

Esri News

for State & Local Government

Fall 2019

A New Approach at Reno-Tahoe International Airport

Discover how GIS fueled its efforts toward success

Preparing for the Future for the Masses

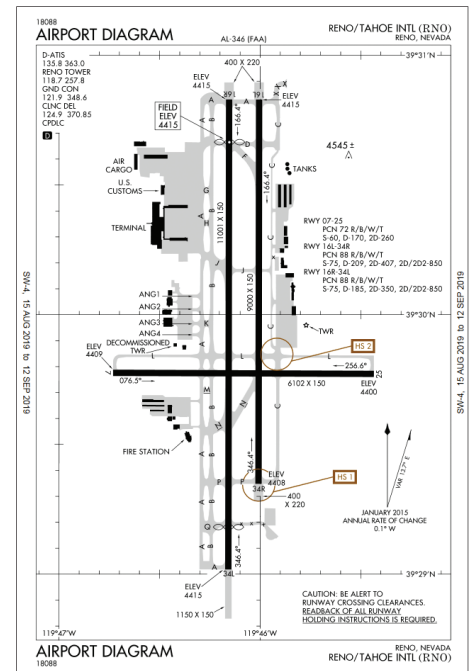
Moving passengers and connecting people from one location to another is a well-understood function of an airport. Currently, over 4 million passengers a year travel through Reno-Tahoe International Airport (RNO). Operated by the Reno-Tahoe Airport Authority (RTAA), it delivers an economic impact of over \$3 billion for the region. Forecast to exceed 6.5 million passengers per year and increase cargo growth opportunities, it was clear that RNO's plans needed to consider accommodating future passenger growth to expand positive impacts on the Reno-Tahoe region.

To accommodate future growth, RNO had to implement a comprehensive expansion plan and comply with the

Federal Aviation Administration (FAA) Airports Geographic Information System (GIS) Program. Dan Bartholomew, former president of Planning, Engineering and Environmental Management at RTAA, recognized that the airport needed an enterprise GIS to support its plans; but with a limited budget, he was also hesitant of trying to do too much too fast. Bartholomew wanted an implementation methodology that was, in his words, "simple, logical, affordable, and manageable."

Paving the Way to Support Future Plans

To help Bartholomew achieve those goals, he brought on Arora Engineers, Inc., to help guide the airport through the development process. Arora began



↑ FAA-Required Airport Diagram for RTAA

to collect the precise survey and orthoimagery data to support the creation of the required FAA data elements. Wanting to minimize hardware and software costs, an early decision was made to use Esri's ArcGIS Online to deliver both data products and applications to the airport.

The data collected by Arora Engineers provided the foundation for a series of immediate applications, which were designed to support not just the FAA but also the wider airport and airspace operations, such as unmanned aircraft system (UAS)-restricted airspace, airport height restrictions, airport land use, emergency flood analysis, and airport surface radar coverage analysis.



↑ Reno-Tahoe Airport's Spatial Data Portal

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Smarter Government: How to Govern for Results in the Information Age

Book Review by Stephen Goldsmith, Professor of Government, Harvard Kennedy School

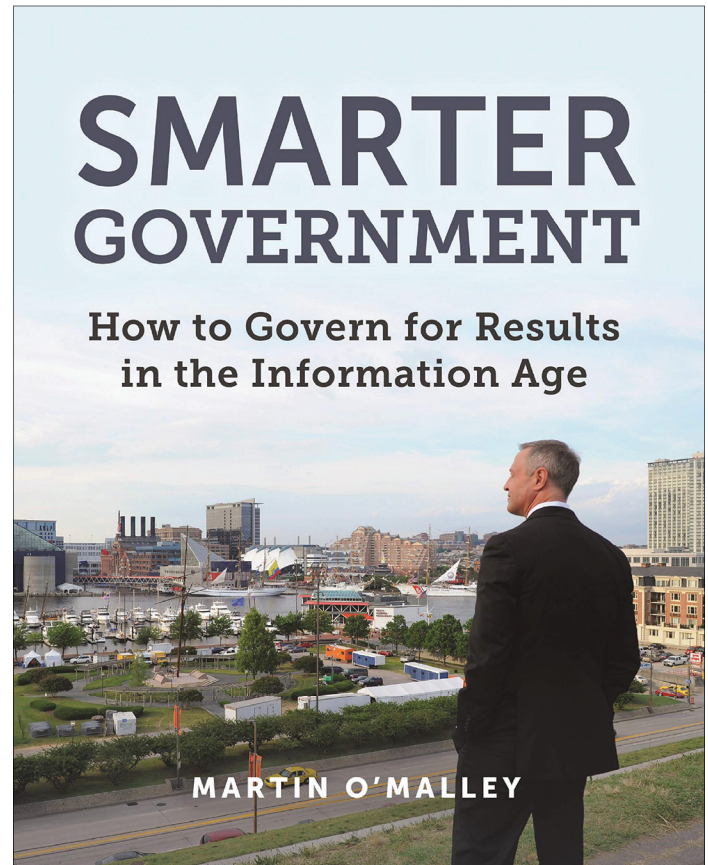
I first met Martin O'Malley after watching him personally preside over a session in Baltimore City Hall on performance management. The session presented an important evolution of the famous CompStat program, which had helped drive dramatic decreases in crime in New York City. The next time I witnessed the mayor at work, he was advocating before an esteemed panel at Harvard Kennedy School, which had recognized his performance program—known as CitiStat—with the school's prestigious Innovations in American Government award. Some years later, I had the opportunity to observe the then Governor O'Malley apply the same approach to the infant mortality Stat program for Maryland.

I thought of these events as I read O'Malley's brand-new book, *Smarter Government: How to Govern for Results in the Information Age*. When he stood in front of that Harvard panel, he stated that his goal was to introduce tools and procedures that would "transform the way our city government works." For the reader interested in public service, this book stands out as an optimistic and constructive exemplar of how motivated officials using the right management tools can make a difference.

As O'Malley points out, "This book is not so much a user's manual for Stat or GIS [geographic information system technology] but rather a practitioner's guide for collaborative leadership in the Information Age." Yet at the same time, *Smarter Government* certainly shows that a true leader cannot turn vision into action without the data and mapping tools that produce results.

O'Malley's book weaves together a number of technologies and applies them to a broad set of public functions. The modern data-driven manager incorporates an array of tools in the constant effort to produce public value. The book addresses performance management and data-driven decision-making, GIS technology, customer service, relationship management, 311 call center services, and more. Mapping tools allow high-quality visualization of open data, which drives up trust in government, a point O'Malley repeatedly makes in the book.

However, *Smarter Government* is also about the process, the data, the map, and the method for achieving dramatic public sector progress. And, as the author rightfully claims, "it is about making complex problems visible and understandable for everyone who has a stake in seeing better outcomes and results." People come together to help their city when they have confidence that their efforts matter and when openness and transparency both set the stage for a shared understanding and clearly explain a problem and the steps taken to address



it. In describing changes in governance, O'Malley links up "the changing nature of authority in the Information Age with the tools an elected official needs to create collaborative progress. With city hall losing its monopoly on information and authority more than ever, the transparent and easy-to-understand data about a community will build the platform for a shared response.

The book will help practitioners as it takes on specific areas where technology can make a difference, including disaster response; public safety; education; health and well-being; and clean water, air, and land. This book is by one of the country's most enthusiastic and dedicated leaders—one with a deep appreciation of the visionary and the tactician—and the lessons in it will provide a useful guide for public officials and community leaders alike.

For more information on this book, visit go.esri.com/SmarterGovBook.

