decisions about when and where to redeploy additional team members. However, the teams sometimes found it difficult to locate themselves in the field, as each team had several overlapping maps. I recommended we use a grid system in the maps so that communicating about the location would be easier."

The immediate impact of the AIM project in the Greater Fifth Ward neighborhood was that it identified indigent families and addressed their immediate basic needs. Needs were broadly classified as food/clothing, other basic needs, shelter, rent/utility assistance, elder services, counseling, job readiness/education, medical support, youth activities, and other (such as immigration, legal services, and day care). A total of 864 Refer-and-Link forms were processed to match appropriate service response teams with a family's identified needs, the majority being for food/clothing, rent/utility assistance, and home repair services.

"GIS helped us save time, money, and human resources," said Foreman. "Spatial summation and mapping formed the foundation of planning and execution of the AIM project with substantial savings on resources."

For more information, contact Riju Stephen, GIS analyst, HDHHS, at Riju.Stephen@cityofhouston.net.

Each division was subdivided into three team areas, as shown in this map of Division D (top map).

Each team received a detailed parcel map of the area the team would visit (map at right).

Akron Housing Authority Streamlines Vacant Land Planning
GIS Supports Quick Analysis and Decision Making

By Jung-Wook Kim, Planning and Development Specialist, Akron Metropolitan Housing Authority

Since 2001, the Akron Metropolitan Housing Authority (AMHA) has utilized Esri's GIS software for a variety of planning and administrative activities such as neighborhood, crime, and housing market analyses; resident relocation tracking; and site acquisition. It manages more than 4,700 public housing units and 130 vacant properties in Akron, Ohio. But it wasn't until 2008 that the authority began using its GIS in a systematic planning process when it launched a GIS-based land asset inventory project for managing its then approximately 250 vacant parcels. The GIS-based inventory has evolved into a GIS-based Land Asset Planning Support System (LAPSS) with a clearly defined planning process for managing the authority's vacant land.

The LAPSS contains the vacant parcel database and other GIS layers, which were obtained from the county auditor's property appraisal data and other public sources. The parcel-level information includes detailed site characteristics such as a parcel's size, dimensions, and adjacency to other AMHA-owned properties, with hyperlinks to on-site photographs and digitally scanned property records. Other layers are used to put the property information into a spatial context, including information on the parcel's environmental constraints (e.g., floodplain and steep slopes), neighborhood characteristics (e.g., poverty concentration and housing vacancy), and applicable public policies (e.g., the housing renewal plan and the city's capital improvement program areas).

GIS overlays are used to identify parcels that are suitable for the construction of new housing. For example, the system was used to identify buildable parcels that were larger than a critical size, did not have large slopes, and were not located in a floodplain or wetland. The parcel-level information is combined with the neighborhood and institutional policy information and AMHA's policy goals (e.g., reducing the concentration of low-income areas and maintaining recreational areas) to provide a comprehensive view of AMHA's vacant parcels.

