Energy Currents

Esri • Summer 2011

GIS for energy

Arizona Public Service Makes It Happen

By Jessica Wyland, Esri Writer

Driven by the motto "The Power to Make it Happen," Arizona Public Service (APS) staff consistently look to improve outage response and vegetation management. At the same time, APS stays ahead of the curve on new utility challenges such as smart grid and renewable energy.

APS, headquartered in Phoenix, is Arizona's largest and longest-serving electricity utility with more than 1.1 million customers in 11 of the state's 15 counties. Integral to the success of a utility is the wisdom to take full advantage of resources, and APS does just that with its geographic information system (GIS) technology.

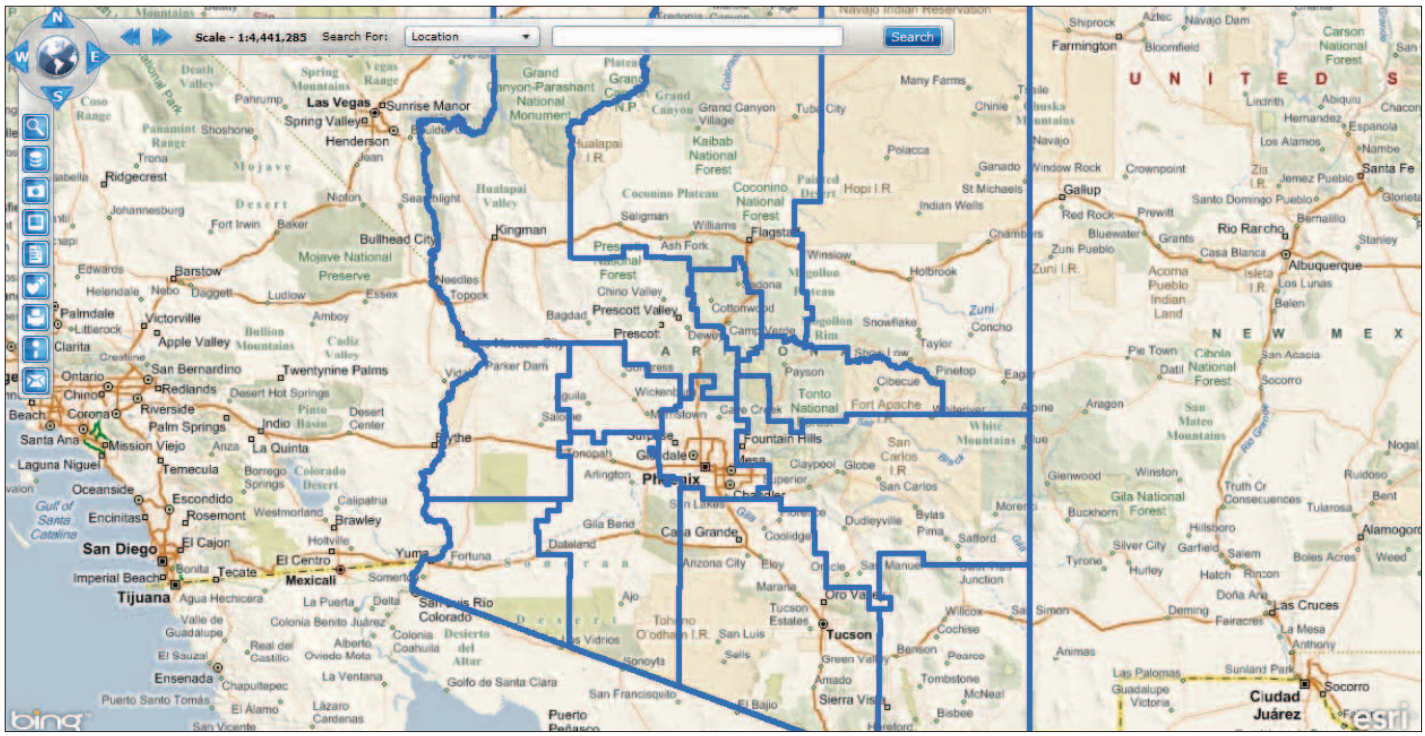
Recently, APS expanded the use of GIS by developing a web-based application for company-wide viewing, planning, analysis, and data management.

The web-based application, developed with ArcGIS API for Silverlight, is used by field crews, engineers, and decision makers to meet crucial utility requirements such as smart meter installation, vegetation management, and pole inventory.

The application was built to provide a near real-time look into the enterprise GIS distribution facilities geodatabase (GDB). This GDB is updated daily as new facilities are installed and old facilities are removed or maintained. Spatial analysis capabilities allow personnel to query specific devices or view a specific area in the network.

continued on page 11

In This Issue



The Arizona Public Service basemap allows customers to navigate to their service area, separated by divisions such as northwest, southwest, northeast, southeast, and metro.

Esri on the Road

American Public Gas Association
July 24–27, 2011
Memphis, TN USA
www.apga.org

NISC Member Information Conference
Week 1: September 7–9, 2011
Week 2: September 12–14, 2011
St. Louis, MO USA
www.nisc-mic.coop

Itron Users' Conference
September 18–20, 2011
Scottsdale, AZ USA
www.itron.com

SAP for Utilities
September 18–21, 2011
San Antonio, TX USA
www.sap-for-utilities.com

Esri Online

Electric and Gas Resource Center
The Electric and Gas Resource Center is the place where you can find ArcGIS maps and apps that help you manage geographic information, visualize trends, and publish great web maps. To learn more, visit resources.arcgis.com and click the Electric and Gas link.

Community Speaks Up at Spatial Roundtable
Pull up a virtual chair at spatialroundtable.com and join the conversation of GIS thought leaders as they address topics requested by the geospatial community.

Follow the Esri Utilities Community on Twitter
Keep up with the latest GIS news, especially as it relates to the energy industry, by following Esri on Twitter:

Industry writer Jessica Wyland: @EnergyGIS
Pipeline and gas industry manager Rob Brook: @robertgbrook
Director of utility solutions Bill Meehan: @bill_meehan

Webinars
Listen to a new series of monthly EGUG webinars with upcoming topics that include mobile GIS, DIMP, and networks. To learn more, visit esri.com/egug and click the webinar link.

Stay Connected, Get Updated

You are invited to the 2011 Esri Electric and Gas User Conference. This event is your chance to see cutting-edge utility best practices, glean solutions from GIS experts, and discuss your biggest challenges with your most capable peers.

