

WHITEPAPER

Locana
EVERYTHING LOCATION

Modernize Your Enterprise to Improve Operations and Accelerate Growth

*How utilities achieve a greater return on value upgrading
GIS as part of their corporate innovation strategy*



Market disruption drives modernization

Estimates show that the global utility market will grow to [\\$4.5 trillion in 2021](#), up 7.2% from the previous year. And growing populations, greater access to energy sources, and higher living standards could lead to a [20% rise in global energy demand](#) by 2040.

All of this comes at a time when consumers and businesses are demanding more efficient energy options.

Rapid change defines today's utility business landscape, and the utility industry can lead the transition to greener energy. Some utilities are setting the ambitious goal [of zero carbon emissions by 2050](#) with increased solar, wind, and energy storage investment to help combat climate change.

To better manage the complexities of this market disruption and growth, more utilities are turning to enterprise business systems that provide operational efficiency while delivering safety and reliability. These digital transformation initiatives support critical business functions with holistic processes and higher quality data. And geographic information system (GIS) will play an essential role.

Modern geospatial solutions for [utilities](#) meet the market demands of today and tomorrow, especially with networks becoming more localized and smarter. The solutions can help address the trend of distributed assets moving closer to the

customer and involving the two-way flow of commodities from both the network to the customer and back again. Moreover, they can help manage networks with intelligent sensors that capture real-time location data.

Deploying traditional or legacy GIS is inadequate to address these issues because it lacks the capabilities needed in a 21st-century world. Modern enterprise GIS opens up access in a way legacy GIS simply can't. It integrates into the organization's larger IT ecosystem and supplies enterprise access using web services and mobile applications.

Utility business challenges

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|--|---|
| 1 New sustainability requirements | 6 Legacy business systems |
| 2 Changing consumer demands | 7 Increased demand and competition |
| 3 Aging infrastructure | 8 Regulatory requirements |
| 4 Lack of capacity | 9 Extreme weather events and wildfires |
| 5 Capital investments | 10 Aging workforce |

Modern GIS meets evolving utility needs

New and alternate energy technologies, like solar generation, battery storage, and electric vehicles, are changing how utilities interact with consumers. They are giving rise to distributed, two-way networks and the “prosumer,” a customer that acts as both micro-supplier and consumer. In addition, the Internet of Things (IoT) and mobile technologies are changing consumer behavior, with intelligent devices enabling greater consumer control over energy consumption.

Customer expectations for utility services are evolving as well. For example, customers now expect a digital relationship with their energy providers. Because they have more choice in energy supply and usage, they want utilities to cater to their needs. They require speed using digital means, have less patience with traditional engagement, and are more willing to change relationships based on their experience.

Adding complexity to the utility business are increasing service shutdowns and weather events. The cost, and negative brand equity, resulting from disruptions can be immense. Utility companies need new ways to ensure transmission and

distribution lines are resilient and well maintained to decrease outages on the grid, in gas pipelines, as well as water/wastewater systems.

The need to leverage accurate data as a commodity rests at the heart of these trends. For several years, organizations, including energy companies, recognized that their most precious resource is data because of its availability and impact on the business. In addition, most utility organizations understand that success moving forward will require leveraging the abundance of available data to empower employees, improve processes, and meet consumer demands.

Geospatial data provides enormous value to the organization. When a company moves from departmental GIS to a modern, spatially-enabled enterprise, it facilitates instant access to maps and related information across departments. It georeferences every piece of business information, allowing utility staff to include location analytics and geospatial data into their everyday workflows. It enables them to monitor the status of their utility networks and events that may affect services.

Why modernize GIS?

- Move to model-centric network that better represents real-world conditions
- Integrate with other systems to spatially enable maps and location analytics
- Replace silos and manual processes that result in data errors and latency
- Increase data accuracy, timeliness, and completeness
- Provide real-time visualization, analytics, and reporting



For utilities undergoing significant digital transformation initiatives, the overarching IT strategy must include modern GIS. If utilities run legacy GIS or older versions of GIS software with these new transformative technologies, they will inevitably need to refactor their applications and solutions once they upgrade to modern software.

In addition, many departmental GIS systems are no longer supported by their vendor. As a result,

integrating enterprise systems becomes a much more costly, complex, and inefficient process.

A modern GIS allows organizations to eliminate silos, improve work and asset management, and streamline customer and financial processes. It connects to enterprise resource planning (ERP) to provide accurate transactions and scheduling, clarifying spatial behaviors and relationships for optimal asset management.