The LAPSS was initially used in a series of meetings attended by AMHA asset management staff to evaluate vacant parcels, 120 of which turned out to be nonvacant parcels such as parking lots and lawns. ArcGIS was used to display the information for each parcel on
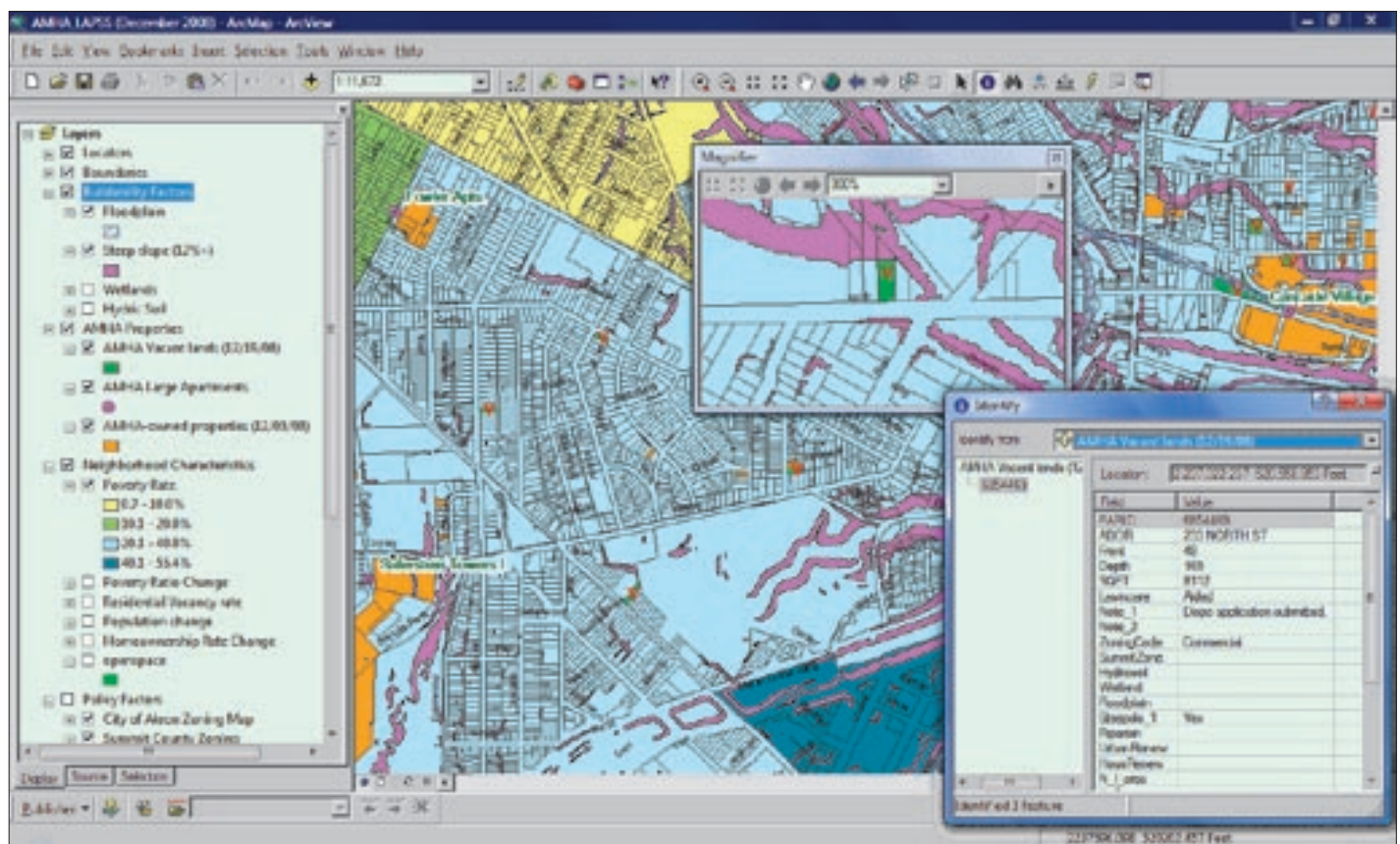
Planning information for more than 200 scattered vacant sites is shown in dark green including policy factors and site characteristics. Shown during an AMHA staff meeting, it improved land asset planning sessions.

a large screen. The real-time visualization of the available spatial information allowed AMHA staff to quickly and easily review the information on each parcel and evaluate the implications of using different criteria to identify buildable and nonbuildable sites. The information was used to classify the vacant parcels into three categories—prime, secondary, and marginal—and develop a plan for holding, developing, or disposing of each parcel.

The ability to interactively analyze and quickly and easily view the available spatial data allowed AMHA staff to engage in a series of highly informative and productive discussions. Information on the various sites that would have previously taken months to obtain on-site could be analyzed quickly and easily at AMHA headquarters. As a result of the meetings, it was decided that approximately one-fifth of the vacant land inventory should be sold to adjacent property owners, local governments, or community-based development organizations.

The easy-to-understand and lively visualization functionality that ArcGIS provided was unanimously praised by AMHA staff and leadership, who had not been familiar with GIS earlier. They particularly appreciated the time savings and the informative planning sessions that ArcGIS made possible.

The vacant parcel information was then used to prepare recommendations that were presented to the AMHA executive director. AMHA staff and leadership could review the vacant land information on their own using a free viewer for ArcGIS.