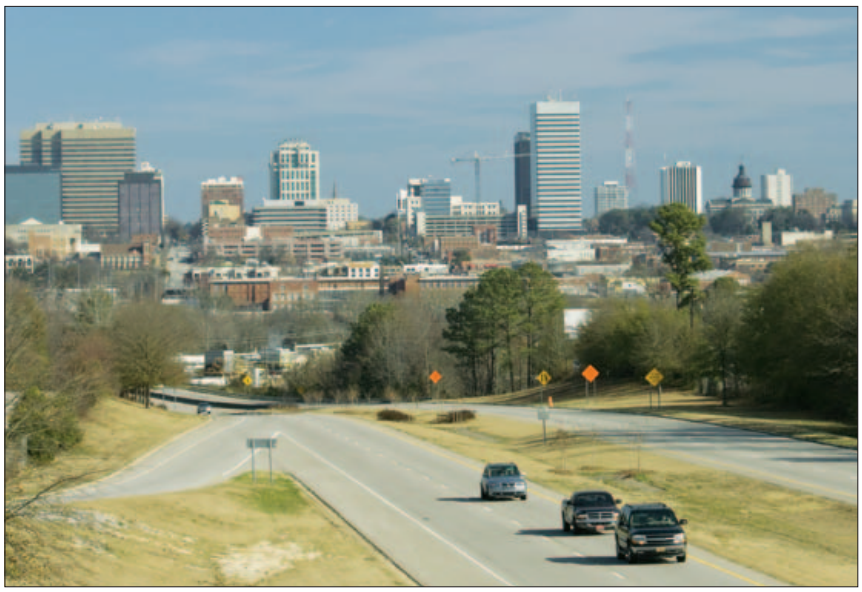
The conference will be held October 9–12 at the Columbia Metropolitan Convention Center in Columbia, South Carolina.

At the event, you will

- Learn to stretch your GIS investment beyond mapping to cover infrastructure projects, utility marketing, and smart grid implementation.
- Become equipped to approach new government regulations with a thorough, demonstrable knowledge of your system.
- Achieve readiness for emergencies and outages by learning to take your maps into the field and send your data into the cloud.

This conference is a major resource for professionals from all types and sizes of electric and gas utility organizations. Whatever your position or GIS experience, bring your team and find out how GIS innovation is helping utilities everywhere become more successful today.

To register, visit esri.com/events/egug.



South Carolina welcomes the Esri Electric and Gas User Conference in October.

Esri Receives "Strong Positive" Rating in Leading Analyst Firm's Utility Industry MarketScope Report

Esri received a Strong Positive rating, the highest possible, from Gartner, Inc., the leading provider of research and analysis on the global information technology industry. The report, *MarketScope for Energy and Utility Geographic Information Systems*, by Randy Rhodes, was published March 22, 2011.

"Utilities around the world rely on Esri technology and Esri partner solutions for crucial business functions including infrastructure management, emergency response, sustainable development, and risk analysis," said Bill Meehan, Esri director of utility solutions. "We believe Gartner's Strong Positive rating affirms our commitment to continue to meet the dynamic and evolving needs of the utility industry."

Esri's ArcGIS technology integrates hardware, software, and data for capturing, managing, analyzing, and displaying all forms of geographically referenced information. Users are able to query data and identify relationships, patterns, and trends in the form of interactive maps that can be viewed on the web, from the office, and in the field.

View the complete report, courtesy of Esri, at esri.com/utilityreport.

About MarketScope

US Gas Utilities Focus on DIMP

For MDU Resources Group's utility division, Esri technology emerged as the logical framework on which to build its Distribution Integrity Management Program (DIMP). DIMP regulations, put forth by the US Department of Transportation Pipeline and Hazardous Materials Safety Administration, aim to ensure better overall management of the risks that impact gas distribution infrastructure.

"With pipeline safety coming into focus on an international scale, Esri technology is becoming crucial to gas utilities," said Rob Brook, Esri gas and pipeline industry manager. "Every threat to pipeline integrity has a geographic location, and Esri is helping companies connect distribution data to its geographic location."

MDU Resources' utility division is made up of Montana-Dakota Utilities Co., Great Plains Natural Gas Co., Cascade Natural Gas Corporation, and Intermountain Gas Company.

For MDU Resources and many other gas companies in the United States, Esri's GIS technology helps fulfill DIMP needs by allowing users to combine multiple layers of data for risk identification, modeling, and spatial analysis.

"GIS is already an essential repository for information about the gas distribution system," said Lance Elroy, GIS manager for Intermountain Gas Company. "Since GIS is a configurable technology, we are able to point to different data sources and link to that data from the GIS. We are working with Esri staff to adapt the Esri Risk Calculation Model to fit our specific DIMP compliance needs."

For more information about GIS technology for DIMP compliance, visit esri.com/dimp.

Middle East and Africa Utility User Group

Utility companies in the Middle East and Africa now have a local source for sharing ideas, success stories, and information about Esri technology. The Middle East and Africa Utility User Group held its inaugural meeting March 15–16, 2011, in Dubai, United Arab Emirates. The event was hosted by Esri along with Esri partners GISTEC and Khatib & Alami.

The community of utility professionals formed to discuss the best ways to meet daily challenges and to learn how proven applications of GIS technology can support business processes such as asset management, design, regulatory requirements and compliance, mobile solutions, network safety, and reliability.

"The Middle East and Africa Utility User Group will become a valuable resource for the many Esri utility users in these regions," said Atif Karrani, GIS director for Sharjah Electricity and Water Authority (UAE).

Karrani was elected president of the group. Majid Hussain Mohd, deputy senior manager of Dubai Electricity and Water Authority (UAE), was elected vice president.

"Our goal is to ensure that members build a strong community in order to provide consolidated feedback to Esri and its partners on solution offerings," Mohd said.

Utility companies managing electricity, gas, water, wastewater, storm water, and district heating networks in the Middle East and Africa regions are encouraged to join the group today by sending an e-mail to meauug_external@esri.com.