Modern GIS vs. Traditional GIS

- Model-Centric
- Open
- Mobile First
- Integrated
- Digital Twin
- Enterprise
- 3D+



- Map-Centric
- Proprietary
- Desktop
- Standalone
- Digital Map
- Departmental
- 2D



From map-centric to model-centric GIS

Traditional or legacy GIS supplies a 2D, map-centric approach to 21st-century challenges. Today's forward-thinking, safety-first organizations leverage a model-centric GIS that more accurately reflects the actual utility network. This approach integrates and fuels previously siloed systems like advanced distribution management systems (ADMS), building information management (BIM) systems, supervisory control and data acquisition (SCADA), as well as ERP-based applications like work management, asset management, and customer financials.

Model-centric GIS can consume and publish all the pieces and parts of the utility system in web services and provide simulations that supply what-

if-scenarios, predictive analytics, and more. Modernizing GIS, specifically with the Esri Utility Network (UN), helps manage the network completely based on real-world attributes, whether for electric, gas, or water systems. Moreover, it provides tools to update and maintain infrastructure, as well as mitigate and prepare for potential disruption.

Utilities can take data from traditional GIS, combine it with CAD, imagery, and live data feeds, and create a seamless view. With these capabilities, utilities can increase safety, improve service, and enhance performance and profitability.

BENEFITS

- 1 Effective network management** – A shift is taking place from large networks to more localized distribution that includes two-way power supplies from solar, wind, and other alternate sources. The two-way flow from customers to the network has changed everything from operations to billing and service. Modernized GIS provides modeling, visualization, analytics, and interoperability to manage these complex networks effectively.
- 2 Better business resilience** – Cybersecurity threats, extreme weather events (wildfires, floods, hurricanes), and grid modernization increases the need for better business resilience. Modern GIS provides decision makers the operational awareness needed to visualize, understand, and analyze disruptions and their potential impacts. This enables executives and operations personnel to quickly initiate actions for reestablishing operations.
- 3 Increased safety** – Geospatial solutions proactively identify aging assets and potential network disruption so utilities can take corrective action before an incident occurs. Utilities can effectively share maps and data to protect people, property, and the environment and meet new government mandates and requirements. In addition, they can deploy field crews with greater confidence that they are in the right location and working on the right asset.
- 4 New business models** – Utilities can better compete for customers and provide more non-commodity-based products and services. This replaces traditional cost-to-serve models, using spatially-enabled customer systems that interact with asset management and other systems. As a result, they can produce and distribute energy at a local level and control distributed generation.
- 5 Increased profitability** – Spatially enabling the enterprise can help identify potential new business, such as charging stations. It improves customer satisfaction through faster service delivery, shorter outage times, and greater community communication and engagement. Moreover, improvements in network performance, combined with workflow and process efficiencies, resulting in lower costs.

Spatially enable the enterprise

For decades, utilities relied on GIS to perform several vital functions. From map-making to network management, GIS played a crucial role in the business's success. However, these **legacy GIS systems typically operated at the department level** and lacked the integration needed to address today's complex networks and market drivers.

Modern GIS supports the 21st-century challenges. First and foremost, it seamlessly fits into the corporate IT infrastructure and provides robust capabilities for modeling behavior on top of the traditional map analysis. For instance, managing smart grids requires corporate systems to work together seamlessly, from ADMS to engineering design to BIM to asset management. Modern GIS **enables this tight integration** and improves these systems as a result.

Moreover, modern GIS brings a wealth of new technical geospatial capabilities to the work of network operations. It leverages advanced 3D simulations, predictive modeling, real-time data, sensor integration, imagery, and more. It **provides sophisticated analytics**, including big data, IoT, artificial intelligence, and machine learning. And because it leverages a complete data model, it provides ease of editing, expanding connectivity, and scaling to any size.

For example, a modern GIS enables generating **an authoritative geospatial digital twin**, allowing utilities to modernize their grid while providing safe, reliable customer service. The digital twin supplies a more accurate version of the network that includes behavior and physical characteristics.

You can bring live data feeds such as weather and traffic to analyze these and other real-world relationships with the physical networks.

For most utilities, **the best approach to modernization** involves migrating to the latest version of the Esri ArcGIS system and the **ArcGIS UN**. This transformative solution provides a comprehensive framework for modeling utility assets and networks. It provides a quantum leap in network representation in 2D and 3D that more closely represents assets as they appear on the ground. In addition, its real-time data and analysis capabilities provide better situational awareness. Finally, it integrates all types of data and takes advantage of business intelligence (BI) dashboards to enable workforce efficiency, optimizing plans and resources.

