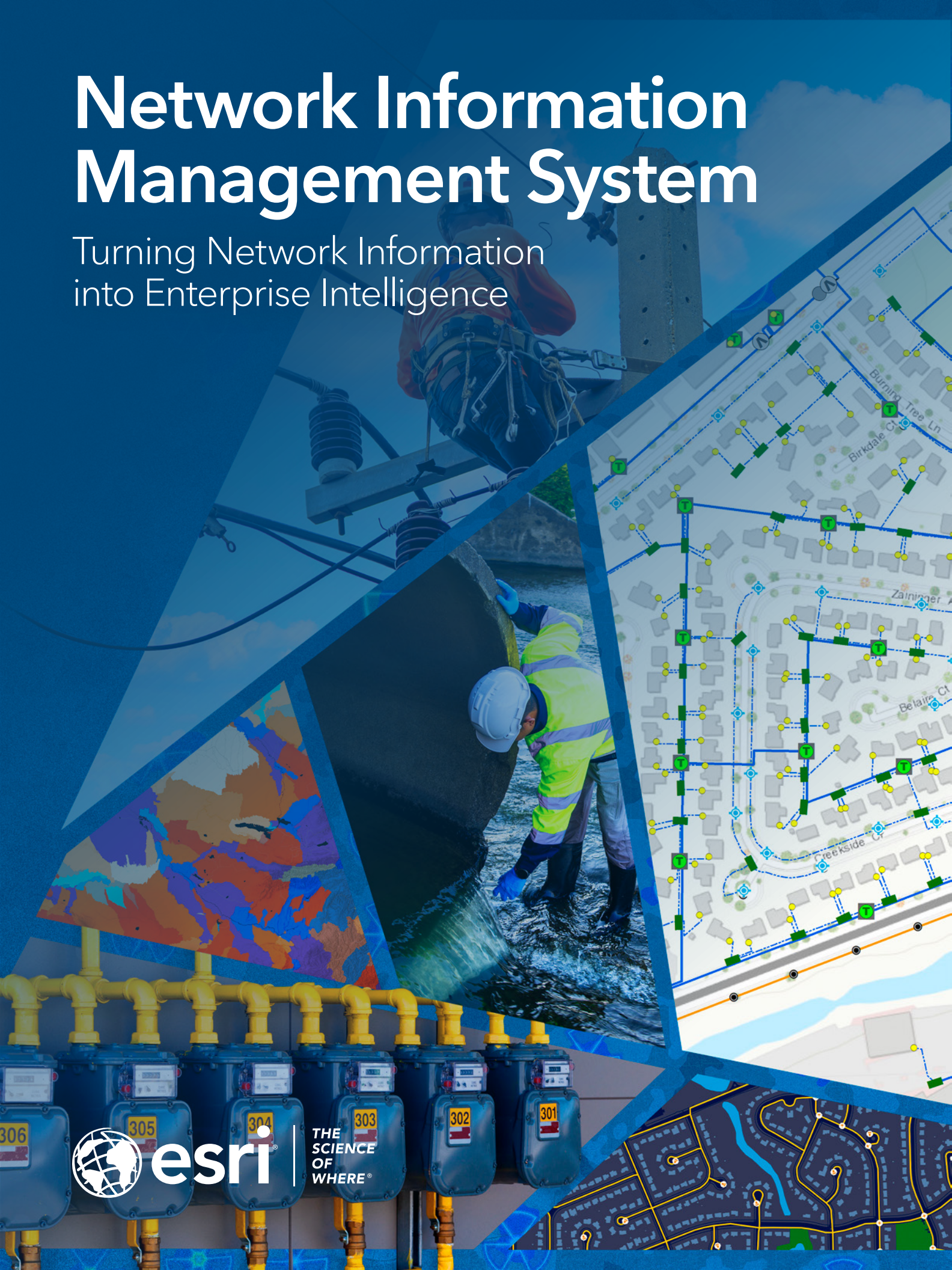
Network Information Management System

Turning Network Information into Enterprise Intelligence



esri® | THE SCIENCE OF WHERE®



Preface

Utilities and telecommunications organizations are pursuing network modernization from very different starting points. Some are focused on replacing paper records, CAD drawings, and fragmented legacy applications with trusted digital asset information. Others have progressed to managing network connectivity, improving data quality, enabling tracing, and integrating geographic information system (GIS) technology with operational systems. The most mature organizations are creating highly connected digital environments where network information supports enterprise-wide decision-making, operational awareness, and digital twin initiatives. Regardless of where an organization begins, the common objective remains the same: establishing a trusted source of network intelligence that can support the evolving demands of the business.

This ebook examines the evolution of the modern network information management system (NIMS) and its role as the authoritative system of record for utility and telecom networks. It explores how organizations can progress from basic asset mapping to connected network modeling and, ultimately, to intelligent, enterprise-wide digital twins. While technology capabilities differ across implementation approaches, the underlying journey is remarkably consistent. Organizations first establish trust in network data; next, create visibility into network connectivity and behavior; then finally operationalize that knowledge through advanced analytics, enterprise-wide integration, automation, and digital twin capabilities .

As organizational maturity grows, an organization's geospatial intelligence becomes operationalized through living digital twins of its networks. These dynamic representations of physical networks combine authoritative network models, real-time operational information, enterprise data, and analytical capabilities to support planning, operations, resilience, customer service, and investment decisions. A living digital twin is not a separate initiative from network information management. Rather, it is the outcome of establishing trusted network information; applying geospatial intelligence; and integrating people, processes, and systems around a shared understanding of network reality.

The customer stories presented throughout this ebook demonstrate that successful modernization is not defined by a single technology deployment or implementation methodology. Instead, success is achieved through a deliberate progression toward greater organizational trust, improved operational visibility, and stronger enterprise alignment. Each example illustrates how the modern, rules-based network information management system serves as the foundation for network intelligence, enabling organizations to improve reliability, strengthen resilience, accelerate collaboration between field and office teams, integrate enterprise systems, and prepare for the future.

The central message is clear: Every utility and telecom organization can begin its network intelligence journey from its current state and then progress at a pace aligned with its business priorities. Geospatial technology provides the foundation. Geospatial intelligence creates understanding. Living digital twins operationalize that understanding. Together, supported by a modern network information management system as the authoritative system of record, these capabilities create a scalable pathway toward smarter, more resilient, more customer-focused, and future-ready operations. ■

What's Inside

Geospatial Intelligence Supporting a Modern Network Information Management System 4

Building a Modern Network Information Management System 5

The Foundation for Modern Network Information Management 6

Improving Data Quality, Governance, and Organizational Trust 10

Connecting Field and Office Workflows 14

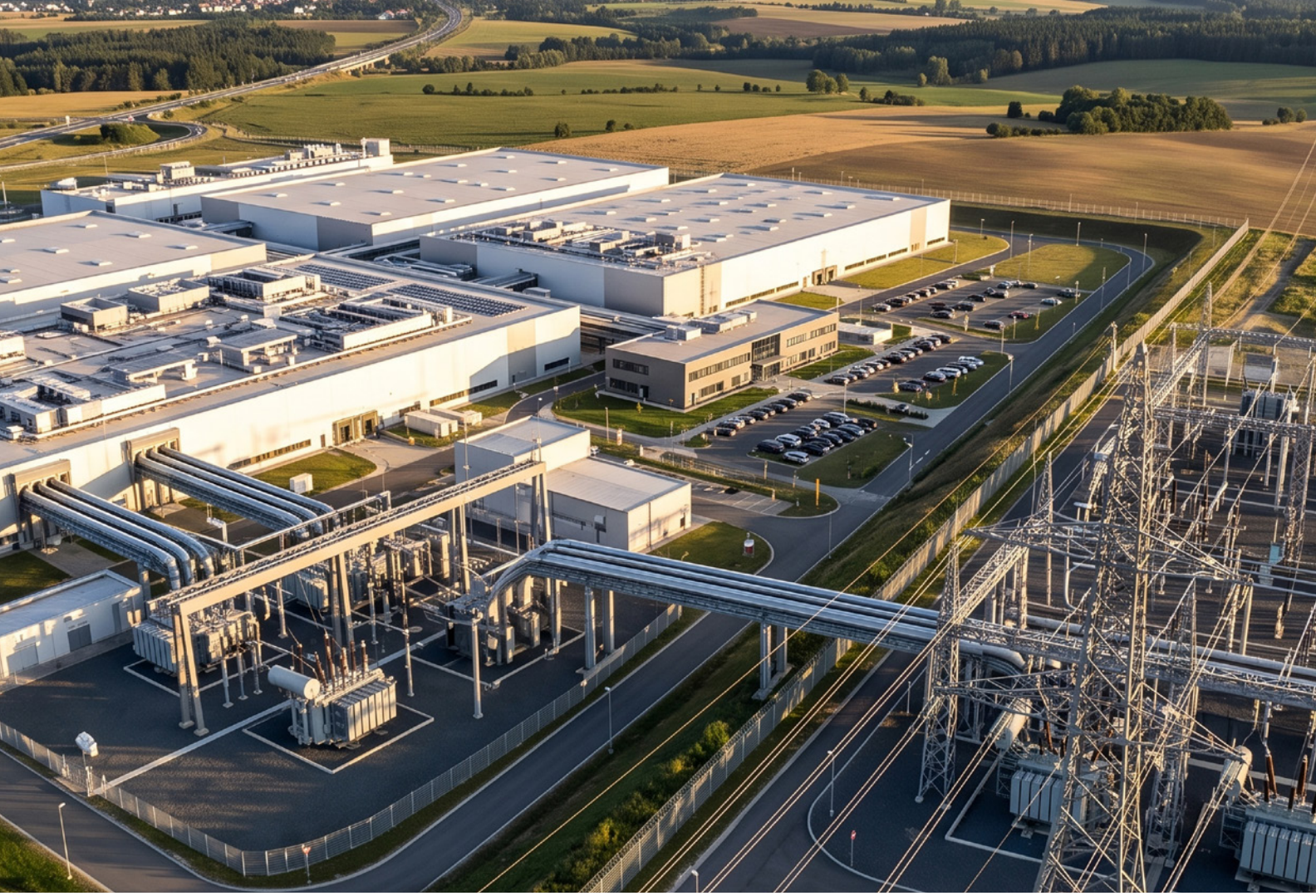
Advancing Analysis, Tracing, and Operational Effectiveness 18

Strengthening Reliability, Resilience, and Customer Service 22

Integrating Enterprise Systems for a Connected Utility 26

Creating the Digital Twin for Future-Ready Operations 30

The Rightsized Deployment for Your Network Information Management Journey 32



Geospatial Intelligence Supporting a Modern Network Information Management System

Every utility asset exists somewhere. Every customer is served from somewhere. Every outage, incident, inspection, investment, and operational decision takes place within a geographic context. Yet many organizations continue to separate network information from the spatial context that gives that information meaning. The result is fragmented understanding and limited operational awareness.

Geospatial intelligence bridges this gap. It transforms network data into business understanding connecting assets, customers, environmental conditions, operational events, and enterprise systems through location. By creating relationships between data that would otherwise remain disconnected, geospatial intelligence enables organizations to see patterns, dependencies, and risks that cannot be discovered through traditional reporting alone.

As a result, geospatial intelligence becomes the analytical layer of a modern network information management system. It enables utilities to move beyond answering where assets are located and begin answering more strategic questions: what is at risk, who will be impacted, what investments should be prioritized, and how the network will respond to changing conditions. This understanding becomes the foundation for operational excellence and future digital twin initiatives. ■

Building a Modern Network Information Management System

Modern network information management systems differ fundamentally from legacy network records systems. The objective is no longer to document it's to create a trusted digital representation of network connectivity, behavior, relationships, and operational dependencies that can serve the entire enterprise.

Successful organizations approach NIMS as a strategic enabler of their business transformation strategies. They establish a common network information model that supports engineering, operations, asset management, customer service, planning, and executive reporting. The network becomes a shared enterprise asset rather than departmental information managed in isolation.

A network information management system is not a one-size-fits-all solution. It is an implementation pattern that can be deployed to meet organizations where they are and scale with them as their needs evolve. Some organizations begin with simple mapping to gain visibility into network assets. Others introduce connectivity, tracing, topology, and network diagrams through ArcGIS® Utility Network. Organizations ready for advanced capabilities can adopt industry-defined data models to build a high-fidelity digital twin that supports enterprise integration with systems such as ADMS, OMS, CMMS, SCADA, billing, work management, and customer communication platforms.