Majid Hussain Mohd (left), Deputy Senior Manager of Dubai Electricity and Water Authority (UAE), and Atif Karrani, GIS Director for Sharjah Electricity and Water Authority (UAE)

Nova Scotia Power, Inc., Updates Electric Distribution Model

Nova Scotia Power, Inc. (NSPI), recently launched the three-year GIS Connectivity Project in an effort to create an accurate digital representation of its expansive electric distribution system. Data collected using mobile devices and web-enabled GIS software will replace the current models that are based on original design sketches. Thus far, the project is providing time and cost savings while helping the utility create a foundation for improved customer service.

Nova Scotia Power, Inc., manages $3.5 billion worth of generation, transmission, and distribution assets across a 15,500-mile system that serves nearly half a million residential, commercial, and industrial customers across the province of Nova Scotia, Canada.

Using BlackBerry smartphones and GIS software, NSPI crews are collecting precise asset and customer location information along with data about customer connectivity and distribution system features such as transformers and disconnect switches. Data is collected using the Freeance Mobile for BlackBerry software and transferred to the utility's ArcGIS Server. Technicians access the new data and update the electrical model within minutes.

"We are building a more accurate picture of NSPI's distribution system, which has tremendous benefit for operations and customer service," said Brian Shannon, NSPI's GIS Connectivity Project manager. "This is, at the heart, a customer-service initiative, although there's no question this project has returned measurable time and cost savings already."

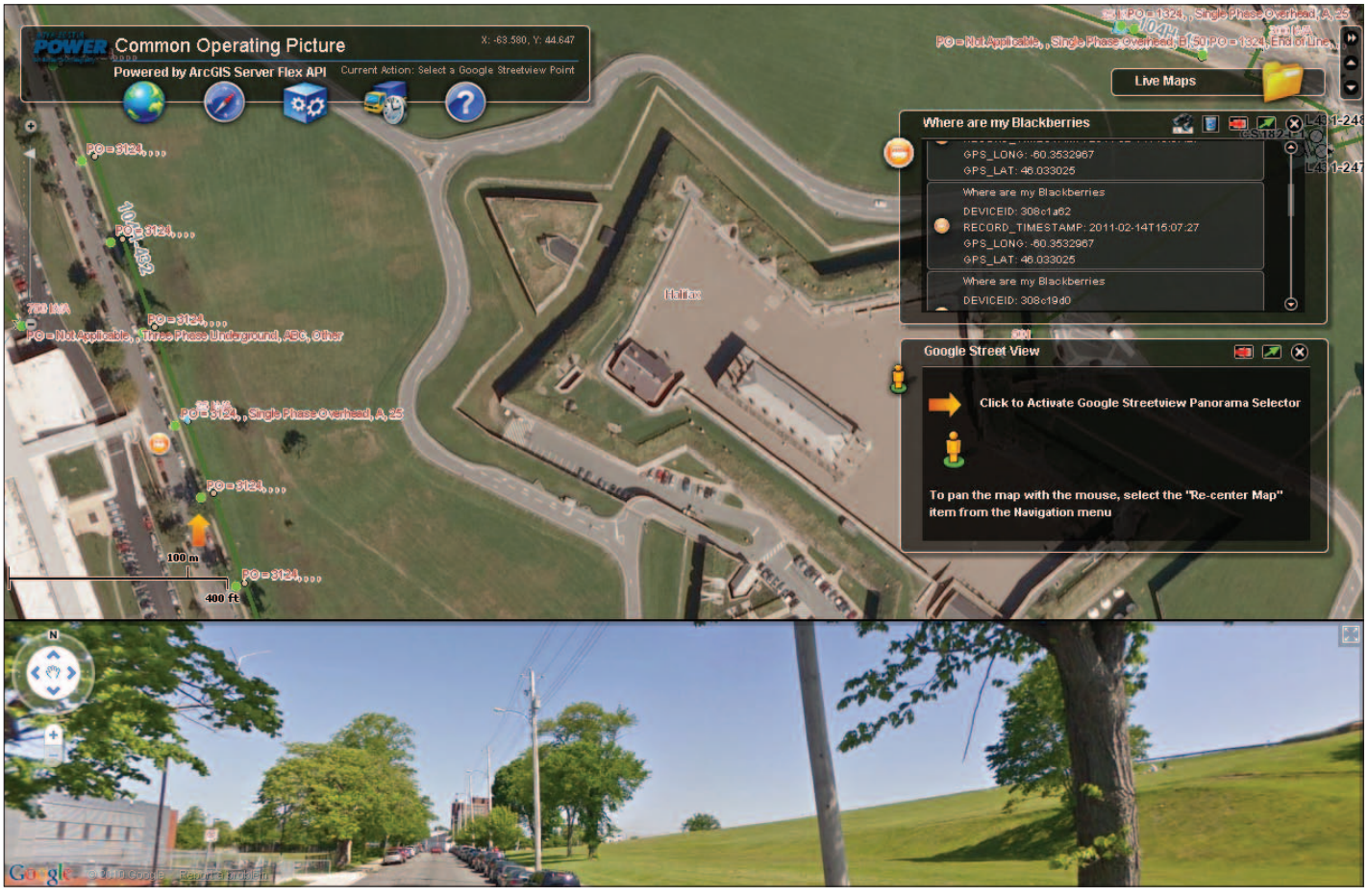
A highly accurate electrical model will improve NSPI's outage management system (OMS), enabling the utility to better predict the impact of storms, dispatch line crews more effectively, and provide better information to customers and emergency officials during outages.