The benefits all trace back to the **unifying component of location intelligence**. With location intelligence moved beyond departmental silos and embedded into the utility enterprise, numerous departments can derive a deep understanding of patterns and situations that tabular data and traditional tools might otherwise miss. As a result, utilities see a complete picture to improve decision-making, as well as enhance communication, collaboration, and coordination.

Modernized GIS achieves better business results

ArcGIS, combined with Esri UN, provides integration that fits within larger business enterprises, laying a solid foundation for the future. It's built on a service-based architecture so utility professionals, whether working in engineering, operations, customer care, or IT, can publish data once, and it's available on all types of applications (desktop, mobile, web). In addition, they can distribute functionality from desktop to mobile to web services without separate development for each.

With more digital tools available, users perform tasks using fewer resources and in less time. Whether it's design, construction, repairs, maintenance, or inspection, the result is smarter, faster, and more cost-efficient work across departments for all aspects of the business, including:

- **Safety and compliance:** Knowing where assets are located and when they need to be inspected is foundational for a utility. If utilities haven't mapped an asset, there is a considerable risk of it getting damaged and causing an event (e.g., ruptured or over-pressurized gas mains underground). Companies that can perform analysis to identify previously unmapped assets or perform accurate asset reporting can reduce regulatory compliance violations.
- **Network management:** Build a smarter grid using GIS and the right data model as an integration platform to combine digital sensors,

network and data management, advanced analytics, and real-time data feeds to improve network management. Companies can leverage imagery to help identify potential problems and proactively replace assets as needed. GIS can also feed risk models so utilities can manage their assets more proactively.

- **Vegetation management:** A modern GIS can support field apps and incorporate data from third parties that show current and projected vegetation, along with risk models for fire. With the ever-increasing threat of wildfires, combined with concern with properly preserving the environment, geospatial analysis allows utilities, for instance, to remove only the trees and vegetation that pose the most risk.
- **Customer care:** GIS web apps give customer reps the map-based interface to data they need to handle calls, answering questions about service disruptions, repairs, construction timelines, and more. Utilities can also provide online map apps to give customers everything they need to report an outage and view restoration status. In addition, it allows companies to integrate with customer systems and gain insight into energy usage and provide better services (see on a map when field technicians will be onsite).

- **Design and engineering:** Materials tracking and traceability using legacy GIS is a tremendous problem because it's run on a departmental level, but many pieces of data exist outside the department. This results in manual processes, internal knowledge, and multiple systems needed to get the right information. With GIS connectivity to the supply chain, asset management system and design tools, organizations can generate a design, know where to build it, and share it with the asset management system.
- **Grid modernization:** Modern GIS, specifically the new Esri UN, provides a higher fidelity for making your grid resilient, reliable, and efficient. Smart grids use sensors that supply location-based data for building a tougher, more sustainable electric grid. It uses that data to improve insights on grid behavior and identify potential vulnerabilities. As a result, organizations can mitigate against risk using high-powered analysis and visualization.
- **Emergency response:** Sophisticated dashboards in the operations and emergency centers provide real-time situational awareness through a common operating picture. Utility leaders and their emergency command counterparts and field staff access data to help prioritize repairing or restoring critical facilities, like pump stations. They also work offline when mobile communications are down or unavailable, meaning your utility staff can operate under stressful conditions when digital service is down.
- **Leak management:** Whether for gas pipelines or water-loss detection and response, GIS helps with data management analysis to proactively identify potential risk and respond faster and more strategically to maintain infrastructure and quickly repair damaged assets. With GIS connected to the organization's other enterprise systems, you can ultimately reduce commodity losses and maximize long-term capital expenditures.



Modern mobility delivers safer, more efficient service

Companies using legacy GIS can't take advantage of GIS integration with field force capabilities. For example, they can't leverage real-time access to asset data and maps seamlessly integrated to improve work order management. In addition, they can't take these capabilities in the field to respond to service disruption and emergency events, from gas leaks to main breaks and damaged assets caused by storms, fires, floods, main breaks, and more.

Modern IT and GIS innovation means moving the power of apps and data to the field where workers need it the most. With [mobile GIS](#) connected to work order management, field crews can make intelligent decisions fast, keeping operations secure, timely, and efficient. Mobile capabilities give field access to your existing geospatial workflows like redlining and as-building.

