Riverside County Takes GIS to the Next Level

By Monica Pratt, *ArcUser* Editor

Riverside County, located in Southern California, is known for many things. It was the birthplace of the California citrus industry. It is currently the fourth most populous county in the state. And it has been, over the past 50 years, one of the fastest-growing areas in the entire nation.

However, the county's CEO, Jay Orr, wants Riverside County to be known for something else—for being the best place in America to live. Orr believes that the delivery of "customer-centric public service that is better, faster, and fiscally prudent through technology" is critical to making this vision a reality. To help accomplish this, the county has adopted a new enterprise GIS strategy that makes extensive use of ArcGIS Online.

A GIS Veteran

GIS is not new to Riverside County. It was an early adopter of Esri software and began integrating GIS technology into government functions in 1989. The county soon found innovative ways of applying GIS.

For example, in 1993, when fires burned thousands of acres in the county, the GIS team assisted the Emergency Operations Center with its response efforts by identifying the owners of destroyed or damaged properties to speed recovery assistance. Subsequently, GIS also helped determine the boundaries of burned areas so strategies for controlling flooding and mudslides could be developed and damage to environmentally sensitive areas evaluated.

As the cost and operational efficiency benefits of GIS were recognized, individual departments implemented GIS with
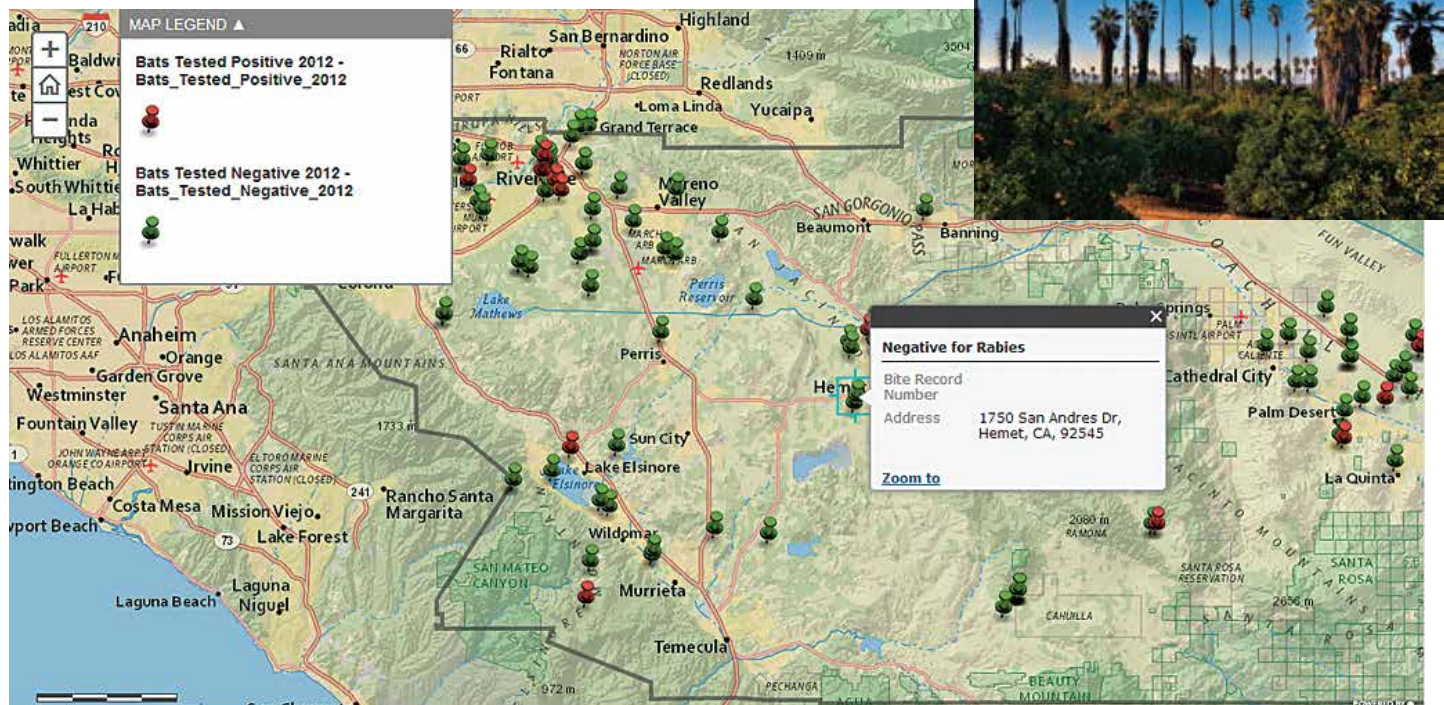
↑ Riverside County uses ArcGIS Online for internally facing web maps like this one showing where bats were trapped and tested for rabies.

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great success. The county Transportation and Land Management Agency (TLMA) and sheriff and fire departments made extensive use of the technology and worked together to facilitate the creation, maintenance, and use of foundation GIS layers such as parcel, road network, and point locations. Other county departments that have made substantial use of GIS include the Riverside County Department of Public Health, the Riverside County Flood Control and Water Conservation District, and the Assessor Clerk Recorder.

→ This three-panel map relates the occurrence, surveillance, and mitigation efforts in response to West Nile virus.
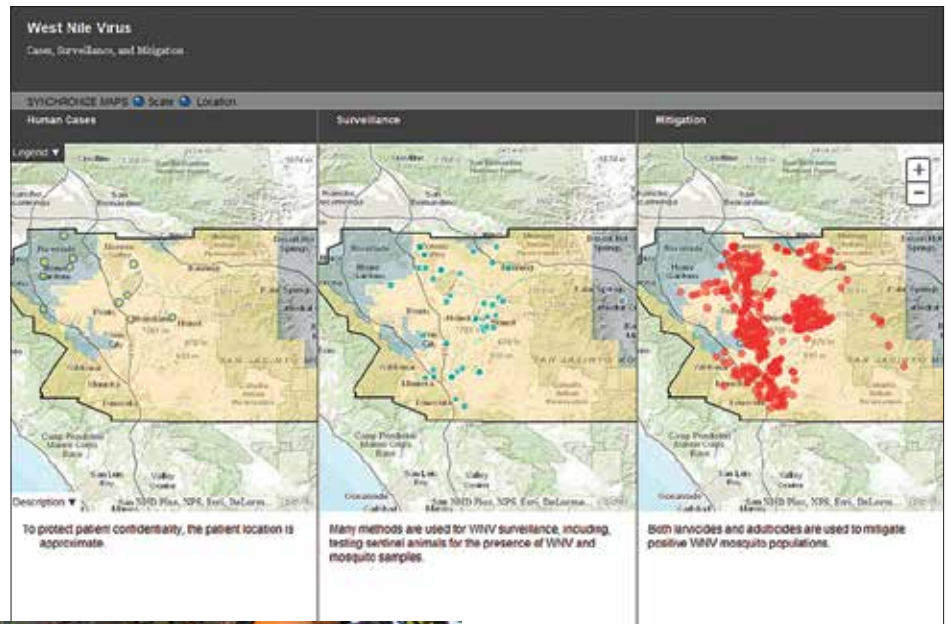
A New Vision

County leaders, who were dealing with the effects of the recent economic recession, began exploring ways that technology could be used to deliver more value for the county. Although it has had a successful history in Riverside County, GIS was identified as a technology with the potential to deliver even greater returns.