A Rocky Start

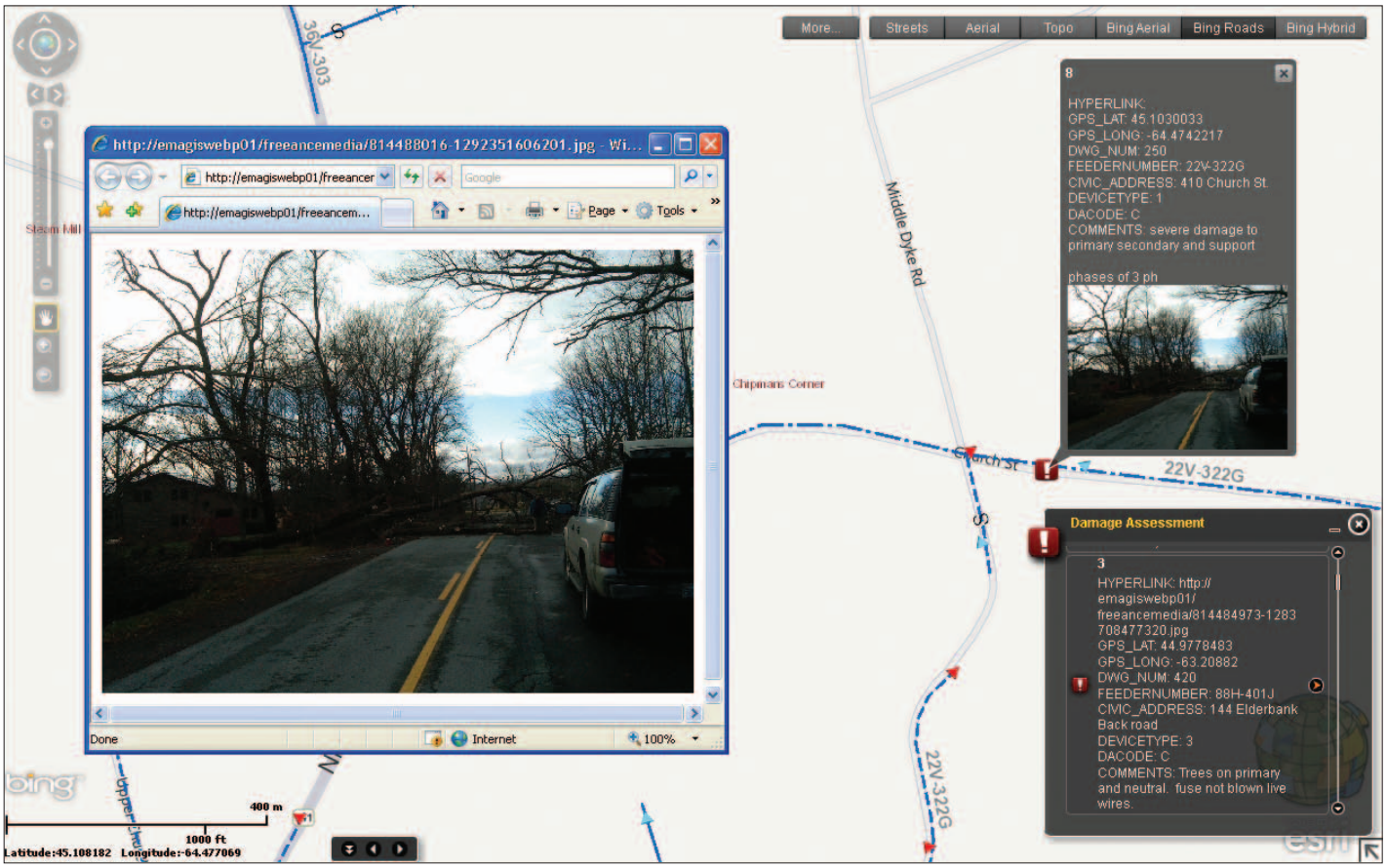
The province of Nova Scotia spans an area of 34,352 square miles, with population dispersed between major urban centers and small coastal villages. Data collection is performed on foot and by vehicle in urban, rural, and off-road areas.

At the start of the GIS Connectivity Project, Shannon foresaw a problem with the projected labor profile. It was going to be nearly impossible to complete the work on time. Shannon deduced this based on the experience of an earlier small pilot program where engineering students gathered data using ruggedized devices built specifically for use in the field.

"With the ruggedized units, students in



Damage Assessment Points in the Common Operating Picture (COP) Collected via BlackBerry during Storm Response



Data collection points are visible as they are being collected. Google Street View integration assists office personnel in answering questions about electrical devices.

the pilot program had to travel to and from local NSPI offices scattered throughout the province to upload the collected data to local computer terminals," Shannon explained. "For the GIS Connectivity Project, allotting time to travel to and from these depot offices every day would significantly reduce daily productivity."

Because capital expenditure approvals were in place for the three-year plan, Shannon and his team had to make things work.

The ruggedized devices were capable of connecting to the NSPI network via modem; however, this method of connectivity lacked the required IT security control. Customer connectivity information is private data that requires secure encryption.

A technology solution was needed that met this security requirement. The utility had additional requirements. The operators needed a simple way to coordinate multiple teams collecting data on handheld devices. The solution had to eliminate trips to an office for data transfer and increase the data process flow, thereby reducing time to get data into the production environment. Further, the utility aimed to simplify the data gathering process with easy-to-understand forms and predefined values, thereby reducing potential errors.

Already using a BlackBerry platform for executive-level communications, NSPI recognized it had the communications backbone in place to move forward swiftly.

It quickly emerged as the right solution.

"The Freeance GIS software for BlackBerry has provided an integrated business solution for our utility by improving speed and accuracy throughout our processes, including data collection in the field, updating the ArcGIS system, and approving system changes," said Richard Janega, executive vice president and COO at NSPI.

A welcome surprise for Shannon and his team was how the smartphones stood up in field conditions and in every conceivable type of weather.

"We have our BlackBerry Storms in OtterBox units, and we don't have issues in terms of durability," Shannon said. "In our experience, BlackBerry smartphones are very suitable for field use in rugged conditions. They stand up fine."

Numbers Don't Lie

Shannon identifies the linchpin of the GIS Connectivity Project as the ability to provide reliable connectivity in the field for immediate GIS server updates.

"We avoided the need for collectors to travel to local utility depots for data uploads each day," said Shannon. "This saved two hours per day for each of the 14 collectors. That translates into nearly $200,000 worth of labor savings."