This means a more efficient process of finding information in the field, less need for back-office support time, better data sent to the enterprise, and safer resolutions. Utilities reduce the amount

of time spent communicating with the field office, trying to locate needed information.

Mobile GIS for field service gives technicians intuitive map interfaces and in-app navigation menus to move seamlessly between systems. Whether using SAP Work Manager or Salesforce Field Service, they can view GIS data, initiate workflows, and complete work orders without copy/paste or manual app-switching. This delivers an intuitive method to complete all aspects of fieldwork.

With enterprise geospatial functionality available across departments and in the field, utilities gain a greater return on value upgrading GIS as part of their innovation strategy. Moreover, they can take advantage of modern geospatial technology that provides a platform for future growth.

Whether online or offline, organizations can empower field crews to do more—while saving time and money—by bringing the right mapping capabilities to the field.

Mobile GIS allows field crews to:

 Locate correct assets quickly

 Sketch, redline, markup, and create as-built drawings

 Look up asset characteristics

 Understand asset connectivity

 Record work and defect locations

Maximize value with a trusted adviser

Digital transformation initiatives are extremely complex, have constantly shifting deadlines, and can run into budget issues. Because of this, many, if not most, projects fail.

For example, the Boston Research Group reports that [70% of digital transformation projects fail](#), with even fewer positive results for more traditional industries like utilities. This certainly applies to major GIS modernization initiatives, where launching an enterprise system that fits into the larger digital vision requires a unique set of skills.

In order to fully benefit from an implementation of GIS as part of a digital transformation, utilities often look to an experienced outside consultant to provide [expert services](#). The right partner should have deep experience in enterprise IT and GIS implementations. They should understand the technical challenges, such as integration with other business systems, system performance, data modeling, and data migration.

It is also important that they know how to work with clients effectively and, more importantly, learn to understand the client organization's culture. In addition, these utilities should look for partners with industry knowledge and a proven track record working with clients to listen first and then deliver based on their specific business needs.

With over 30 years of knowledge, experience, and innovation, Locana worked closely with multinational clients in numerous industries, including [federal](#) and [local government](#), utilities, private sector, and [nonprofit](#). For utilities, in particular, Locana has worked with electric, gas, water/wastewater businesses of all sizes across the U.S. and around the world, including the very first implementation of Esri UN.

How? Locana leverages a delivery model that caters to the client's resourcing needs and unique business and IT objectives. After an extensive understanding of the client, Locana works in partnership to implement a modern GIS that fits with corporate IT systems such as SAP, Salesforce, and others to unlock the value of geospatial throughout the organization.

Specifically, with [Locana's Flexible Collaboration Spectrum](#), utility clients decide how the project work will be executed and how the partnership will move forward to achieve targeted business objectives. The amount of collaboration needed will vary depending on client skillsets and resources. The flexible collaboration spectrum allows the customer to decide the type of help they need and how they will interact with the consultant.

From ad hoc assistance to managing all aspects of the project, providing strategic advising to building and deploying a turnkey implementation, Locana offers a range of services a utility can select from based on their needs and desires. And for organizations not sure, Locana provides an extensive evaluation to suggest options.

The Locana advantage

- Extensive utility, GIS, and IT consulting experience and expertise
- Proven track record delivering self-sustaining, self-sufficient projects
- Proprietary and open source technology expertise
- Dedicated to transparency and ownership
- Side by side collaborators with a change order philosophy

The future of innovation today

Digital transformation involves leveraging technology to deliver business value that meets critical challenges of the day while taking advantage of trends pointing to the future. However, new technology is not enough. You need a new way of doing it—modern GIS that fits seamlessly into the entire organization's overall IT ecosystem. It should provide a model-based approach built on a modern architecture to manage the network and disseminate geospatial functionality.

As more and more utilities look to enterprise systems to transform how they do business in the 21st century, GIS departments will need to decide if they should continue to support traditional software and data or transition to next-generation solutions. For companies looking to invest in next-generation GIS as part of a larger digital transformation initiative, partnering with a trusted implementations services provider with deep experience and expertise will provide a significant return on value and ensure long-term business success. ■

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Contact Locana today to learn more about how you can achieve a greater return on value with a modern GIS as part of your digital transformation.

[Learn more](#)



[Locana.co](https://locana.co)



info@locana.co



303-713-3230