Making Infrastructure Customers Successful

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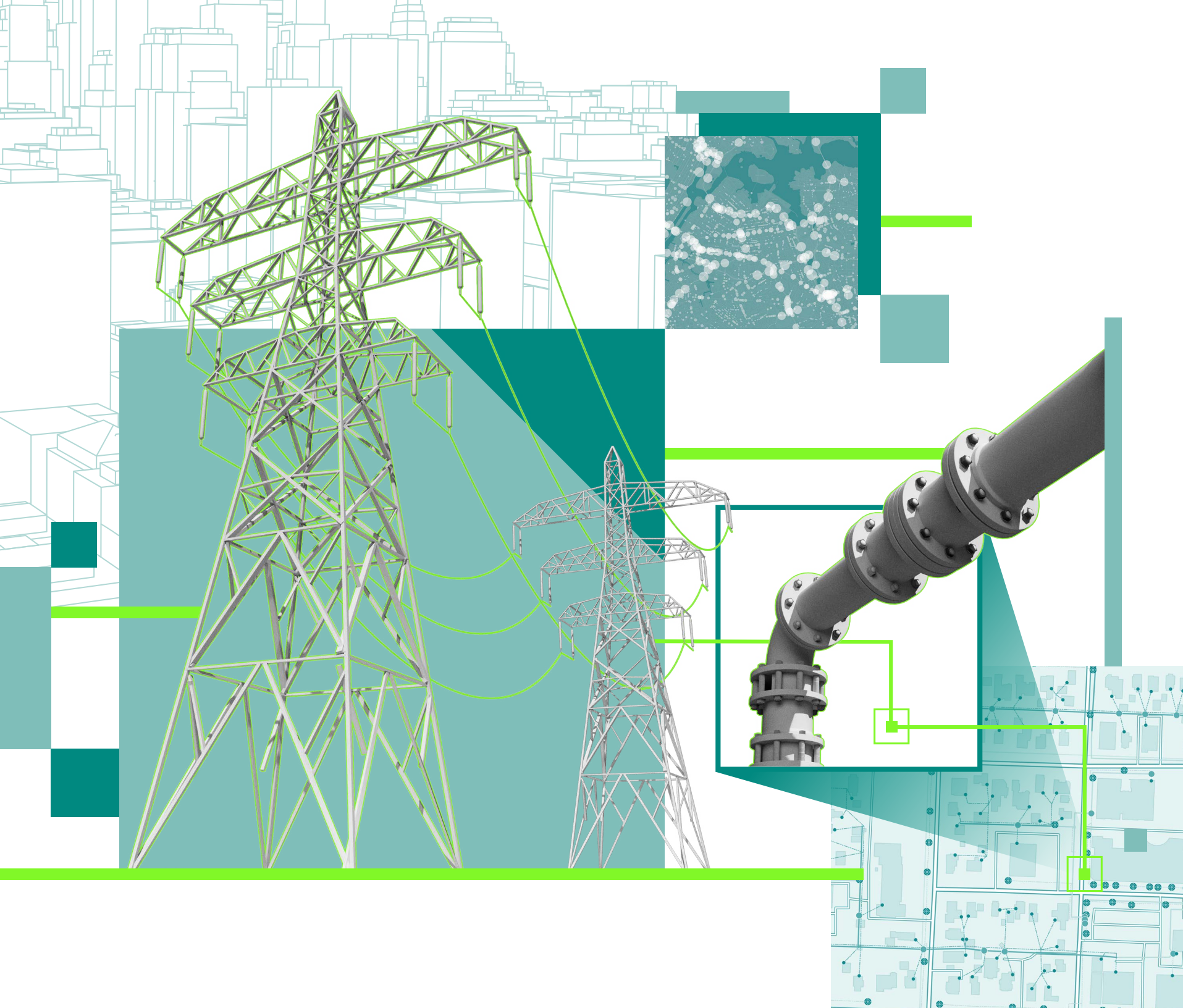
CONTENT

Providing Solutions for a Changing World

In today's ever-changing landscape, decision-makers at infrastructure organizations of all sizes are proactively adopting resilient and sustainable practices. To address these challenges, organizations are harnessing the power of location intelligence.

Applying location-based technology revolutionizes infrastructure management by aligning operations with human needs and environmental sustainability. This transformation is driven by geospatial approaches that provide businesses with a comprehensive understanding of their infrastructure and the world in which they operate. This holistic view, powered by Esri's ArcGIS® software, enhances situational awareness and efficiency, ensuring that services are safe, reliable, and sustainable.

Electric; gas; water; architecture, engineering, and construction (AEC); and telecommunications providers develop proactive strategies to achieve their goals. As a result, they improve service delivery, which is crucial for maintaining infrastructure resilience and adaptability in the face of evolving demands, and environmental challenges. Furthermore, location-based technologies facilitate collaboration with communities and stakeholders, fostering shared knowledge and innovation.

Explore the transformative power of geospatial technology in leading organizations, as the following stories highlight its role in shaping the future of infrastructure management and customer satisfaction for modern digital utilities. ◾

Asset Management

In today's fast-paced environment, asset management within infrastructure companies is more crucial than ever. This section will delve into the strategic approaches and innovative practices shaping asset management's future. We will explore how cutting-edge technologies and data analytics are harnessed to enhance infrastructure assets' efficiency, sustainability, and resilience.

From integrating a geographic information system (GIS) to applying predictive maintenance powered by artificial intelligence (AI), the landscape of asset management is undergoing a significant transformation.

Explore how GIS enhances asset management through analysis, visualization, and situational awareness. ■
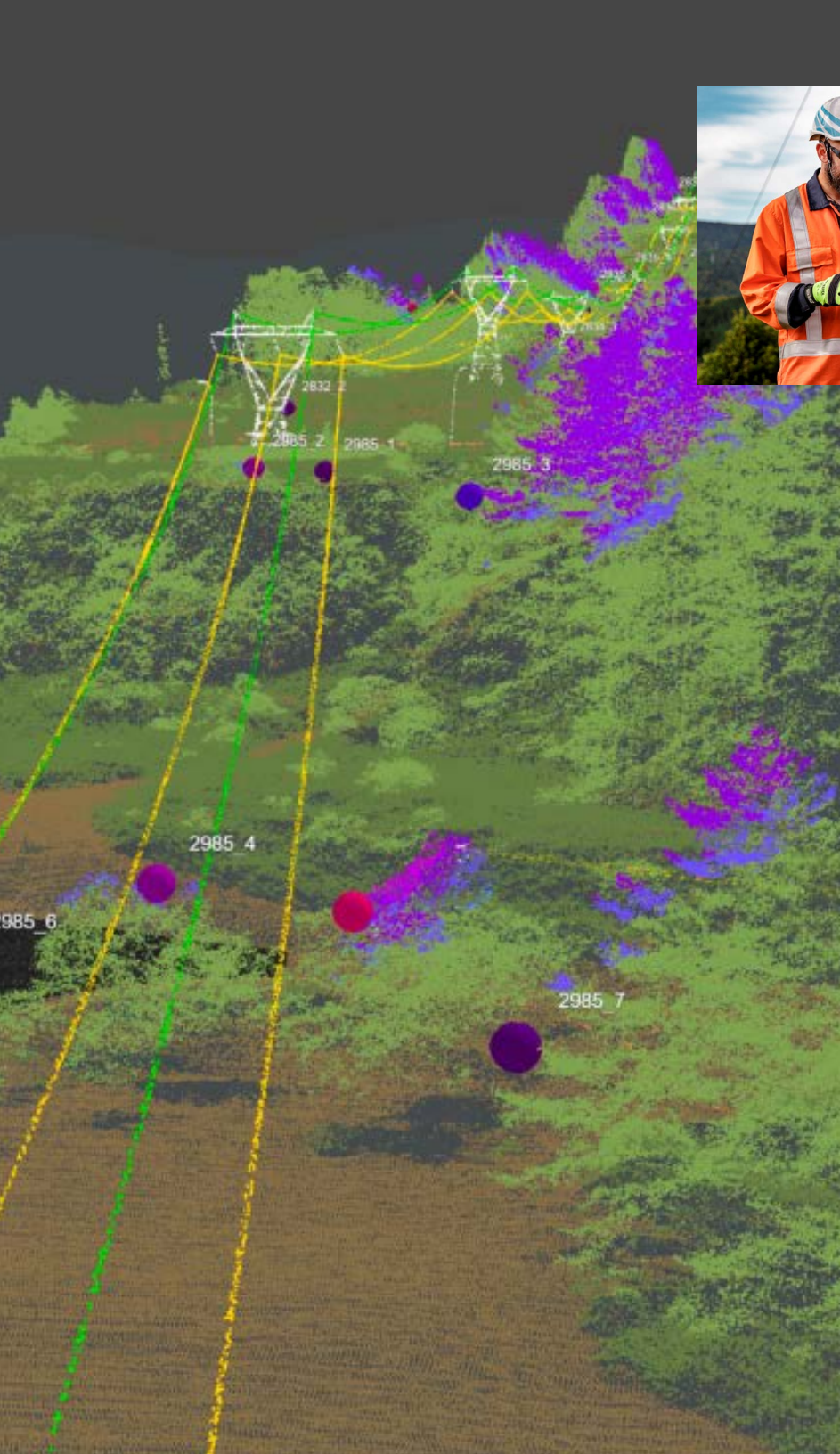
Imagery, Lidar, and GIS Transform
Transpower's Vegetation Management

Transpower, a New Zealand state-owned enterprise responsible for the transmission of electricity across the country, has long faced challenges related to vegetation encroachment on its network. Dense forests and difficult terrain in New Zealand foster rapid vegetation growth, which can interfere with transmission lines, causing safety hazards, service disruptions, and outages. Traditional vegetation management methods like manual surveys and field inspections were labor-intensive and often inaccurate. To address these issues, Transpower is adopting modern technologies, including lidar data and orthophotography imagery, to improve the accuracy and efficiency of its vegetation management efforts.

By capturing detailed three-dimensional data of transmission corridors and surrounding vegetation, Transpower is able to visualize and assess vegetation risks more effectively using Esri's ArcGIS tools, including ArcGIS Online, ArcGIS Experience Builder, and ArcGIS Dashboards. This data, collected by aircraft and processed by contractors, is published and visualized in a spatial environment, enabling better planning and communication of vegetation risks. The new system allows Transpower and its service providers to identify problems in advance, improve work scheduling, and enhance safety by ensuring adequate ground-to-conductor clearances.

In collaboration with Esri partner Eagle Technology, Transpower is implementing this advanced vegetation management strategy, which promises long-term benefits such as reduced costs, improved customer satisfaction, and enhanced operational resilience. The next phase of the project will focus on expanding the use of lidar for asset management, maintenance, and repair, with the potential for even greater predictive capabilities in the future. Read the full story. ∎

Learn more about Eagle Technology.