Empowering Employees and Residents through GIS Intelligence

By Clint Hutchings, GIS Administrator, and Andrew Thorup, GIS Specialist, City of West Jordan, Utah

It can be difficult to manage your assets when you aren't sure how many you have. This was once a major issue in the City of West Jordan, Utah. Prior to implementing a GIS-centric asset management system, the city relied on multiple shapefile formats of water, sewer, and storm water systems. Most of these files had been created using as-builts and staff memories or by simply drawing lines and points closest to where an asset was believed to be.

Unreliable data led to expensive problems. In one instance, a waterline broke and crews could not find the shutoff valve to stop the water. As the water continued to flow, the city lost valuable time, money, and energy. It became clear that having a general idea where assets are buried was not enough.

Value in GIS

City staff understood the importance of GIS, so they began looking for a system with GIS-centric asset management capabilities. Cityworks met their specific needs, and they liked that it integrated seamlessly with ArcGIS.

A GIS specialist, Spencer Munson, was brought on full-time to focus on creating spatially accurate data. His office became a central location for utility managers and workers to collaborate and bring their data, knowledge, and frustrations. Using a combination of as-builts, drawings, GPS points, closed circuit television (CCTV) records, and institutional knowledge, Munson combed through the data, marking places that needed to be verified. He then worked with the department to survey assets in the field.

Improvements to West Jordan's asset data helped city officials identify where their assets are located and how many they have. Accuracy improved greatly as departments invested more time and effort in submitting precise information, knowing their contributions would be updated promptly. Perhaps most importantly, the GIS and utility departments have developed a relationship of trust and accountability.

"Although we had some GIS elements prior to Cityworks, the new platform gave our staff a better appreciation for what GIS can do," said Andrew Thorup, GIS specialist at West Jordan. "Users began interacting with and depending on GIS data as opposed to paper maps or institutional knowledge. Our data became more accurate because our users had a stake in making sure their field observations matched what was in the GIS."

There's an App for That

Since then, West Jordan integrated Esri's Collector for ArcGIS to help each department report errors, see where the GIS team has marked places to verify, and check in real time whether issues have been addressed. The city now has an official workflow for verifying missing or inaccurate asset information.

West Jordan also implemented Esri's Crowdsource Reporter with Cityworks to engage its residents in the care of city assets. Now, when a resident reports a problem from their phone or computer, the issue is automatically directed to the appropriate department, and a service request is initiated within Cityworks. The resident receives automatic confirmation when the request has been initiated and again when the work has been completed.

The seamless workflows enabled between Cityworks and Esri apps allow the City of West Jordan to be more efficient, effective, and responsive in the care of its citywide infrastructure—improving levels of service and quality of life.

For more information on how Cityworks is empowering local communities across the state of Utah, visit go.esri.com/cw-utah.



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City of Gastonia Looks to the Future with Valve Exercising Program

Thirty minutes west of Charlotte, North Carolina, the City of Gastonia serves more than 100,000 customers with water and sewer services. Its municipal-owned water utility, Two Rivers Utilities (TRU), is home to the largest system in the area, with more than 13,000 valves.

For 15 years, TRU has known that a valve exercising program would be beneficial. (Valve exercising is the routine task of opening and closing a valve to check if it's functioning properly.) But it was only within the past 5 years that the utility hired the right team to champion the project.

Leading the charge were GIS analyst Brian Hart and utilities division manager Brian Potocki.

"We brought in the right staff, with our two Brians," said Ron Cook, TRU assistant division manager of systems maintenance. "One made the case for a valve exerciser and trailer, while the other was able to get the technical side of things running."

Gastonia purchased a valve exercising trailer from EH Wachs, which included a built-in handheld controller to guide the complete workflow.

The controller can also connect via Bluetooth to an external GPS receiver, which was critical because this would allow TRU to update valve locations through the exercising program.

"Most of the locations were OK," Hart said. "But they weren't pinpoint accurate."

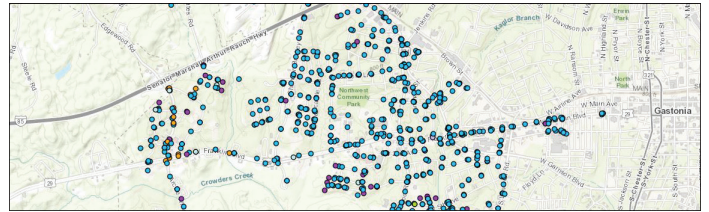
Pinpointing Every Valve

Hart had heard about the Esri-aligned Arrow 100 Global Navigation Satellite System (GNSS) (GPS) receiver made by Esri Silver partner Eos Positioning Systems. He contacted Eos for help connecting the Arrow 100 to the handheld controller. Once paired, the Arrow 100 provided (on average) 40-centimeter-accurate locations to the handheld, which snapped the data to the valve ID, thanks to the free Wide Area Augmentation System (WAAS) differential correction service.

Hart had the Arrow 100 welded to the valve exercising trailer, and two field technicians were trained on the equipment. A third (a previously retired field technician who knew the system well) was hired to "hopscotch" ahead of the exercising crew and paint valves, based on printouts from ArcMap.

"We're speeding up their time because they do not have to locate each valve themselves," Hart said.

After data was collected, Hart exported it from the handheld to ArcGIS Online. Sometimes, a valve not previously recorded in the GIS was recorded in the handheld as a New Valve Number X. This lets Hart add new valves to the GIS and keep a count of the total number of newly discovered valves.



↑ By having a highly accurate representation of its water system, TRU will be able to isolate smaller sections of its water system, especially during emergencies.

"In the first zone alone, we've found 400 valves that were not in the GIS," Hart said.

Improving the Workflow

Mapping all the valves in Gastonia's six zones is expected to take six years. With two zones mapped in the first two years, TRU decided to pilot a new workflow in the third zone, aimed at greater efficiency.

Instead of using ArcMap printouts, the field technician used an iPad configured with Collector for ArcGIS to locate valves. Hart purchased a second Arrow 100 GNSS receiver to connect to the iPad through Bluetooth. The first benefit was the elimination of manual data entry to ArcGIS, thanks to real-time updates via Collector and ArcGIS Online. Second, the time to locate valves sped up dramatically.

"The field technician was almost too quick," Hart joked. "Some of his paint was already starting to wear away by the time the valve exercising technicians arrived."

Fewer Service Interruptions with Isolated Tracing

The ultimate goal for Hart is a long-term eye toward valve tracing using the ArcGIS Utility Network Management extension. With a highly accurate representation of its valve network, TRU will be able to isolate smaller sections of its system during emergencies. Crews can easily address service interruptions so as to disrupt the fewest customers.

"We'll be able to pinpoint valve shutoffs during a main break, as opposed to cutting off water to a larger section of customers," Hart said. "This will allow us to keep the service running for the other customers."

Routine maintenance and scheduled repairs are expected to similarly benefit.

"We are really passionate about customer satisfaction," Hart said. "Being able to reduce service disruption is a huge win for us and our customers."

For more information on Eos Positioning Systems, visit go.esri.com/eos-gnss.