The decision was made to move from a collection of individual GIS implementations to a truly enterprise-wide GIS centralized in the Riverside County Information Technology (RCIT)

department. The county's enterprise GIS is not designed to be a one-size-fits-all solution. Riverside County CIO Kevin K. Crawford noted that while it transcends departmental interests, enterprise GIS must support departmental and operational requirements. It must serve, not detract from, the business functions of each department and be implemented to meet the varied business requirements of county agencies. The goal is not just sharing automated data but improving business processes.

"The principle purpose is to implement a shared vision for the use of GIS and geographically based data," according to Colby Cataldi, assistant CIO, who oversees enterprise GIS. "The vision represents the crucial outcome of action, direction, purpose, collaboration, and willingness to bring the best thinking into discussion about global issues that may appear to be unique to a department or agency but may also affect departments countywide."

In 2012, the TLMA GIS group moved to RCIT, and the county created the Geographic Solutions Division (GSD), which manages the county's enterprise GIS. GSD supplies a variety of geospatial services not only to internal customers but also to the Southern California Association of Governments (SCAG); University of California, Riverside (UCR); the Western Riverside Council of Governments (WRCOG); and the Coachella Valley Association of Governments (CVAG).

In 2011, the county entered into a public safety enterprise license agreement (ELA) with Esri. That experience led the county to evaluate a broader,

countywide ELA. With wider access to GIS software, the county could more easily develop a common GIS framework that would improve collaboration within and across departments, make staff more efficient and productive, and enhance customer service. The countywide ELA, signed with Esri in November 2012, has enhanced sharing of GIS information across the organization, with business partners, and the public.

A Dramatic Change

With its ELA, Riverside County gets an ArcGIS Online organizational account that provides a large block of named users and credits. This opens up GIS resources to the entire organization as maps, apps, data layers, and web services, eliminating the learning threshold that had limited access to and benefits from the county's GIS.

With ArcGIS Online, a cloud-based system for creating and sharing maps and geographic information, organizations can upload and easily publish data to create intelligent web maps that can be viewed on any device and embedded in websites, blogs, and applications. ArcGIS Online users have access to ready-to-use, high-quality global basemaps that are constantly updated and data that has been shared by others.

Previously, users of the system needed at least some level of GIS knowledge to directly use the system. Often, the value derived by those working directly with the system was dependent on their skill level with the software. Non-GIS staff members obtained maps and reports by making requests to GIS specialists.

The county will still require GIS professionals to perform analysis, create and maintain data, and develop web maps and apps. However, once created, those maps and apps can be made immediately accessible to knowledge workers, decision makers, other non-GIS staff, and the public via ArcGIS Online. Everyone in the organization can be empowered to get the maps and answers they need. They can also contribute back by adding data,

refining information, and creating their own maps shared on ArcGIS Online. This helps the entire organization by allowing decisions to be made based on the best available information. This dramatically increases the value the county receives from its GIS.

ArcGIS Online is seen by the county as a key component of its enterprise strategy. Implementing ArcGIS Online "will transform the way we spatially interact with data and information," according to Tom Mullen II, assistant CIO. "The ability for policy makers to spatially see the affected areas of the county and how citizens are cared for, in an interactive map, adds to their depth of knowledge and understanding of the unfolding events and how best to effectively respond to the areas of greatest need in a dynamically changing environment. It provides a department [with] the ability to spatially visualize relationships between services they provide and the communities they serve in an interactive map," said Mullen. In this cloud-based environment, users
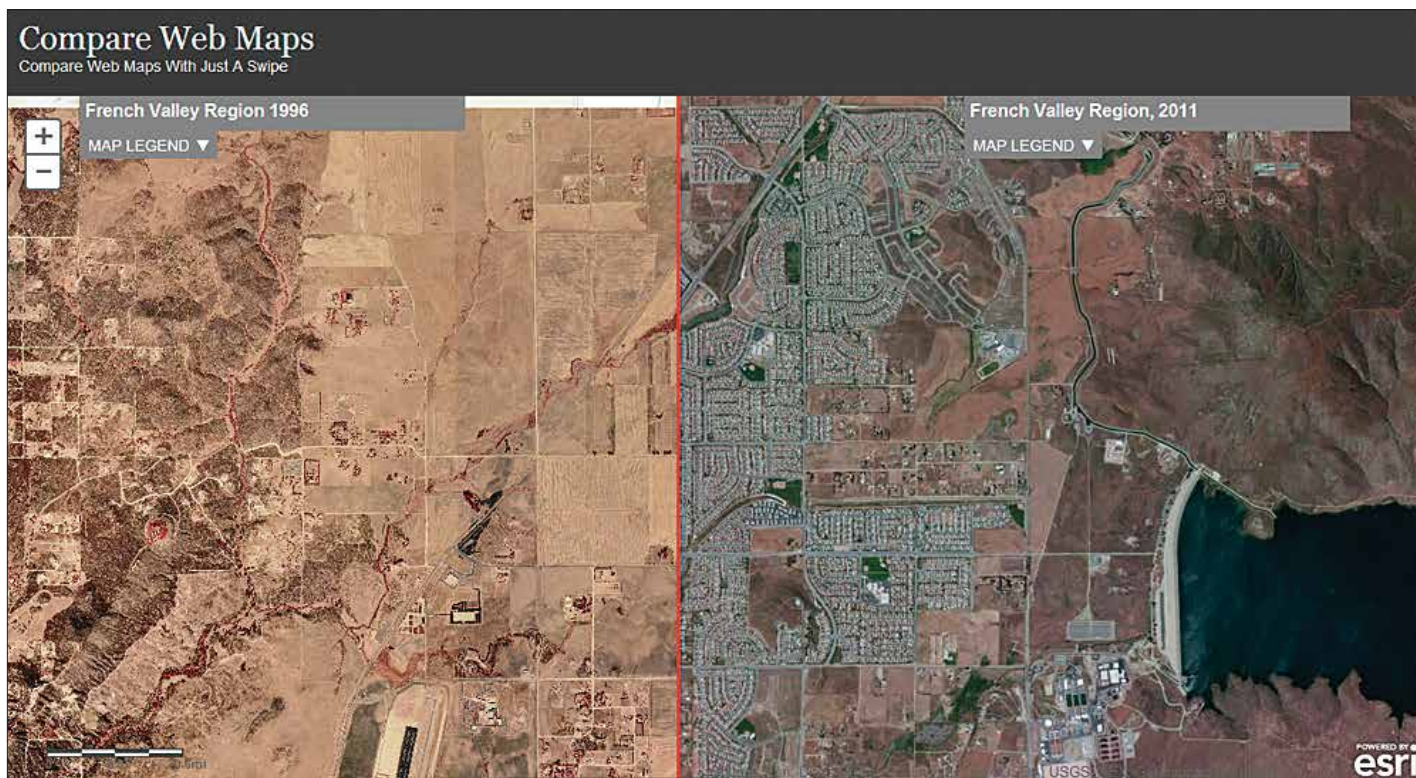
↑ Policy makers can easily appreciate the changes over time to an area known as French Valley.

can quickly create maps utilizing standard templates and best-practice cartography. Using templates also gives maps on the county website a standard look and feel as well as helps county staff rapidly deploy them.

Reaching a Larger Audience

Shortly after signing the ELA in November 2012, the county started creating web maps and apps. By March 2013, the first ArcGIS Online maps were up.

The county's externally facing sites furnish information to county residents and the general public. These sites also promote government transparency. One of the first sites to take advantage of ArcGIS Online capabilities was the Meet the Supervisors site. Using an Esri story map template, this site introduces each supervisor, indicates the location of the district served by that supervisor, and links directly to individual district websites.