"*Prior to our implementation, we had limited visibility into the vegetation risks across the transmission network. This improved process using lidar is enabling Transpower to forward plan the work and provide an easy-to-use GIS tool for our service providers and staff.*"

–Mathy Dornan, Geospatial Manager, Transpower
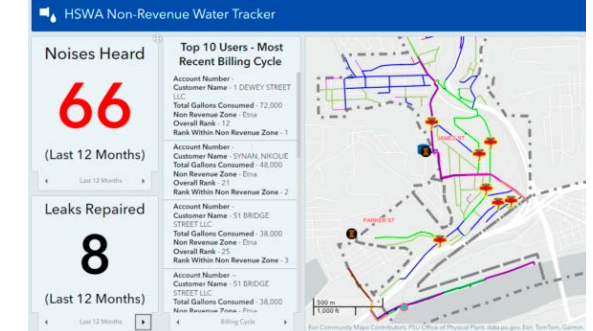
GIS Helps Hampton Shaler Water Authority Reduce Nonrevenue Water

Hampton Shaler Water Authority (HSWA) knew over 35 percent of the water sent out into the system was unaccounted for. This nonrevenue water includes anything that isn't billed to the customer (e.g., billing errors or stopped meters), doesn't make it to the customer (e.g., leaks), or is used to ensure the quality of the water (e.g., flushing operations), as well as the occasional firefighting/training uses. HSWA needed a way to find where their water was missing or unaccounted for so they could improve their services and save money. Accounting for nonrevenue water would also help HSWA improve datasets needed for better-informed management decisions (e.g., line replacements/leak detection efforts) and for annual reporting to state agencies.

With recent investments in GIS, HSWA can capture flushing data (both automated and manual) and leak information in real time. ModelBuilder is being used to autoimport hydrant and flushing data to the GIS. An ArcGIS Arcade expression is used to calculate water usage by day and month. The GIS helps to find where the unaccounted-for water is going by utilizing existing regional primary meter data and individual account meter reads.

Water usage trends going up are often quickly followed by mobile crews hearing noises in the associated area while checking for leaks. As leaks are repaired, water usage trends drop, identifying the approximate amount of water that the repaired leak(s) were losing. When shared with the management team, this data helps to plan both short-term leak detection/repair work and long-term line replacement priorities. Overall, this GIS-aided process helps to streamline and solidify decision-making. HSWA, using this new data system, has saved millions of gallons of the precious resource of water. Read the full story. ■

Learn more about EBA Engineering, Inc.

"Having these processes in place helps us to identify leaks that have been an issue for months or years. Thanks to this success, we are looking to invest in additional regional meters and expand the program throughout our service area as appropriate."

—Jake Casile, HSWA Distribution Manager

Tohono O'odham Utility Authority Transforms Utility Services with GIS

The Tohono O'odham Utility Authority (TOUA), serving the Tohono O'odham Nation in Arizona, transformed its utility services using GIS technology. Historically, TOUA faced significant challenges managing infrastructure due to the vast and remote nature of the Nation's lands, which made it difficult to track assets and maintain efficient utility operations. Manual processes and paper maps led to inefficiencies, slowed down responses to outages, and created issues with maintenance scheduling.

With the integration of GIS, TOUA could digitize their utility networks, which improved the accuracy and accessibility of asset data. This shift allowed mobile crews to access real-time information on infrastructure locations, improving response times and enhancing overall service reliability. GIS has also enabled TOUA to plan more effectively, optimize routes for mobile teams, and manage utility expansions with greater precision. The system proved invaluable for long-term planning, risk management, and data-driven decision-making. TOUA developed the project with the strong support of Palmetto Engineering & Consulting (PEC), an Esri partner.

By adopting GIS, TOUA enhanced its operational efficiency, cut costs, and elevated service quality for its customers across the Tohono O'odham Nation. The digital transformation also empowered TOUA to support future growth and sustainability, demonstrating how technology can effectively address infrastructure challenges in rural and Indigenous communities. Read the full story. ■

Learn more about Palmetto Engineering & Consulting (PEC).

"The system has given us a much safer work environment for our workers and our community. And best of all, we have happy members."

–Kristan Johnson, Telephone Operations Manager, TOUA
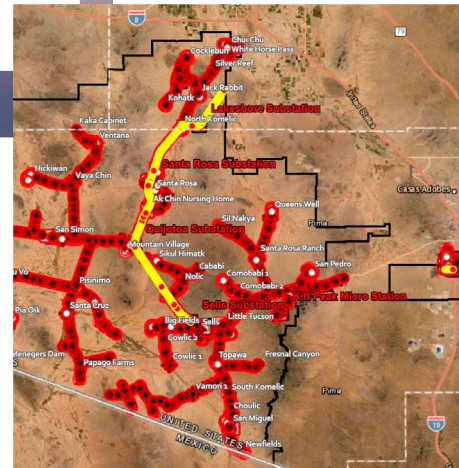
Merging Transmission and Distribution Models at Enbridge Gas

Enbridge Gas supplies natural gas to over one million customers in Utah, Wyoming, and Idaho, through two pressure-level systems, each previously modeled separately in its GIS.

Enbridge could not model its two pressure-level systems, which operate as one integrated system in the real world. Consequently, Enbridge's ability to perform several important analytical and management functions was inhibited. Enbridge's separate distribution and transmission data models lacked the connectivity at the regulator stations required to trace from gate stations to meters. Removing the obstacles preventing an integrated model in the GIS would be essential to meeting Enbridge's current and future business needs.

Enbridge, collaborating with Esri partner UDC, implemented Esri's Utility and Pipeline Data Model, ArcGIS Utility Network, and ArcGIS Pipeline Referencing. These technologies would provide the advanced GIS capabilities needed to create, maintain, and analyze a model of Enbridge's unified pipe network, from the wellhead to the customer's meter.

This initiative merged Enbridge's gas transmission and distribution assets into one network management model, providing the basis for a holistic enterprise view of gas operations and greater visibility into compliance activities. Enbridge is using its new capabilities to facilitate efficient gas workflow management, increase data integrity, enhance the data editing experience, streamline operations, support enterprise applications, and bolster pipeline safety and compliance reporting. Read the full story. ■

Learn more about UDC.

[ArcGIS] Utility Network provides a stable platform that will support opportunities to configure business-specific applications, reports, and maps. Getting maps and data into the hands of our teams will empower them to make data-driven decisions to operate more safely, reliably, and efficiently

–Matt Bartol, PE, General Manager of Gas Operations, Enbridge Gas

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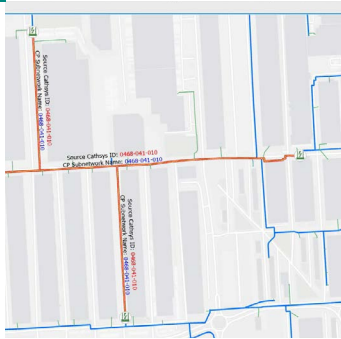
Dominion Energy
Selects EpochField
to Improve Inspections

Dominion Energy, serving six million customers across 15 states, selected Esri partner Epoch Solutions Group's EpochField platform to improve its field inspection and maintenance processes. Traditionally, Dominion's internal GIS mapping application had limitations, especially in areas with unreliable internet, complicating data updates and access to road information for line workers. The solution, EpochField, offers mobile and offline GIS capabilities, enabling workers to capture, update, and sync field data using smartphones and tablets. The platform integrates with ArcGIS, providing real-time updates and advanced spatial analysis features like route optimization and asset management.

EpochField's offline functionality is vital, allowing workers to track and breadcrumb new access routes and sync them with centralized GIS databases once reconnected. Integration with SAP and an eNav system further enhances usability, allowing turn-by-turn navigation and streamlined data management. Dominion and Epoch worked collaboratively over 10 months, ensuring a smooth transition through periodic developer check-ins and interactive training. This initiative empowers Dominion's mobile workers to improve inspection accuracy and safety, enhancing Dominion Energy's capacity to deliver reliable energy. Epoch Solutions Group's role as an Esri partner emphasizes its expertise, making EpochField a critical tool in Dominion Energy's continued innovation in field operations. Read the full story. ∎

Learn more about Epoch Solutions Group.

> *"The in-person support before rollout was especially nice. From a project management standpoint, everything just fell into place. The response to the EpochField rollout has been very positive. Our line workers like the fact that the EpochField application is in their pocket and available on their phones. They also appreciate that they can provide updated field information to GIS, which reviews it for accuracy and pushes it out via EpochField."*

—Matthew Rogers, Supervisor, Electric Transmission Lines Operations, Dominion Energy

Innovation Leads to a State-of-the-Art GIS for a Regional Sewer Utility

The Greater New Haven Water Pollution Control Authority (GNHWPCA, or the Authority) operates and maintains the wastewater system of constituent municipalities, the City of New Haven, Town of Hamden, Town of East Haven, and Town of Woodbridge.

The City of New Haven is the only combined sewer system. The city's combined sewer overflow long-term control plan included developing a GIS database, building a foundation for hydraulic modeling, pipe risk assessments, prioritization of inspections, and identifying rehabilitation projects. The Authority hired Langan Engineering and Environmental Services LLC (Langan), an Esri partner, to help centralize its GIS data.

Goals included planning for major flooding surge and overflow events, responding quickly and effectively to calls for utility location services, and reporting unplanned events. And like many communities, new construction required planning for increased sewer flows, capital planning, and budgeting for new sewer infrastructure.

Today, ArcGIS provides a variety of web and mobile applications used to monitor and maintain the health of the regional sewer system and integrated utility network. Ricardo Ceballos, senior engineer and GIS manager, underscored tasks that once took hours or days can now be completed in less than an hour.