The most effective implementations are built around a phased journey. They begin by establishing trusted network foundations, then progressively enable new capabilities, workflows, analytics, integrations, and automation. The result is a system that grows in value over time as more business processes consume the outputs of—and contribute to—the authoritative network model. ■

Functionalities and Capabilities Grow with Your Needs



Option 1 | Non-Topological Data Model

- Asset visualization
- Simple features
- No tracing

Option 2 | User-Defined Data Model

- Direct migration from geometric network
- Simple network model
- Connectivity and basic tracing
- Network diagrams
- Integrate with external systems

Option 3 | Industry-Standard Data Model

- Partner tools for migration
- Digital twin of assets
- Advanced tracing and analysis
- Well-defined network rules
- Tighter integration with other systems

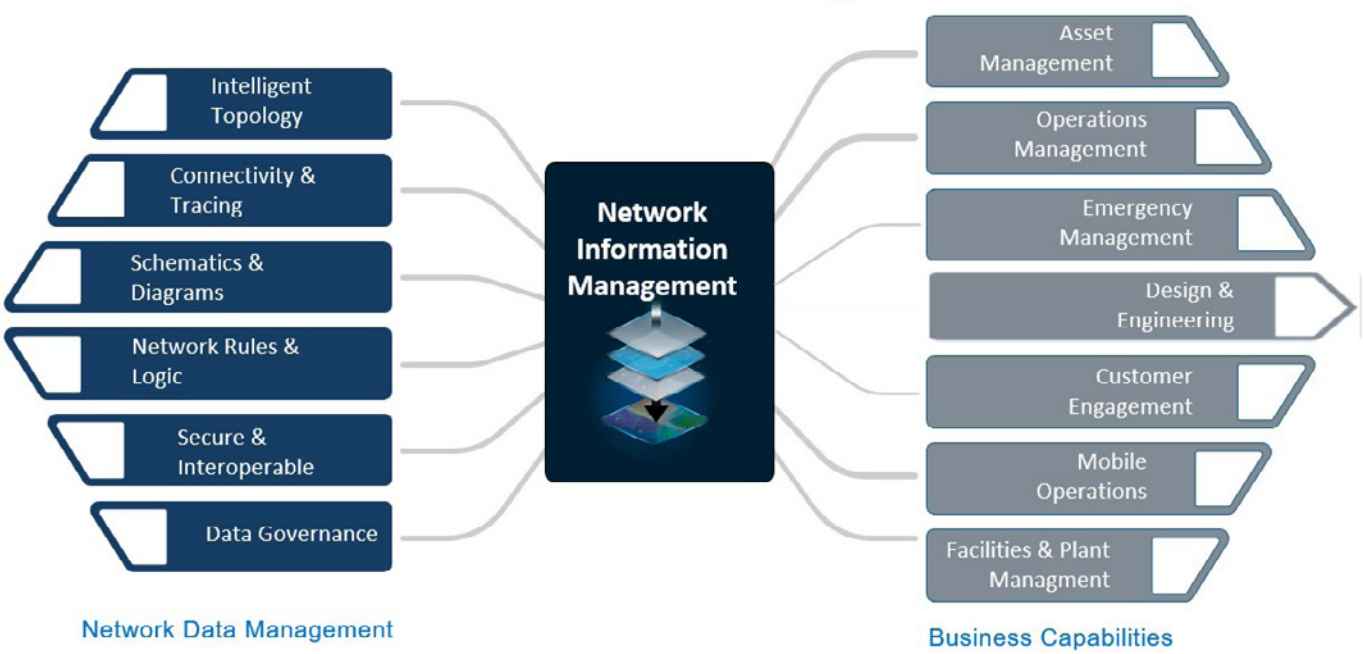
The Foundation for Modern Network Information Management

For many utilities and telecommunications organizations, the journey to modern network information management begins with moving beyond paper records, CAD drawings, legacy GIS applications, and disconnected systems that were never designed to support modern operations. These environments often create multiple versions of the network as well as inconsistent data, information latency, and limited visibility into how assets are connected and operate. As organizations modernize, they increasingly establish ArcGIS as the foundation for a trusted network information management system, creating a single authoritative source of truth for network assets, connectivity, topology, and operational relationships.

Modern NIMS platforms achieve this by modeling not only assets but also relationships, connectivity, containment, dependencies, and network behavior. They capture how networks are engineered, how they operate, and how they evolve. This enables organizations to maintain a continuously updated system of record rather than a collection of disconnected data repositories.

This foundation provides far more than technical capability. It establishes a common operational language that can be shared across the entire organization. Once this trusted foundation exists, organizational alignment becomes possible. ▸

Network Information Management





Positioning HMLP for the Future with ArcGIS Utility Network

Hull Municipal Light Plant (HMLP) serves a densely populated coastal community with limited staff and mounting pressure to modernize. Field crews used to collect inspection data on paper and then enter it manually into disconnected AutoCAD drawings. The network model stayed perpetually out of date; integration with other systems was out of reach; and the organization lacked the connected foundation needed to support reliable, enterprise-wide decision-making.

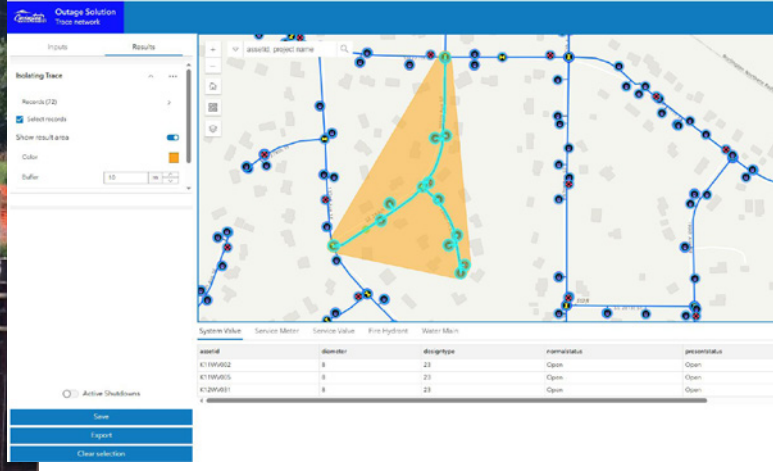
To build an accurate outage management system, HMLP partnered with RINA to establish ArcGIS Utility Network as the core of the utility's network information management system. RINA transformed HMLP's legacy CAD drawings into an ArcGIS Utility Network capability-ready enterprise geodatabase that accurately models the utility's full distribution network in ArcGIS Enterprise. With topology enabled and feeder subnetworks created, the system delivers advanced tracing capabilities, connecting transformer load and meter information within a single authoritative platform. ArcGIS Field Maps extended the connected network model into the field, replacing paper-based inspection workflows with real-time mobile data collection technology that functions offline for crews working across the coastal service territory.

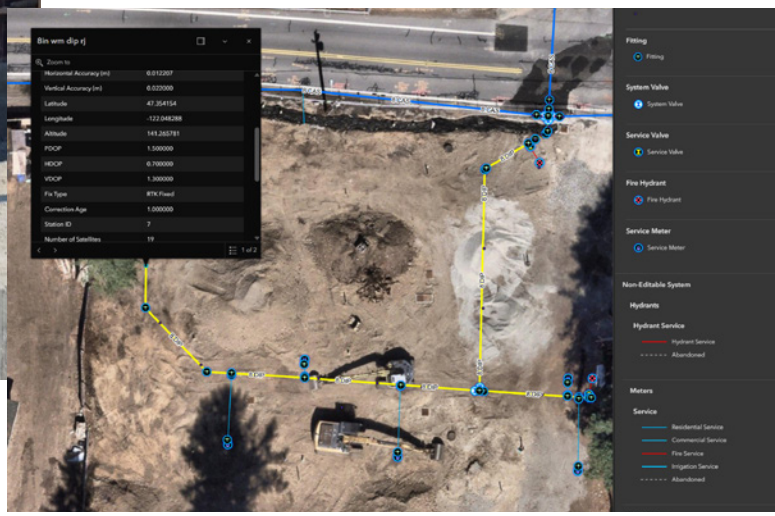
HMLP now operates on a single trusted source of network data. The migration addressed paper-based inefficiencies; eliminated disconnected workflows; and built a scalable, performant network management foundation. Outage management workflows are integrated, and the organization is positioned for advanced metering infrastructure (AMI) connectivity and the next phase of grid modernization. ▶

Read the full story

> "The inspection forms in Field Maps have streamlined our inspection processes. We are no longer fumbling with piles of paper or filing inspections that will be soon forgotten."
>
> –Mike Schmitt, Operations Manager, Hull Municipal Light Plant







Covington Water District Manages Vast Water Assets with GIS at the Center

Covington Water District used to depend on CAD paper drawings and quarter-section maps to track underground assets, often relying on historic records to estimate system connection points. Recognizing the inefficiency of maintaining these CAD files, district managers set out to implement a GIS strategy to clean up data, quickly access as-built drawings, create comprehensive maps, support informed decision-making, and reduce time and costs.

The modernization began with investments in Esri's technology and GPS equipment, enabling the district to digitize historic records, enhance data quality, and transition from paper-based files to a modern GIS platform. The next phase was ArcGIS Utility Network implementation. To prepare, staff engaged in training and peer collaboration and developed a detailed project road map. The district partnered with HDR, Inc., to help configure subnetworks, tracing workflows, and make necessary data model adjustments, while district staff coordinated asset decisions and migrated from ArcMap to ArcGIS Pro. ArcGIS Utility Network was launched during a period of low construction activity to minimize operational impact.

Throughout the migration, Covington Water District focused on building internal GIS expertise by working closely with HDR for expert support. This collaborative approach empowered staff to troubleshoot challenges, retain critical knowledge, and foster organizational trust. As a result, leadership and departments gained improved visibility into assets, and ArcGIS Utility Network delivered benefits such as enhanced asset quality control, streamlined editing, standardized data, easier network analysis, reduced maintenance, upgraded system architecture, and greater readiness for future advancements. ▶

Read the full story

> "We made a concerted effort to keep a lot of the work and knowledge in-house, but we knew we couldn't get there without expert help from HDR."
>
> –Steve Lee, Engineering Manager, Covington Water District

Delta Utilities Modernizes Gas Operations with ArcGIS Utility Network

Delta Utilities, a newly formed natural gas utility serving customers across Louisiana, needed a modern GIS foundation to support safe, reliable, and efficient operations. The utility inherited years of gas network data maintained in a legacy GIS, but the legacy system lacked the advanced modeling, connectivity, and integration capabilities needed to support a connected utility enterprise. Delta needed to transform its data into a trusted, modern network information system.

To accelerate its transformation, Delta partnered with Epoch Solutions Group to migrate the utility's legacy gas asset data into ArcGIS Utility Network. Using EpochSync Pro, the team automated the extraction, transformation, and loading of complex network data while validating asset connectivity and aligning information with the ArcGIS Utility Network data model. This approach enabled Delta to complete the migration efficiently while maintaining data accuracy and minimizing disruption to ongoing operations.

With ArcGIS Utility Network, Delta established a single authoritative source for its gas infrastructure, providing a connected, rules-based network model that supports improved decision-making across the organization. The new system enables better integration with enterprise applications; improves access to accurate network information; and creates a foundation for future capabilities such as advanced analytics, field mobility, and operational improvements.

By transforming legacy data into a modern connected network model, Delta Utilities has created the digital foundation needed to support continued growth, enhance operational efficiency, and deliver reliable service to its customers. ■

Read the full story



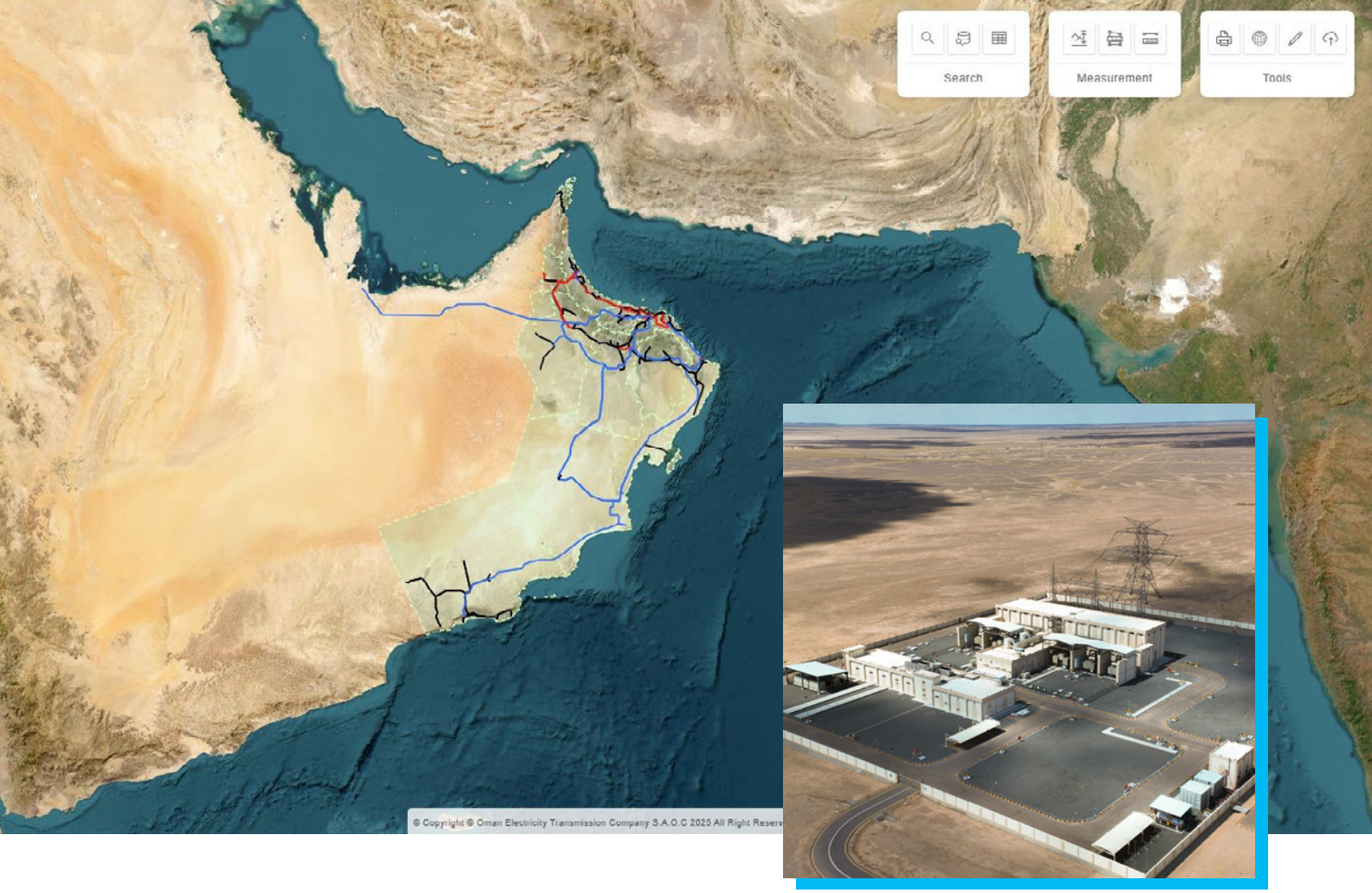
Improving Data Quality, Governance, and Organizational Trust

Leading organizations recognize that data and information governance cannot be treated as a periodic cleanup exercise. Improving organizational trust in data is most effective when governance becomes embedded directly within operational workflows. Business rules, validation processes, traceability, auditing, stewardship practices, and accountability mechanisms ensure that quality improves continuously rather than deteriorates over time.