The County of Riverside Ag Trail website leverages ArcGIS Online through a collection of embedded web maps that show the location and give directions and website links to more than 100 businesses and events related to agriculture in the county. This information is of interest to both residents and tourists. Maps feature farms; wineries; fairs and festivals; and stands and markets that sell

organically grown products, fresh fruits, and vegetables.

Because building healthy communities is a top priority for the county, the Riverside County Department of Public Health (DOPH) has used ArcGIS Online to create many kinds of information products, such as the County of Riverside Healthcare Inventory map, which helps residents locate health service providers near them such as hospitals and clinics.

Other county internally facing websites use ArcGIS Online maps to enhance communications within and between county agencies and departments to improve operations. The Department of Animal Services tracks the occurrence of rabies in bats by mapping locations where it has impounded bats and results of tests on those bats.

The West Nile Virus Activity map reports the location and status of surveillance traps, the location of spraying sites, and the boundaries of vector control districts in the county. Information on the occurrence of West Nile virus in the human population, as well as surveillance activities and mitigation efforts, can be compared using a three-paneled web mapping application. (Patient confidentiality is protected by supplying only approximate locations on the map.) Some ArcGIS Online maps, like the

Licensed Healthcare and Social Vulnerability map, help policy makers identify potential problems so they can be mitigated. On this map, care facilities, services, and clinics are mapped against the USA Social Vulnerability Index (SoVI), which measures the vulnerability of US counties to environmental hazards based on factors that may reduce a community's ability to recover from floods and other hazards.

Other maps provide greater perspective for policy makers. A three-panel map shows changes in the population density for the desert community of Mecca. Data for 2000 and 2010 can be compared with projections for 2050. Another map lets the user swipe across the map to compare the dramatic growth that has occurred between 1996 and 2011 in a portion of southwestern Riverside County known as French Valley. Maps like these can help county staff make better decisions regarding where to strategically locate resources to best serve the needs of residents today and tomorrow.

Ingredients for Success

A clearly enunciated vision of the role of GIS in the county and buy-in by the top departmental leadership have contributed to the success and growth of enterprise GIS. By eliminating redundant and competing systems, the county is saving both time and money. ArcGIS Online is making information in the county's GIS directly available to knowledge workers and decision makers in a timely fashion.

The enterprise GIS remains a work in progress according to the county's CIO. The county will focus on the five patterns of GIS business behavior: data management, planning and analysis, field mobility, operational awareness, and citizen engagement. "Moving forward, Riverside County will develop and deploy a common GIS standard and continue to leverage the power of geographic data in an effort to expand the use of shared information; improve the business processes; and promote more timely, informed decisions," said Crawford.

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Open Data Initiative Previewed at Federal Conference

Organizations Can Create Custom Websites to Serve the Open Data Community

At the Esri Federal GIS Conference in Washington, DC, in February, Esri showed enhancements to ArcGIS Online that allow organizations to create custom, open data websites. Attendees saw how these enhancements simplify making geospatial data accessible to the public.

The upcoming release of ArcGIS Online gives organizations out-of-the-box tools to share authoritative data with their open data users. Members of the public can then search and download data by topic or location, filter to discover information, and immediately see it on an interactive map.

"The new ArcGIS open data capabilities make it much easier for organizations to provide open data access to the public," said Andrew Turner, chief technology officer, Esri R&D Center, Washington, DC. "We are particularly excited about how this new technology supports the federal government's open

data initiatives. Open data published using ArcGIS is also a fantastic resource for entrepreneurs who need authoritative and reusable data to build innovative mobile and web applications."

To learn more, visit arcgis.com.

↑ In the upcoming release of ArcGIS Online, open data can be easily filtered and seen on a map.

Start-ups in the Spotlight at Inaugural CIO Summit

By Monica Pratt, *ArcUser* Editor

More than 100 CIOs—from start-ups, businesses, and governments—who were invited to the 2014 Esri Public Sector CIO Summit learned how GIS solves real problems in ways that matter. The event was held January 15 and 16, 2014, at Esri's headquarters in Redlands, California.

Traditionally, the CIO was the chief information officer for an organization. This was the person who managed the computer systems and worked on improving clerical productivity. More often these days, the *I* in *CIO* stands for innovation rather than information. In government as well as business, the CIO has become the driver of innovation designed to deliver better service or greater sales.

The summit served as a bit of a matchmaking service, introducing CIOs to GIS-driven solutions from the start-up community and Esri. CIOs met representatives from start-ups that are creating the next generation of tools, services, and resources for solving tough problems and enhancing the lives of citizens. Executives from start-ups D4H; MindMixer; Recovers; RFSpot;

↑ "GIS is in everything you do and changing how we live," said Steve Ressler, founder and CEO of GovLoop.

RideAmigos Corp; OpenCounter; Sensimob; thrdPlace; Valarm; and WorkHands, Inc., were on hand throughout the event.

GIS and innovation were recurrent themes in the Lightning Talks given during the summit by Recovers, MindMixer, D4H, and thrdPlace. In his Lightning Talk, Chris Kuryak, chief operating officer for Recovers, observed that when a disaster strikes, individuals look first to local government.

Because local governments are not set up to handle a barrage of phone calls, e-mails, texts, and other forms of communication from constituents, they can quickly become overwhelmed. This can result in little to no response from governments, which squanders the strong but short-lived interest of residents wanting to help out.

Typically, 70 percent of offers of aid are made in the first four days after a disaster. Even with no encouragement, many local groups will step in to help but may not know how or whom to help. Recovers harnesses the good intentions of residents and others in communities dealing with disasters such as floods and tornadoes by connecting local needs with local resources and government. It also helps communities prepare for and recover from disasters by coordinating relief efforts.

Esri's new Partner of the Year, MindMixer, set out to reinvent the town hall meeting and capture great ideas. Nathan Preheim of MindMixer, formerly an urban planner, saw firsthand how traditional town hall meetings involved a small

← "I like to think that geography component really elevates governance into the 21st century," said Nathan Preheim of MindMixer.

↑ Innovation Community Panel moderated by Robin Jones, Esri (right), with Clara Brenner, Founder and CEO, Tumml, and Thomas Fisher, Dean of the College of Design, University of Minnesota.

number of citizens who have an inordinate effect. MindMixer believed there had to be a better way to engage citizens.

These days, citizens are online and texting, and that is where they should be engaged. Preheim and cofounder Nick Bowden wanted to use technology to discover great ideas, gather valuable feedback, and measure impact. This cycle results in actionable data that lets governments make more informed decisions. Preheim refers to MindMixer as "a decision support service."

In addition to hearing directly from innovators, the summit hosted panel discussions about how business intelligence is improved by location analytics. Over two days, attendees listened to talks and panel discussions highlighting how GIS is helping drive innovation in established and emerging companies and government agencies of all types.

Steve Ressler, founder and CEO of GovLoop, praised governments for the important work they do but noted that they must deal with increased demands for government services, staggering deficits, rapid technology change, and a retiring work force that is taking its expertise with it. These developments in technology give governments the opportunity to come up with new solutions to cope with this changed landscape.

Often heading efforts to deal with this situation is the chief innovation officer, characterized by Ressler as "the free safety of government innovation." And GIS is powering many of these solutions. "GIS is in everything you do and changing how we live," he said. As one of the largest purchasers of technology, governments are in a position to benefit from these advances in technology, particularly GIS.

