MODERNIZING ASSET MANAGEMENT

A COMPLETE GIS

Electric and Gas Utilities

esri THE SCIENCE OF WHERE®

Introduction

Asset management maximizes the performance of assets. It balances risks, existing resources, and costs.

Utilities have billions of dollars invested in their assets. As such, they must gain as much value as possible. A modern asset management must optimize maintenance, increase asset utilizations, and integrate diverse types of data and systems to create understanding across the entire asset life cycle.

Esri's ArcGIS® platform enables a holistic approach with fresh insights. Assets are spatial—they all have locations, and every location has a story to tell.

Using location, utilities discover patterns and trends that simple reporting cannot detect—improving asset management results.

ArcGIS uses location technology to fine-tune asset management. ArcGIS brings value to utilities at all stages of asset management. It offers strategic capabilities that dramatically improve key performance indicators and business results.

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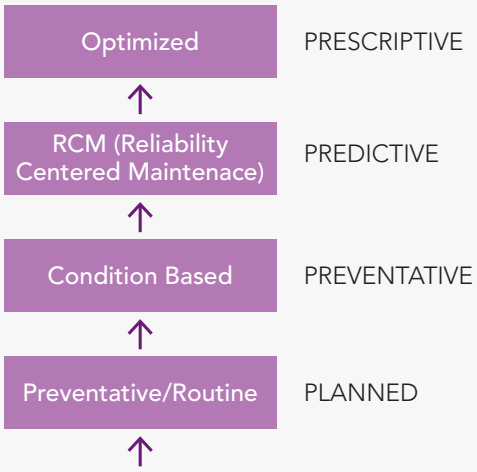


A Maturity Model of Asset Management

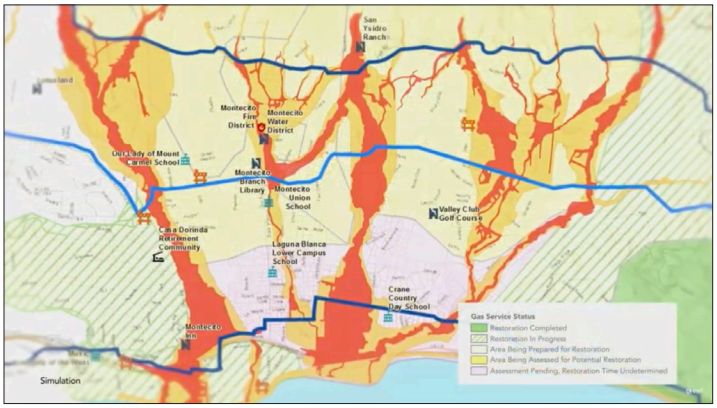
Utility asset management practices vary widely. Their maturity is based on an organization's infrastructure, resources, methods, and technology, and it spans from passive to prescriptive. This maturity model illustrates climbing the ladder from operational to strategic by adding the power of location.

> "One of the biggest challenges in asset management is the injection of long-term thinking (strategic goals and sustainability) while under pressure to deliver short-term results."
>
> –John Woodhouse, Asset Management Thought Leader

Asset Management Maturity Model

- Passive (operational): Runs assets to failure, often sacrificing customer impact for maximum asset life
- Planned: Maintains assets on a time scheduled basis; replaces assets based solely on age
- Preventative: Services equipment based on current condition; considers how assets are used and the stresses that they have endured
- Predictive: Repairs and replaces equipment based on current condition and historic failure rates; includes factors for criticality and risk
- Prescriptive (strategic): Optimizes the complete process; balances costs, conditions, failure rates, environmental conditions, reliability, and risk

ArcGIS improves asset performance at each level of maturity with location. This provides value to utilities seeking to enrich asset management workflows and outcomes.



Why Location Technology Matters

Assets are spatial—they all occupy location. Location determines each component's impact to the larger utility system. Assets are also affected by

- Relationships to other assets, customers, and external factors.
- Environment changes such as emergencies, severe weather, and security threats.
- The assets' criticality.

Mature asset management programs address both short- and long-term interests. In the short term, ArcGIS effectively handles asset transactions, real-time data, and situational awareness. In the long term, ArcGIS provides trends and analytics enabling discovery for strategic decision-making. To climb the ladder from passive practices to prescriptive ones, utilities need the following:

- Better data management
- Insight into asset performance
- Engagement from users

In a modern GIS, location technology supports effective asset management by delivering a complete and accurate model of the utility. It brings disparate types of information together, modeling the past, present, and future states of the system. Powerful analytics optimize data to reveal the unknown. And information is made available to all stakeholders—on any device, anywhere, day or night.