ArcGIS network information management system solutions improve data quality and governance by embedding engineering standards, network rules, and business logic directly into the network model. Rather than relying on manual processes and periodic data cleanup, the system continuously validates how assets are connected, what information is required, and how the network is permitted to behave. This ensures that network records remain accurate, consistent, and aligned with real-world operations while reducing errors, information silos, and reliance on institutional knowledge.

The result is a trusted and governed network information management system that serves as the authoritative source of truth across the enterprise. By enforcing connectivity rules, attribute validation, topology integrity, and auditability throughout the life cycle of network updates, ArcGIS Utility Network creates confidence in the data used by operations, planning, asset management, and customer-facing systems. This foundation improves organizational trust, supports regulatory compliance, enables reliable analytics and tracing, and provides the consistency required to integrate enterprise systems and build future digital twin capabilities.

The greatest benefit of governance is trust. When planners, operators, engineers, executives, and mobile workers all rely on the same authoritative information, organizational confidence increases dramatically. The conversation shifts from debating data accuracy to acting on intelligence. ▶



Empowering OETC with Self-Service GIS Solutions

Oman Electricity Transmission Company (OETC) recognized GIS as a critical tool across its enterprise, but data quality concerns put the technology's potential out of reach. Leadership identified a core problem: Without a reliable data governance process, the organization could not trust its network data, and without trusted data, it could not build toward a modern network information management system.

OETC took a disciplined approach, establishing a data governance framework to measure, track, and improve the accuracy and completeness of the organization's GIS data. The results were tangible: Geodatabase completeness climbed from 57 percent to 75 percent, with further gains on the way. With clean, governed data as the foundation, OETC integrated its GIS with its computerized maintenance management system (CMMS), and the organization is now positioned for integration with SCADA, its online condition management system, and its fixed-asset register. Self-service web applications and dashboards now place network information directly in the hands of employees and customers, reducing bottlenecks and enabling smarter decisions across the enterprise

OETC is building toward the next phase of its NIMS journey: migrating to ArcGIS Utility Network to establish a connected network model and further accelerate data quality improvements across its transmission system. The company is building on the Esri® foundations data model to support business and technical requirements gathered during OETC's user workshops. ▶

Read the full story

> "Without a reliable data governance process in place, we wouldn't be able to leverage the capabilities of our GIS. Now we can."
>
> –Khalil Al Shukaili, Asset Information and GIS Manager, OETC

East Valley Implements ArcGIS Utility Network for Modern Data Management

East Valley Water District established a solid foundation for its ArcGIS Utility Network implementation by first conducting a data-readiness assessment, thoroughly cleaning and consolidating datasets, and eliminating redundant or unnecessary information. By actively involving stakeholders and refining its data model, the district developed a more accurate, efficient, and streamlined dataset to enhance analytics, connectivity, and long-term data integrity.

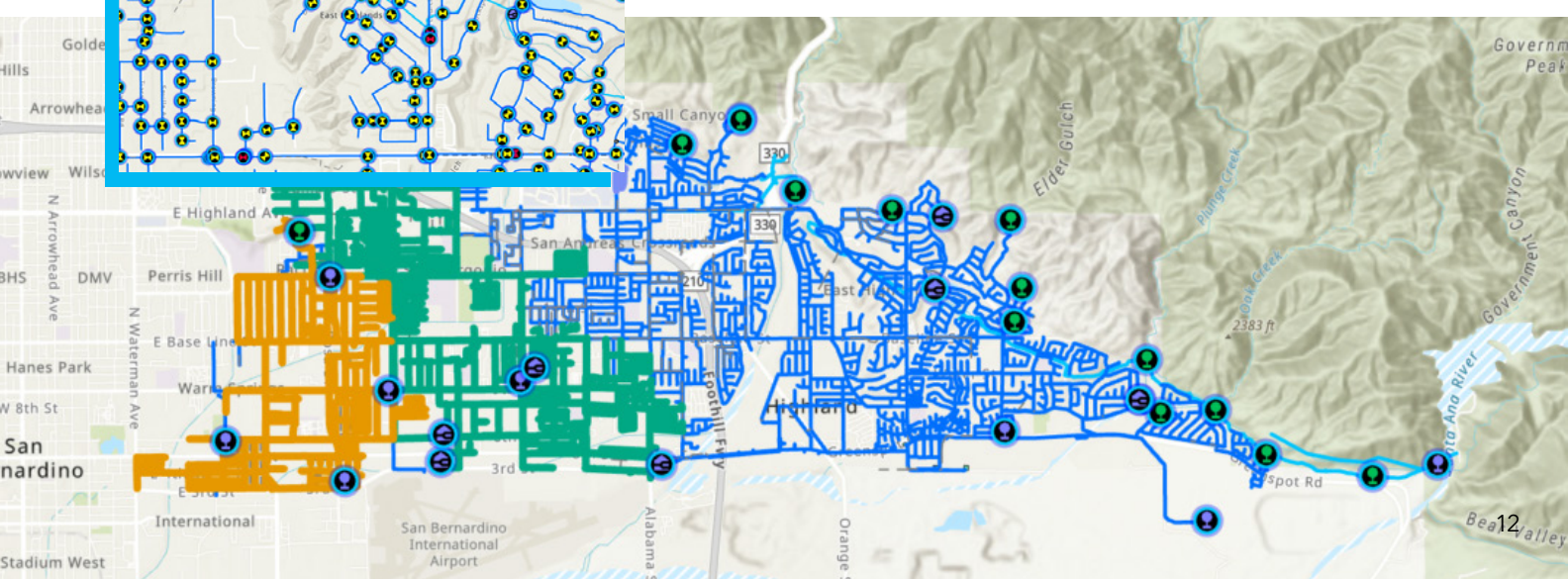
Once the data was prepared, it was migrated into the utility network model, where connectivity rules and network elements were configured. After thorough testing and review, the data was deployed to the district's enterprise database. Pro-West & Associates provided training for the engineering staff integrating utility network data into their workflows and the IT staff leading editing processes. The transition to ArcGIS Utility Network also included developing custom viewers for field crews; integrating with inspection, asset management, and work order systems; and establishing new editing workflows with quality control.

With ArcGIS Utility Network, East Valley significantly improved its ability to analyze and manage its system. The new platform not only ensures data integrity and supports advanced tracing and hydraulic analysis but also enables staff to quickly identify and resolve network issues; enhance emergency response; and make informed decisions for infrastructure planning, maintenance, and budgeting.

ArcGIS Utility Network allowed East Valley to integrate GIS with billing, finance, and work order systems, automating workflows and replacing manual data entry. This integration improved data accuracy; streamlined operations; and enabled real-time synchronization of meter, financial, and maintenance data across the organization. ▸

Read the full story

> We are excited to keep leveraging GIS tools to further improve operations at East Valley. Implementing ArcGIS Utility Network was a crucial first step in modernizing how we manage and use our data, and it's opened a lot of doors for us. We look forward to bringing even more of our vision to life.
>
> –Sarah Paredes, Information Technology Analyst, East Valley Water District





TenneT

TenneT, one of Europe's largest transmission system operators, manages a vast electricity network spanning Germany and the Netherlands, serving more than 43 million people. As the company expanded and modernized its grid to support the energy transition, it faced a growing challenge: Critical asset information was spread across multiple legacy systems, creating data silos, inconsistencies, and operational risks. Traditional 2D GIS tools could no longer accurately represent the complexity of modern transmission infrastructure, particularly where overhead lines, underground cables, substations, and interconnected assets converged.

To address these challenges, TenneT embarked on a three-year digital transformation project to create a unified enterprise asset registration platform built on ArcGIS Utility Network. The new system standardized asset data; incorporated automated validation rules; supported multiple languages; and migrated information from a range of legacy sources—including SAP, 2D GIS, databases, and spreadsheets—into a single 3D model that accurately reflects real-world infrastructure.

> "While the project was complex, its purpose is simple: to create one reliable, shared view of all our assets."
>
> —Markus Pitteroff, Product Owner, TenneT

The new platform provides TenneT with a comprehensive digital representation of its transmission network, enabling engineers to visualize complex assets in three dimensions, trace electrical circuits, and better understand network connectivity while maintaining accurate engineering relationships. Integrated with SAP S/4HANA and supported by enterprise-wide data governance, the solution delivers a reliable, shared view of assets that improves operational decision-making, engineering efficiency, and data quality.

The project was delivered in collaboration with Accenture, which supported the broader enterprise transformation and SAP integration; Avineon Tensing, which led ArcGIS Utility Network implementation, data modeling, and migration; and Arvato Systems, which provided the hosting infrastructure. Together, the partners helped establish a scalable platform that strengthens asset management today while laying the foundation for future web and mobile GIS capabilities, BIM integration, and a unified digital twin that will support TenneT's evolving energy infrastructure.

TenneT now operates from a single authoritative enterprise platform that integrates GIS with SAP S/4HANA, giving every team across engineering, operations, maintenance, and asset management access to the same trusted network model. ■

Read the full story

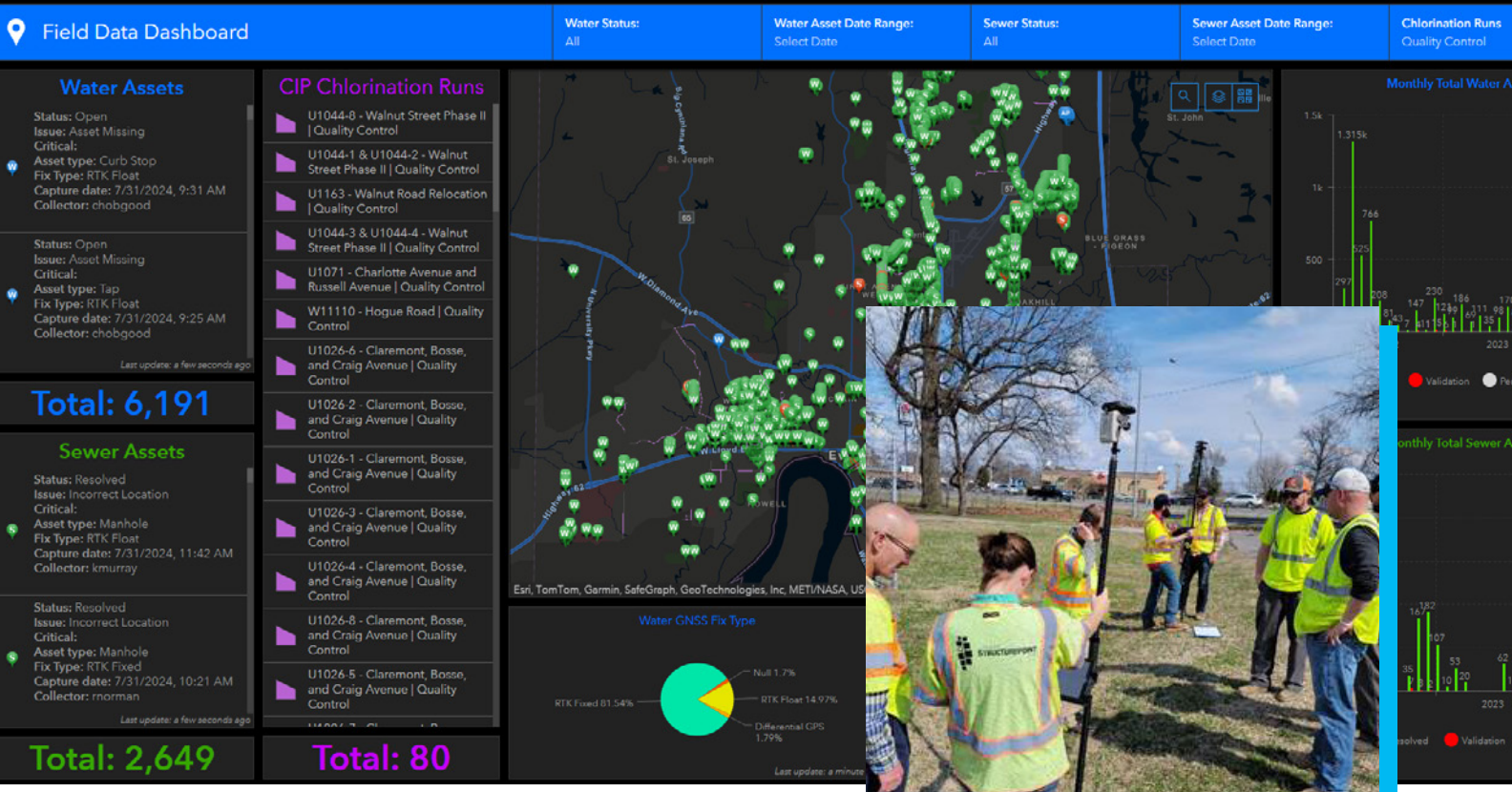


Connecting Field and Office Workflows

Many utilities continue to experience significant information latency between field operations and enterprise systems. Data captured in the field often requires manual reconciliation, paper-based processes remain common, and updates can take weeks or months to become operationally available.