In his talk, Esri president Jack Dangermond noted that after 40 years, GIS is growing faster than it ever has. Changes in technology continue supporting the adoption of GIS. Today's web GIS is not like the GIS that ran on mainframes or later GIS that ran on minicomputers; workstations; PCs; client/servers, and now, servers. With each of these stages, there have been orders of magnitude in increases in usage. In the age of cloud and web GIS, usage has gone from millions to hundreds of millions. In all these cases, GIS continues to deliver value in the context of making better decisions, improving communication, and driving efficiencies in every field.

Government GIS is becoming an infrastructure for the other information systems in an organization. Some governments, like those in Abu Dhabi and Geneva, Switzerland, have their IT systems wrapped in GIS. Large corporations like General Motors Company, Nike, McDonalds, and Starbucks are also seeing their businesses spatially. Bruce Wong, manager of advanced network analytics for General Motors Company, described how an established and substantial company is using spatial analytics to better understand its dealer network.

During a panel discussion on community innovation, Esri platform adoption business manager Robin Jones sat down with Tumml founder and CEO Clara Brenner and Thomas Fisher, dean of College of Design, University of Minnesota, to talk about the work that is being done to improve life in cities.

Brenner's San Francisco-based Tumml, a 501(c)(3) nonprofit, nurtures what she termed "urban high-impact

entrepreneurs." These start-ups provide products and services that address problems unique to cities.

Tumml gives mentoring and seed money in exchange for a five percent equity stake in the new business. Tumml is looking for businesses, not projects. HandUp, a crowd-funding platform for the homeless, is a Tumml alumni. Another company that got its start with Tumml was WorkHands, which has been described as a blue-collar LinkedIn. It not only addresses unemployment but connects workers and employers in the right place. This has become increasingly important as more cities mandate local hiring.

Brenner noted that these start-ups need the right data to thrive. Often, the right data is maintained on a regional or state level, not by a city. Access to the current data at the right level is vital to success.

Fisher's institution does $800 million in research work. Right now, he feels the most important work his students are doing is in the invisible design world of the systems, networks, infrastructures, processes, and procedures that relate directly to the success of organizations.

He observed that we are living in cities designed around the needs of the Second Industrial Revolution, which was based on mass production and consumption. That economy "is in its end game," Fisher said. We are in a "phase change" as we transition into a third industrial revolution. "The way people live, work, and make things is going to radically change," said Fisher. He sees cities moving from rigid segregation of business, residential, and leisure uses to design that has people working, living, and playing in the same place.

GIS and, specifically, geodesign are powerful tools that will help cities face the challenges of a new era. Fisher believes that if we map our assets, we will realize the wealth of human, social, cultural, and environmental capital that cities possess, which has the potential to solve many of these issues. "Innovation is both learnable and teachable," said Fisher. "Everyone can learn to be more innovative."

New and Noteworthy

OpenCounter

Peter Koht, formerly an economic development professional with the City of Santa Cruz, California, and Code for America fellow Joel Mahoney wanted to make the permitting process easier for entrepreneurs. They created OpenCounter to provide a way for new business owners to visit their city-sponsored application; answer a few questions; and get an overview of the requirements, fees, and processing times that will apply to their business and location. The approach helps serve the small business community and promotes economic development and job creation.

OpenCounter.us

↑ OpenCounter helps new business owners through the permitting process.

Valarm

Valarm is a mobile and cloud platform for sensor networks, remote environmental monitoring, mobile data acquisition, and asset/vehicle tracking. With Valarm, you can track almost anything via GPS and remotely monitor environmental factors, equipment status, or machinery location using built-in and external sensors. Valarm's hardware and services integrate easily into the Esri system.
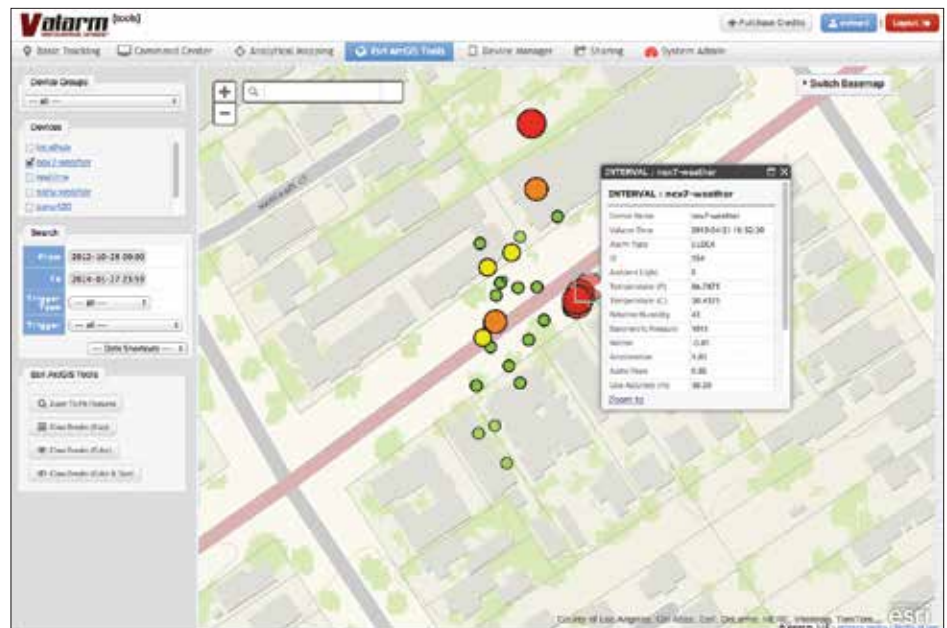
Valarm.net

↑ Valarm's real-time environmental sensor data integrates with Esri GIS technology.

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ArcGIS Improves Water System Permits in Kendall County, Illinois

By Todd Drefcinski, LEHP, Assistant Director, Environmental Health Services, Kendall County Health Department, Yorkville, Illinois

Prior to 2001, the Kendall County Health Department (KCHD) stored all well and septic permit data in large binders. In those days, it would take hours to locate a record as staff manually flipped pages, searching for a matching address or the original homeowner name.

As the Environmental Health Services (EHS) unit grew and residential development increased, it realized the books would no longer be an appropriate means for data storage. In 2001, the staff created a new database system to log permit records. They began entering all permit data into spreadsheets on the office computer (they only had one desktop PC back then). Nearly 10,000 records were manually entered into databases. It took vision to determine that the data needed to be in a better format for searching and sharing down the road.