Ceballos and team have converted their geometric network to ArcGIS Utility Network and are expecting to gain value by integrating with the customer information system, taking advantage of utility network traces that show impacted customers and trigger automated notifications. GNHWPCA is also planning to explore ArcGIS Indoors as a solution to map interior spaces of their large pumping stations and wastewater treatment plant. ArcGIS Pro flood analysis tools will also be reviewed. Read the full story. ∎
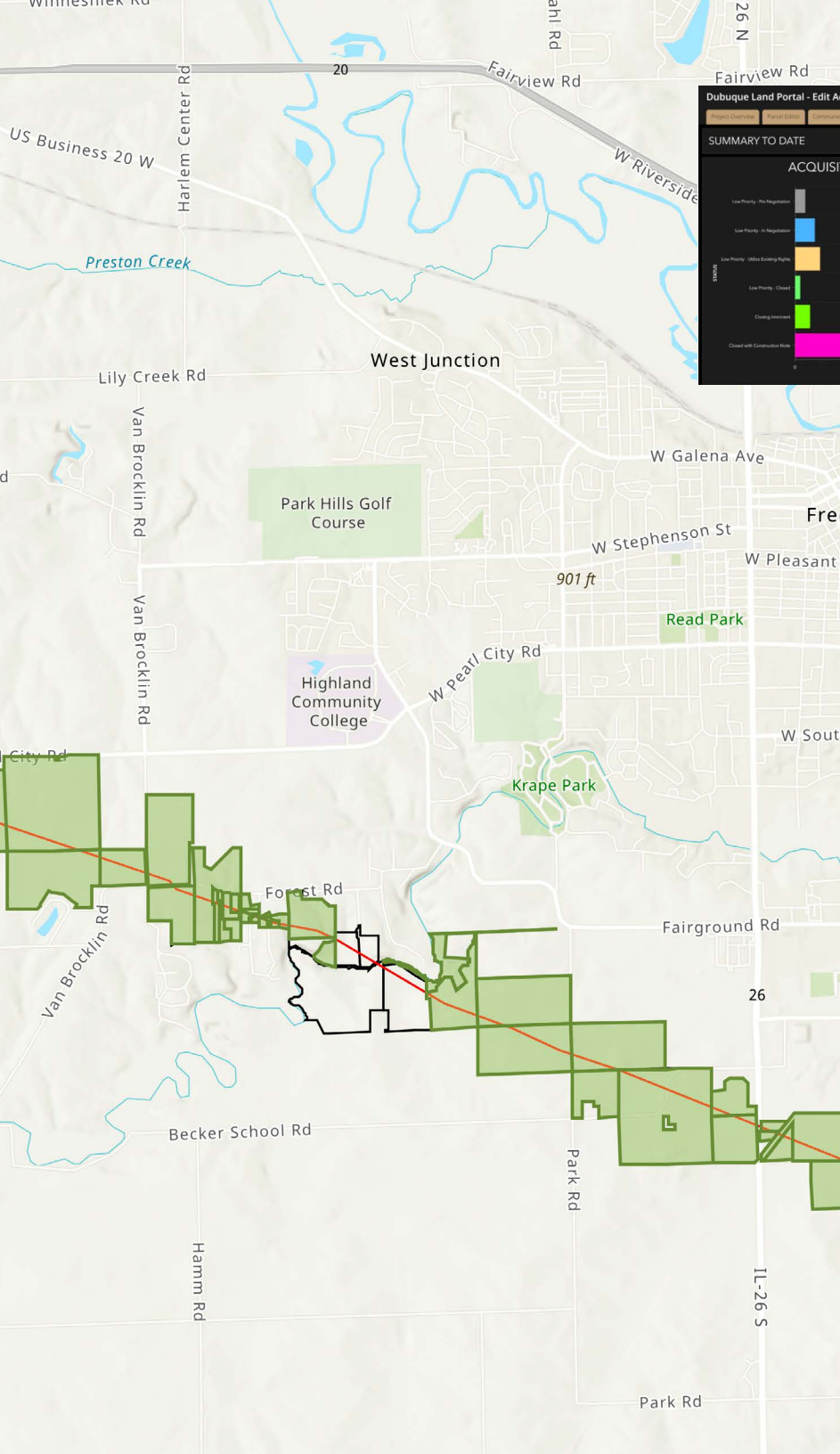
Learn more about Langan Engineering & Environmental Services.

"We are continuously finding new ways to streamline our business workflows and deliver easy-to-use decision support apps and tools for our stakeholders"

–Ricardo Ceballos, Senior Engineer and GIS Manager, Greater New Haven Water Pollution Control Authority

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Geoenabling a Land Management Workflow

GIS is essential in enhancing land management solutions, offering tools for the collection, analysis, and visualization of spatial data. Southern Company Gas (SCG), a leader in natural gas distribution, utilizes GIS to optimize workflows related to fixed assets like pipelines, which are crucial for the US energy sector. The SCG land management team sought an effective solution to improve efficiencies and workflows for a 100-mile-long pipeline project in Illinois, addressing the limitations of their previous paper-based inspection processes.

Historically, SCG relied on paper documentation and flat-file spreadsheets for managing gas pipeline easement acquisitions, which hindered real-time updates and collaboration among team members. This outdated method made it challenging to track parcel statuses and provide management with a clear overview of acquisition metrics. The reliance on PDF forms and project manager emails for instructions further complicated the workflow, leading to inefficiencies and a lack of visibility into the overall business value of the project.

To address these challenges, Dawood Engineering, an Esri partner, implemented a land management GIS portal using Esri's ArcGIS technology. This automated solution streamlined the field inspection process, allowing for real-time data collection and management through a single device, thus promoting a paperless approach.

The new portal enhances team efficiency, communication, and collaboration by providing a centralized repository for project information, enabling quick access to acquisition data and facilitating seamless updates. This digital transformation not only improved operational efficiency but also instilled confidence in clients regarding facility installations and record availability. Read the full story. ∎

Learn more about Dawood Engineering.

> "The GIS land portal increases efficiency, tracking, communication, and reporting, and reduces past issues SCG [Southern Company Gas] faced in these areas. We are confident that Esri's geoenabled approach will more than pay for our initial investment and apply to additional infrastructure and asset improvements."
>
> —David Surina, Manager of Land Management, Southern Company Gas

Operations

In the dynamic field of infrastructure management, operational excellence is increasingly dependent on advanced technologies like a geographic information system (GIS). These tools enable operators to comprehensively model and visualize network information, enhancing situational awareness and real-time insights. This section highlights how integrating GIS into daily workflows allows for optimized resource allocation, efficient workforce tracking, and rapid response. Operations dashboards further support this by displaying data trends that inform strategic decision-making, ensuring high performance and minimal disruptions.

Explore how these technologies transform infrastructure operations, promoting efficiency and effectiveness across the board. ∎

Advanced Planning and Construction with CIM Integration at Andel

Andel, a utility company in eastern Denmark serving 1.5 million customers, recently consolidated its legacy geographic information system—ArcGIS with the geometric network and Intergraph G/Technology—with ArcGIS Utility Network. This move was supported by Esri UK's web application UNE for ArcGIS, and by the Similix CIM [Common Information Model] Adaptor, enabling seamless integration with different advanced distribution management system (ADMS) technologies. ArcGIS Utility Network has become a business-critical system at Andel, playing a key role in network planning, design, construction, operations, and maintenance.

To address challenges like aging assets and integrating distributed energy resources, Andel sought to leverage the high-fidelity data model in ArcGIS Utility Network. This strategy aimed to align the representation of real-world assets in GIS with operational systems, enhancing spatial analytics and ensuring that both GIS and ADMS reflected the grid's actual state.

The implementation included advanced data transformation using the Similix Utility Network Migration Suite and Esri UK's UNE for ArcGIS app for grid design—this integration streamlined grid extension and commissioning processes, improving efficiency and accuracy.

The results have been impressive, with ArcGIS Utility Network now serving as Andel's primary data system.

The implementation has reduced training costs by 80 percent, increased productivity tenfold, and provided a future-proof solution that supports efficient workflows and strategic goals. Read the full story. ∎

Learn more about Similix.

Learn more about Esri UK.

"*As part of a modern network management strategy, we are challenging ourselves to use a web-first approach and find smarter ways of working to optimize our processes and deliver improvements over the whole network management life cycle of design, plan, build, and operate. Working with Similix and Esri UK to address this challenge and maximize our investment in ArcGIS Utility Network has been extremely productive. We have enabled our GIS to serve as the [primary] data system for ADMS through [Common Information Model] CIM-based integration and rolled out an intuitive and focused user experience application to over 600 users. We have been impressed by the technology and the services that Similix and Esri UK have delivered and look forward to continuing our work with them to realize our strategic goals fully.*"

—Jakob Møl Mortensen, Head of Energy Systems, Andel
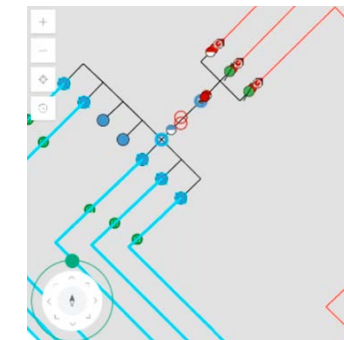
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MEDC GIS: Getting Smarter

The Muscat Electricity Distribution Company (MEDC) oversees power distribution in Muscat, Oman, serving over 450,000 customers. Since its formation in 2005 post-privatization, MEDC has leveraged innovative GIS technology to improve efficiency, transparency, and asset management. One key operational challenge MEDC faced was maintaining its distribution substations, which required regular, paper-based inspections for issues like oil leaks and equipment damage. This manual process led to inefficiencies, errors, and data management difficulties, impacting maintenance tracking and strategic decision-making.

To address these issues, MEDC implemented a digital, mobility-based inspection solution using Esri's ArcGIS tools and Schneider Electric's ArcFM Web. The system allowed mobile crews to use GPS navigation, digital forms, and real-time data collection, greatly enhancing the accuracy and transparency of inspection data. ArcGIS Dashboards provided comprehensive monitoring for stakeholders, while the ArcGIS Enterprise system enabled streamlined data processing and access to interactive dashboards.

The new approach doubled daily inspections per worker, improved asset health insight, reduced operational costs, and enhanced customer service by decreasing outages. MEDC's partnership with Khatib & Alami, an Esri partner, supported this transformation, developing an Integrated Reporting Engine for real-time network status monitoring, which makes MEDC's operations more proactive and data-driven. Read the full story. ∎

Learn more about Khatib & Alami.

"This is a wonderful, innovative, complete solution for management. MEDC GIS raises the quality of analyzing data and making decisions."

–Eng. Sulaiman Al Amri, Z3 Manager

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Real-Time Rainfall Monitoring Alerts Gas Company Staff of Severe Weather-Impacted Areas

National Fuel Gas Company is a diversified energy company operating in the Northeastern United States, involved in natural gas transmission, distribution, and storage. It serves over 740,000 customers across New York and Pennsylvania, emphasizing safety, reliability, and regulatory compliance in its operations.

National Fuel Gas Company implemented a real-time rainfall monitoring system using Esri's ArcGIS technology to enhance safety and regulatory compliance for its pipeline network. Previously, National Fuel relied on employees' judgment to monitor rainfall, a method that risked inaccuracies due to the broad, variable nature of weather data. Esri partner Baron Weather provides the live weather data

to analyze in ArcGIS GeoEvent™ Server and display it on the end user map. The new system automates real-time rainfall data tracking, alerting staff when rainfall exceeds severe thresholds in specific areas, allowing for faster, targeted pipeline inspections after storms. Leveraging ArcGIS GeoEvent Server and ArcGIS Online, the solution integrates live radar data, geofencing, and personnel assignments, notifying relevant staff instantly. This efficient approach focuses inspection efforts, minimizes costs, and ensures timely regulatory compliance while enhancing safety for customers and the community.
Read the full story. ∎

Learn more about Baron Weather.