A modern NIMS closes this gap by serving as a shared operational platform between field and office teams. Network information becomes accessible wherever work occurs. Field personnel provide real-time updates, while planners, dispatchers, engineers, and executives gain immediate visibility into changing network conditions.

The strategic outcome is not simply improved productivity. It is organizational synchronization. Every stakeholder operates from the same understanding of network conditions, enabling faster execution, better coordination, improved safety, and greater customer responsiveness. ▸



From Months to Moments: EWSU Cuts Turnaround Time with Eos GNSS and Expands GIS Access with ArcGIS Utility Network

Evansville Water and Sewer Utility (EWSU) modernized its GIS by migrating to ArcGIS Utility Network and integrating high-accuracy Global Navigation Satellite System (GNSS) technology, dramatically improving data quality and operational efficiency. Previously, inaccurate asset locations slowed service requests, inspections, and capital projects, with as-built updates taking months or even up to a year.

To address this, EWSU implemented Eos Positioning Systems Arrow GNSS receivers with ArcGIS Field Maps, enabling field crews to collect centimeter-level asset data and sync it in real time. This eliminated delays and ensured accurate mapping of dense infrastructure, such as valves and service connections.

> "It's all about customer service. Having this type of accuracy in our system allows for greater response, reaction, and repair—which translates to greater customer experience."
>
> —Ryan Key, GIS Manager, EWSU

The utility also deployed real-time kinematic (RTK) base stations for enhanced accuracy, and it trained field staff—many without GIS experience—to easily collect and submit data. In the office, dashboards created with ArcGIS Dashboards provide real-time visibility into field activity, while a custom ArcGIS Utility Network web app expands GIS access to nontechnical teams.

This modern workflow has transformed operations. EWSU now completes as-built updates almost immediately; improves inspection efficiency; and supports faster, better-informed capital planning. The utility has mapped thousands of assets and made accurate data accessible across the organization and to contractors.

By combining high-accuracy data capture with real-time GIS, EWSU has shifted from delayed, manual processes to streamlined, proactive operations that improve service delivery and customer outcomes. ▶

Read the full story

Wired for Success: TREDAŞ Transforms Field Operations with ArcGIS

Trakya Elektrik (TREDAŞ), an electricity distribution utility in Türkiye, needed to modernize how it manages its distribution network. Field crews worked with disconnected data, records drifted out of sync between field and office, and custom-built tools consumed significant time and budget to maintain.

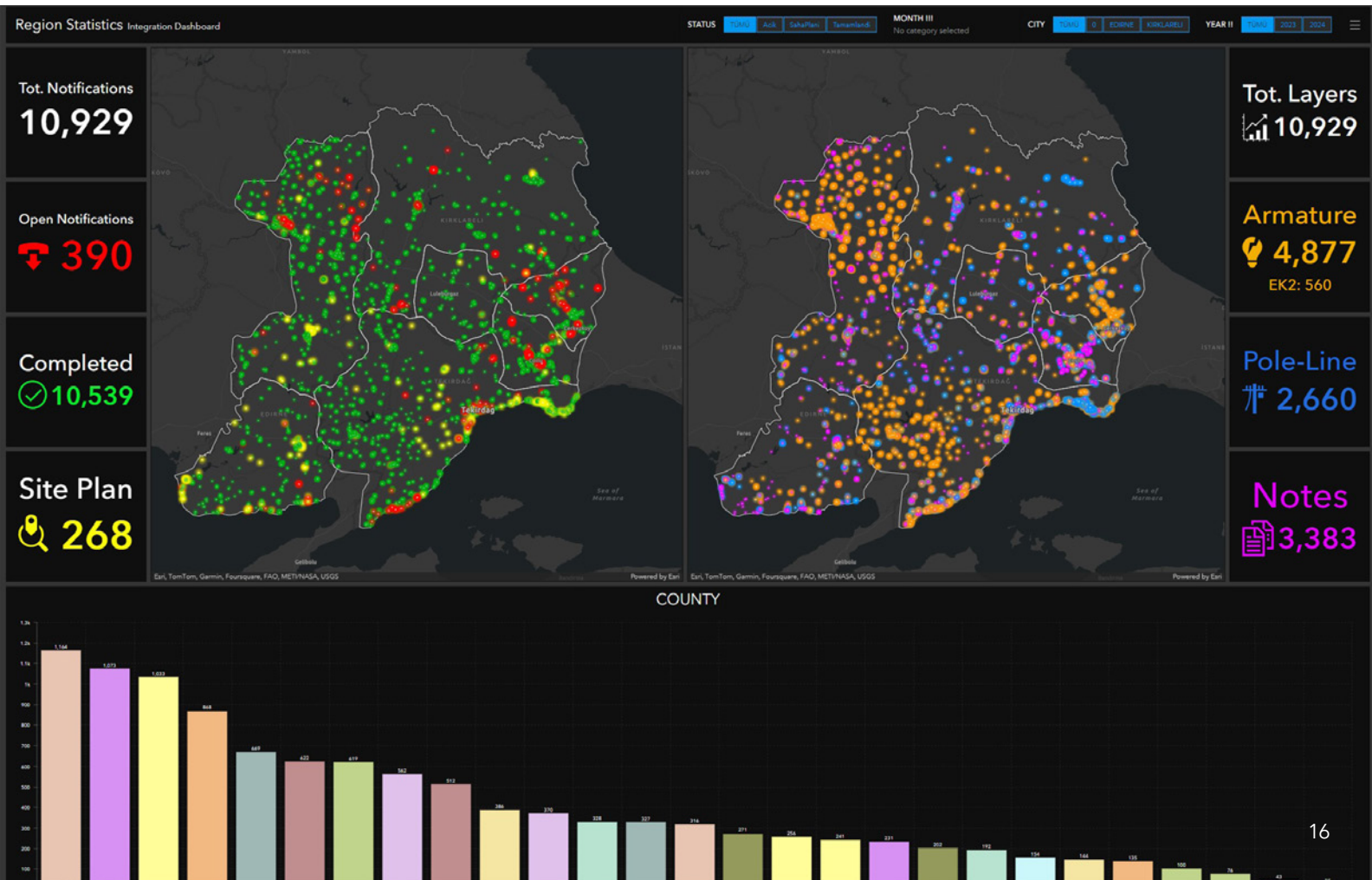
TREDAŞ deployed an ArcGIS technology-based network information management system with ArcGIS Utility Network at its core—giving the organization a single, connected system of record for its entire electricity distribution network. This enabled real-time network tracing and analysis across all assets. ArcGIS Field Maps extended the connected model into the field, with full offline capability for remote locations.

ArcGIS Dashboards delivered real-time operational visibility across the enterprise. Integration with Safe Software's FME and existing SAP platforms ensured that every field change flowed accurately throughout the organization.

The shift to a unified network information management system reduced application development costs by 95 percent. Network data now remains current. The improved response times and reliability gains improved customer satisfaction across TREDAŞ's service territory. ▶

Read the full story

> "With the new system's seamless integration and real-time updates, we are now able to operate more efficiently and with greater confidence."
>
> —Emin Saka, GIS Manager, TREDAŞ





Customized Esri Training Helps Albuquerque Bernalillo County Water Utility Authority Modernize Workflows

The Albuquerque Bernalillo County Water Utility Authority modernized its GIS by migrating from ArcMap and a geometric network to ArcGIS Pro and ArcGIS Utility Network, using a people-centered approach to ensure success. Serving more than 650,000 customers, the utility recognized that technology alone would not deliver value without preparing staff for new workflows and concepts.

Through the Esri Advantage Program, the utility paired its technical implementation with a tailored training strategy aligned to its migration timeline. This included a customized, hands-on training program designed around the utility's own data and real workflows, rather than generic exercises.

A three-day, role-based class brought together GIS editors, administrators, IT staff, and professionals from other teams to learn key concepts such as network tracing, topology, and branch versioning. Using familiar data in a simulated environment helped employees better understand complex topics and directly apply what they learned.

The training also strengthened collaboration by creating a shared understanding across departments, improving communication and alignment. This shift helped turn a complex technology upgrade into a unified organizational effort.

By combining strategic planning, customized training, and cross-team engagement, the utility successfully modernized its GIS and established a strong foundation for long-term operational efficiency and innovation. ■

Read the full story

> "Adopting ArcGIS Utility Network required a paradigm shift, and we knew we needed to bring everyone along for the ride."
>
> –Paul Davidson, GIS IT Application Supervisor, Albuquerque Bernalillo County Water Utility Authority



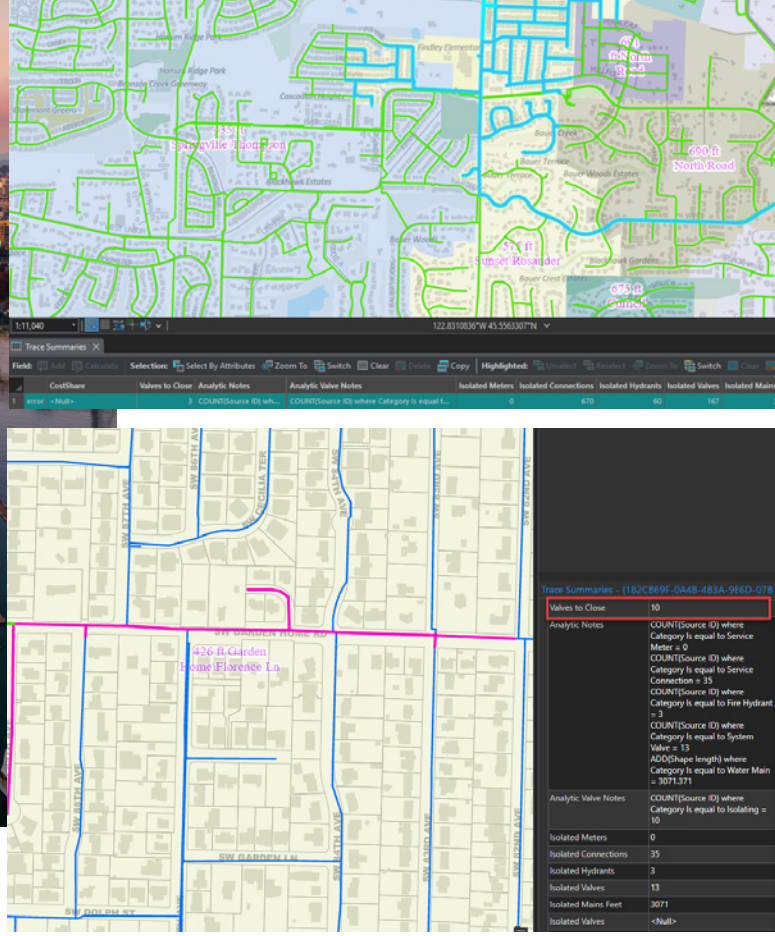
Advancing Analysis, Tracing, and Operational Effectiveness

Fully understanding a network has evolved beyond simply understanding its physical location. Modern utilities need the ability to show relationships and behaviors, predict impacts, analyze dependencies, identify vulnerabilities, and evaluate potential outcomes before they occur.

A modern NIMS introduces network intelligence through advanced tracing, connectivity analysis, scenario modeling, and operational analytics. It enables organizations to understand upstream and downstream impacts, identify affected customers, evaluate asset criticality, and model operational risk with unprecedented precision.

This capability represents a shift from static representations of information to dynamic network intelligence. Executives are no longer limited to understanding what happened. They gain tools to determine what is happening in real time and what should happen next, accelerating decision-making and operational effectiveness. ▶





Tualatin Valley Water District Applies Utility Network Tracing to Drive Smarter Capital Planning

Tualatin Valley Water District (TVWD) transformed its capital planning approach by implementing ArcGIS Utility Network and advanced tracing tools, shifting from manual, map-based assessments to data-driven decision-making. Previously, engineers relied on time-intensive methods to determine valve closures and estimate outage impacts, limiting system-wide risk visibility.