That same vision had the unit searching for different ways to manage the data on a very tight budget. Soon after the
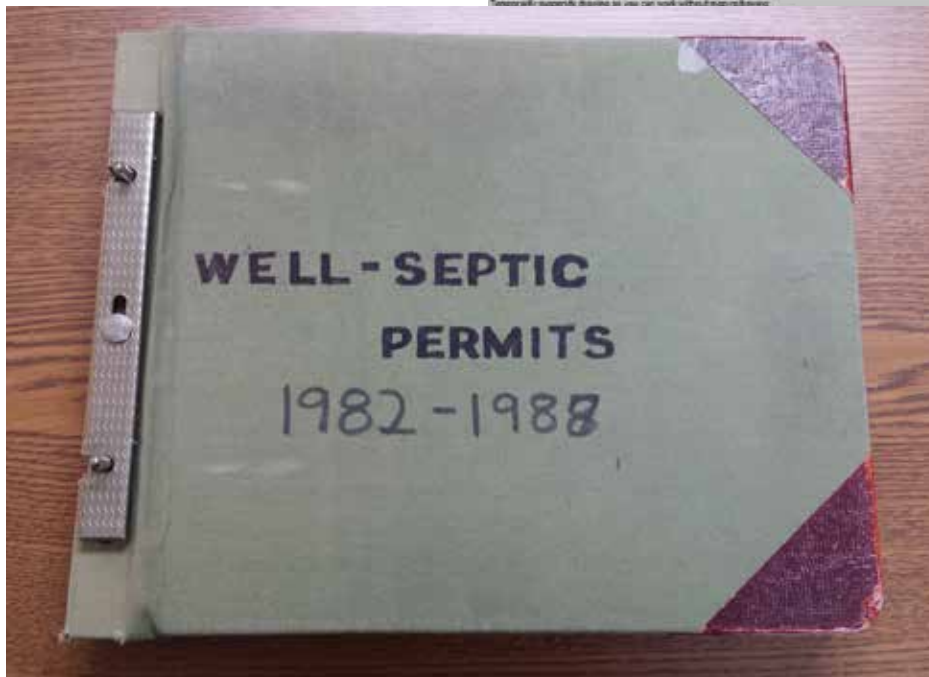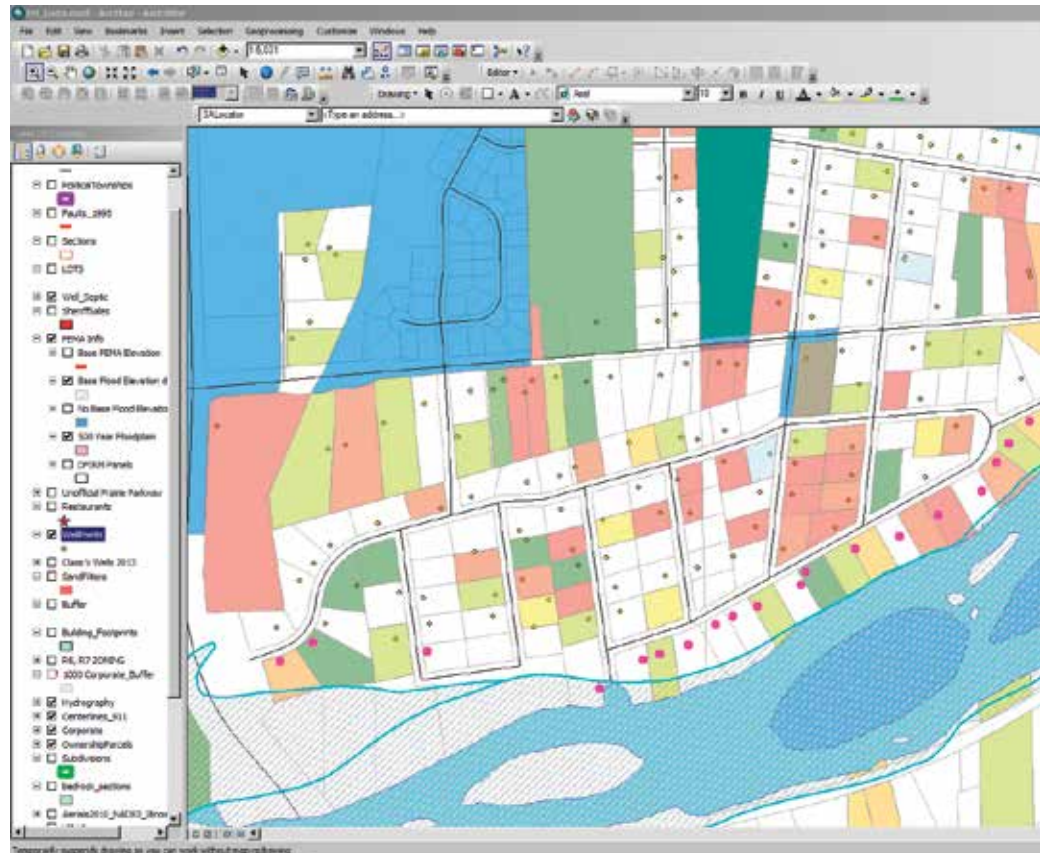
↑ The round points visible in this image are private water well locations. The darker points are private water wells located within a 250' buffer of the Fox River. KCHD worked closely with the county GIS coordinator after a recent flood event to develop ways to identify wells at or near the known flood elevation. The shading on the parcels relates to specific attributes in a permit record (i.e., well depth, corporate boundaries). Many of the parcels in this image were drilled prior to KCHD record keeping (1972), so not all parcels have been linked to permit records.

creation of the databases, the EHS unit realized that scanning the permit records into an electronic format would be the next leap forward and that electronic records would be helpful down the road. Due to the sheer volume of paper permit files (nearly 10,000), the unit was unable to dedicate staff to the scanning process, instead choosing an outside vendor to handle the task.

↑ Example of an Old Permit Record Book, Which Were in Use until 2001

EHS Hooked on GIS after Initial Use

However, budget limitations meant that the bulk of the scanning had to stretch over 3–4 years. During that same period, the unit began discussing the use of GIS to store and manage these records. Ideas for GIS development led to discussions with other local county health departments and the county GIS coordinator.

In 2006, KCHD EHS began using a Thales Mobile Mapper CE handheld GPS receiver to collect locations of private water wells. This was the health department's first use of GIS handheld technology. Sanitarians and interns walked door-to-door in unincorporated areas of the county. They met with residents to discuss private water well maintenance and groundwater protection. During site visits, the surveyors provided door tags containing information on upcoming free well and septic seminars offered

at KCHD. After the site visits, the well locations were entered into the county GIS by the GIS coordinator, Don Clayton, and his staff. This project marked the first time EHS worked with GIS, and like most other users, the department was hooked. EHS immediately began thinking about other ways to utilize GIS for environmental health programs.