ARROW SERIES

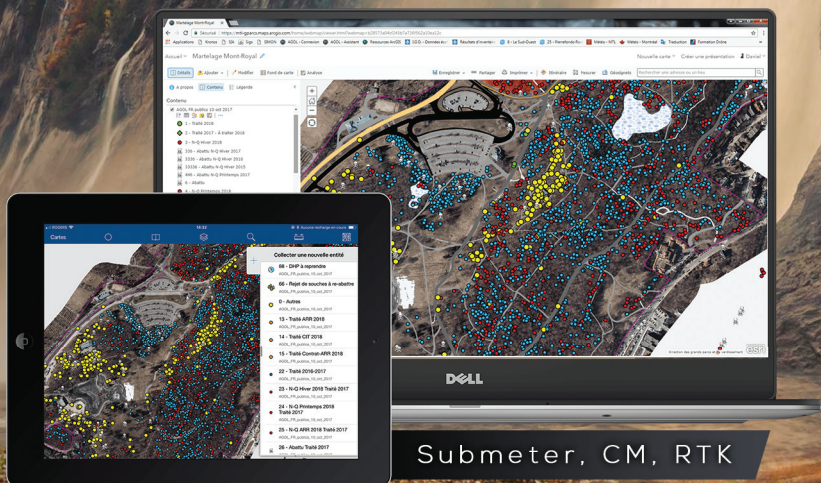
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A New Approach at Reno-Tahoe International Airport

continued from page 1

Through a series of stakeholder meetings, RTAA and Arora were able to further refine the airport's future needs for an enterprise GIS that would support strategic business applications throughout all departments from the data collected.

Leveraging GIS to Achieve Operational Efficiency

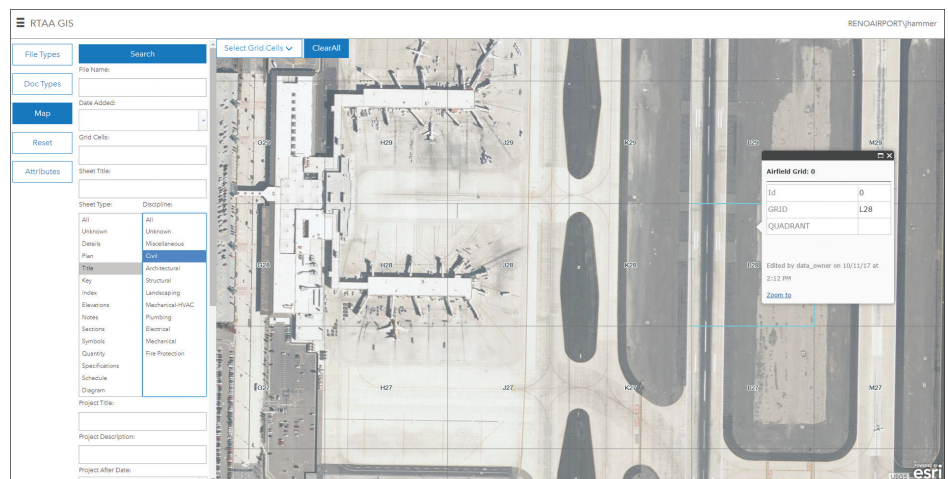
At the center of this implementation is a GIS portal, through which all the major applications and data can be accessed. Any asset or object on the airfield or within the terminal can be identified with corresponding information about the asset. Since it is distributed through ArcGIS Online, the data can be accessed anywhere, at any time, by anyone with appropriate permissions. At the same time, staff can generate their own high-quality maps and exhibits for meetings or documents without having to wait for someone to complete it for them.

One of the first applications identified from the stakeholder meetings was a map-based document discovery system. Disparate documents, whether Word documents, Excel files, photos, CAD drawings, or map documents, can now be geographically tagged to a location map interface and made easy to retrieve.

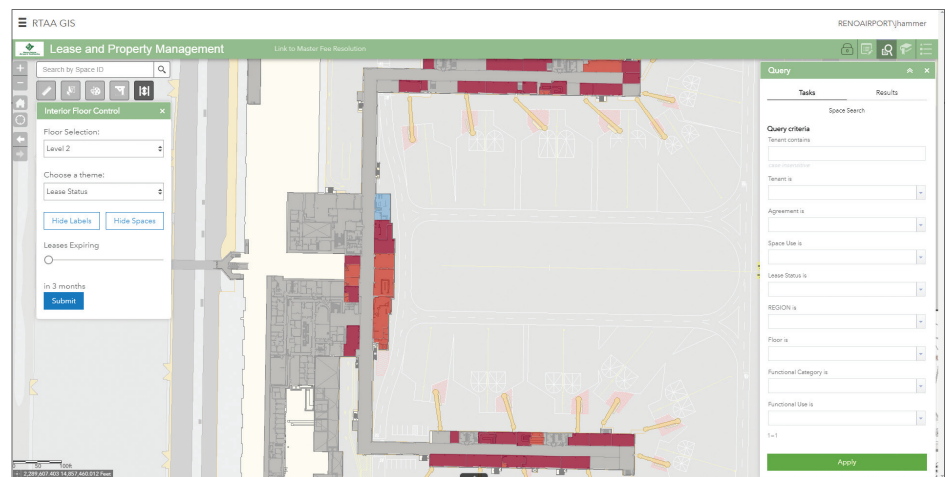
The next order of business was capturing all the terminal lease spaces and integrating the location element with the airport's property and leasehold management application, the GCR Inc. AirportIQ Business & Revenue Manager.

This application allows staff in the property division to access any of the lease information and understand the current status of every property within the terminal, airside, or other airport facilities. This is especially important to accommodate expanded airline service and generate revenue to support future growth.

By using Collector for ArcGIS, staff was able to record the location of assets, add



↑ RTAA's eDOC Spatially Enabled Search Tool



↑ Lease and Property Management Map Used to Monitor Lease Information at Reno-Tahoe International Airport

attributes based on field observations, and add photos from the field and tag them to their precise location. In this way, they assembled a complete inventory of the airport's major assets. This data, in turn, has become the foundation for their daily inspections, which are required by FAA regulations of all certified, commercial service airports.

At each step of the development process, the team would evaluate the success of the developed application to ensure that the business requirements of each department were being met. These stakeholder meetings served not only to bring greater clarity and focus to what the airport wanted to do with its GIS but also

to help bring the business units closer together in defining their common goals. There were regular meetings and updates with senior leadership, which served to build substantial support over time.

Reaching the Goal with GIS

A goal for Bartholomew and team was to establish the data foundation of their enterprise GIS to sustain the airport well into the future. Consultants helped them achieve this goal by writing comprehensive CAD and GIS standards, along with robust data maintenance procedures.

As Bartholomew likes to point out, all this was accomplished with minimal staffing, infrastructure, and IT support

and delivered under the original budget. The result was a GIS foundation that only requires minimal dedicated staff to maintain and develop. Jed Hammer, the current GIS manager, will handle much of this work and lead the program forward. Current and future projects include mapping the airport's utilities and implementing a GIS-enabled airfield asset management system.

The value of the GIS proved itself two years later, when the airport brought Mead & Hunt Inc. on to develop a new, long-range airport master plan. The

airport created a separate ArcGIS Online group for the master plan team, and all the data previously collected became the foundation for its planning activities. Not only Mead & Hunt—but other subcontractors as well—could take the data into the field, make comments, and add their photos to be shared among the consultant team members and, ultimately, with the airport.