> "We didn't want to just modernize our GIS. We wanted a platform that could drive smarter decision-making and help us proactively manage risk across our system. This is about implementing today's best-available technology to plan tomorrow's water system."
>
> –Matt Oglesby, Asset Management Division Manager, TVWD

Working with NV5, TVWD developed automated trace analyses to identify where additional valves could reduce the impact on customers and where single-feed areas increase outage risk. Two key tools were created: Valve Impact Traces, which show how many valves must be closed to isolate a pipe segment, and Customer and Asset Impact Traces, which quantify how many customers, hydrants, and pipeline length are affected.

These insights help distinguish normal system design features from higher-risk conditions, enabling targeted improvements such as adding valves or looping mains to increase redundancy.

Because the analyses are automated and repeatable, TVWD can continuously update results and integrate them into planning and operations. This enables a shift from reactive response to proactive risk management, allowing the utility to justify investments, simulate scenarios, and prioritize projects that strengthen resilience and reduce customer impacts. ▶

Read the full story

Geospatial Solutions Support Metropolitan Utilities District's Vision for the Future

Metropolitan Utilities District (MUD) modernized its GIS to improve water and natural gas operations for more than 600,000 customers. After years of using ArcMap software-based tools, the utility faced limitations with slow performance and unreliable syncing. To address these challenges, MUD implemented ArcGIS Enterprise and migrated to ArcGIS Pro and ArcGIS Utility Network, beginning with data cleanup, pilot projects, and architecture planning to create a reliable, connected, real-world utility data model.

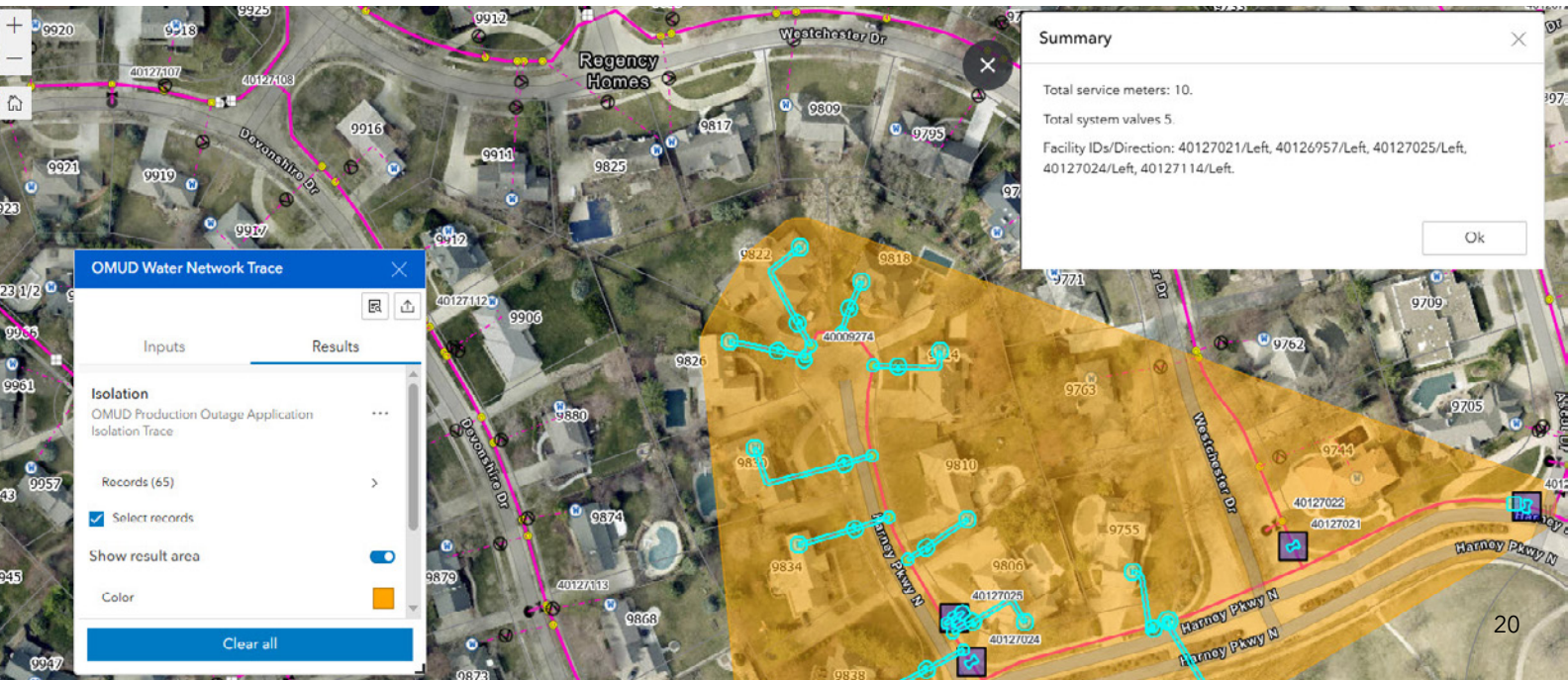
ArcGIS Utility Network became the foundation for high-value workflows. It improved hydraulic modeling by providing cleaner, more connected data, reducing the time engineers spent resolving connectivity issues. MUD also used decades of water main break data, asset information, and GIS analysis to support risk modeling and capital improvement planning. Web maps and ArcGIS StoryMaps℠ help communicate project priorities, replacement needs, and system growth.

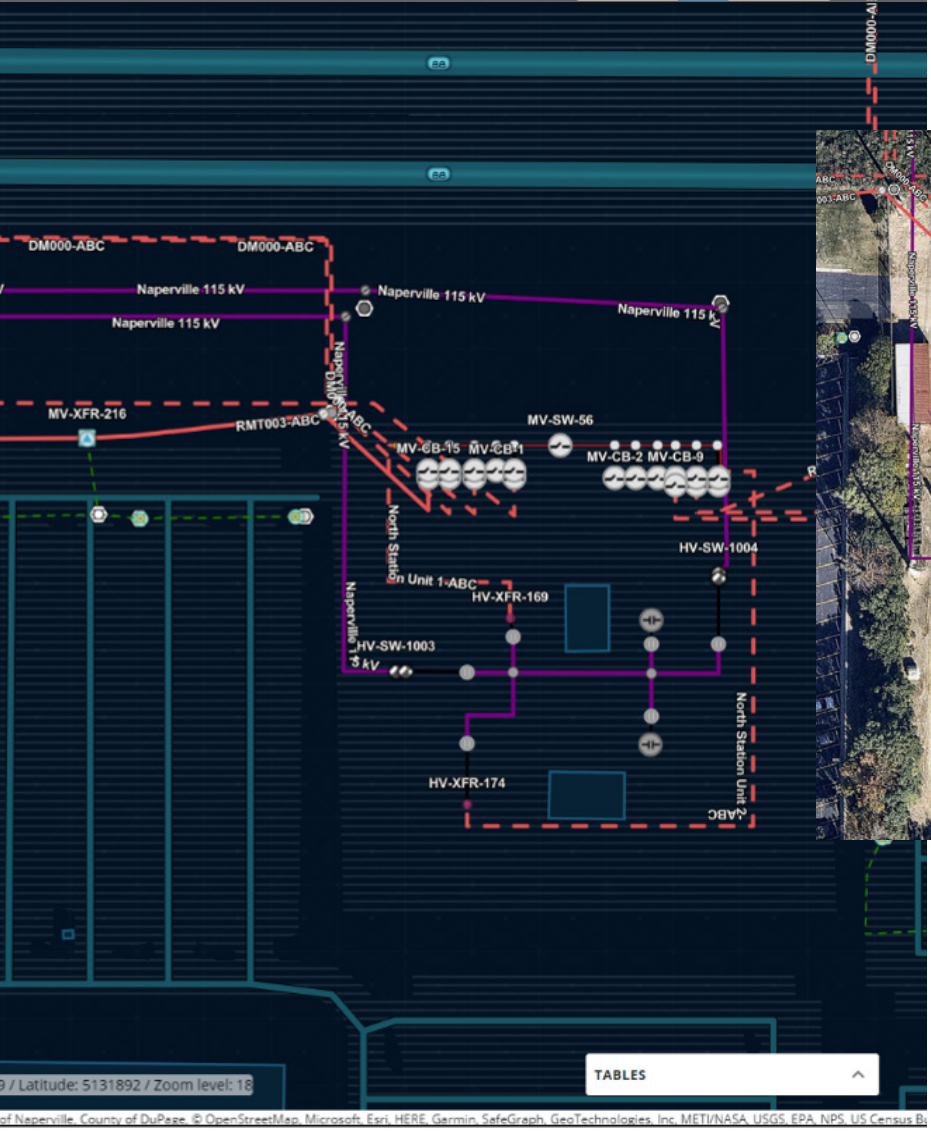
GIS modernization also transformed outage management and regulatory compliance. MUD built an outage application that uses ArcGIS Utility Network tracing to help field crews identify isolation valves, outage areas, and impacted customers from the field. For compliance with the US Environmental Protection Agency's Lead and Copper Rule, MUD created a water service line inventory; a public-facing map; and workflows to support inspections, contractor coordination, quality checks, GIS updates, and replacement scheduling. MUD also improved gas-emergency response by using threat-analysis tools to create exclusion zones for gas-filled structure incidents, improving situational awareness.

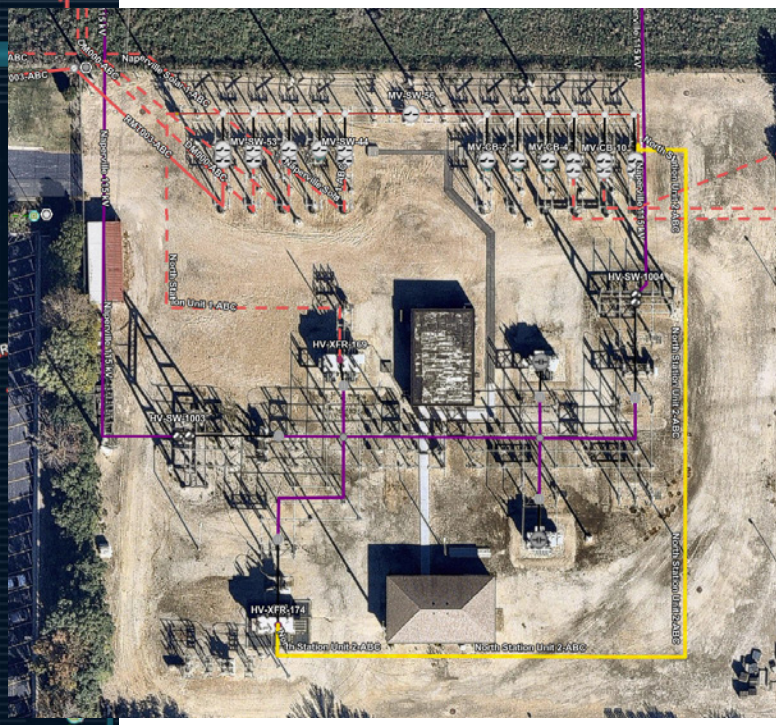
MUD plans to continue expanding GIS capabilities to automate reporting, improve corrosion-control workflows, enhance outage tracking, support planned outage work, and improve as-built records and AutoCAD integration. ▶

Read the full story

> "Using data from [ArcGIS Utility Network] has resulted in less time fixing connectivity issues in the hydraulic model. The built-in connectivity rules ensure good data, which is very important when modeling flow through our system, knowing what's connected to what and how the system flows together."
>
> –Evan Martin, Director of Infrastructure Integrity, MUD







> "Our goal was to bring our software products under one hood so we could get better engineering data and a more complete view of the system."
>
> –Brandon Young, General Manager, HOTEC

HOTEC Improves Grid Visibility with ENER-i and ArcGIS

Heart of Texas Electric Cooperative (HOTEC) has powered rural Central Texas communities since 1937, growing to serve more than 19,000 members across nearly 4,000 miles of electric line in a region where severe storms and extreme heat make reliability nonnegotiable. As the cooperative expanded through consolidation and increasing grid complexity, its operational data became a liability. GIS, AMI, SCADA, CIS, fleet systems, and engineering tools performed their individual functions but could not share a common picture of the network. Engineering teams spent more time moving distribution models between disconnected platforms than evaluating the studies those models were meant to support.

HOTEC partnered with Electric Power Engineers to deploy ENER-i, a cloud-based integration platform built on native Esri technology, establishing ArcGIS as the visualization and data foundation of HOTEC's network information management system. ENER-i connected GIS, AMI, SCADA, CIS, fleet location, and engineering analysis data into a single operational model. Powered by the OpenDSS simulation engine and integrated directly with ArcGIS mapping, the platform lets engineers run hundreds of planning simulations in a single environment rather than transferring models across separate tools.

Engineering teams now spend less time preparing data and more time evaluating planning scenarios, resiliency strategies, and capital investment decisions. Departments across the cooperative work from the same trusted, map-based system model, improving collaboration and giving HOTEC leadership clearer insight into infrastructure priorities and long-term grid modernization needs. ■

Read the full story



Strengthening Reliability, Resilience, and Customer Service

Reliability and resilience have become board-level priorities. Customers, regulators, and communities increasingly expect utilities to anticipate disruption, recover quickly, communicate effectively, and maintain essential services regardless of conditions.

A modern NIMS provides the intelligence required to support these outcomes. By understanding network dependencies and customer impacts, organizations can improve outage response, optimize restoration activities, reduce operational risk, and prioritize resilience investments where they deliver the greatest value.