In 2007 and into 2008, EHS added an additional component to the well point data collection project: the unit compiled fact sheets on groundwater and private water wells and placed them in packets for residents, delivered during the door-to-door site visits. Funding for the packet materials was provided by a local groundwater protection committee, the Northeastern Illinois Regional Groundwater Protection and Planning Committee (one of four IEPA funded groundwater protection committees in Illinois).
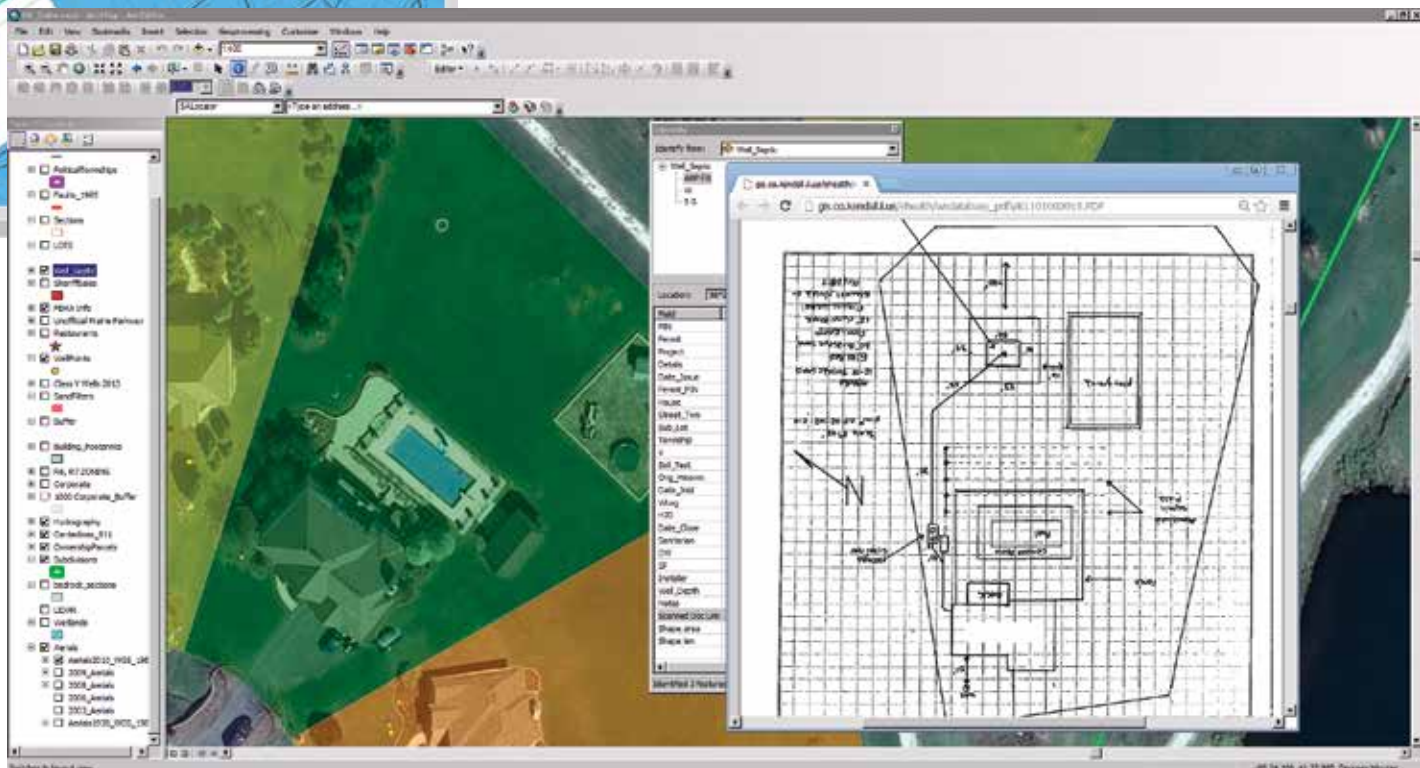
↑ The round points visible in this aerial image are private water well locations. The drawing is the as-built, which is completed by EHS sanitarians after the well and septic installation inspection. All permit attributes previously stored in Excel have been pulled over as attributes for use in ArcGIS. Those attributes are visible in the Identify window, behind the scale drawing. The full permit record is linked to the parcel ID number. By clicking Scanned Doc Link (highlighted in the Identify window), the full permit record opens in a browser window.

ArcGIS Improves Water System Permits in Kendall County, Illinois

Birth of Private Well Education & Mapping Project

The project then was given a new name: The Private Well Education & Mapping Project. In 2008, KCHD EHS began working with ArcGIS for Desktop as part of the Private Well Education & Mapping Project. One ArcGIS for Desktop license was provided for the EHS unit (all staff now have a PC at their workstations). Initially, staff used the program to add/move well points. This basic use of ArcGIS for Desktop opened people's eyes to the power of the program. The Private Well Education & Mapping Project continues to take place as time permits during summer and fall.

Within a few months of obtaining the license, EHS was asking for different layers for the table of contents. It began thinking of other data that could be incorporated into GIS. After some discussion, it set its sights on a huge target—incorporating all the scanned well and septic permit records into ArcGIS for Desktop. The wish was to click on a parcel and bring up any permit records associated with it.

Over the next three years, EHS worked with the county GIS coordinator to develop the system and add data. EHS

secured an additional software license for ArcGIS for Desktop and began working more with the program. In 2011, it set a goal to incorporate all well and septic system records before the end of 2012. The department reached that goal. In 2012, EHS set a goal to incorporate all well and septic records before the start of 2013. It reached that goal six months early. In early 2013, it left the old spreadsheet system behind and started entering all new well and septic permit data into ArcGIS for Desktop.

Fully Integrated GIS at Little Cost

Currently, EHS is managing all new permit-related data in ArcGIS for Desktop, also scanning permits into the system once the permits have been closed. This GIS integration process involved a lot of training and the development of several "how-to" documents for the EHS unit. As might be imagined, the training has been conducted in-house by the GIS coordinator and EHS staff to limit costs.

The data has always been the backbone of the environmental health programs, and now EHS can access this data quickly and efficiently. At the present time, the department is able to click on

a parcel/lot, pull up all well and septic permit information, and share the permit record via e-mail in a matter of seconds. It no longer needs to open large binders, multiple databases, or programs to view, edit, and manage the data. It's reached its goals for viewing and managing the data. Now, it's setting new goals for the future. It has taken some time from concept to inception, but the slow progress worked well for the Kendall County Health Department Environmental Health Services unit. The well and septic records are the largest, most complicated dataset the unit maintains. The group is confident that it can incorporate other programs into ArcGIS for Desktop if/when it chooses to do so. Advice for other local government agencies is that it is possible to fully integrate into GIS for a very small monetary investment if they're willing to invest some time and have support from their departmental administration, county mapping, and GIS and/or IT departments.

For further information on Kendall County's use of ArcGIS for Desktop, contact GIS coordinator Don Clayton at dclayton @co.kendall.il.us or Todd Drefcinski, assistant director, Environmental Health Services, at tdrefcinski@co.kendall.il.us.

Visit Kendall County Health Department's environmental health programs at http:// health.co.kendall.il.us/ Environmental/index.html#

ArcGIS Online Delivers Results in Lithuanian Elections

In October 2012, Lithuania held two rounds of elections for the 141 members of its national parliament and a referendum on construction of a new nuclear power station. To help voters better understand the election results, Esri's Lithuanian distributor HNIT-BALTIC, UAB created a series of maps on ArcGIS Online.

The maps on vrk.maps.arcgis.com showed election results according to political party and candidate, referendum results, polling locations, and voter turnout. For comparison, historical maps allowed people to see results and voter turnout from the previous parliamentary elections in 2008.

"We were happy to create the gallery of election maps in collaboration with HNIT-BALTIC," said Zenonas Vaigauskas, chairman of the Central Electoral Commission of the Republic of Lithuania. "We wanted to use the newest online GIS technology to convert all the data we had in tables and charts to web maps. Previously, we didn't have tools to present election data in such a visual way, to show how it changes over time, and the activity of the electorate. It's easier to understand this kind of data in maps than in tables and charts."

The Central Electoral Commission included a link to the maps on its website, and leading newspapers featured them in their election coverage. The ArcGIS Online site included instructions for journalists who wanted to embed the maps into their websites.

On election days, the Central Electoral Commission posted results data in tables as it became available. HNIT-BALTIC received the data soon after it was posted and then updated the maps to keep the public informed of the latest results.