The utility also reports significant direct cost savings in terms of hardware, software server, and licensing. The cost savings alone may prove to be a big factor leading to the GIS

continued on page 7

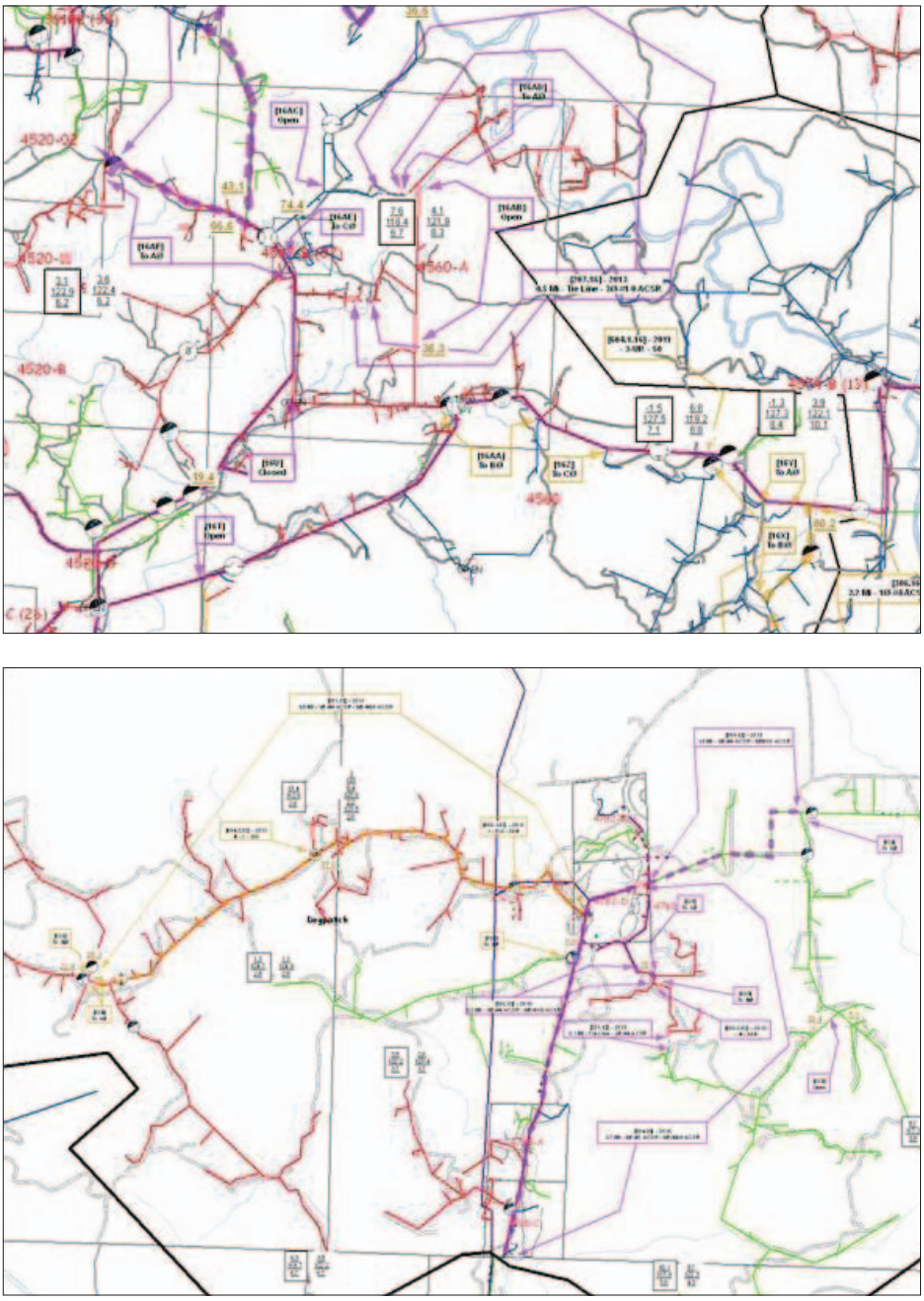
Rural Utility Gains New View of Network, Secures USDA Funding

By Jessica Wyland, Esri Writer

To keep pace with the needs of its members, Carroll Electric Cooperative Corporation recently secured funding from the US Department of Agriculture (USDA) Rural Development program for utilities. The not-for-profit electric utility serves northwest Arkansas and southwest Missouri.

Under the Rural Electrification Act of 1936, direct loans and loan guarantees are available for facility construction, demand management, renewable energy development, and energy conservation programs.

The first step for Carroll Electric staff was to acquire and clean up data stored in its GIS. The utility used the data to perform in-house analysis and planning to design a work plan that ensures growth and reliability. Plans are then reviewed, approved, and amended as needed within ArcGIS.



Carroll Electric's Electrical System Improvement Map helped the utility garner USDA funding.

The move to ArcGIS has shown a significant difference in the loan application and reporting processes. It has also changed the way the electric network is viewed by utility staff and the government agency.

"Using CAD, we were getting a very broad view of our system," said Taylor Wynn, GIS coordinator for Carroll Electric. "Since GIS is data driven, we get a more detailed view. Now instead of basing estimates on an average load, we can look at individual customer accounts. We know how much electricity each customer is using and what phase of service that customer is receiving. We can determine what changes need to be made based on projected customer use. GIS also helps with operational decisions such as balancing load on the feeders."

An important part of the work at Carroll Electric involved data acquisition and clean-up. By making sure all utility data was as up-to-date and accurate as possible, Wynn is able to identify errors in the network before the information is handed over to the engineers.

"The data was all here, it was just in a hundred different places on paper," Wynn said. "One of the many reasons we chose ArcGIS is because we wanted to maintain and update all facility data within one software system as well as give everyone in the organization one source for viewing information."

Now the GIS team at Carroll Electric can supply engineers with data to feed into an engineering analysis model based on technology from Milsoft Utility Solutions, an Esri partner. The engineers are able to look at load balancing and system improvements based on forecast growth rates.

Growth rates are based on previous peaks, new service requests, and operational experience. The engineering analysis model is exported back to the GIS team for map production.

For planning and reporting, Carroll Electric relies on ArcGIS software-based maps that show how the company will accommodate load projection. With these maps, the utility is able to view and analyze customer usage, conductor length and size, phasing, and protection devices. The information helps determine system weaknesses, such as overloaded feeders, taps, and substation transformers. It can also be used to calculate voltage drop, determine whether certain customers experience low-voltage during peak hours, and predict which protective device may potentially trip.

Reports created within the Milsoft application can justify new facilities by showing why and where a new substation is needed. GIS helps the utility manage and display report data in an organized structure including information related to the current of the line at particular locations, voltage drops at certain line intersections, and the conductor size and age of older lines. This can be useful in analyzing which "fix" would be best when a number of options are available.

GIS also can offer insight geographically, showing the utility which region might experience higher growth. Decisions for routing for a conductor in an area near a lake or interstate corridor can be made based on right-of-way clearing, future patrolling, and future potential growth.

Carroll Electric uses GIS to document plans and update as needed. Justification for funding involves economic analysis based on losses, projected load growth, and reliability on a new route versus an existing route.