> *National Fuel needed to create an automated process to proactively monitor rainfall throughout its operating territory to meet its own safety goals and the Pipeline Hazardous Materials and Safety Administration's (PHMSA) regulatory requirements that operators perform transmission pipeline facility inspections starting within 72 hours of extreme weather events once that area can be safely accessed by personnel and equipment.*

—Ed Shafer, General Manager, Safety, National Fuel

Clallam Public Utility District Extends NISC Mapping for Added Value

Clallam County Public Utility District (PUD) in Washington state serves over 30,000 customers with electric, water, and broadband services across a large, rural area. To improve service reliability and streamline operations, Clallam PUD integrated Esri's ArcGIS technology with the mapping system from National Information Solutions Cooperative (NISC), an Esri partner. This integration enabled a seamless exchange of data across departments, giving staff and mobile crews real-time access to vital infrastructure information.

Prior to this system upgrade, Clallam PUD managed its assets and workflows through separate, often manual processes, resulting in data silos and inefficient communication. By connecting ArcGIS with NISC's tools, the utility district created a single source of truth, allowing for

accurate, real-time asset mapping and facilitating easier data sharing for everyone from mobile crews to managers. Mobile staff could now access critical data via mobile devices, improving accuracy in inspections, repairs, and response times for outages.

This GIS-driven approach enhanced operational visibility, enabling Clallam PUD to respond more effectively to customer needs, reduce service disruptions, and allocate resources more efficiently. The integration improved data accuracy, reduced operational costs, and supported the utility's commitment to high-quality service and reliability, while making it easier for crews to manage assets in the rugged, expansive terrain of Clallam County. Read the full story. ■

Learn more about NISC.

> *Users can import NISC data to enhance or expand upon it for further business requirements. On the horizon, as Clallam PUD moves to AMI [advanced metering infrastructure], they plan to use similar functions to record meter changeouts and key information, including before-and-after photos. Also, the innovative staff will use apps to perform equipment inspections and plan their fiber build-out.*

–Ken Brilhart, Sr. Systems Administrator, Clallam PUD

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Accelerating Hope's ArcGIS Utility Network Implementation and Migration

Hope Gas provides natural gas to approximately 125,000 residential, industrial, and commercial customers in 35 West Virginia counties.

Hope acquired the gathering, transmission, and distribution assets of Dominion West Virginia and its supporting operations, which included the data in a legacy GIS. Hope Gas could not maintain the gas assets in this legacy data format and needed to implement the Esri platform in nine months to maintain the data, capture inspection data in the field, and generate compliance reports for the newly acquired gas distribution systems.

With the assistance of Esri partner RAMTeCH, Hope implemented ArcGIS technology, including the Utility and Pipeline Data Model, ArcGIS Enterprise, ArcGIS Pro, ArcGIS Utility Network, and a GIS mobile application. Read the full story. ■

Learn more about RAMTeCH.

"With no hesitation and [with] true confidence, RAMTeCH stepped in and provided the necessary solution and personnel to ensure Hope had its new GIS technology operating by the firm deadline set by the State of West Virginia. Our collaboration with RAMTeCH guaranteed all expectations were met and Hope's systems program was a success."

–Nagy Nagiub, Vice President of Corporate Services, Hope Gas

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Digital Forms for Water Quality Assessment and Informed Decision-Making

Industrial and manufacturing companies are mandated to monitor groundwater conditions, especially at sites with contamination histories. This monitoring involves measuring water depth, recording field parameters, and collecting samples for laboratory analysis to ensure compliance with water quality standards. The collected data is crucial for tracking compliance and assessing the effectiveness of management practices.

Traditionally, groundwater monitoring relied on paper-based forms, which were inefficient and prone to errors. Mobile staff faced challenges in manually recording data under varying weather conditions, leading to time-consuming transcription processes back at the office. To address these issues, engineering firm and Esri partner Kennedy Jenks

transitioned to digital forms, utilizing ArcGIS Enterprise. This shift provided a user-friendly interface that streamlined data entry, allowing mobile personnel to easily navigate and input information, attach relevant photos, and access historical data, all while functioning offline.

The implementation of digital forms significantly improved data quality and accessibility. Project managers could now review data in real time, enabling timely decision-making and reducing the need for costly site visits. A visually appealing dashboard was created to provide quick insights into monitoring results, enhancing communication between mobile staff and management. The transition to digital forms has not only increased efficiency and accuracy in water quality assessments

but also ensured compliance with environmental regulations, ultimately benefiting both the firm and its clients.
Read the full story. ■

Learn more about Kennedy Jenks.

"*Project managers value the ability to look at the data before somebody leaves the field because it's very expensive and time-consuming for somebody to drive to a site. So if there's an issue that can be addressed while the person is still there, that is definitely a time-saver.*"

—Joshua Sales, Vice President, Kennedy Jenks
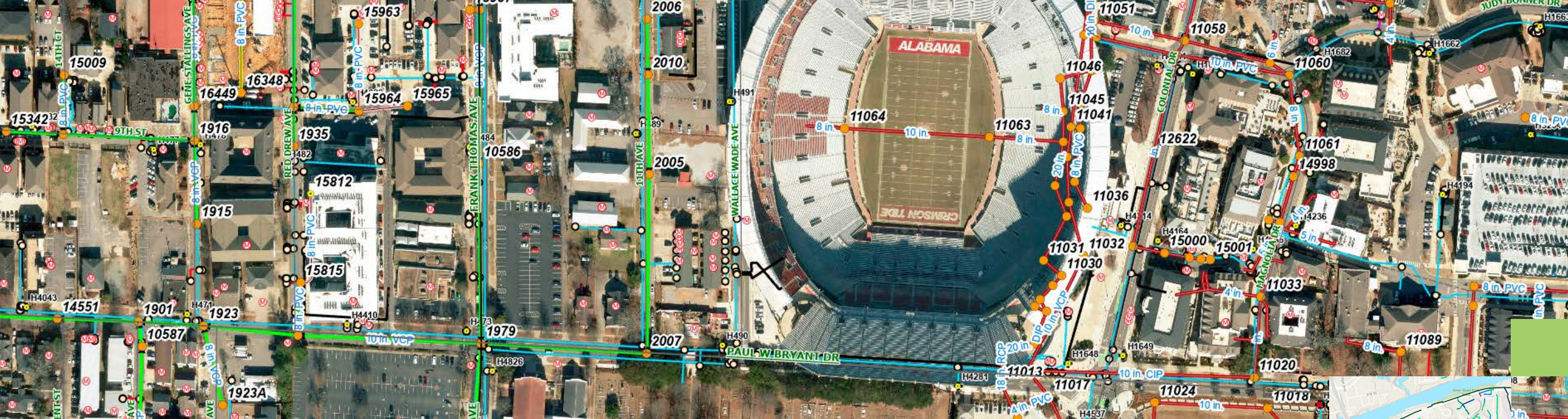
Field Goals to Flow Goals: Tuscaloosa's Game Plan for Sewer Management Success

The city of Tuscaloosa, Alabama, known for its dynamic community and vibrant college atmosphere, faces unique challenges in managing its extensive sewer system infrastructure. The city manages over 507 miles of sanitary sewer pipes and 252 miles of storm drains, ensuring efficient, uninterrupted service to residents and the bustling university population.

Tuscaloosa's primary challenge was the lack of a cohesive system for managing and prioritizing sewer system maintenance. The existing processes were time-consuming and lacked the precision needed for effective decision-making. The city needed a way to accurately identify where there were blockages leading to overflows or deteriorating infrastructure that could cause sinkholes.

The city implemented ITpipes to provide video inspection software integrated with CentralSquare technology and Esri's ArcGIS, providing data within a mapping environment. This integration provided a powerful tool for visualizing the sewer network in a geographical context, allowing for more strategic planning and prioritization of maintenance tasks. The solution offered comprehensive video inspection capabilities, enabling detailed assessments of sewer lines' conditions. Coupled with Esri's GIS platform, the solution allowed for real-time data access and analysis, empowering mobile crews with actionable insights directly on-site.

The adoption and integration of the ITpipes solution and Esri software revolutionized Tuscaloosa's approach to sewer management. Critical inspection and maintenance data is no longer siloed, resulting in more effective field operations and a dramatic reduction in sewer overflows. In addition, the number of incidents was reduced by more than half within three years, and the water and sewer department then took a proactive approach to maintenance. This strategic shift improved efficiency and significantly reduced emergency repair costs. Read the full story. ∎

Learn more about ITpipes.

"ITpipes [provides] a very versatile tool that helps efficiency in all processes throughout the city of Tuscaloosa, including [not only] repairs and maintenance of sewer assets but also billing and capital improvement projects. It is very user-friendly, and the tech support team is amazing!"

–Joy Cowart, Asset Management Quality Control Specialist at City of Tuscaloosa

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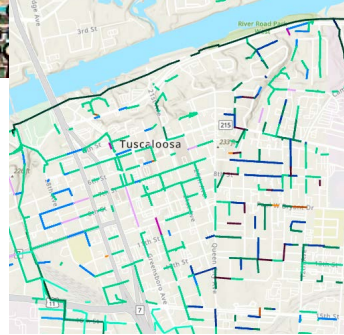
Empowering the City of Henderson with Seamless GIS and Asset Management Integration

The Department of Utility Services for the City of Henderson, Nevada, serves over 330,000 residents. Utility Services has approximately 1,000 miles of water lines, 1,000 miles of sewer lines, and 107,400 service connections. The utility has over 348,000 synced assets between its geographic information system (GIS) and its asset management system—Esri ArcGIS and IBM Maximo, respectively. Integration of Maximo and ArcGIS is essential to the utility's daily operations, providing visibility into its assets and work orders.

Utility Services uses custom-developed scripts to unify data and provide reporting of the synchronizations between the ArcGIS and Maximo systems. The unreliability in data synchronization necessitated ongoing efforts to address duplicate and orphaned data, leading to the additional burden of manually reloading records due to errors. The maintenance and management of the synchronizations were increasingly costly.

The City of Henderson also faced difficulties upgrading their ArcGIS deployment, as it would have necessitated significant development rework for the utility team. They needed a better solution for ArcGIS and Maximo integration to ensure access to data and improve the utility's ability to upgrade its GIS. They decided to partner with Geonexus to improve integration.

The team chose to implement the Geonexus Integration Platform (GIP). This fully supported, no-code data integration platform connects ArcGIS and Maximo, and provides robust reporting on the synchronizations. The platform includes connectivity for ArcGIS Desktop, ArcGIS Online, Portal for ArcGIS, and ArcGIS Enterprise. This gives Utility Services the ability to seamlessly integrate its ArcGIS and Maximo systems.