After the first round of elections on October 14, the home page of the election map site had more than 800,000 views. After the second round of elections on October 28, the page views were up to more than one million.
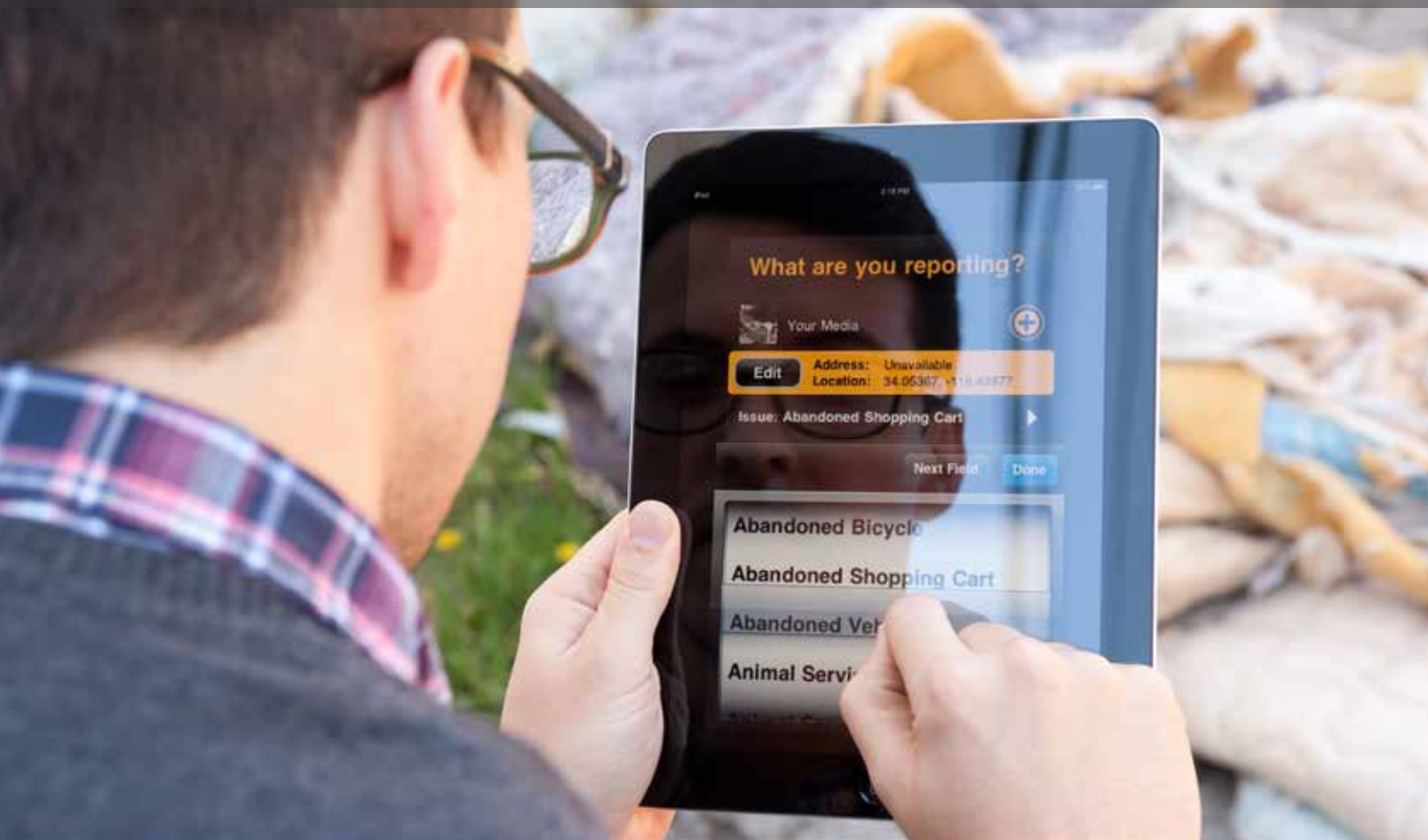
"Online electoral maps allowed people to not only find their voting district, polling location, and the shortest way to it but also opened wide possibilities to track election results in real time; compare maps; combine different data; analyze them; and make decisions based on easy-to-access, understandable web maps," said Linas Gipiskis, managing director, HNIT-BALTIC.

For more information, contact Linas Gipiskis, managing director, HNIT-BALTIC, at lgipiskis@hnit-baltic.lt.

← Election Results in Single-Member Constituencies

# Douglas County Meets Growing Demand for Parcel Maps

ArcGIS for Land Records with Parcel Fabric Helps Create and Manage Parcel Maps

Demand for the property maps maintained by local and regional governments is steadily growing. Their core function—showing where one property ends and another begins for tax levies—is now just one of multiple uses by governments and others.

One recent example was the aftermath of Hurricane Sandy, which struck the eastern United States in 2012 and caused an estimated $71 billion in damages. To assist in recovery efforts, adjusters from private insurance companies and the Federal Emergency Management Agency relied on local land records to assess and understand the damage. Yet, while demand for land records grows, funding for the agencies that create and manage them shrinks, forcing officials to seek efficiencies and reconsider traditional approaches. Hundreds of cities and counties have consolidated the many different functions that go into creating and maintaining land records by using the parcel fabric templates.

Consider Douglas County, Nevada. The county's challenges have a common thread to local governments everywhere in that they revolve around land records management.