Equally important, customer engagement improves. Organizations gain the ability to rapidly identify affected customers, provide more accurate communications, and present a consistent operational view across customer-facing systems. Trust is built through transparency and responsiveness. ■



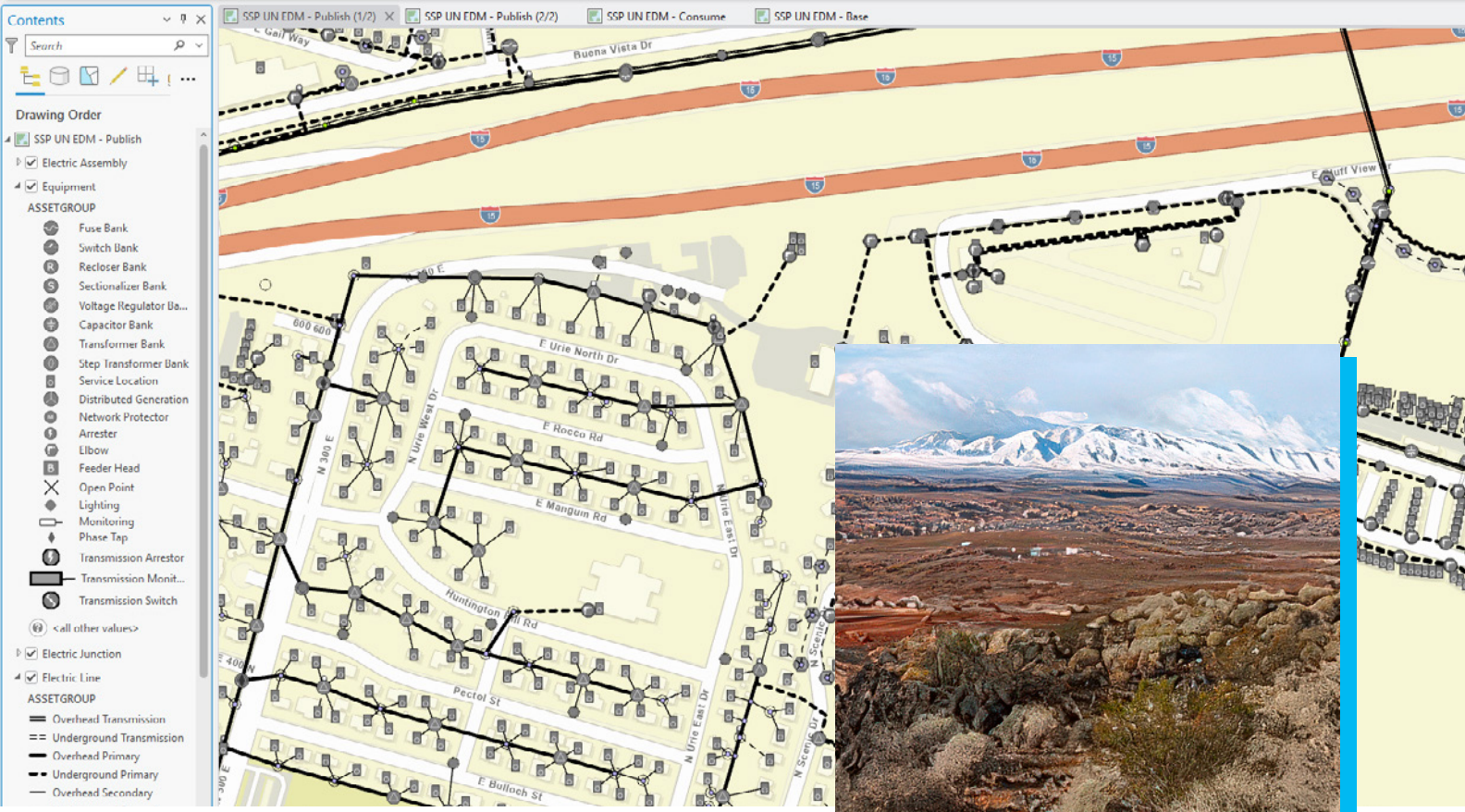
Modernizing IVR Customer Notifications with ArcGIS Utility Network

Many utilities struggle to accurately identify and notify customers affected by planned maintenance, outages, or emergency service disruptions because customer communication systems are disconnected from the network data that defines service impacts. This often results in broad notifications, manual processes, unnecessary customer calls, and reduced confidence in utility communications. To address these challenges, utilities are modernizing interactive voice response (IVR) and customer notification workflows by integrating them with the ArcGIS Utility Network, creating a more accurate, GIS-driven approach to customer impact analysis.

Using ArcGIS Utility Network tracing capabilities, utilities can identify precisely which customers are affected by a specific network event and automatically deliver targeted notifications through IVR and customer communication platforms. By leveraging ArcGIS Utility Network as a system of record for connectivity and asset relationships, organizations can improve communication accuracy; streamline outage and maintenance workflows; reduce call center burden; and provide customers with timely, relevant information during service interruptions. This GIS-centric approach strengthens operational efficiency while improving customer experience and trust. ▶

Read the full story

> "Arc GIS Utility Network gave us the opportunity to rethink a process that had remained largely manual for years. By combining network tracing with automated customer notifications, we created an innovative solution that saves our team valuable time, reduces unnecessary effort, and lowers operational costs while improving service for our customers."
>
> –Kenneth Frazier, Chief Technology Officer, Greenville Water



Washington City Power Modernizes with ArcGIS Utility Network

Washington City Power (WCP), a municipal electric utility in Utah, ran its network on a legacy GIS that could not keep pace with the demands of modern utility operations. The system lacked connectivity and topology rules, leaving crews with limited visibility into circuit configurations and meter connections. Outage management was inefficient; data maintenance was a constant struggle with limited staff, and the path to integrating modern operational technology systems was effectively blocked.

WCP migrated to ArcGIS Utility Network as the foundation of its network information management system, targeting accurate topology; real-time network visibility; and enterprise integration with SCADA, advanced metering infrastructure (AMI), and outage management systems. The migration established a connected network model with accurate phase connectivity across the full distribution system. Tracing and phase propagation tools then went to work on the existing data, surfacing and correcting legacy errors that had compounded for years. WCP's GIS editors began using ArcGIS Pro for network editing and planned to extend field access for crews via ArcGIS Field Maps, bringing the connected network model directly into the field.

The impact was immediate. Switching procedures that once took days now take minutes, powered by versioned modeling and validation tools. Outage response has improved with real-time circuit data that lets crews identify affected meters faster. The implementation also laid the groundwork for integrating AMI and outage management systems, advancing WCP's long-term automation goals. According to WCP leadership, the system's accuracy and responsiveness delivered measurable value in the field within weeks of deployment. ▶

Read the full story

> "The migration process went smoother than I anticipated. We finished earlier than expected and got to do a few more things that weren't on the original list."
>
> –Rick Hansen, Director, Washington City Power

GIS Enables N1 to Outmaneuver Historic Storm Surge

When a historic storm surge threatened Iceland, N1—the country's largest electricity distributor, serving approximately 800,000 customers—faced a race against rising water. Flood damage to cable cabinets and transformer stations across the network could mean widespread, long-duration outages affecting nearly the entire country. N1 needed to act before the water arrived, and it needed accurate, real-time network intelligence to do it.

Working with GIS partner and Esri distributor Geoinfo A/S, N1 built a data-driven situational awareness tool on top of its ArcGIS software-based network information management system in less than 24 hours. The solution pulled publicly available hydrological flood-risk maps showing projected inundation levels at various water heights and overlaid them directly against ArcGIS Utility Network asset data containing precise locations for every cable cabinet, transformer station, and grid equipment installation across the network. A custom dashboard—created using ArcGIS Dashboards—delivered real-time risk visualization to N1's control center, enabling operators to continuously forecast which assets were approaching critical flood exposure and act before water reached them.

The results demonstrate the power of a connected network model in an emergency. N1 proactively de-energized 410 cable cabinets based on forecasted risk. Only 15 of those shutdowns were caused by actual inundation, meaning the spatial analysis correctly predicted the rest. Just 3,000 of approximately 800,000 customers lost power, and most had service restored within a day. Financial and reputational risk dropped dramatically because ArcGIS Utility Network gave the team the spatial intelligence to outmaneuver the storm. ■

Read the full story

> "The new analysis tool has proven invaluable in our preventive efforts, enabling us to strategically deploy technicians for patrols and perform network disconnections during the storm surge. As a result, the number of customers affected by power outages was minimized, and the subsequent restoration work turned out to be far less extensive than anticipated."
>
> —Mads Norsted Sørensen, Operations Center Senior Manager, N1





Integrating Enterprise Systems for a Connected Utility

Modern utilities depend on a complex ecosystem of enterprise systems, each designed to manage a specific aspect of the business. ERP systems manage financials and work management, EAM systems govern asset life cycles, ADMS and SCADA support network operations, CIS platforms manage customer interactions, and engineering systems enable planning and design. The challenge is not the systems themselves but ensuring they operate from a common understanding of the network. Geospatial technology provides that foundation by creating a shared operational context that connects assets, customers, infrastructure, and business processes through location. As an enterprise GIS, ArcGIS serves as the integration framework that harmonizes information across departments and systems, enabling a common view of operations and improving enterprise-wide decision-making.

At the center of this ecosystem is the network information management system, which acts as the authoritative system of record for network assets, connectivity, topology, and operational relationships. By providing a trusted digital representation of how the network is engineered and operates, the NIMS enables information to flow consistently between enterprise systems while maintaining a single source of truth. The result is a connected utility where operational technologies and business systems work in concert; organizational silos are reduced; and geospatial intelligence can be applied across planning, operations, customer service, and asset management. ▶



Veitur Utilities Builds a Connected, Data-Driven Enterprise with ArcGIS

Veitur, a multi-commodity utility serving Reykjavík, Iceland, delivers district heating, water, sewer, and electricity across one of Europe's most geographically unique service territories. Managing that complexity across separate legacy systems created real-world limits on how effectively the organization could plan, operate, and maintain its networks. Veitur needed a single, connected foundation to tie it all together.

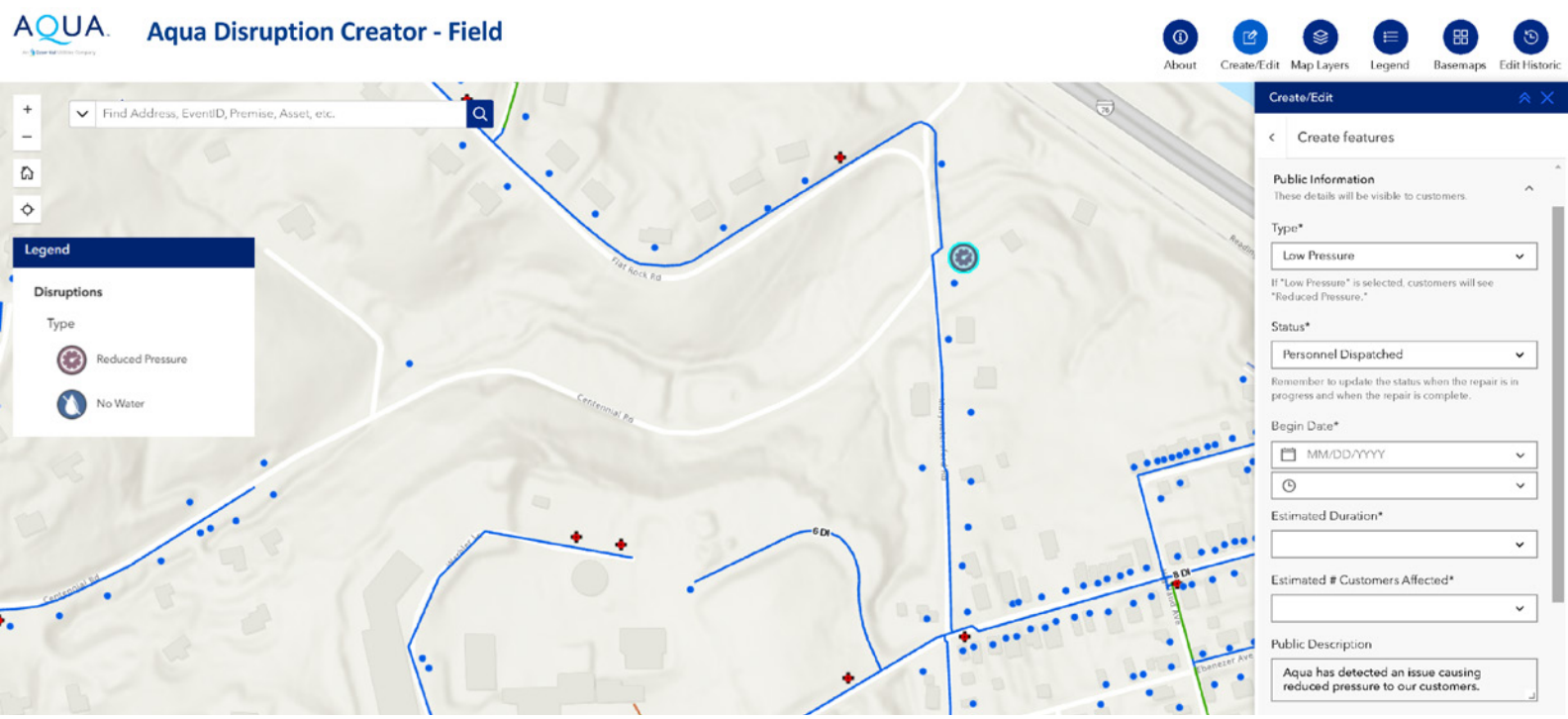
In 2019, Veitur launched its ArcGIS software-based network information management system, beginning with the utility's electric distribution network. Working with Esri partner Similix, which provides ArcGIS Utility Network migration services, the internal GIS team undertook extensive data migration and cleansing to build accurate connectivity across thousands of network elements. The team built more than 8,500 subnetworks representing the full electrical hierarchy, from 13 primary substations and 960 secondary substations down to street-level cabinets. This level of detail establishes ArcGIS as a foundational system of record for the utility enterprise.