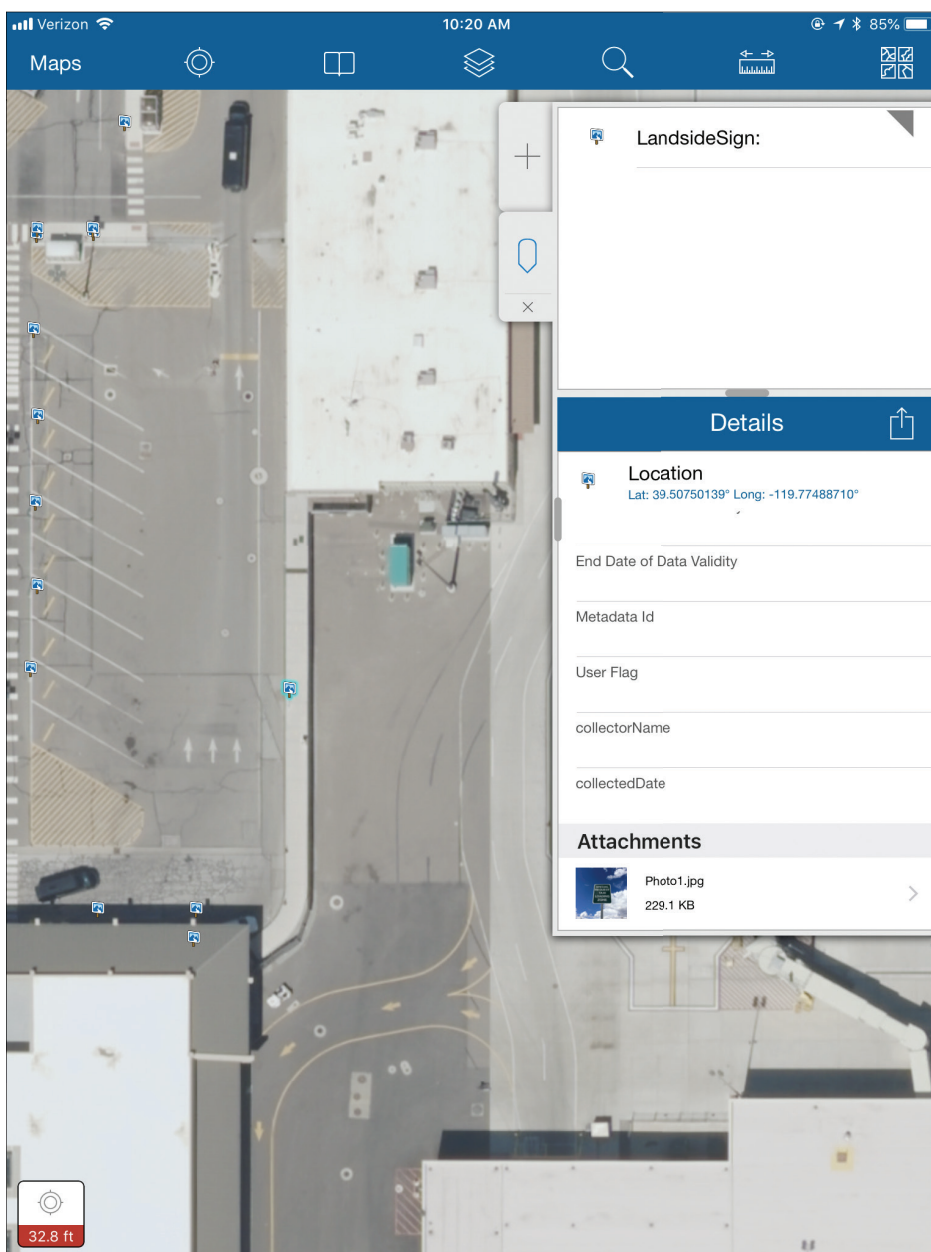
With its master plan, the airport sought a new approach to expanding commercial air service, general aviation and cargo service, and regional economic

development, with a strong focus on customer service. Central to that effort was defining a true partnership between the airport and the community and region, that would promote the creation of a dynamic hub for economic growth.

All the GIS data was central to the development of the airport's master plan, which calls for a \$1.6 billion modernization and capital improvement plan to support growing passenger and cargo volumes. ArcGIS Online supported a crowdsourcing app along with the ability to add subcontractors to the master plan team.

The master plan has now been submitted to FAA for approval, and the airport is positioning itself for a new, more significant role in the regional economy.

For more information on how to leverage GIS to modernize airport management, visit go.esri.com/Esri4Airports.



↑ RTAA's Mobile Data Collection Application

"The implementation and application of GIS at the organization will improve the overall business process by connecting departments and making information more accessible. Ultimately, this will allow us to serve our customers and stakeholders better than ever before."

Marilyn Mora

President/CEO
Reno-Tahoe Airport Authority

Smart Communities Thrive When Location Is at the Forefront

Smart Community Information System

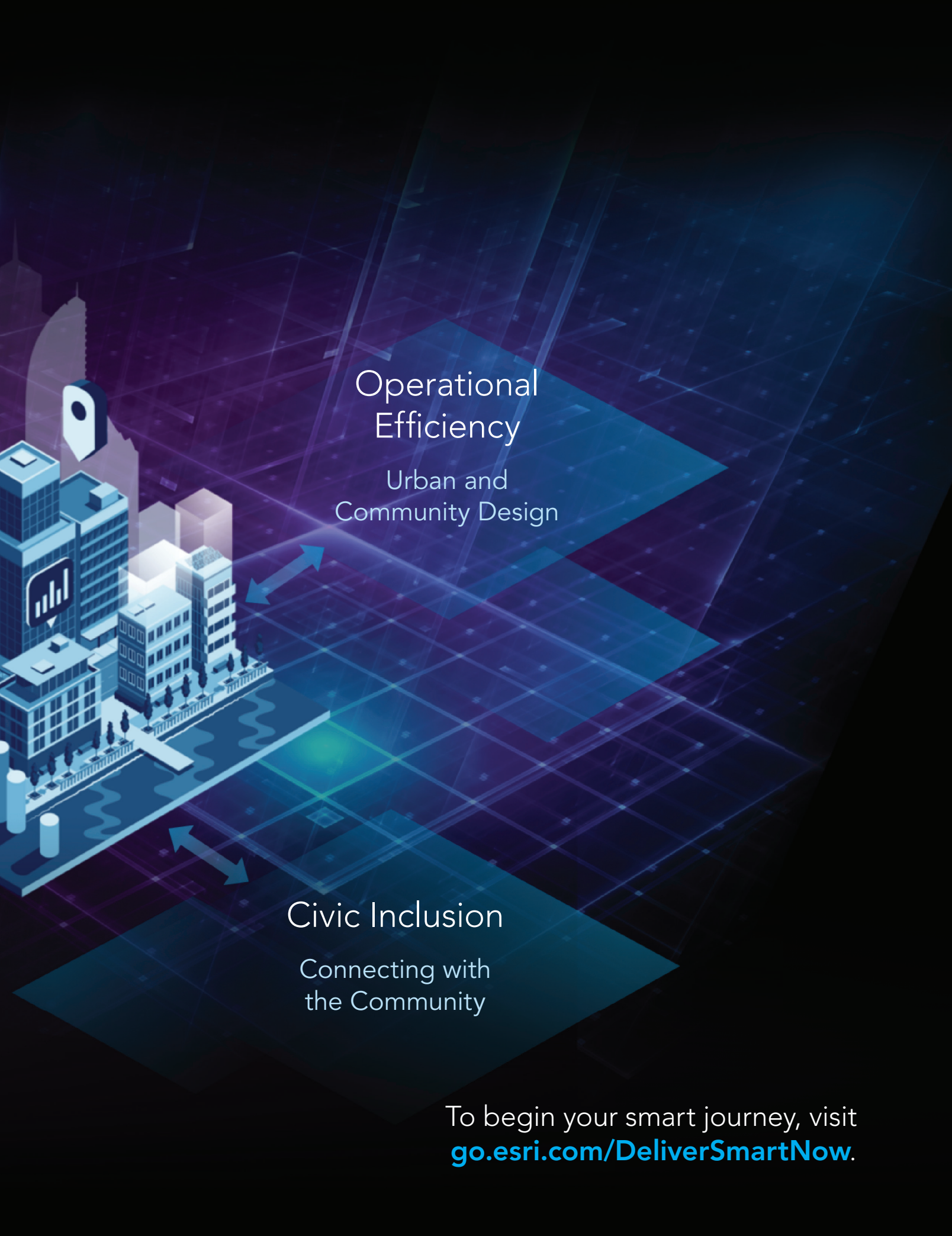
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Open Data Site Supports Fish, Wildlife Conservation Efforts in North America

State fish and wildlife personnel from across the western United States are working together to save priority species and their habitats, and many of them are connected with the Western Association of Fish and Wildlife Agencies (WAFWA). A non-profit organization, WAFWA coordinates with agencies from 19 US states and 5 Canadian provinces over 3.7 million square miles of some of North America's most wild and scenic country to ensure strategic, science-based conservation and practical resource management.