In Minden, Nevada, the picturesque semirural community east of Lake Tahoe and the Sierra Nevada mountain range, Douglas County GIS supervisor Eric Schmidt's four-person GIS team delivers services not only for the team's employer Douglas County but also for neighboring Storey and Lyon Counties and historic Carson City, a tourist destination 14 miles to the north. Schmidt was experienced with Esri software before joining Douglas County and switched the department to the ArcGIS platform. Prior to Schmidt's arrival, the county used ArcView, but mainly for collaboration with the local 911-CAD system.
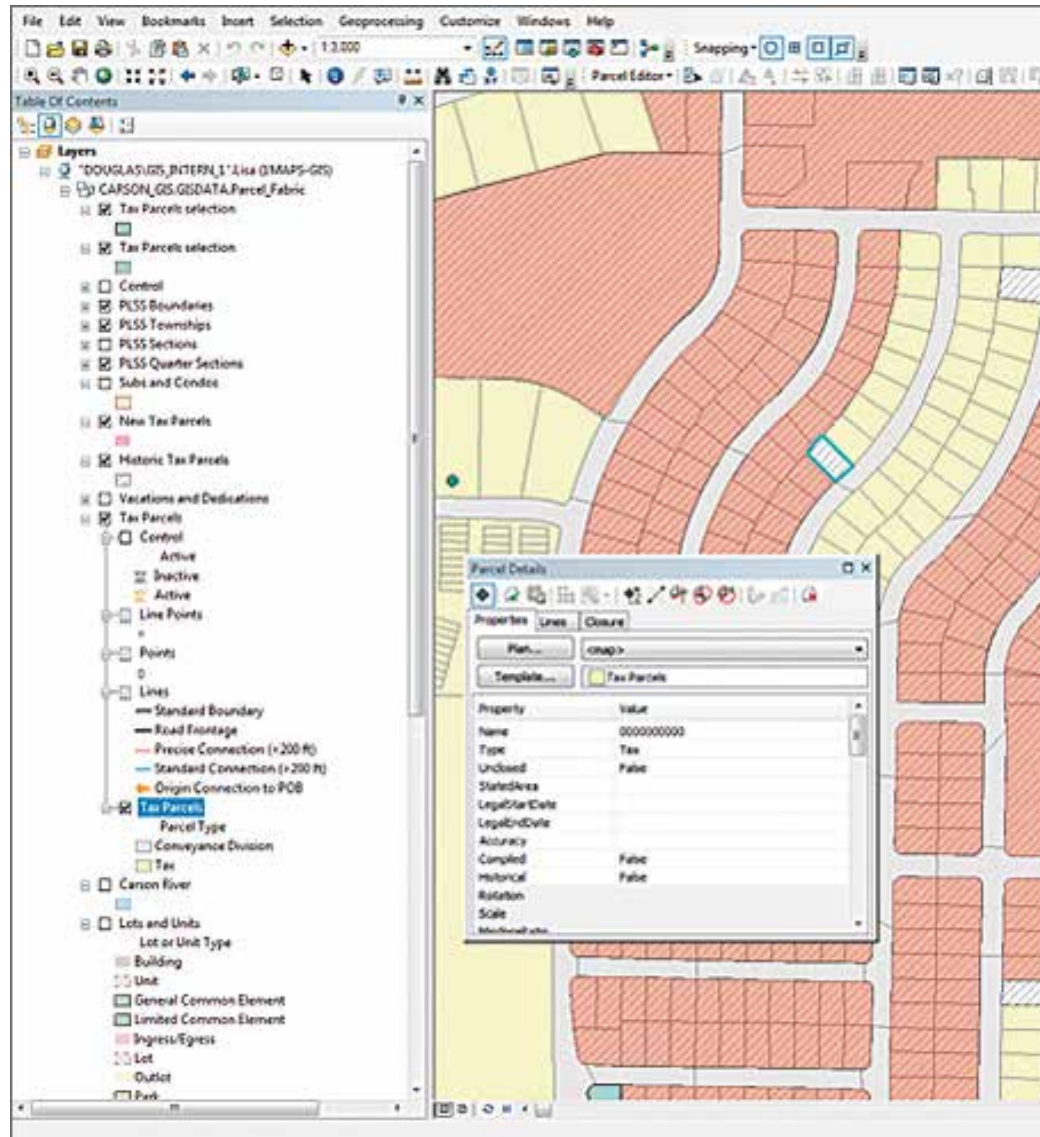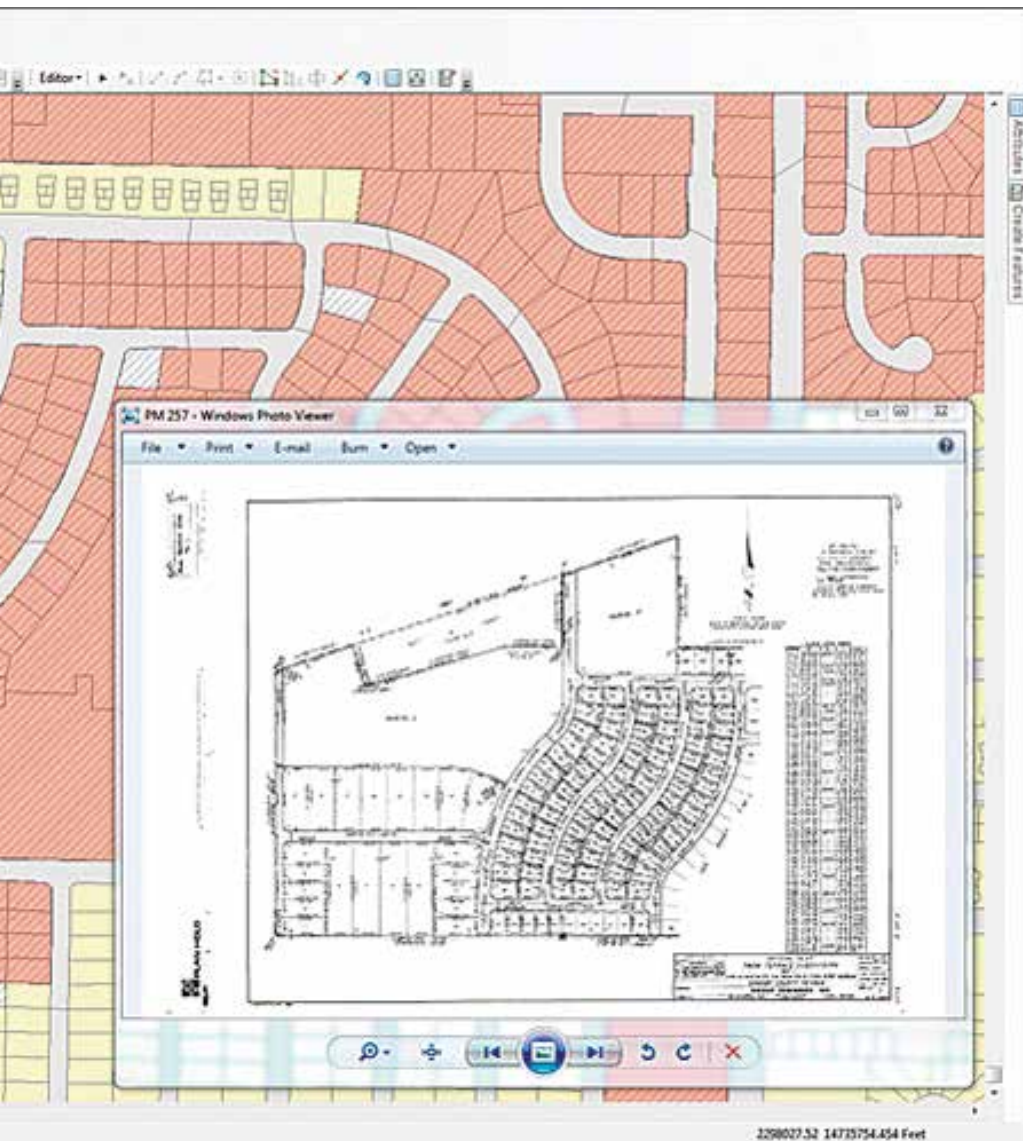

Douglas County is in the midst of advancing its GIS services using the ArcGIS for Land Records solution. Part of Schmidt's vision was to expand the GIS team's capabilities beyond producing printed maps for clients in departments throughout Douglas County and its neighbors. Because the GIS team was well established even before his arrival in 2010, it was kept busy filling requests for hard-copy maps.

"That left precious little staff time for anything else," Schmidt says. He and his staff were quickly able to take advantage of downloadable applications and workflow templates available for the land records solution. And even though their GIS department doesn't have a developer on staff, they could build the kind of applications they needed.

"These templates allow us to put GIS in the hands of non-GIS practitioners so

↓ The Douglas County, Nevada, GIS team uses the ArcGIS for Land Records solution and its parcel fabric to manage parcel maps for itself and other city and county governments it serves, including historic Carson City, Nevada.

to one piece are automatically transferred to every other piece affected. Like the Land Records solution, parcel fabric is included as part of ArcGIS for Desktop Standard and ArcGIS for Desktop Advanced licenses.

With the parcel fabric, users can take advantage of parcel polygons that are created from boundary lines and points with associated accurate legal information stored as attributes. This allows the user to have a seamless network of parcels with important legal dimensions. These points, lines, and polygons are easily updated using efficient editing tools designed specifically for maintaining land records. Users can also easily track the history of parcels and link to related record documents like deeds and surveys.

Schmidt and his team worked with Esri Professional Services to help migrate parcel data into the parcel fabric in a process known as a jump start. Over a three-day period, Schmidt's team and Esri migrated all the data for Carson City. As part of the process, Esri consultants explained the structure of the parcel fabric, the parcel types defined in the Local Government Information Model, and parcel fabric editing. They also traveled with the team to Carson City to review assessor map books and the data structure.

For more information, contact Eric Schmidt, Douglas County, Nevada, GIS supervisor, at eschmidt@co.douglas .nv.us, or Daniel Stone, Esri, at dstone@esri.com.

that they can have immediate access to data for decision making," says Schmidt. "This is freeing us up to refine our workflows, deepen our data, and expand our sphere of service."

Since ArcGIS for Land Records is a commercial off-the-shelf (COTS) solution, it uses implementation patterns common in local government for land records. These include efficient data management, spatial analytical tools for value analysis, data

access in the field, executive dashboards, and communicating information to the public. Unlike highly customized systems, COTS software is updated and supported.

In 2012, Schmidt's team was ready to start using the Esri parcel fabric—a dataset that is part of the Land Records solution—to help create and manage parcel maps. The parcel fabric enables users to stitch land parcels together like pieces of a quilt. That way, adjustments

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