In addition to vacant land planning, the system is now broadly used for property data management, planning analysis, visualization, and data sharing. The spatial information has provided an extremely useful reference concerning AMHA activities such as preparing a property insurance policy, contracting for property maintenance, and evaluating property assessments, as all AMHA properties have been incorporated into LAPSS.

For more information, contact Jung-Wook Kim, planning and development specialist, Akron Metropolitan Housing Authority, at jkim@akronhousing.org.
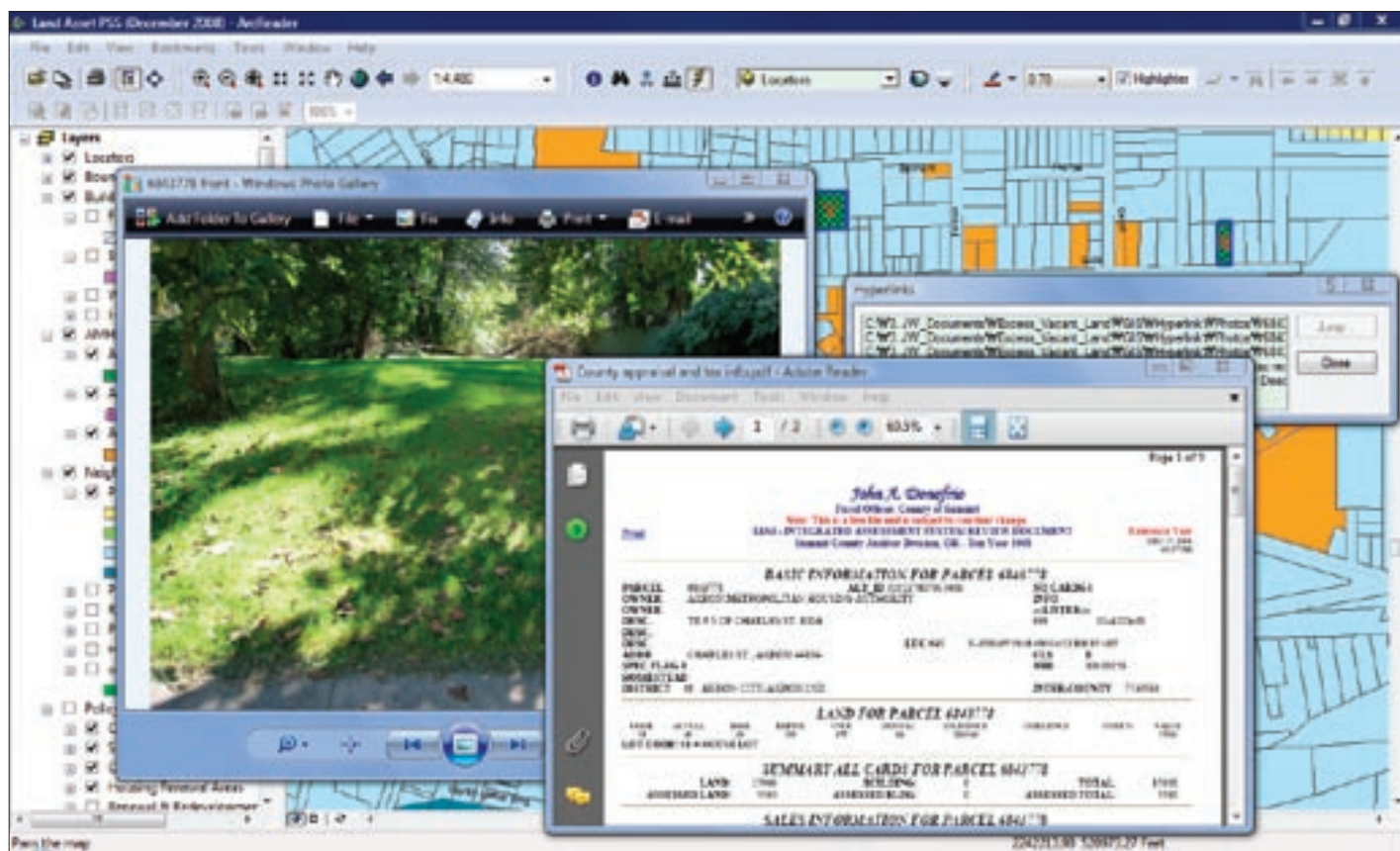
ArcGIS includes a free viewer that provides user-friendly GIS functionality for first-time GIS users on AMHA's asset management staff.