The organization shares data using an online land-use planning solution called the Crucial Habitat Assessment Tool (CHAT). Recently, WAFWA leaders decided to upgrade CHAT to an open data website so it would be easier to customize, control content, and collect and share information.

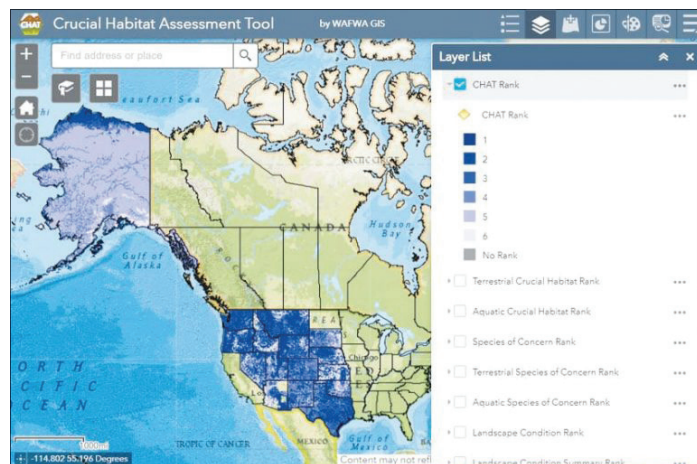
"We needed a technological solution to help our conservation work reach new heights—one that allows us to grow the site and add new features," said Mike Houts, GIS lead for WAFWA-CHAT and a research associate for the Kansas Biological Survey at the University of Kansas.

An Upgrade Facilitates Growth

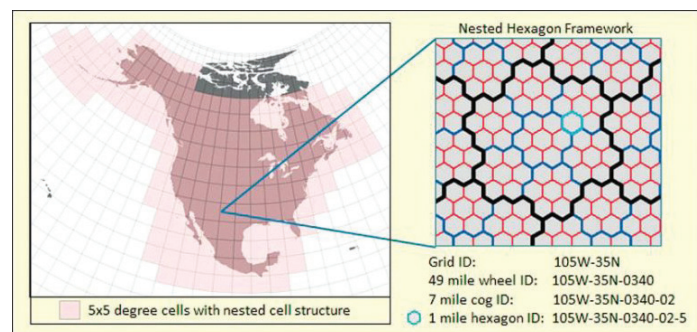
The CHAT website was initially created by a third-party company that employed an online map service to display relevant data. To upgrade CHAT so it could be managed internally, Houts and the GIS team elected to use ArcGIS Online and ArcGIS Hub. They took advantage of the ArcGIS Online cloud-based mapping capabilities to create and share maps and data. Then they used ArcGIS Hub to share open data on WAFWA's hub site, wafwachat.org, with the goal of engaging governments and communities around related policy initiatives.

"Over the course of the last year, we really started digging into ArcGIS Online and ArcGIS Hub, and that's turned out to be incredibly beneficial," said Houts.

The use of CHAT data and maps is quickly growing based on the needs of specific projects and initiatives. To facilitate the expansion of CHAT to states beyond the western United States and address data and location privacy concerns, the University of Kansas developed the Nested Hexagon Framework (NHF). Covering all of North America, the NHF consists of three nested spatial mapping units and a standardized set of attributes—such as species name and observation date—to summarize integrated datasets and convey information. By relating the attribute data to a hexagonal/cog/wheel spatial mapping unit (which is somewhat analogous to the Public Land Survey System's township/range/section mapping unit used in the



↑ WAFWA shares conservation data via a land-use planning solution called CHAT, which is now managed using ArcGIS Online and ArcGIS Hub.



↑ NHF consists of three nested spatial mapping units (in black, blue, and red on the map) and a standardized set of attributes to summarize datasets and convey information.

United States), the NHF allows various agencies to share their information without revealing raw data, such as sensitive spatial data or precise locations. This has proven valuable for states with stringent privacy laws. States can then use the datasets summarized by the NHF to determine CHAT ranks.

Improved Control

The CHAT GIS team selected ArcGIS Hub because of its high usability. Houts said the site's primary web page and the secondary topic-specific pages are now easier to design and implement. Overall website management has also been simplified. When creating a new hub page to summarize a WAFWA project, for example, project leaders can easily convert a Microsoft PowerPoint presentation that highlights goals and content into a story map that can then be posted on the hub page.

"Now we've got improved control over these sites and can add new projects and new text," said Houts. "Our team can update things really easily, as opposed to going through our third-party vendor."

Because ArcGIS Hub enables open data sharing and better data management, WAFWA can efficiently share data with people from state agencies who visit the site. This is a huge development, given that, as Houts noted, the details in CHAT data were not openly shared before. Harnessing this momentum, WAFWA and state agencies are now working to leverage the CHAT and the NHF to make more information available for use in decision-making processes.

Visitors to WAFWA's hub site can download CHAT attribute data for the entire western United States as a .dbf file, and the NHF spatial grid is available for download in 5 x 5 degree tiles. Users simply download each piece and join them by the hexagon ID to get the information for their area of interest. Splitting the data up like this makes the downloads smaller and more focused. The GIS team also created a dashboard that logs the number of downloads and what areas are downloaded to help keep track of areas of high interest. The only requirement to obtain data is a valid email address.

Making Data More Accessible

States participating in WAFWA's CHAT update their habitat priority rankings as needed, and efforts are now under way to launch a mechanism through which dataset owners can submit

their data for integration into the NHF. Once this data is summarized and incorporated into the framework, CHAT users will be able to see additional details about what is within each cell.

"The goal of collecting all this data is to help make better decisions and inform, but it doesn't do any good if the information is not made accessible," said Houts. "So CHAT, the NHF, and ArcGIS Hub are helping make our data accessible to decision-makers and the public while protecting the raw data."

WAFWA partners and the public can also use ArcGIS Hub capabilities to provide input on how the CHAT tool is working and what new functionalities they may want to see in the future via a feedback option on the web page.

"The ArcGIS platform and ArcGIS Hub provide the powerful data sharing capabilities that we require—along with the visualization and analytics—to achieve our goal of making the data accessible and useful," said Chanda Pettie, a WAFWA-CHAT coordinator.

Enhanced Collaboration

WAFWA's implementation of ArcGIS Online and ArcGIS Hub has greatly improved data sharing and is fostering increased collaboration. For starters, the use of Hub has enhanced data management and is getting agencies to better handle their data for CHAT analyses and summaries.

"ArcGIS Hub and ArcGIS Online are helping us meet our goals by making the project information more accessible to the public, as well as planners and developers," said Houts. "The hub site gives a nice project overview on things, while download and online mapping tools provide additional information for queries, analysis, and project summaries."