Utility Services can now synchronize data bidirectionally between ArcGIS and Maximo, see reports of data exchanges and errors, and load assets significantly faster. They can quickly populate thousands of null values from ArcGIS to Maximo and keep the systems aligned. They are also able to upgrade their Esri technology at will. Read the full story. ■

Learn more about Geonexus.

"Bidirectional synchronization allows us to push data updates in either direction. GIS, clearly having the majority of legacy information, is able to push data into Maximo to fill huge gaps in our infrastructure attribution."

—Erika Provost, Senior Utilities Business Analyst, Utility Services, City of Henderson

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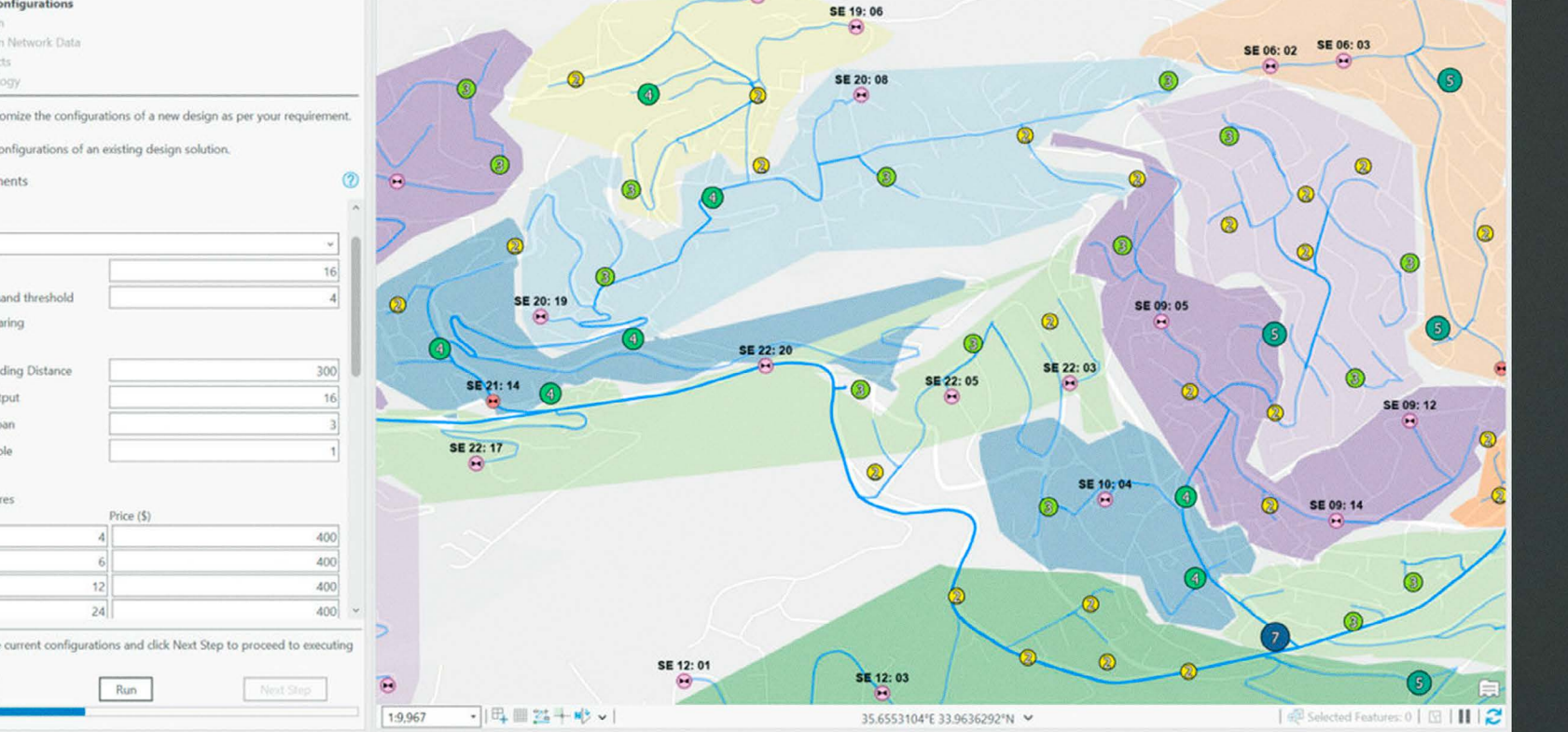
Planning and Engineering

In infrastructure planning, the integration of geospatial data and advanced analytics is revolutionizing design and engineering workflows. ArcGIS tools enable the creation of 3D digital twins, providing a comprehensive view of network performance. This technology allows for the visualization and analysis of trends and patterns by location, supporting informed decision-making and strategic planning. Predictive modeling helps identify potential vulnerabilities, ensuring resilient and future-proof projects.

These tools enhance project planning and anticipate future demands, leading to sustainable solutions. Collaborative management streamlines execution, aligning stakeholders and optimizing communication.

Explore the transformative impact of these technologies in shaping efficient and forward-thinking infrastructure development. ∎
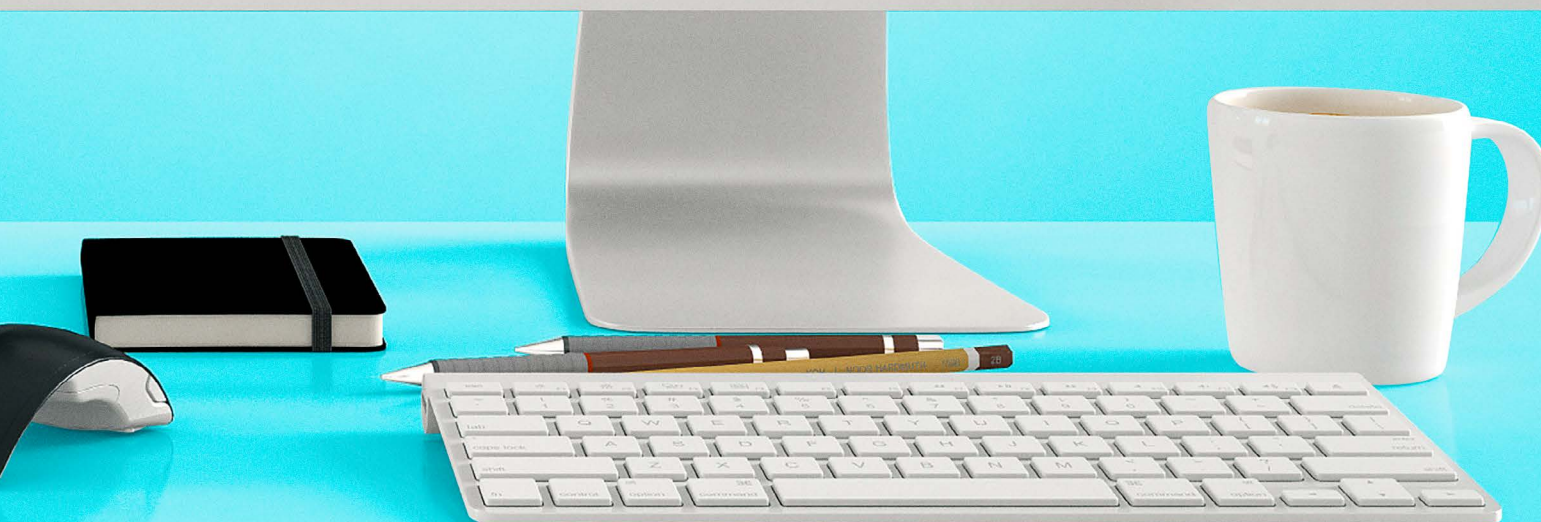
Migration of
HK Electric's Legacy GIS to ArcGIS Utility Network

HK Electric, responsible for electricity production, transmission, and distribution for nearly 600,000 customers in Hong Kong, recently transitioned to ArcGIS Utility Network as part of a major GIS modernization project. The company had previously relied on a heavily customized legacy geographic information system developed over the course of 25 years. Due to its complexity and unique functionalities, age posed significant challenges in maintaining and adapting the GIS to modern smart grid requirements.

To address these issues, HK Electric migrated to a standard, sustainable GIS environment with minimal customization. The project was a collaborative effort between Electric and Esri partners Similix and D&C Consulting. ArcGIS Utility Network, and particularly its open data model from the Utility Network Community (UNC), provided the framework for this transition. This new model replaced many of the custom-built functionalities, simplifying the system while preserving the accuracy and detail required for Hong Kong Island's dense underground network. Read the full story. ∎

Learn more about Similix.

Learn more about D&C Consulting.

> **"*The degree of customization to implement the planning has drastically reduced, hence, largely improved the long-term sustainability and reduced the total cost of ownership of the solution.*"**

—Chris Poon, Manager, Data & Emerging Technology, HK Electric

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Rebuilding Paradise:
A Comprehensive Storm Drain Master Plan for Resilience

2024 Special Achievement in GIS (SAG) Award winner

The town of Paradise, California, faced significant challenges following the devastating 2018 Camp Fire, which severely damaged its infrastructure, including the storm drain network. The melting of PVC pipes highlighted the urgent need to reestablish this infrastructure as part of the town's Long-Term Recovery Plan. The goal was to guide reconstruction efforts, enhance resilience against future storm runoff, and develop strategies to mitigate flooding risks.

To address these challenges, the town of Paradise partnered with Wood Rodgers Inc., a multidisciplinary engineering firm. Wood Rodgers, an Esri partner, was tasked with developing a comprehensive Storm Drain Master Plan (SDMP) using Esri technology and the ArcGIS platform. The team conducted extensive data collection and analysis to identify deficiencies in the storm drain network, creating a digital basemap of the existing infrastructure. They also established an AEC Project Content Delivery site using ArcGIS Online to facilitate collaboration among stakeholders, enabling efficient data collection and monitoring through tools like ArcGIS Survey123.

The SDMP has had a significant positive impact on the town's rebuilding efforts. Wood Rodgers generated detailed parcel maps showing flood extents for all 11,000 parcels, providing residents with essential information to make informed decisions about rebuilding their homes. The recommendations from the SDMP will help prioritize infrastructure improvements, ensuring the town is better prepared for future flooding events. Read the full story. ∎

Learn more about Wood Rodgers Inc.

"Effective use of GIS was instrumental in being able to deliver a high-quality Storm Drainage Master Plan while meeting budget and schedule constraints."