Veitur then connected that system to its advanced distribution management system (ADMS) using Similix CIM Adaptor, eliminating redundant data maintenance and ensuring that critical operational systems draw from a single trusted source.

The result is a connected, data-driven enterprise where planning, operations, and maintenance teams work from the same network model. ArcGIS Utility Network serves as the primary data system, feeding downstream applications and enabling integration possibilities that simply did not exist before. ▶

Read the full story

> "ArcGIS Utility Network is built on subnetworks. It requires accurate topology, data cleansing, and accuracy for connected assets. It's a lot of work, but it opens a whole new door of future opportunities."
>
> –Valdimar Kjartansson, Former GIS Manager, Veitur



Águas do Norte: GIS Integration Strategy Using ArcGIS Utility Network

Águas do Norte, a Portuguese water supply and sanitation utility serving water and wastewater operations across multiple municipalities, has spent the past decade building GIS into its operational architecture and is now expanding that foundation through ArcGIS Utility Network.

The organization faced the challenge of designing an integration strategy that could connect GIS with a broad range of business systems. The strategy needed to include enabling bidirectional data flows, specifically to receive and process georeferenced events such as water leaks, maintenance interventions, and other operational incidents.

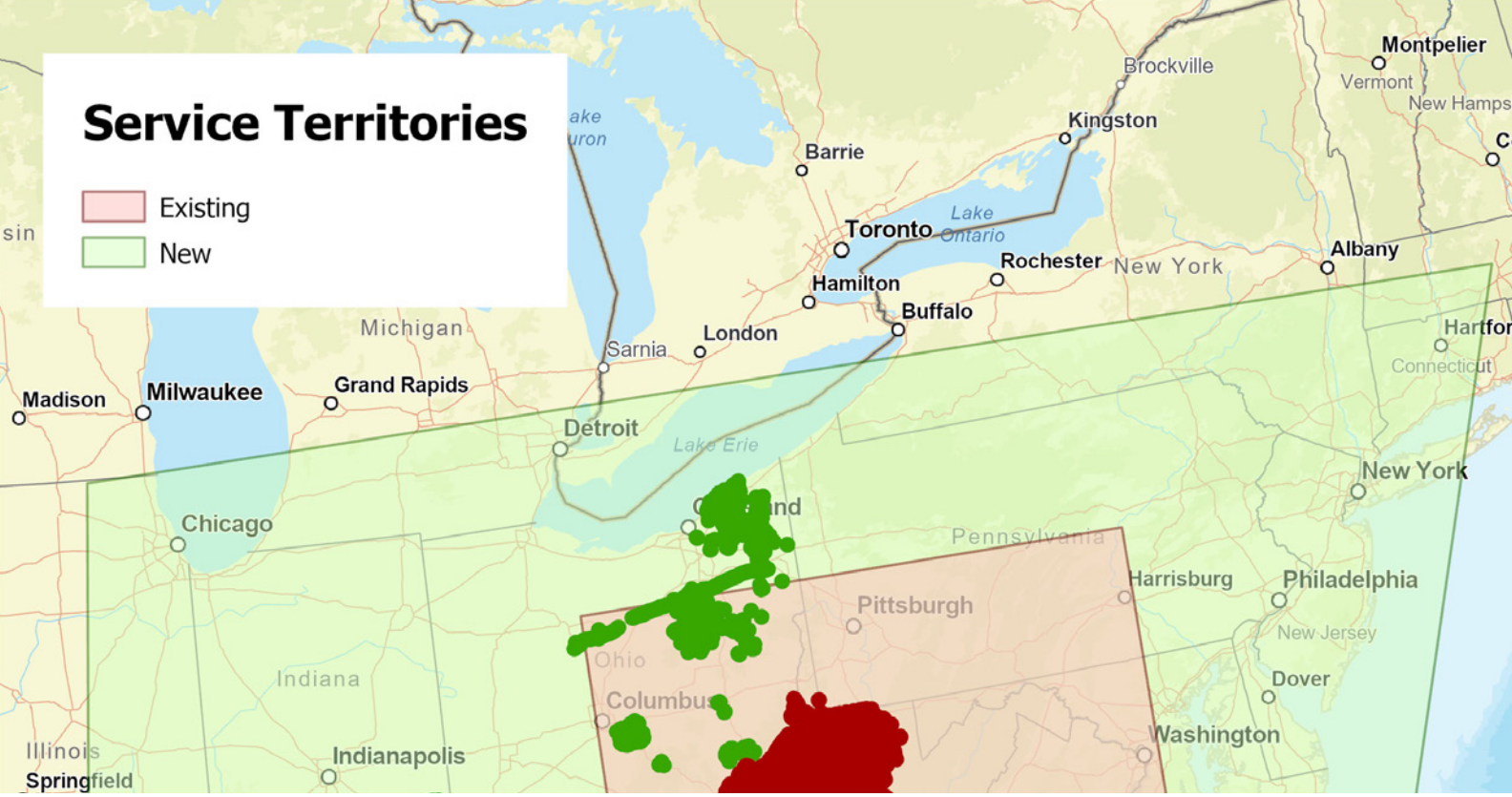
By migrating to ArcGIS Utility Network; exposing ArcGIS REST API to internal systems; and using ArcGIS API for Python to automate enrichment, validation, and geoprocessing workflows, Águas do Norte enhanced its GIS capabilities. It can now augment GIS layers with contextual network information such as district metered areas, pressure zones, pipe material, and diameter.

Águas do Norte's GIS strategy has resulted in more accurate, up-to-date asset records and the automation of key business processes. The organization has developed robust dashboards, introduced spatially enabled reporting, and improved analysis of pipe bursts and leak trends. By leveraging ArcGIS Utility Network and providing access to essential business data, Águas do Norte empowers better decision-making while expanding network capabilities like isolation tracing and validated water model exports.

Aligning GIS with enterprise systems helps Águas do Norte improve operational efficiency, strengthen decision-making, and deliver greater value across departments. ▶

Read the full story

> "The primary objective of a geographic information system is to deliver geographical context and decision-making capabilities to the business. To maximize return on investment and accelerate value delivery, Águas do Norte has strategically aligned its GIS initiatives with this vision, ensuring that business operations across departments benefit from enriched geospatial data and increased process efficiency."
>
> –Rui Leite, GIS Coordinator, Águas do Norte



Hope Gas Expands Its Utility Network GIS for Service Growth

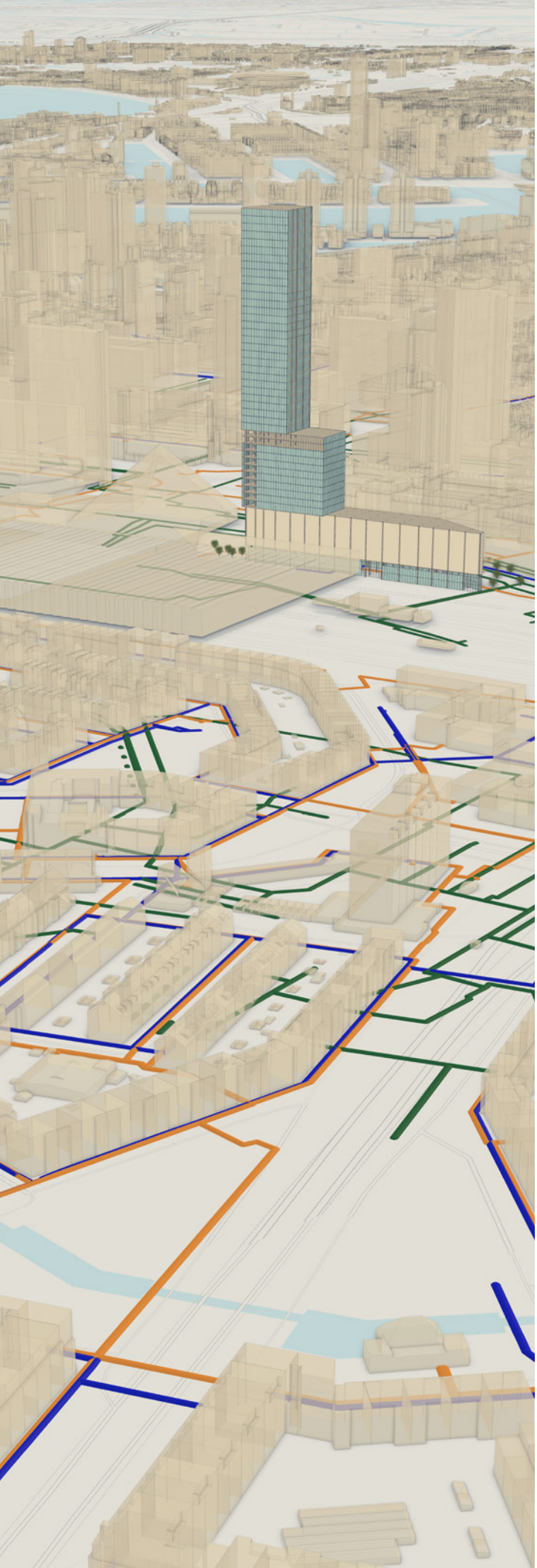
Hope Utilities sought to integrate its newly acquired service areas—served by Northeast Ohio Natural Gas Corp., Sycamore Gas Company, and Frontier Natural Gas—into its existing ArcGIS Enterprise geodatabase. The goal was to consolidate all territories into a single GIS platform and deploy mobile GIS solutions for field crews. Challenges included incompatible spatial references, outdated schemas, and offline access limited to West Virginia. Expansion into North Carolina, Ohio, and Indiana required a new SAP HANA Enterprise Cloud geodatabase, standardized spatial references, and updated data models to support future growth. Hope also needed mobile GIS access for new crews.

> “By unifying all six service areas into one Esri ArcGIS Enterprise geodatabase, Hope has reduced duplication, cut maintenance costs, and improved data consistency. Our field crews now operate more efficiently with RAMTeCH’s gMobile offline access, enabling faster, more efficient operations across all territories.”
>
> –Nagy Nagiub, Vice President of Corporate Services, Hope Gas

RAMTeCH delivered a comprehensive solution that unified six service areas into one ArcGIS Enterprise geodatabase, enabling centralized GIS data maintenance through ArcGIS Pro and ArcGIS Utility Network tools. Field crews now use the gMobile solution for Windows and iOS for offline access to mission-critical data, ensuring uninterrupted operations across all territories. The consolidated system improves data accuracy, streamlines workflows, and provides a scalable foundation for future acquisitions.

RAMTeCH partnered with Hope to design and implement data model updates, migrate the existing West Virginia utility network, and integrate new assets using uNet data migration tools. RAMTeCH deployed gMobile for iOS alongside the existing Windows solution, enabling offline field access for all crews. Specializing in GIS integration and ArcGIS Utility Network implementations, RAMTeCH delivered centralized workflows, improved efficiency, and a scalable system for continued growth. ■

Read the full story



Creating the Digital Twin for Future-Ready Operations

Digital twins are rapidly becoming a strategic priority across utility and infrastructure organizations. Yet many initiatives struggle because the underlying network information lacks the quality, governance, and operational fidelity required to support meaningful insights.

A living digital twin begins with a modern NIMS. The authoritative network model provides the trusted representation of assets, connectivity, and operational relationships required to create a dynamic view of the system. Geospatial intelligence adds context and understanding. Real-time operational data adds awareness. Together, they create a continuously evolving representation of network reality.