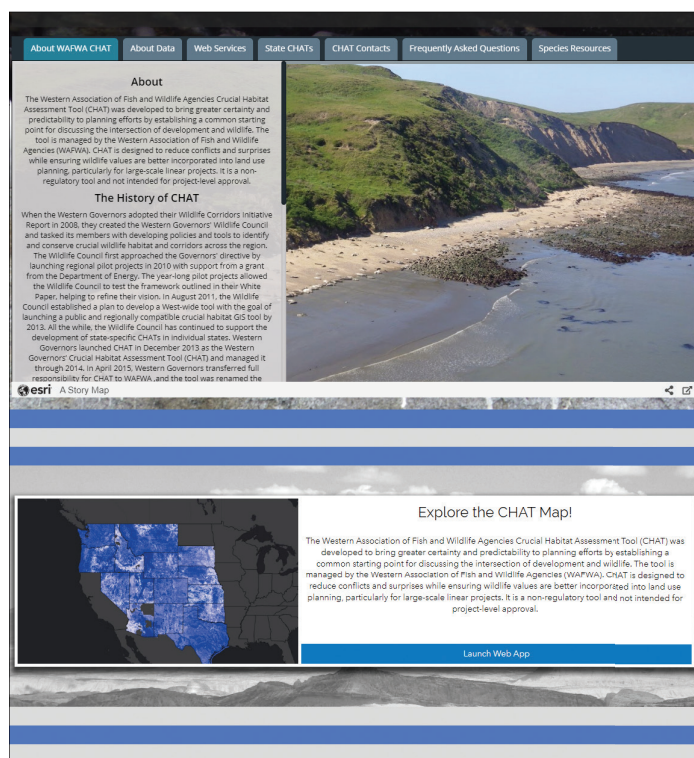
For Houts and his team, the ArcGIS Online interface simplifies how mapping apps are created and improves the user experience. Those who are not skilled in GIS can effortlessly examine a map and obtain detailed information.

Additional Apps for Data Collection

WAFWA employs other Esri tools to collect and share data with CHAT as well. For example, WAFWA teams use Collector for ArcGIS and Survey123 for ArcGIS to administer breeding surveys on the lesser prairie chicken, a bird of conservation interest in the southern Great Plains.

According to Houts, the apps have made "data collection easy and submitted data more complete, consistent, and accurate."

To learn how GIS technology can enhance collaboration within environmental and natural resources agencies, visit go.esri.com/ENR-GIS.



↑ To easily and clearly communicate important conservation information, WAFWA displays story maps on its ArcGIS Hub pages.

Small County, Smart Community: Renville Leads with ArcGIS Hub and ArcGIS Pro Success

Renville County, Minnesota, is a small county by any standard. With a GIS department of one and a population of 15,000, Renville's ability to adapt to new location technologies is turning traditional expectations of small organizations on their heads.

In just a couple of months in 2019, Renville County implemented ArcGIS Hub and became one of the first organizations in the country to implement the new parcel fabric and parcel management capabilities in the ArcGIS platform.

What enables a small county like Renville to pursue emerging technologies and, moreover, to implement and make them successful?

"In a word, opportunity," said Renville County's GIS specialist, Alex Lange. "By showing departments what GIS can do for them, we give them the opportunity to follow a GIS path. My job is to demonstrate how we can solve a problem or fill a need using location technology. It may take time, but the cost-benefit is tilted in favor of GIS."

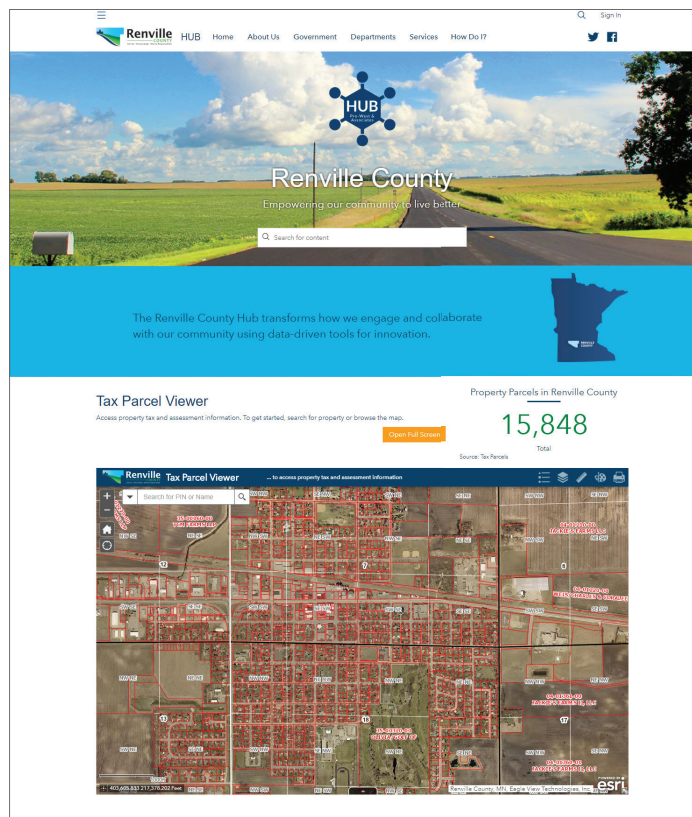
Renville's goals for 2019 included modernizing land records management, from how parcel data is maintained to how it is used by the public. ArcGIS Hub was a logical choice that supported the county's enterprise GIS rollout, also taking place this year. Renville already had a well-used ArcGIS Online solutions gallery, but Hub capabilities allowed Renville to take its interactive solutions even further. Hub was deployed featuring updated branding, connecting the public with searchable GIS solutions and allowing users to find the information they need more easily than ever.

"It's hard to imagine a better solution for Renville County, right now, than ArcGIS Hub. By letting users focus on what they need and making it easy to consume information, they are learning to use GIS. Hub sets a baseline, a one-stop shop that can expand to fit the entire county's need both internally and externally. Not to mention, everyone loves a map!" said Lange.

The county's plans for the future of its hub include completing the transition from its ArcGIS Online solutions gallery to provide an efficient, engaging user experience.

Going ArcGIS Pro for Parcel Management

Renville County also recognized that the opportunity to transition parcel maintenance to ArcGIS Pro was on the horizon. The county knew the move would eventually become necessary as the desktop parcel fabric is deprecated and would fit into its enterprise GIS deployment and land records modernization strategy. Renville partnered with Pro-West, a participant in Esri's parcel fabric testing program, bringing together two organizations making big steps forward.



↑ Renville County's ArcGIS Hub (<http://bit.ly/RenvilleHub>)

The county worked with Pro-West to test the new parcel fabric capabilities—still in beta—with the goal of integrating the new environment into the county's enterprise GIS rollout. With its parcel data in ArcGIS Pro, the county can streamline data maintenance with ample time to build expertise in the new editing processes and learn to independently manage its parcel data before the desktop environment is deprecated.

Lisa Schaefer, geospatial data specialist at Pro-West, said: "The parcel fabric in the ArcGIS Pro platform allows the county to more efficiently manage parcel data with the ability to customize automated tasks, build in attribute rules and editing constraints to minimize errors, and set up robust quality management checks. Renville County has fully embraced the new technology to ensure [that] staff and the public have access to accurate information."

With a cohesive enterprise GIS and service-driven resources, the county is fulfilling its vision of being a smart community, engaging and serving its users with information that is accurate, accessible, and valuable.

For more information on how Pro-West can help you strengthen engagement with citizens, visit go.esri.com/prowest-hub.

The High Cost of Low-Hanging Fruit

By Brent Jones, Esri



Low-hanging fruit refers to the obvious and easy things you do to achieve success or make progress toward a goal. It's the easy stuff. It's the things that always work.

Why is this a problem?

We all want the easy way to get the job done, but it's a problem because disruption sniffs out complacency. Low-hanging fruit is the target of disruption *because it's easy*. Advancing technology solves easy problems efficiently, so anyone can do it.