"The availability of all the geographic and facility data from ArcGIS, along with the load flow data from Milsoft, makes the analysis of the system much easier," said Kean Steely, vice president of engineering and operations at Carroll Electric.

For more information, contact Taylor Wynn at twynn@carrollecc.com.

continued from page 5

Nova Scotia Power, Inc., Updates Electric Distribution Model

Connectivity Project coming in on or under budget, according to Shannon.

Reduce Errors, Increase Efficiency

Previously, personnel who noted discrepancies in the location or identification of features in the field would have to manually record any new findings on paper diagrams and submit them to office personnel for manual updates to the model. Now, field personnel simply fill out a GPS collector form.

The form is configured with required fields and predefined values, and the integrated BlackBerry GPS records the location automatically. The record is saved and is immediately available to the GIS technician in the office, who verifies the data and updates the model within minutes.

"Having the collected data transmitted directly to the GIS server during the collection process reduces errors and eliminates the turnaround time between data collection and submission to the GIS technicians for processing," Shannon explained.

He credits the ease of use of the GIS collector as integral to these operational savings.

"Our enthusiastic field collectors are not necessarily utility-experienced folks, yet they are accurately capturing the different components of our infrastructure," said Shannon. "We are giving them a basic orientation to what the field assets look like, and they are using drop-down lists from the custom forms, which improves data accuracy and avoids potential errors."

Service with a Smile

In addition to the operational and financial benefits, the ultimate payoff for NSPI is increased ability to deliver exceptional customer service. For instance, more accurate data in the electric system model means outage locations are more accurately predicted and crews are dispatched more effectively.

"In large storms, where dozens of crews can be dispatched to make repairs, we can now stage the crews correctly to maximize performance, minimize logistical effort, speed resolutions, and ultimately benefit customers through quicker restoration," Janega explained.

For more information, visit esri.com/electric.

Operators use GIS to coordinate multiple teams collecting data on handheld devices.

Imagery Supports TransCanada Pipeline Construction

TransCanada, one of North America's largest providers of gas storage, anticipates a 2012 completion date for its Keystone Pipeline—a conduit for Canadian crude oil that will run from Alberta, Canada, to the Gulf of Mexico.

A decision made early on in the $12 billion project continues to manifest benefits for TransCanada executives, contractors, and crews. TransCanada officials decided they needed top-quality imagery of each proposed corridor, and easy-to-use measuring software. This would supply contractors with superior visual information so bids could be provided more quickly and without costly site travel.

As a result, hundreds of contractors on the Keystone project can now access a single image-based decision tool for vegetation analytics, high consequence area (HCA) verification, elevation modeling, and other key functions.

Proper Alignment

Alignment sheets are commonly used in pipeline construction to provide land information, specs, and visual information to contractors bidding on a proposed corridor.

The imagery contained on these sheets is typically captured by helicopter and costly to produce. More importantly, the visual information is very basic. To get better visual information for estimating, contractors travel proposed routes to observe terrain on foot, which is costly and time-consuming and often results in an inaccurate understanding of the land.

"Initially, contractors were not looking at the imagery provided to them on the alignment sheets because the information was not useful," said Jesse Bajnok, project engineer for TransCanada. "As a result, construction bids were not as tight as we needed them to be."

In an industry where a single mistake can cost hundreds of thousands of dollars, Bajnok wanted to improve the visual information contained on the alignment sheets so contractors would refer to the sheets for more consistent, tighter estimating.

The Approach and Solution

Once it became clear to Bajnok that better imagery would provide a powerful solution to the alignment sheet dilemma, TransCanada worked to add this component to its GIS based on Esri's ArcGIS technology.

> "We are now able to work with affordable, easy-to-use, detailed, and accurate imagery."
>
> Jesse Bajnok, TransCanada Project Engineer

Esri partner Pictometry offers solutions specifically designed to give contractors the ability to see around a location and measure directly on imagery. Using Pictometry Intelligent Images within ArcGIS, for example, contractors would be able to see the steepness of a river bank or view and measure a utility pole—two features that may not be visible in traditional overhead imagery.

Better imagery provides a powerful solution to an alignment sheet dilemma for TransCanada's construction of the Keystone Pipeline.

In June 2008, Bajnok began working with Pictometry to secure imagery for phase III alignment sheets. Within weeks, Pictometry had captured imagery of a 1,400-mile corridor between the Canadian border and the Gulf Coast and had tiled ortho images and mosaicked the tiles into a video for GIS use. TransCanada secured the new imagery and began customizing measurement and annotation tools.

"We are now able to work with affordable, easy-to-use, detailed, and accurate imagery," said Bajnok. "We only had so much time and resources to put into this before we would have to move on. We were looking to see progress and results. We were looking for value, and we found it."

Upon Implementation

Three months into the project, Bajnok and the Pictometry team had created a custom system that captured a 2,000-foot swath of corridor (at 6 inches) in a single pass. Route videos using oblique imagery with shapefiles and labels were created. A workable file format was created that would transfer information—specifically, digital elevation models from UniversalPegasus GIS—for overlay on Pictometry oblique imagery.

To deploy the imagery and allow users to measure and annotate on it, a technology called Pictometry Online (POL) was customized for the linear project. Navigation queries for milepost and tract numbers were designed. Interfaces were also made easy to use. Changes to the POL viewer were made faster and more accessible by multiple Internet browsers.

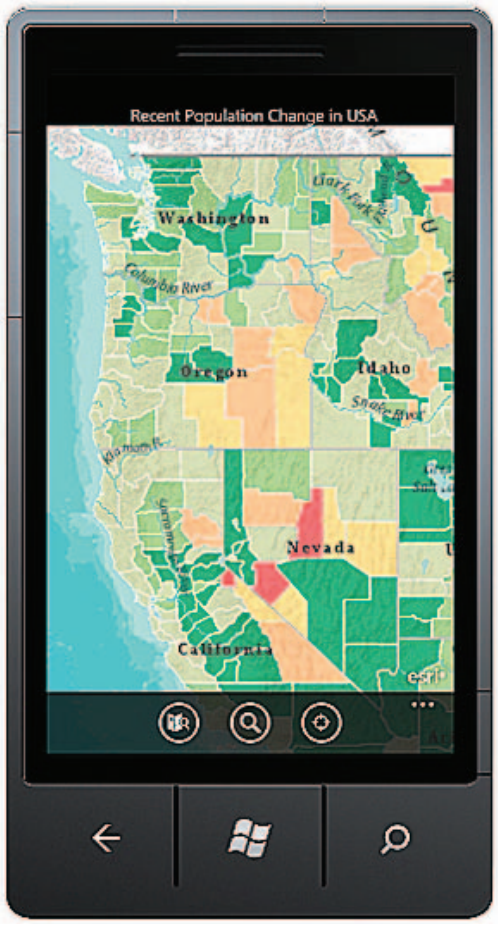
Pipeline contractors now have new image-based decision tools for vegetation analytics, HCA verification, elevation modeling, and more. TransCanada also now has access to better, more complete visual information for more accurate estimates; a tool for double-checking accuracy and ensuring fewer errors; better visual information for less than the cost of traditional methods; and the potential to reduce the need for costly, time-intensive travel.