–Harvey Oslick, PE, CFM, CPSWQ, ENV SP, Principal Engineer, Wood Rodgers
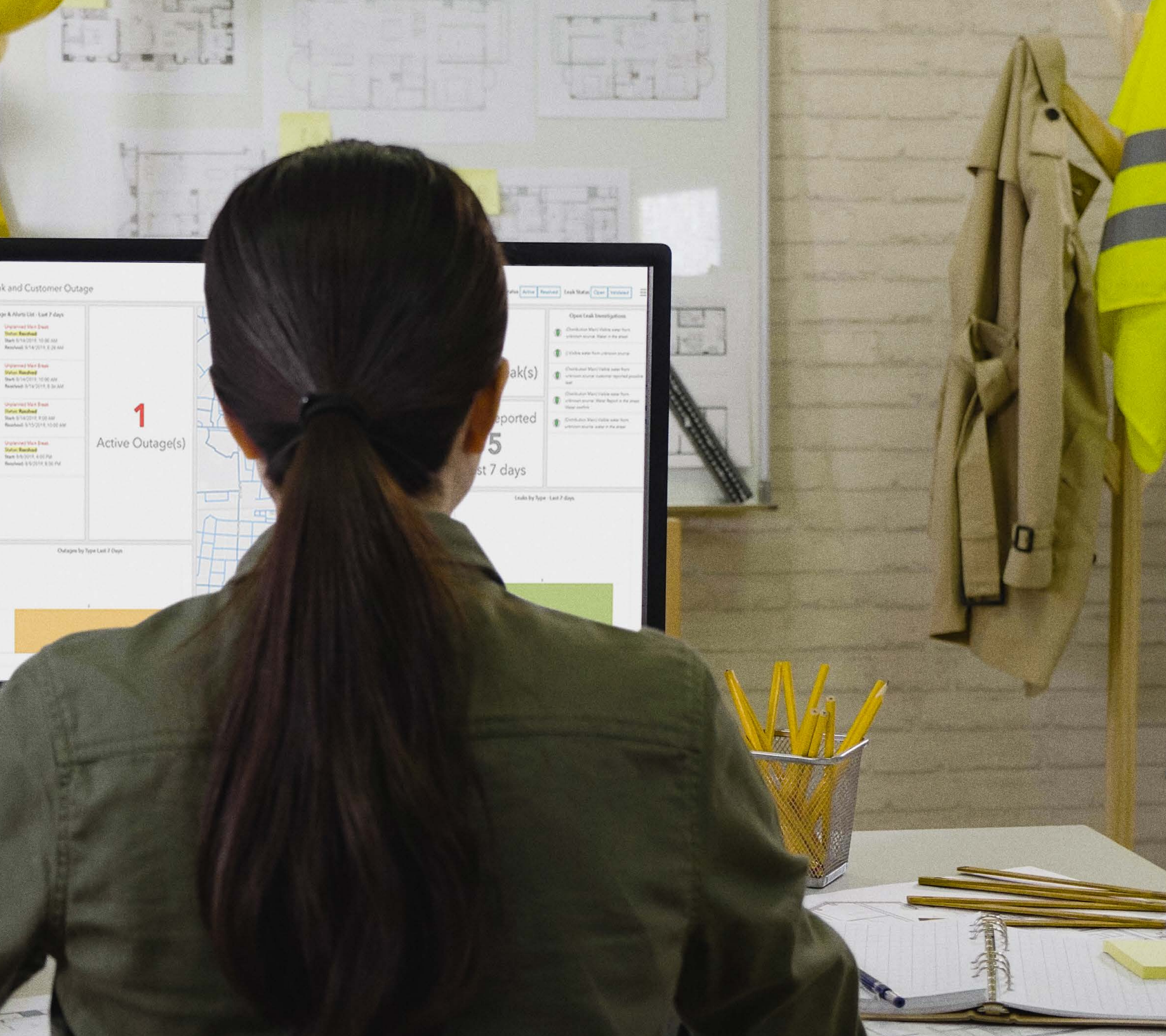
NCC Improves Fiber Network Operational Efficiency with CrescentLink

NCC, a broadband network provider based in northwest North Dakota, now boasts a state-of-the-art, user-friendly fiber management system that seamlessly integrates data to deliver information promptly to mobile technicians, aiding in both current operations and future expansion plans. This system keeps NCC's vast array of members—ranging from homes and schools to government agencies and oil locations—well-connected across 16 exchanges and about 7,000 locations. It also ensures the smooth operation of over 3,000 miles of active fiber. The move to a modern digital infrastructure has revolutionized how NCC manages its network, shifting from outdated, labor-intensive methods to a streamlined, efficient process that enhances service delivery and network management.

Transitioning from traditional paper-based recordkeeping to a robust digital platform, NCC collaborated with Esri partner GEOGRAPH Technologies, leveraging its CrescentLink software integrated with ArcGIS to address NCC's specific needs. This partnership has transformed NCC's operational capabilities, allowing real-time access to network data for mobile technicians, facilitating rapid troubleshooting, and enabling effective management of new subscriber builds and capacity upgrades. The CrescentLink software not only provides a comprehensive view of all connected assets but also brings significant time and cost savings, reducing the need for extensive travel to diagnose and resolve network issues. This digital transformation has positioned NCC to better manage its expansive network, ensuring reliability and preparing for future growth, all while maintaining a focus on the organization's commitment to connectivity and customer service. Read the full story. ∎

Learn more about GEOGRAPH Technologies LLC.

"GEOGRAPH's team has personal telecom industry experience, so they understood exactly what we needed."

–Garth Vaagene, Engineer, NCC

Esri IMGIS Conference 2024 Award Winner

Step Telecoms Increases Efficiency with Asset Management Using ArcGIS

Step Telecoms, a leading telecom operator in Ireland, has been pivotal in building and maintaining robust telecommunications networks since its inception in 2014. Managing over 250,000 meters of duct network, the company took a significant leap in 2022 by integrating a geographic information system to enhance its network capabilities. In collaboration with K&A Solutions, an Esri partner, Step Telecoms transitioned its telecom data into Esri's solution template. This strategic move has streamlined operations and bolstered network management, offering a unified platform for physical network inventory that simplifies daily workflows and boosts overall efficiency.

Faced with the challenge of integrating diverse network data from various formats, including Excel, PDF, and shapefiles, Step Telecoms partnered with Khatib & Alami (K&A) to deploy innovative digital tools. Utilizing Python utilities and custom ArcGIS Pro add-ins, the companies efficiently orchestrated utility network data and facilitated seamless network editing. This advanced toolset enabled the conversion of varied data formats into the ArcGIS Utility Network data model, enhancing data integrity and adherence to network guidelines. The results were transformative—Step Telecoms not only consolidated its telecom features into ArcGIS Utility Network but also optimized operations by validating splicing and patching connections, and by auditing ISP data. This integration provided a clear visualization of circuits and their impact on service delivery, leading to improved operational insights and a significant reduction in data-entry errors and manual labor. The deployment of the Esri solution, backed by K&A's expertise, has set a new standard in digital transformation for telecom networks, making Step Telecoms a model of innovation and resilience in the industry. Read the full story. ■

Learn more about Khatib & Alami.

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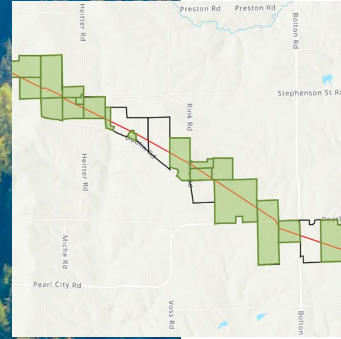
Beyond the Portal: Empowering Aldridge Electric with GIS

Aldridge Electric, which manages electric transmission line projects for a major utility provider, faced challenges with an inefficient, spreadsheet-based workflow that relied on excessively detailed data from subcontractors. This decentralized approach made it difficult to track construction statuses and manage project data, leading to communication breakdowns, increased risks of delays, and costly errors. As project complexity grew, Aldridge Electric recognized the need for a more robust and dynamic system to centralize data, provide real-time updates, and enhance communication among project managers, mobile staff, and executives.

To address these issues, Dawood Engineering, an Esri partner known for innovative GIS solutions, developed and implemented a custom right-of-way GIS portal for Aldridge Electric. Following an Agile-based development methodology, the solution centralized all project-related data into a single web-based portal, enabling real-time data integration. This transformation allowed stakeholders to monitor progress, track construction and permitting statuses, and make informed decisions based on the latest information. For instance, the GIS identified a newly discovered pipeline not in the construction book, preventing significant costs and delays. The dashboard provides visual lead times for permits, which reduces scheduling issues by approximately 50 percent, while delivering real-time data on access roads and property conditions to minimize conflicts with property owners.

The implementation of Dawood's GIS portal significantly enhances Aldridge Electric's project management workflow by consolidating all project data into an accessible platform. This transition reduced errors, improved communication, and accelerated decision-making, while real-time data access mitigated risks and delays. The portal now tracks multiple projects, permits, structures, parcels, and conductor spans, providing comprehensive oversight and cutting unnecessary interactions. The knowledge gained from this solution empowered Aldridge Electric to geoenable additional workflows, further boosting efficiency and positioning the company to address future challenges confidently. Read the full story. ∎

Learn more about Dawood Engineering.

"Dawood was instrumental in helping us navigate the possibilities, identify critical needs, and determine the best approach for portal design and development. With their quality coaching and training, we hit the ground running as we moved from ROW to construction, with our team taking on the majority of the development work."

—Jeff Klotter, Aldridge Electric
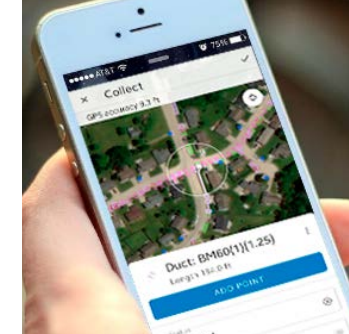
From Paper to Progress with GIS-Powered Construction Management

UtiliSource, an Esri partner, is a comprehensive solutions provider that focuses on transforming client challenges into effective field-first solutions, particularly in the fiber-optic industry. Clients often struggle with obtaining real-time updates on project construction statuses. UtiliSource's clients faced several operational challenges, including a lengthy billing process that took up to four weeks, difficulties in tracking construction progress in real time, and inefficiencies in managing restoration tasks. Slow subcontractor invoicing and inconsistent data collection from mobile crews further complicated the situation, highlighting the need for a more streamlined system.

To address these issues, UtiliSource has developed BuildSource, a GIS-based construction management system that integrates CrescentLink and Esri technologies. This system enhances visibility into construction progress, streamlines workflows, reduces the billing cycle, and improves data accuracy and reporting processes.

The partnership with GEOGRAPH Technologies LLC was crucial in creating BuildSource, which allows for comprehensive management and visualization of fiber-optic networks.