Relying on low-hanging fruit is well described in the book *Who Moved My Cheese?*, the often recommended (and ridiculed) book on change management. In it, mice who constantly seek security are upended by the possibility that they may lose it.

There is no security in the easy stuff. Relying on past patterns, regulations, and holding on to the status quo because "That's the way it's always been" and "We don't do that" are all ingredients in the recipe for obsolescence.

A senior vice president at a company I worked at many years ago said, "Don't worry about the phone ringing. It has always rung." That was true. . . until it wasn't. That company is now a shell of its former existence.

Complacency invites disruption and is the cousin of failure. I'm not saying you shouldn't pick the low-hanging fruit. I'm saying that if that's all you do, you're doomed.

Artificial intelligence (AI) and machine learning are real, and they're coming fast. What were once time-consuming human intelligence activities are becoming automated and combined with rapidly growing cloud capabilities.

This will replace core workflows for many professionals such as lawyers, appraisers, assessors, accountants, and surveyors. Our ability to use AI with GIS and advanced spatial analysis capabilities are rapidly moving the dial. There's hardly an area that won't be touched as one business overtakes the core business of another.

This equals disruption. Are you ripe for disruption? Probably. We all are. Everything is changing and will continue to do so. Our cheese is getting moved, and our low-hanging fruit is being eyed by others. What do we do to prevent the disruption of our work? How do we prevent what Uber did to taxis from happening to us?

It's surprisingly simple. Transformation is disruption that you do to yourself. Disrupt your organization from the inside. Take the lead.

Build resilience to external disruption. Do this by staying current with your technology. Technology is moving ahead far more rapidly than it did just a few years ago, and the acceleration will increase.

Thomas Edison once said, "I start where the last man left off." Use this to your advantage. Don't reinvent the wheel. Use what's been done to leapfrog your organization ahead of where it is today. This requires a bit of work, but what worked in the past will probably not work long into the future.

Jack Dangermond, president and founder of Esri, has said many times, "Act like a startup." This means work lean, innovate, make mistakes, try new things, get out of your comfort zone, and do it quickly. These strategies are all important to defend against external disruption.

There is no better time than today to get started with your transformation. It will be more difficult next month, and more difficult the following month. I doubt it will stop.

Get started. Network with peers, vendors, and suppliers. Attend a conference or webinar. Join an association committee. Look at which communities your peers are connected to.

I cut a quote by former IBM president Tom Watson, Jr., out of the newspaper and hung it near my desk for many years. It's perhaps more pertinent now than it was in the 1950s when he said it.

"Solve it. Solve it quickly, solve it right or wrong. If you solve it wrong, it will come back and slap you in the face, and then you can solve it right. Lying dead in the water and doing nothing is a comfortable alternative because it is without risk, but it is an absolutely fatal way to manage a business."

Your low-hanging fruit is being moved. Move with it.

About the Author

Brent Jones oversees Esri's worldwide strategic planning, business development, and marketing activities for land records, cadastral, surveying, and land administration. As a recognized innovator, Jones specializes in modernizing existing land administration systems and designing new GIS-based cadastral management systems for small and large governments globally. He is a member of the URISA board of directors, past president of the Geospatial Information and Technology Association, and a current member of the United Nations Committee of Experts on Geospatial Information Management and its Expert Group on Land Administration and Management.

For more information on how GIS can help modernize your organization, visit go.esri.com/LHF-Smart.

Recouping Millions after Natural Disasters

Home to 183,000 residents, Bay County, Florida, is situated on the northwest coast of the Sunshine state. Flood response is a big expenditure for the county, and like many coastal areas, the risk is only getting bigger.

Challenge

In addition to routine infrastructure maintenance, Bay County Public Works was often on the move repairing flood damage from severe weather events. But with simplistic record keeping tools, the team members didn't have clear insight into how they were spending their time or what condition their assets were in.

"We were relying on paper and maps and a lot of memories," says public works director Keith Bryant.

The problem became especially clear when assessing the damage and repair costs after a natural disaster. Crews would repair a range of damaged assets from asphalt to signs. And, the department staff would spend weeks working to compile that information into accurate reports for

the Federal Emergency and Management Agency (FEMA)—often feeling they were leaving money on the table.

The department counted on recall from employees who had been with the department for over 30 years, but as those employees retired, so did their knowledge. "When you lose those employees, you lose that information. So we needed a way to record this data."

Solution

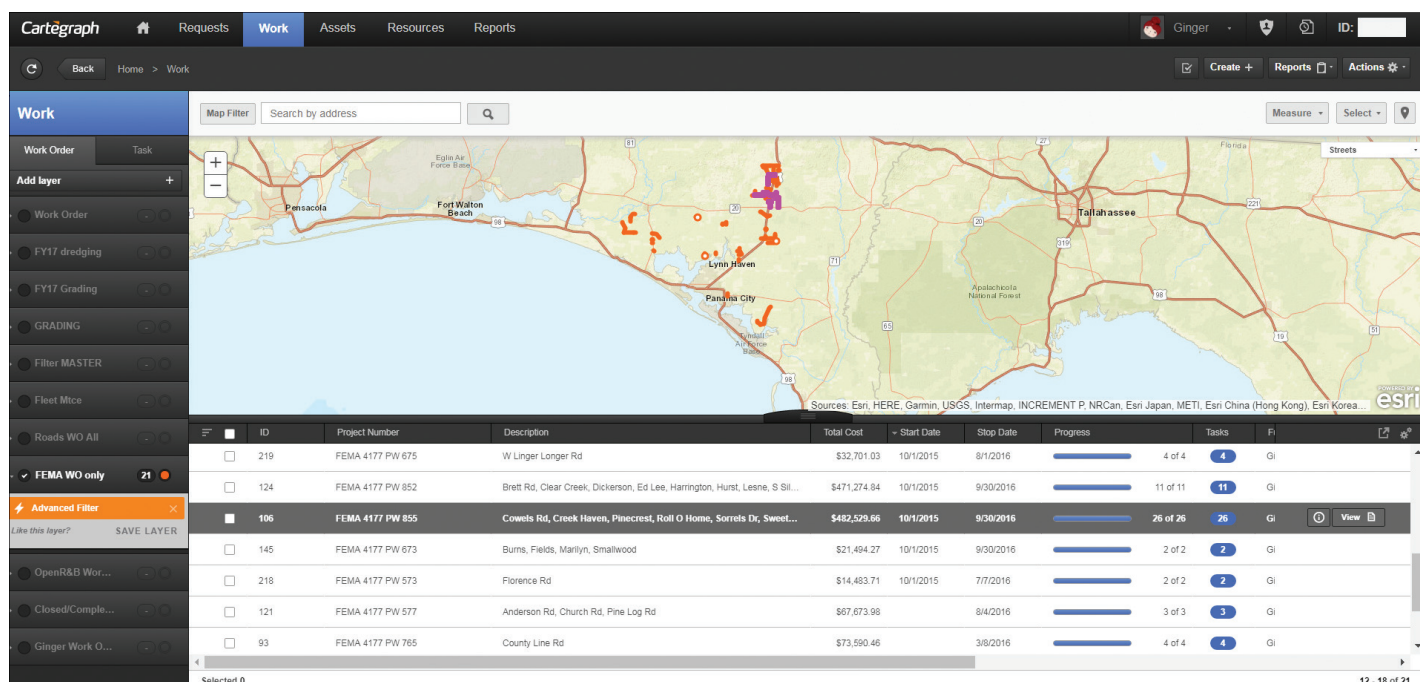
Using Cartegraph's mobile field app, Bay County set out to document each asset in one centralized real-time database. The team collected information about thousands of assets, generating an overall condition index (OCI) for each sign, road, signal, and more. The OCI data points helped the team members generate automatic work orders so they could do repairs more proactively—and say goodbye to stacks of slow-moving paper work.