For more information, visit esri.com/pipeline.

The Power of Mapping Right in Your Hands

Smartphone users can now access sophisticated mapping capabilities on the go.

ArcGIS apps for smartphones allow you to navigate maps, collect and report data, and perform GIS analysis. Discover content by browsing map galleries from ArcGIS Online or leverage your existing enterprise GIS services. Display maps and capture information. Develop a custom application or brand your own application specific to your business needs. Extend your GIS to a wider audience.



Browse and access a variety of maps using the ArcGIS for Windows Phone app.

ArcGIS for iOS

ArcGIS for iOS extends the reach of your GIS from the office to the mobile web. It includes the free ArcGIS application for iPhone, iPad, and iPod touch devices and ArcGIS API for iOS. Using the ArcGIS application, the general public or a private group of users can explore web maps hosted on ArcGIS.com or a corporate instance of ArcGIS Server and even add features to report observations—allowing organizations to reap the benefits of community-sourced data. Using ArcGIS API for iOS, developers can embed powerful GIS functionality in custom applications deployed to iOS devices.

ArcGIS for Windows Phone

ArcGIS for Windows Phone extends the reach of a GIS from the office to the mobile web. The app lets users find, use, and share maps, as well as deploy GIS data and functionality on Windows Phone devices. The free app can be downloaded directly from Microsoft's Zune Marketplace. In addition to the free application, Esri has released ArcGIS API for Windows Phone, which allows developers to build custom applications.

"This is a very exciting development for the Microsoft developer community," says David Stampfli, technology architect at Microsoft, "because it allows us to use the tools that we're already familiar with to build a new class of applications for Windows Phone quickly and easily. The capabilities of ArcGIS API for Windows Phone are truly impressive and will allow developers to tap into the full power of the ArcGIS platform."

To learn more, visit esri.com/smartphones.

Benton Public Utility District Implements Smart Grid Solutions

Benton Public Utility District (PUD) supports transmission and distribution of electric energy to more than 47,000 electric customers covering more than 900 square miles of service territory. The municipal corporation of the State of Washington is headquartered in Kennewick, Washington, and was established in 1946. The company manages 37 substations, approximately 90 miles of 115 kV transmission line, 1,582 miles of distribution lines, and nearly 130 miles of fiber-optic cables.

Benton PUD started using AutoCAD in the 1980s to create designs for its construction and maintenance projects but later incorporated CAD-based GIS technology to more accurately map and manage the utility's assets. As its service area grew, the utility began to recognize its repetitive and inefficient processes for data entry and management.

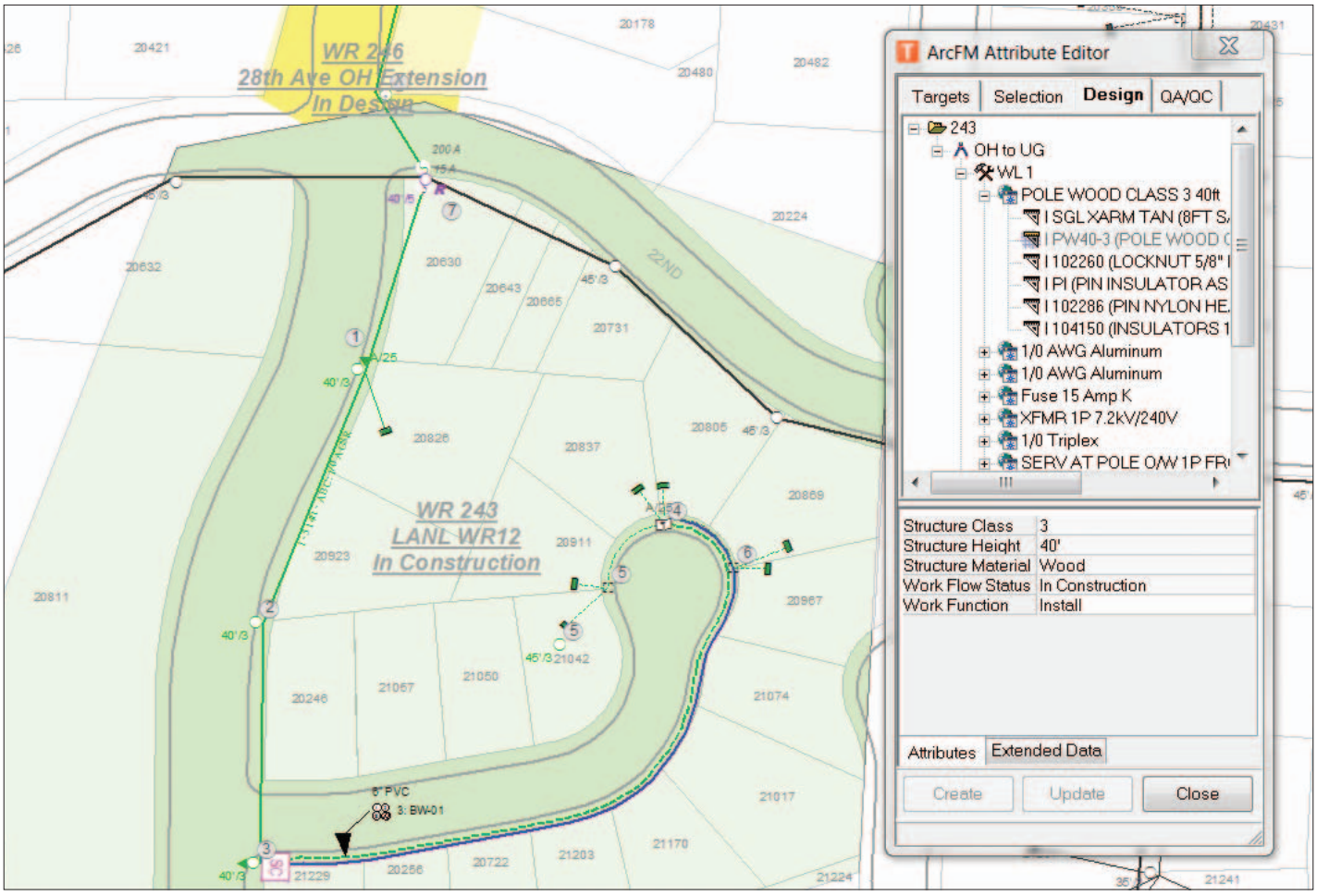
> "We now have a rock-solid system that meets all our business requirements, is stable, and delivers high value for our utility."
>
> Chris Folta, Benton PUD Manager of GIS