Lake County's Tax Parcels Migrate to an Enterprise GIS

By Larry Duke, Land Records Manager, Lake County, Florida

Since its inception in 1887, Lake County, Florida, has primarily been a rural county whose major products included citrus; corn; and winter vegetables such as cabbages, collard greens, and kale. But in recent years, the county's population has significantly increased since it became a popular destination for retirees, many of whom spend their winters in Lake County, returning to more northerly climes during the summer months. In addition to its seasonal population influx, in the last 20 years, the population of Lake County has doubled, leading to a boom in housing. Many of the area's orange groves and agricultural areas have been transformed into homes and businesses.

With development on the rise, paired with an increase in property values, efficiently managing data on land information became imperative. To help with this issue, the coun-ty strengthened the foundation of its GIS by updating several of its data layers, including its parcel layer. But even with more accurate data resting in its GIS, the information was not easily accessible because it was stored in a UNIX workstation environment. Microsoft Windows-based users of the data relied on local installations of ArcGIS Desktop and Hummingbird Exceed software to communicate with the UNIX server. And because the parcel layer dataset was large, it had to be stored in tiles. This made it very difficult to see how parcel edits were affecting unedited adjoining tiles. In addition, to push the parcel data out to users, it had to be merged into a single dataset. Since this merge was primarily a manual process, it was not performed on a regular basis, and the end-user data was not as up-to-date as possible.

Lake County's data and software interoper-ability problem was, and remains, a common one for other counties of its size. The common solution, and the one with the greatest return on investment, is to implement an enterprise GIS, which is the route that Lake County chose. With Windows SQL as its database, ArcGIS Server as the basis for its enterprise GIS, and a Citrix farm to serve out the data and software, the county began migrating its data into the new system architecture.

Kevin Willis, director of the Lake County GIS Division, said, "The GIS enterprise implementation is a win-win strategy, as it allows us to better leverage our existing resources with a higher return on investment and adds value to more diverse county functions."

After migrating a number of the simple data layers, such as structure locations, hydrants, and annexation boundaries, the county
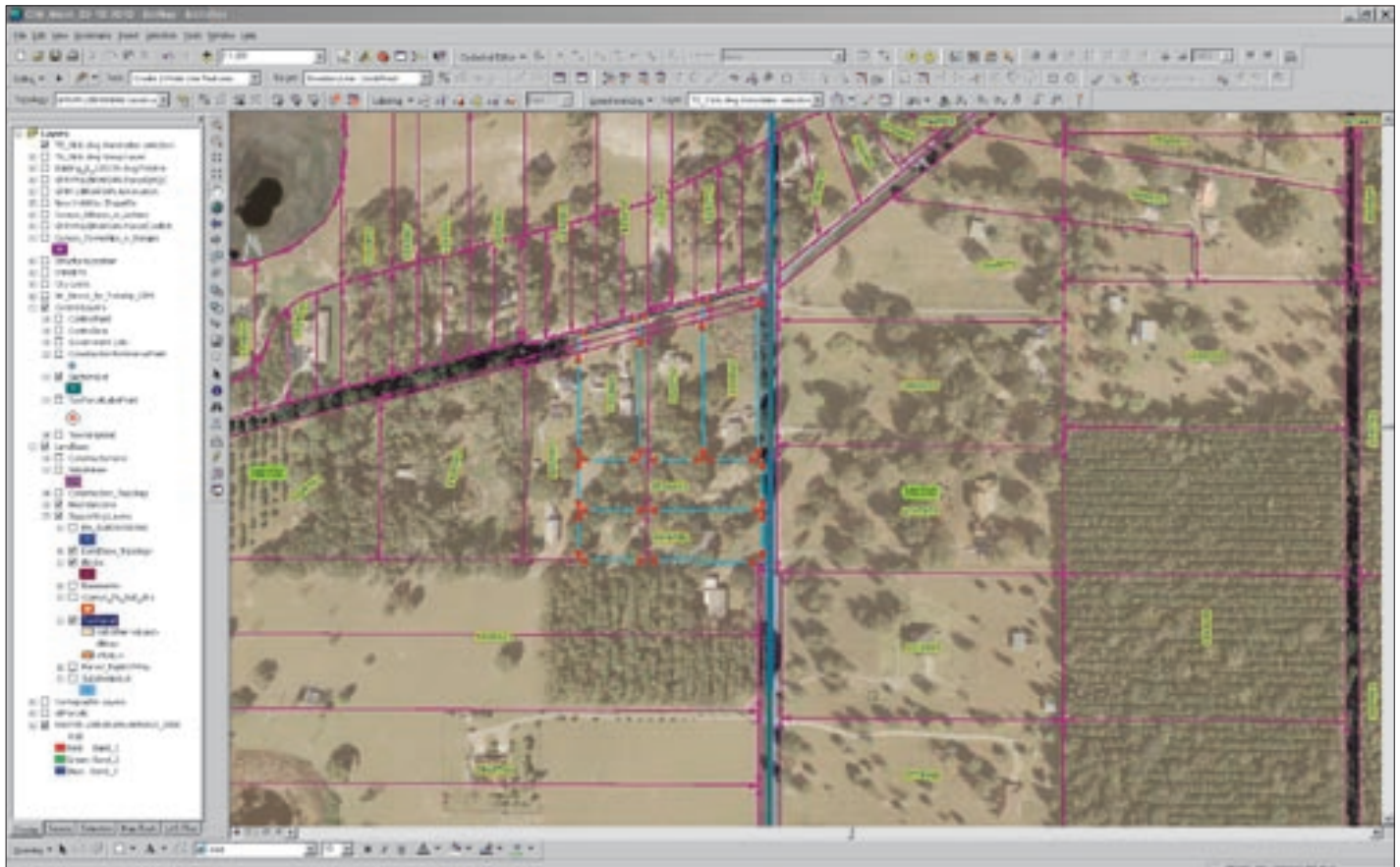
An example of the parcel basemap. The table of contents shows all the feature classes and subtypes, which improves the flexibility of the data for mapping purposes.