The true value of the digital twin is not visualization. It is outcome-based solutions that can deliver results through operationalization. Organizations can simulate scenarios, optimize investments, predict outcomes, and coordinate decisions across the enterprise. The digital twin becomes a decision-support capability that transforms how the business operates. ▸

CORE Enables Digital Twin to Support Next-Generation Options

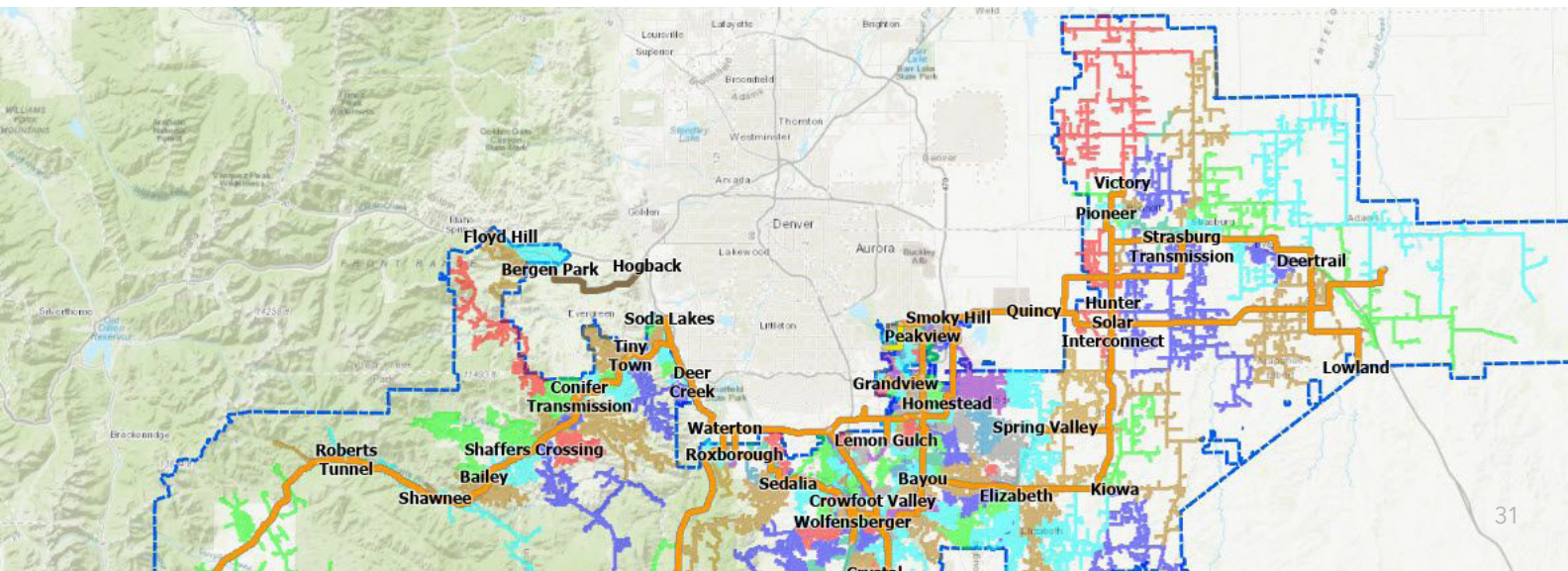
CORE Electric Cooperative has served Colorado communities since 1938 and has grown into the largest electric distribution cooperative in the state. It delivers power to more than 185,000 members across a 5,000-square-mile territory that stretches from the high plains east of Denver into the Rocky Mountains. As CORE's system grew and grid complexity increased, its legacy GIS could no longer keep pace. The organization needed a next-generation network information management system capable of supporting enterprise integrations, advanced distribution management, and a future that includes transmission assets and alternative generation sources.

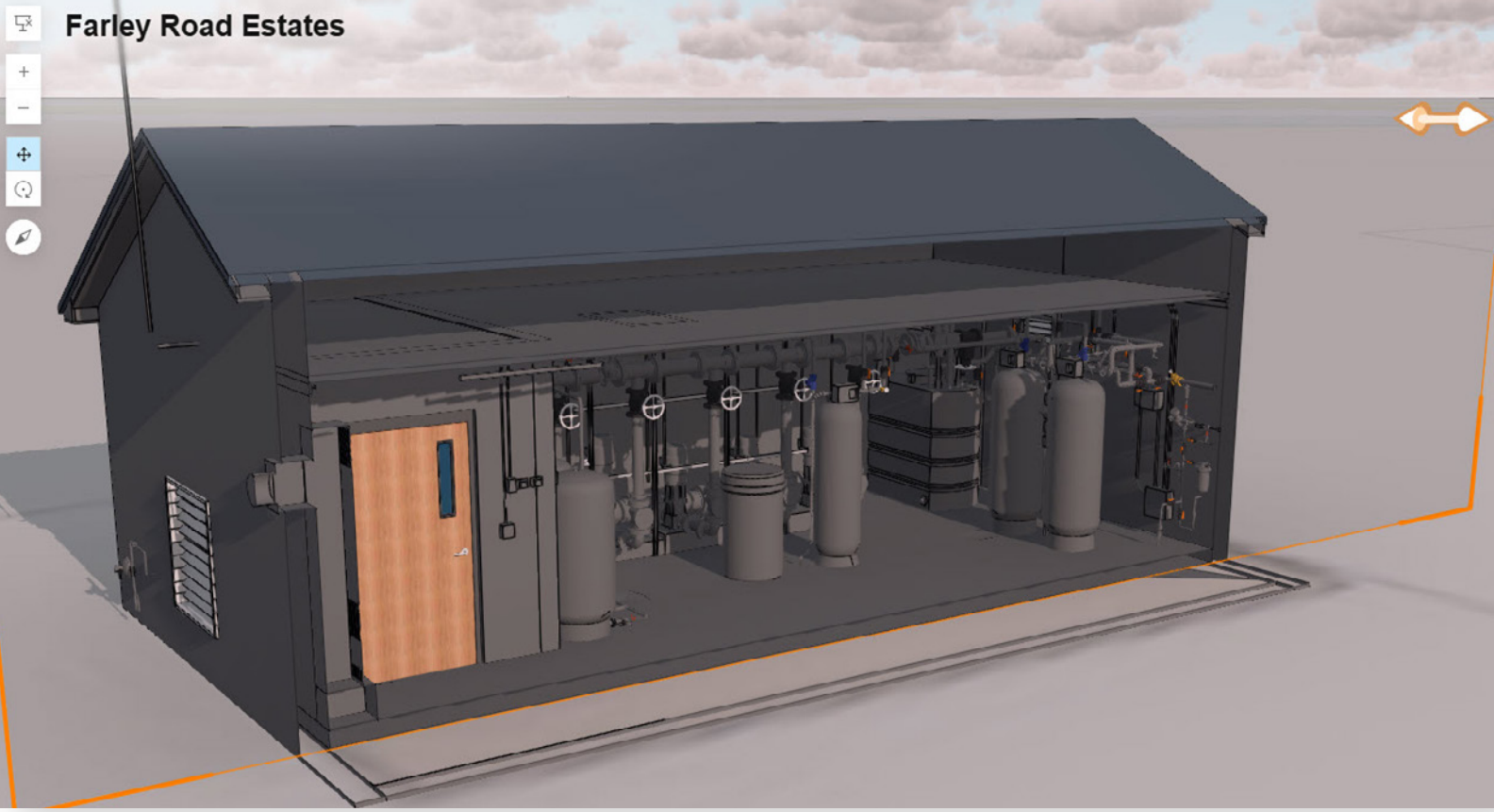
CORE implemented ArcGIS Utility Network as the foundation of its new NIMS, working with Esri partner UDC to build a high-fidelity network model that went well beyond standard Esri essentials configuration. The team spatialized individual units and equipment assemblies, meaning that every capacitor, switch, regulator, pole, vault, and transformer is modeled with precise position, orientation, and connectivity. This level of detail creates a true network digital twin with full traceability, from generation to service point. Critically, CORE unified its electric transmission and distribution networks into a single ArcGIS Utility Network model, consolidating five network tiers into one authoritative system of record. That foundation is now ready to feed both CORE's established outage management system and an incoming advanced distribution management system. ▶

Read the full story

> We are proud to be one of the first midsized utility companies to unify transmission and distribution in a single ArcGIS Utility Network [deployment] that incorporates both spatialized units and equipment assemblies. This achievement represents the realization of our goal for a high-fidelity transformation and positions the CORE GIS as a leading platform, prepared for the evolving demands of modern utilities.

–Duane Holt, GIS Manager,
CORE Electric Cooperative





Pennichuck Water Works Expands Its Digital Transformation with 3D Digital Twins

Pennichuck Water Works expanded its digital transformation by introducing 3D digital twins to improve management of complex facilities such as pump stations and treatment plants. While the utility had already modernized its distribution system with ArcGIS Utility Network and GIS-based workflows, facility assets lacked detail and were often represented as simple points, which resulted in relying heavily on operator knowledge.

To close this gap, Pennichuck partnered with LandTech Consultants to develop detailed digital twins. Using high-resolution laser scanning, facilities were captured with high accuracy; converted into 3D models; and integrated into ArcGIS as interactive, GIS-connected assets.

> "This digital twin represents a huge leap forward for data visibility for our facilities. I expect it to be transformative for our facilities operators and managers."
>
> —Jay Guarneri, GISP, Senior GIS Administrator, Pennichuck Water Works

The resultant solution allows staff to explore facilities in a browser-based application, visualize assets in context, and access real-time and historical data. Work orders, inspections, and maintenance systems are directly linked, creating a unified operational view across teams.

This approach improves efficiency and decision-making by giving operators immediate access to asset information and maintenance history while also enabling GIS staff to maintain more accurate and up-to-date data.

By incorporating digital twins into its enterprise GIS, Pennichuck has strengthened GIS as a central system that connects data, people, and workflows, while establishing a scalable foundation for improved asset management, operational visibility, and future innovation. ■

Read the full story



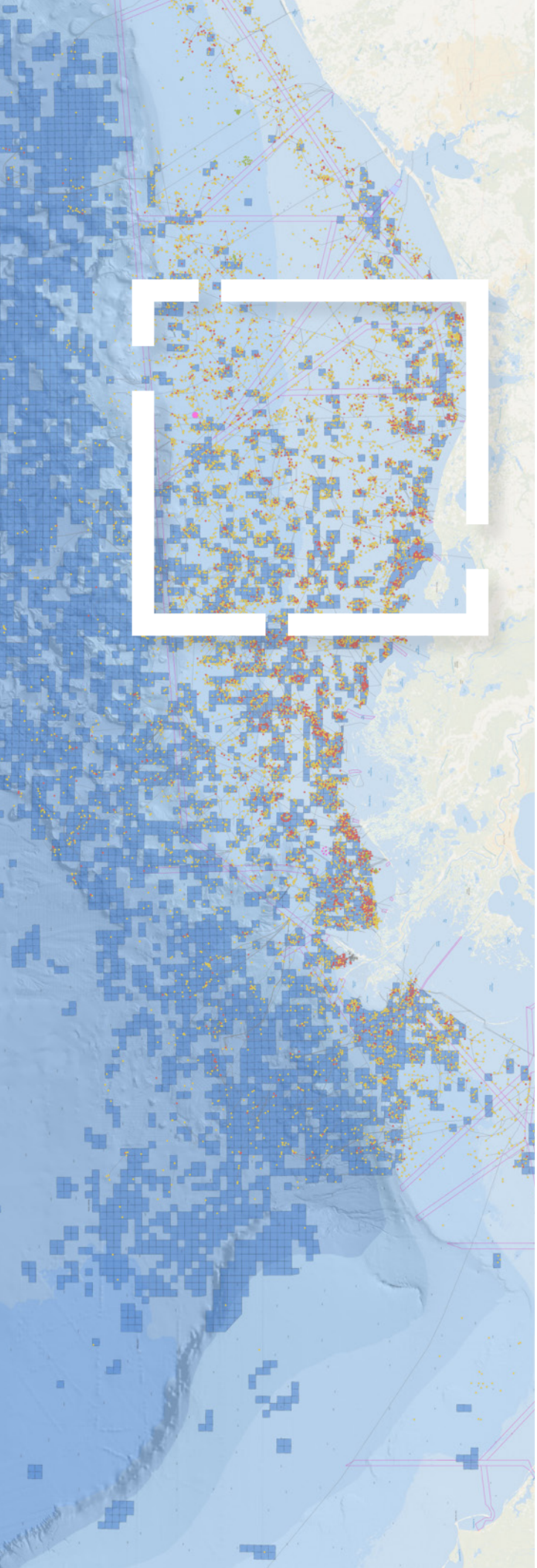
The Rightsized Deployment for Your Network Information Management Journey

There is no single blueprint for modern network information management. Every utility operates within different regulatory environments, network complexities, organizational structures, and strategic priorities. Success does not come from implementing the largest system. Success comes from implementing the right system to support business outcomes.

The most successful organizations establish strong network foundations, introduce governance early, connect operational workflows, and progressively build intelligence and integration. They recognize that modernization is a journey of maturity rather than a technology deployment. Each step increases organizational capability and creates additional value.

Ultimately, the objective is straightforward. Establish a trusted network information management system as the authoritative system of record. Use geospatial technology to provide the foundation. Apply geospatial intelligence to create understanding. Build living digital twins to operationalize that understanding. Together, these capabilities create the network intelligence required for a safer, more resilient, customer-focused, and future-ready utility. ■

> Networks deliver services. Information creates understanding. Intelligence drives decisions. A modern network information management system is the foundation that brings all three together.
>
> –Matt Piper, Industry Solutions, Esri



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 hundreds of thousands of organizations globally, including Fortune 500 companies, government agencies, nonprofit institutions, and universities. Esri has regional offices, international distributors, and partners providing local support in over 100 countries on six continents. With its pioneering commitment to geospatial technology and analytics, Esri engineers the most innovative solutions that leverage a geographic approach to solving some of the world's most complex problems by placing them in the crucial context of location.

For more information, visit our **IT Network Mapping and Visualization page.**



Copyright © 2026 Esri. All rights reserved. Esri, the Esri Globe logo, The Science of Where, and esri.com are trademarks, service marks, or registered marks of Esri in the United States, the European Union, or certain other jurisdictions. Other companies and products or services mentioned herein may be trademarks, service marks, or registered marks of their respective mark owners.

8635851