For example, the utility was forced to access multiple Excel spreadsheets for project costs, print pages of physical maps for engineers, and redraw project designs two or three times to complete day-to-day construction and maintenance projects.

"Our previous design process was very labor intensive. Work order and design information were manually entered and required too much duplication, which left a lot of room for error," explained Chris Folta, manager of GIS at Benton PUD. "Even with a robust AutoCAD system, we needed standardized processes and a single, multiuser enterprise database, as opposed to having multiple single-user databases and spreadsheets."

In addition to inefficiencies in the design process, Benton PUD also lacked an enterprise work management software system. As a result, the utility struggled to accurately track its various projects in progress and efficiently recognize and account for project delays. The inability to effectively track and organize work order forms also made it difficult to enforce standardized business processes to properly complete each task included in the workflow.

To plan for utility growth, Benton PUD wanted a flexible system that could more efficiently integrate GIS and design processes to eliminate redundancies, reduce human error,



Telvent Designer's centralized and intuitive graphical interface allows utilities to easily monitor work requests, build multiple design scenarios and estimate job costs. Built on ArcGIS architecture, Designer minimizes data redundancy and improves the accuracy and consistency of corporate data assets. Its functionality helps streamline operations by incorporating field work into the overall workflow.

and provide enterprise access to operational information. The utility also needed a solution to help organize and track its multiple work order types and enforce the proper business standards for completing each work order.

In 2007, Telvent partnered with Benton PUD to smoothly and efficiently integrate the ArcFM Enterprise GIS and Designer solutions.

ArcFM is based on Esri's ArcGIS technology and is specifically designed for the utility industry, enabling energy companies to model, design, and manage critical infrastructure. By integrating utility data and advanced geographic maps, ArcFM provides a graphic view of a utility's infrastructure and tools that support cost reduction through simplified planning, analysis, and operational response times.

Telvent worked with Benton PUD to consolidate and convert its AutoCAD data into the ArcFM GIS system and integrate Designer, which is an extension of the ArcFM platform that streamlines the entire design, estimating, and construction processes.

The Designer solution provides utilities with the tools to create, control, and manage multiple designs, design versions, work orders, cost estimates, and input from multiple staff members involved in any project. Within the GIS database, users may view, query, and edit designs without having to copy files around the network, therefore eliminating the need for Benton PUD to manage multiple databases, print physical maps, or redraw the same designs in multiple systems.

Benton PUD also took advantage of the Designer extension's flexible workflow process tool called Workflow Manager, which can operate in a stand-alone mode or as the integration point to an enterprise work management system.

"Telvent helped convert our AutoCAD data and ensure that its format integrated properly with our other utility programs," said Folta. "At the same time, Telvent assisted in customizing Workflow Manager to track and organize all our utility's work order types—not just the design projects."

Benton has seven different work order types it uses for various operational projects, and each work order type has a different workflow to complete the project. Telvent helped integrate each work order type and the necessary workflow into Workflow Manager to act as Benton's enterprise work management system.

Since integrating ArcFM GIS with Designer and its customized Workflow Manager, Benton has been able to increase both quality and efficiency in its data management, design processes, and overall work management. As a result of the increased efficiencies, the utility has been able to save on labor costs by handling a larger workload without the need for additional engineering staff.

"In our design process alone, we are completing the work order life cycle 40 percent faster by utilizing Telvent's solutions," noted Folta. "So for Benton PUD, we are able to realize significant labor savings by efficiently producing more accurate work with existing staff, thereby eliminating the need to hire additional resources as the utility grows. Without the need for additional engineering resources, we save at least $120,000 annually."

Folta also estimates that by using Designer and Workflow Manager on a district-wide basis and coupled with using ArcFM Viewer in the field, the utility has eliminated the need to print thousands of maps, design packets, and work order forms, saving approximately $50,000 each year on paper, printing materials, and associated labor.

"Telvent was able to walk us through the entire process at a pace that we felt was comfortable and provided consulting as our requirements changed," said Folta. "We now have a rock-solid system that meets all our business requirements, is stable, and delivers high value for our utility, and Telvent provided the experienced partnership we needed to achieve these goals."

For more information, visit www.telvent.com.

continued from page 1

Arizona Public Service Makes It Happen

APS extended the technology used to construct this application. The utility built a foundation for additional applications and web services that allow planning for placement of smart grid devices and smart meters, tracking of mobile assets, and location of photovoltaic and other alternative energy generation devices. The application also enables APS staff to view the proximity of wildfires to high-voltage facilities.

While the application mainly supports APS electric distribution facilities, the company is now developing another complete GIS for APS transmission facilities. This GIS will include facilities and vegetation data as well as high-resolution imagery. As part of this effort, APS is building web and mobile applications to view, edit, and analyze various functions within transmission maintenance and vegetation management along transmission corridors.

APS began building its GIS in the early 1990s. GIS provides data to the Distribution Operations Management System (DOMS). Currently, DOMS provides workers in the operations center with the ability to address and monitor problems and corrective actions being done in the field. The future vision is to completely do away with paper operations maps and monitor the entire distribution system with DOMS.

Additionally, DOMS will be called on to perform various analyses, load flows, and what-if scenarios that are currently done manually or with various disconnected methods and tools. GIS will provide the daily data updates to make this vision a reality.

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