The BuildSource system utilizes a robust tech stack to provide real-time updates on construction progress, billing, and cleanup tasks. Construction crews can collect field data directly from mobile devices using ArcGIS Field Maps, ensuring project metrics and progress are updated in real time. This data is synced to a dashboard for management visibility, automating billing processes and generating weekly reports. As a result, UtiliSource has significantly improved its operations, reducing the billing cycle to a weekly process, enhancing project visibility, and achieving a mere 1.5 percent difference between billing and engineering data, thereby ensuring accuracy and timeliness in project information. Read the full story. ∎

Learn more about UtiliSource LLC.

Learn more about GEOGRAPH Technologies LLC.

> *❝BuildSource has been key in the company's phenomenal growth rate due to its ability to reduce production time and billing time. The flow of work from a foreman in the field doing redlines, to getting the data to the supervisors, and then moving information on to billing clerks to produce invoices happens in a matter of days instead of weeks. In addition, BuildSource also allows both our team, and our clients, to have a real-time view of projects from start to finish.❞*

—Steve Sellenriek, CEO, Sellenriek Construction, Inc.

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Network Information Management

In the rapidly advancing discipline of infrastructure management, the role of network information has never been more critical. Infrastructure companies are adopting cutting-edge technologies to enhance their network systems and ensure they meet society's ever-changing demands. These technologies are crucial in modeling, managing, visualizing, and analyzing modern utility networks.

Companies improve safety and reliability by focusing on innovative solutions and strengthening their commitment to customer satisfaction.

Network information management is pivotal in driving efficiency and sustainability as the backbone of utility operations. It empowers companies to anticipate challenges, optimize resources, and deliver exceptional service.

Explore the transformative power of modern network information management for the entire enterprise. ∎
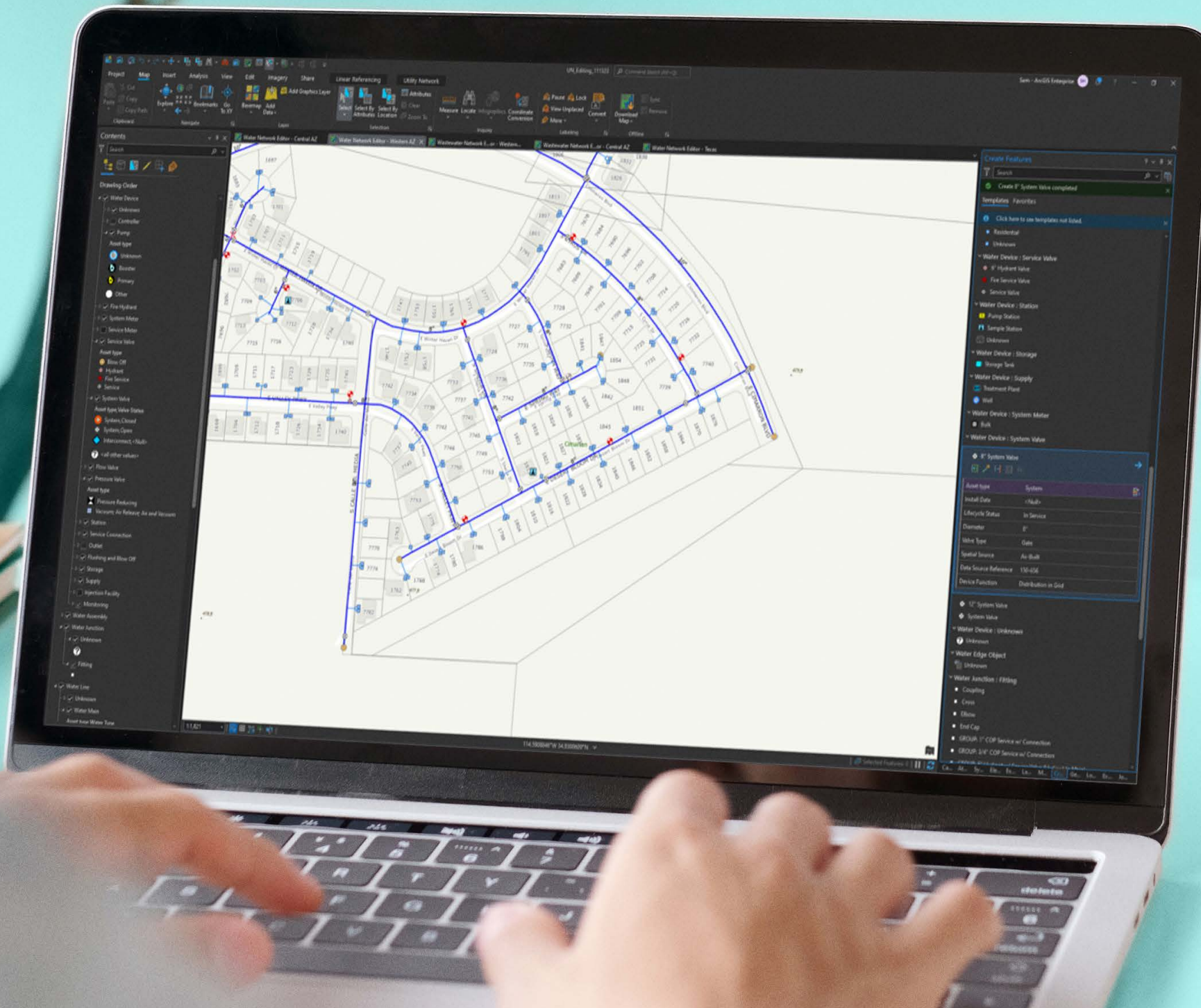
Migrating at Scale: A 10-Database Utility Network Case Study

EPCOR USA Inc. (EPCOR USA) owns, operates, and builds water, wastewater, and natural gas infrastructure in Arizona, New Mexico, and Texas. As one of the largest private water utilities in the Southwest, it serves more than 800,000 people across 44 communities. EPCOR USA's portfolio covers a range of systems—including some of the fastest-growing communities in the nation, wholesale water pipelines, and small to medium-sized rural communities. Through organic development, system acquisitions, and new business ventures, EPCOR USA has consistently grown and evolved over the last decade. One of the key questions faced is: How will EPCOR USA continue to deliver high-quality geospatial services across an expanding footprint?

EPCOR USA teamed up with Timmons Group, an Esri partner, to assess their GIS, gather program needs, and develop a future state plan with primary requirements to modernize with long-term success in mind, which included migrating to ArcGIS Pro and retaining geometric network type functionality.

The project culminated with the GIS team leveraging Portal for ArcGIS to reinvent one of EPCOR USA's most heavily used mapping applications. The new platform, developed in-house by GIS staff with ArcGIS Web AppBuilder, delivers Utility Network content to users across the business. Read the full story. ■

Benefits gained from the project include:

- More efficient editing workflows

- Cleaner datasets and better quality control tools

- A richer data model, capable of tracking finer details

- Easier sharing of GIS content through a modernized enterprise GIS platform

Learn more about Timmons Group.

"We have a geospatial data management solution that can handle a large, varied, and expanding footprint and positions EPCOR USA to remain on the leading edge of GIS solutions."

—Jamie Patterson, GIS Manager, EPCOR USA

Revolutionizing Connectivity: How Emerald Broadband Empowers Communities

Emerald Broadband, a public benefit internet provider in Lane County, Oregon, is dedicated to bridging the digital divide by delivering high-speed internet to underserved communities. Since its founding in 2016, Emerald has become a vital resource in the region, but rapid growth presented a critical challenge: managing vast amounts of network data. Initially stored in KML files, their data lacked the structure needed for effective design and management, resulting in limited searchability, inconsistent labeling, and difficulties in gaining a clear view of their network's status. To overcome these obstacles, Emerald turned to 3-GIS | Web, a powerful network asset management platform designed to centralize and optimize their data.

3-GIS | Web transformed Emerald Broadband's network management capabilities, consolidating their data into a unified, searchable system that provides organization-wide visibility into their fiber network. With this enhanced network insight, Emerald can document fiber strand availability, monitor infrastructure in real time, and simplify data sharing—even with stakeholders without a background in mapping. The platform's intuitive design has improved collaboration across teams, empowered more effective planning for network expansions, and brought Emerald one step closer to its mission of providing affordable high-speed internet to more communities. Through their collaboration with Esri partner 3-GIS, Emerald Broadband is not just expanding access, but also paving the way for a digitally inclusive future in Oregon. Read the full story. ∎

Learn more about 3-GIS LLC.

City of Seguin Migrates to ArcGIS Utility Network with GPS Accuracy

About one hour northeast of San Antonio, Texas, the small city of Seguin serves just over 30,000 residents with water, wastewater, and electric utilities. The City of Seguin is experiencing solid growth as it expands toward neighboring New Braunfels, and vice versa. As farmland between the cities is developed, the demand for municipal water, sewer, and electric services rises.

The city wanted to find a way to accurately map existing assets prior to development, as well as new construction as utilities are installed. In this way, they help builders avoid hitting existing utility infrastructure during construction and set themselves up for success in the future, when crews will inevitably be sent to service the utility grid.

The City of Seguin captures high-accuracy data using field data collection tools set up with ArcGIS Field Maps and Eos Positioning Systems' high-accuracy Arrow Gold receivers. This includes capturing data as infrastructure is installed. The timely and accurate data provided a strong foundation for two large projects: advanced metering infrastructure (AMI) replacement and ArcGIS Utility Network implementation.

Historical data from service orders and work orders are being used in conjunction with the data collected during the AMI project to prototype an artificial intelligence model. The model could potentially use photos taken during meter upgrades to identify material types.

Staff have moved data into their electric network model and are working to clean up dirty areas. ArcGIS Utility Network will be used to manage the entire electric system and feed the outage management system with valuable data for proper intervention. Once the electric migration is successful, staff will begin work on the water utility network. Read the full story. ■

Learn more about Eos Positioning Systems Inc.

“The assets are all very close in proximity to each other, so it's important that we have the best accuracy we can. We're trying to prevent accidents with water and electricity.”

—John Saldana, Smart Grid Solutions Manager, City of Seguin

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How Connexus Energy Uses ArcGIS Utility Network to Drive Digital Transformation

Connexus Energy embarked on a journey to modernize its network management, focusing on laying a strong data foundation for critical systems across the company. As part of this effort, Connexus implemented Esri's ArcGIS Utility Network to support an immediate design-build system upgrade, and a future outage management system (OMS) and advanced distribution management system (ADMS). Recognizing the importance of high-quality data, Connexus took much of the data modeling and implementation in-house, ensuring that data requirements and project schedules were met.

Connexus decided to transition to ArcGIS Utility Network, anticipating that it would meet the company's current needs while supporting future ADMS opportunities. The project began with a phased approach, involving extensive collaboration between technical teams to align systems with end-user practices. Schneider Electric, an Esri partner, helped Connexus Energy realize this vision.