Since the asset management data could be easily integrated with Esri

ArcGIS, the county could see conditions and locations for each asset mapped out in real time.

"One of the phenomenal things about Cartegraph is its seamless integration with ArcGIS," says GIS division manager Jennifer Morgan. "That was just such a key component to us, because previously, with a lot of the systems using paper, there was no syncing to GIS. Now, being able to sync the two platforms is so helpful because the end user is looking at the same data."

Through the software integration, Morgan's team could now recognize spatial patterns related to asset management: flooding issues caused by broken pipes, potholes showing up on deteriorated roadways, and more. This helped managers identify issues in minutes that before could take years to notice. And, by giving that data to engineers quickly, public works could be more effective with planning and upkeep.



↑ With Cartegraph work orders and ArcGIS mapping capabilities, Bay County teams can quickly provide FEMA with activity plans, time records, material usage, and photos.

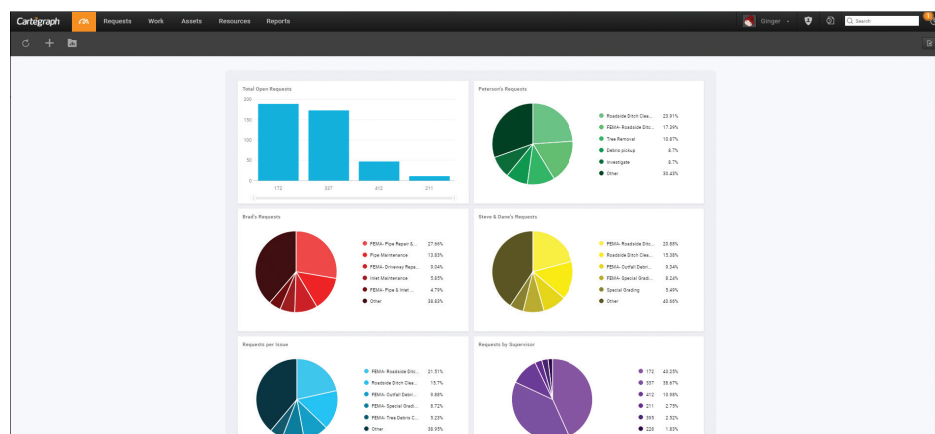


↑ With the move to mobile, nothing gets lost in the shuffle. Bay County crews receive assignments and track work on their mobile device.

Results

Since implementing Cartegraph operations management software (OMS) and Esri ArcGIS into its asset management strategy, Bay County has become more efficient and proactive. The department now has the data to prove budgetary needs.

There is also accountability for citizens—the county has records of repairs to show, with cost data and a timeline of the work done. And, through better prioritization, the county can move faster on maintaining safe road conditions.



↑ Powerful dashboards and reporting tools help Bay County employees visualize data, improving spending decisions.

"I can walk down the hall and tell my boss, 'This is what it's costing us every day to fix these potholes versus what this is going to cost us to resurface the roadway.' That's a tremendous tool to have."

"What would have taken weeks to compile in the old system can just take days now," says roads and bridges technician Ginger Veal. "It's made my job a lot easier, and I think that the citizens of the county are enjoying the benefits of it too."

In terms of flooding prevention and repairs, Bay County has been hit with two different disasters since implementing Cartegraph. Fortunately, the county was able to secure millions by tracking its expenditures down to the penny.

For more information on how Cartegraph can help you sidestep workflow inefficiencies, visit go.esri.com/cartegraph-bay.

A man and a woman are working together at a computer in an office setting. The man, wearing glasses and a dark shirt, is looking at the screen. The woman, with long brown hair and a dark top, is also looking at the screen. The background shows office cubicles and windows. A red gradient overlay is at the bottom of the image.

ArcGIS® Solutions for Elections

Election Outreach

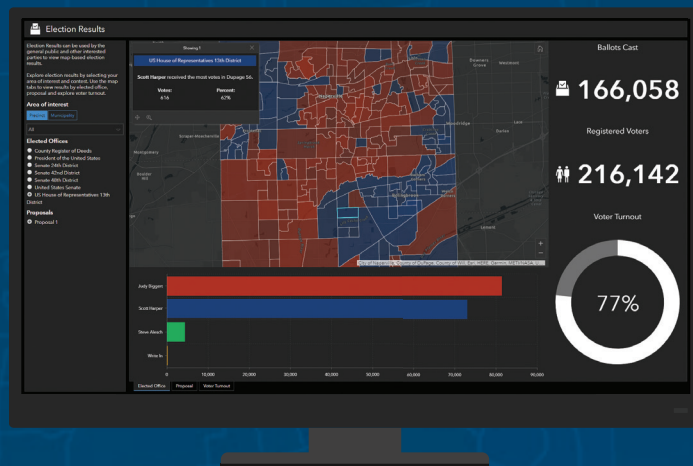
- Find current elected representatives.
- Help voters find their polling places or nearby voting centers, and view current wait times.
- Communicate early voting options to voters.

Election Management

- Report current wait times and request Election Day assistance.
- Manage Election Day requests and track the ballot chain of custody.
- Collect voter satisfaction data and review public sentiment.
- Monitor performance of voting locations in real time.

Election Results

- Share results tabulated on election night.
- Distribute historical results after each election.
- Use maps to provide a modern and simple way to understand election results.



Redistricting with ArcGIS

- Collaborate with key stakeholders.
- Engage the public in redistricting activities.
- Ensure that legislative requirements are met.

ArcGIS Solutions for Elections are a set of ArcGIS templates designed to help clerks, election commissions, and secretary of state offices conduct transparent elections. ArcGIS Solutions for Elections will help educate the public, get voters to the right polling place or voting center, manage Election Day activities, and share election results.



Get a Jump-Start with
ArcGIS Solutions for Elections
[solutions.arcgis.com
/local-government/elections](https://solutions.arcgis.com/local-government/elections)



101 WAYS TO PARTICIPATE ON

GISday



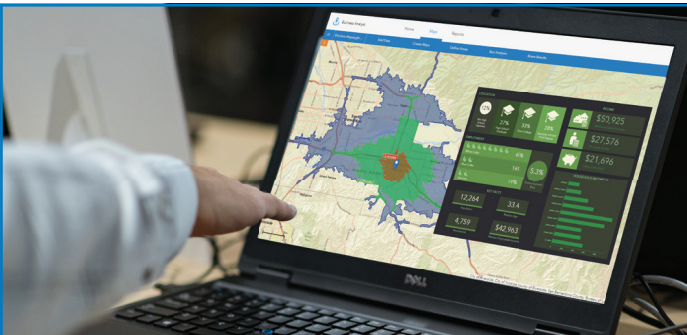
4. Offer to lecture at your alma mater on your career in GIS.



9. Host a GIS Day event in your organization to celebrate your work, and register your event with us.



18. Make a map for a friend.



48. Run an ArcGIS Business Analyst report for a local business.



32. Thank your GIS mentor.



51. Attend a GIS Day event.



97. Instead of a traditional presentation, use a story map to present.



69. Teach yourself a new GIS skill.



95. Make plans to attend the Esri User Conference.

To see the entire list of what to do on GIS Day, visit
go.esri.com/GISDay101.



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NOVEMBER 13, 2019

To learn more about how to celebrate and honor
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Make sure to share your moments using [#GISDay](https://twitter.com/GISDay).



GIS day

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