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Lake County's Tax Parcels Migrate to an Enterprise GIS

tackled the major task of migrating its parcel base layer. Lake County's Program and Software Support Division (PASS), part of the Information Systems Department, was an integral part of the conversion process, designing the new geodatabases and schema. PASS made development of the enterprise GIS possible at a cost that the county could afford in the current economic climate.

To help put the pieces together with respect to the parcels, Panda Consulting was contracted to review the schema and geodatabases, as well as to provide expertise and advice. The Esri partner and Palm Beach Gardens, Florida-based GIS consulting firm also performed the actual parcel data migration and trained the county's parcel editing staff. The guidance allowed a smooth transition from ArcGIS Desktop to ArcGIS Server, which became the new parcel editing platform. The selection of Panda was based on its ability to perform the conversion at a reasonable cost and its focus

of using out-of-the-box ArcGIS Server tools as the edit environment instead of proprietary third-party software.

Through the efforts of Lake County's Programming and Software Support Division, Panda Consulting, and the GIS Division, the county now provides better GIS services to its staff as well as makes better information available to its citizens via a GIS-based Web site at www.lakecountyfl.gov. The GIS data is updated through a fully automated process on a nightly basis. GIS data and software can easily be made available to all county staff, and the GIS layers are much more accessible via the Web. The parcel editing team now edits a seamless layer that allows team members to see the effects of edits the same way the end user views them. This type of visualization promotes more accurate and useful information. In addition, the original parcel layer, which resided in a single feature class, was broken out into several functional areas.

"The GIS of Lake County has woven itself into all aspects of county government," stated Frank Royce, deputy county property appraiser. "All departments of city and county government and many of the constitutional officers are now on the same page, all working together with the exact same information. It is current information in an instant that can be shared between agencies and with the public." Lake County is now in the process of maximizing the benefits of its enterprise GIS system. The increased functionality allows each layer to be viewed with new possibilities for improvements and innovations. Ideas for new and used layers continue to be explored.

More Information

For more information, contact Larry Duke, land records manager, Lake County, Florida, Office of Information Technology/GIS Division, at lduke@lakecountyfl.gov. GM

Lake County's interactive map allows queries of parcel data by anyone who has access to the Internet.

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