The GIS team at Connexus played a central role in handling data migration. Benefits are already being realized, including a more robust data model, optimized processes, and improved designer efficiency. Automated feeder services and simplified troubleshooting have further enhanced operational effectiveness, positioning Connexus for future success. Read the full story. ∎

Learn more about Schneider Electric.

> **The successful implementation of [ArcGIS] Utility Network has revitalized our long-standing systems. Over the past decade, staff changes and retirements prompted us to reevaluate our processes, which had become stagnant. This project catalyzed fresh thinking, encouraging us to move away from existing practices. We embraced native functionality, scrutinized our workflows, and streamlined our business operations. Importantly, this initiative fostered collaboration, engaging stakeholders and ensuring robust support, ultimately leading to an improved product.**

—Jared Newton, Director of Engineering & System Operations, Connexus Energy

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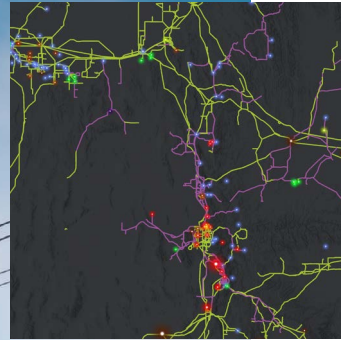
The First Step Toward Ameren's Network Model Manager for Electric Transmission

2024 Special Achievement in GIS (SAG) Award winner

Ameren, a utility company serving Illinois and Missouri, embarked on modernizing its electric transmission (ET) management by implementing Esri's ArcGIS Utility Network. This initiative marked the first step toward developing a comprehensive network model manager for ET. Previously, Ameren's data management involved manual entries across multiple systems, leading to data quality challenges. The outdated data model lacked the connectivity required for modern network management.

Ameren collaborated with Esri partner UDC to address these issues, leveraging UDC's expertise to migrate to ArcGIS Utility Network. This migration involved creating a new data model, configuring subnetwork rules, and integrating unique data elements such as dampers and crossarms. The process was iterative, with continuous data cleanup and validation to ensure accuracy and completeness.

As a result, Ameren transitioned to a connected, advanced network management model, utilizing the latest ArcGIS Enterprise and ArcGIS Pro tools. This upgrade improved data quality, scalability, and security while aligning with industry best practices. Completing this phase within 10 months set the stage for further developments, including modeling internal substations and integrating network models to support Ameren's broader data management goals.

Benefits to Ameren from the project include best practices alignment, future system scalability, structured GIS data editing, better data quality and completeness, streamlined architecture, and increased security with authentication. Read the full story. ∎

Learn more about UDC.

> **Ameren's overall electric transmission GIS infrastructure has never been in a better place. We have best practices on hardware and software deployments, and now we're using the newest versions of what Esri has to offer. We look forward to editing in a structured network that is easier to validate and check.**
>
> –Mark Nordheim, Senior Software Engineer, Ameren

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Revolutionizing Telecom With Esri And 3-GIS: A Case Study On
Oman Broadband Company

Esri, in collaboration with its telecom partners, is dedicated to addressing the challenges faced by the telecommunications industry, such as outdated data management systems, inefficient workflows, and isolated information silos. We provide advanced solutions designed to enhance collaboration, streamline decision-making processes, and significantly improve customer experiences. In an industry where inadequate data management and outdated practices often result in revenue losses and customer dissatisfaction, our goal is to help service providers centralize their data into a cohesive, reliable single source of truth, paving the way for more informed and effective operations.

Embracing digital transformation has never been more accessible or cost-effective. We offer simplified tools and processes that not only streamline the customer journey but also bolster awareness and understanding across your organization. A testament to the effectiveness of our solutions is the success story of the Oman Broadband Company, a prominent broadband service provider in the Middle East. By partnering with Esri partner 3-GIS and integrating Esri's GIS ecosystem, Oman Broadband has revolutionized its network management capabilities. Oman Broadband now leverages existing data for strategic decision-making; generates constructable fiber network designs; and maintains comprehensive documentation of all telecom network assets in one unified system, enhancing both field operations and staff training. If you're looking to transform your organization and elevate your telecom services, Esri and its telecom partners are ready to guide you through overcoming the obstacles of outdated systems and achieving your strategic goals. Read the full story. ∎

Learn more about 3-GIS LLC.

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Conclusion

Esri has collaborated with utility customers for years to create and develop software that meets evolving needs. Even in uncertain times, our mission is unchanged: to help you harness your data's power to serve your customers better. Sharing your commitment to sustainability, we develop systems that meet your current needs and lay the foundation for your future. Our expert staff and partners are here to guide you every step of the way. ∎

Thanks to Our Partners

Thank you to our valuable Esri business partners for their contribution to Esri customer success.

Maximize your ArcGIS platform's potential by partnering with these Esri experts. They provide customized, specialized services like system integration, data migration, application development, and training. Leveraging their expertise accelerates your implementations and return on investment. Esri partners offer guidance and innovative solutions, fostering collaboration for successful geospatial initiatives.

Choose Esri partners to unlock your ArcGIS capabilities fully.
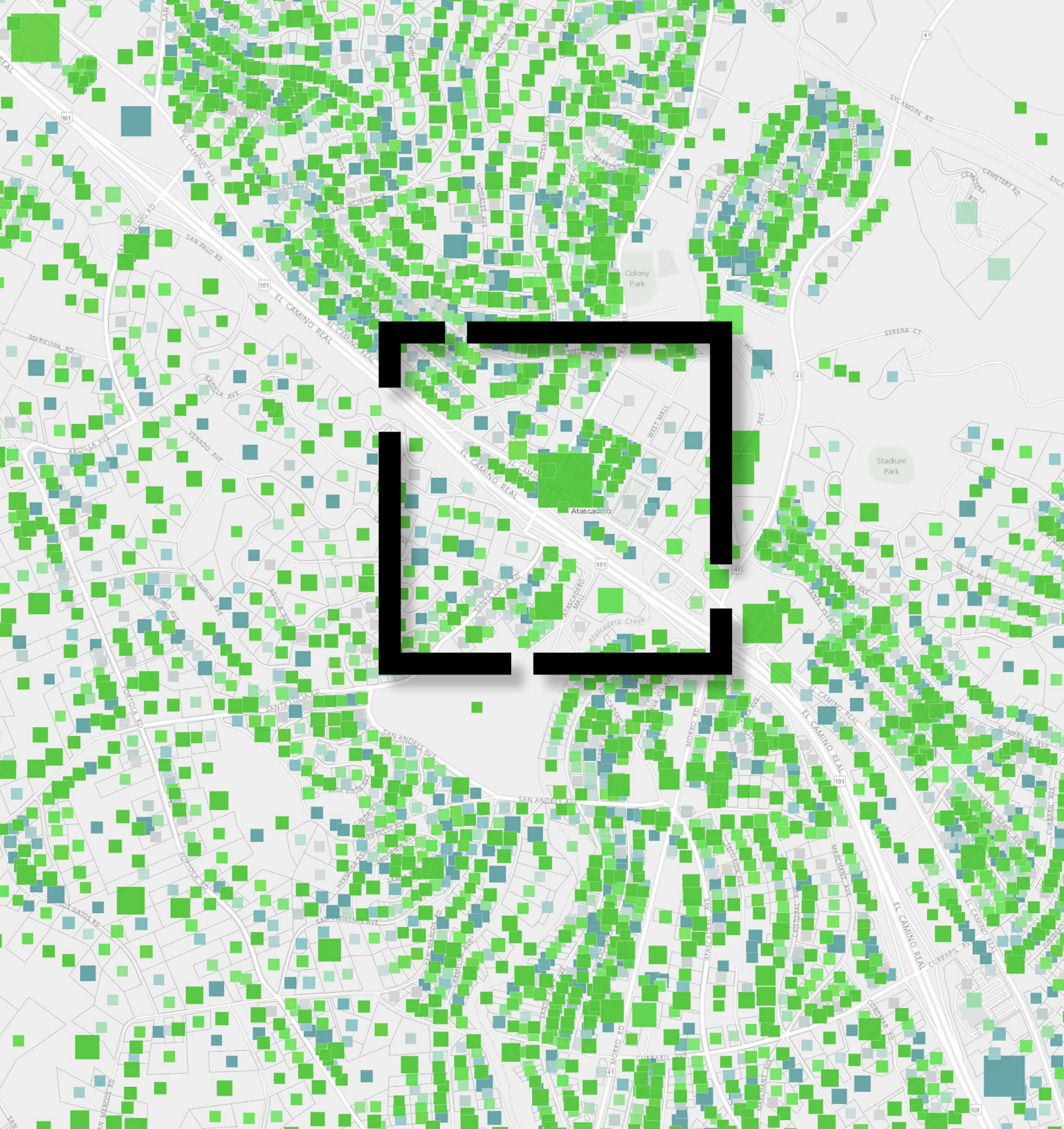
About Esri

Esri, the global market leader in geographic information system (GIS) software, location intelligence, and mapping, helps customers unlock the full potential of data to improve operational and business results. Founded in 1969 in Redlands, California, USA, Esri software is deployed in more than 350,000 organizations globally and in over 200,000 institutions in the Americas, Asia and the Pacific, Europe, Africa, and the Middle East.

Esri has partners and local distributors in over 100 countries on six continents, including Fortune 500 companies, government agencies, nonprofits, and universities. With its pioneering commitment to geospatial information technology, Esri engineers the most innovative solutions for digital transformation, the Internet of Things (IoT), and advanced analytics.

Visit us at esri.com.

Contact Esri

380 New York Street
Redlands, California
92373-8100 USA

1 800 447 9778
T 909 793 2853
F 909 793 5953
info@esri.com

esri.com

Offices worldwide
esri.com/locations
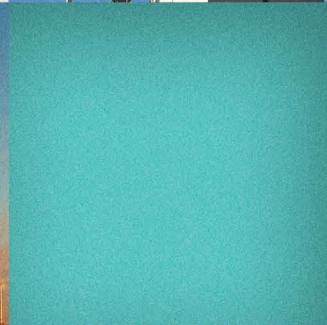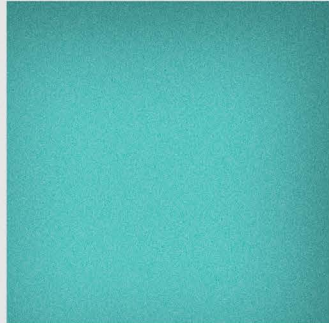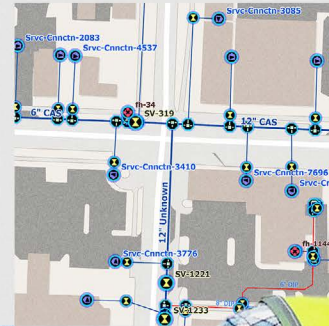
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