ArcGIS effectively manages assets with answers to vital questions:

- **Where** should investments be made based on risk, cost, and operational needs?
- **Where** are assets failing?
- **Where** are the hazards that threaten infrastructure?
- **Where** are costs highest? Lowest?
- **Where** do environmental factors—such as the weather or soil conditions—impact the system?

> "Every asset has a location, and every location has a story to tell."
>
> –Tyler Pilarcik, Esri Solutions Engineer

Fine-Tuned Asset Management

ArcGIS uses location technology to fine-tune asset management. Using location, utilities discover patterns and trends that simple reporting cannot detect. ArcGIS unlocks new sources of value. It does this by addressing three needs:

Life Cycle Management

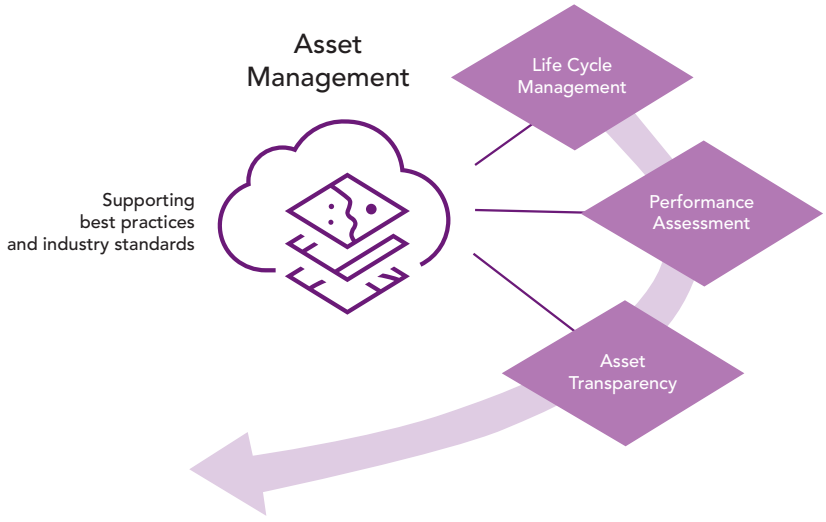
ArcGIS optimizes each asset's life cycle by centering it around location—seeing its role in the system and the environment. Location focuses the entire asset journey from inventory to operation, maintenance, and even faults.

Performance Assessment

Analytics deliver insight into the past, present, and future performance of assets. This expanded data intelligence finds new routes to business value by considering the big picture through the language of location.

Asset Transparency

Streamlined workflows and clarity between office and field staff are critical to asset management. Convenient location-aware mobile apps make fieldwork for inspections and maintenance easier. They also make asset information available to the enterprise in real time.



Life Cycle Management

Location technology brings value to every phase of the asset management life cycle from design to decommissioning. Geographic information system (GIS) technology is much more than a foundation for mapping. It is the system of record for *where*.

Using location to integrate information results in greater understanding of the causes and symptoms of asset failure. It enables asset managers to

- Understand the quantity and distribution of assets.
- Predict where assets will fail—then act to mitigate.
- Visualize failure mode, effects, and criticality.

Enterprise asset management (EAM) systems handle many aspects of the asset life cycle. However, they are blind to the assets' spatial relationships to each other, outside influences, or customers. ArcGIS reveals otherwise hidden impacts. Understanding these connections is essential to optimized asset management.

Optimized asset management hinges on advanced information. High-quality analytical outputs are contingent on detailed, reliable data. Legacy asset data structures are now pushed to their limits.

In direct response to industry needs, Esri developed a new, state-of-the-art network model. The ArcGIS Utility Network represents how assets exist in the real world—how to render and use them anywhere. ArcGIS consumes critical information in real time with built-in data quality controls. Asset life cycles span many years. Modeling assets with location, through time, improves understanding at every step in the asset life cycle.

Customer Example
UK Power Networks needed to assess the condition of assets for hazard mitigation. Black & Veatch gathered actionable data quickly and efficiently using ArcGIS tools. Assigning inspections automatically to the workers' mobile devices aided them in locating the assets. View Story

"ArcGIS enabled us to do, in weeks, a project that might otherwise have taken years."

—Paul Hart, Information Management Specialist, Black & Veatch

Performance Assessment

ArcGIS reveals insights to optimize asset performance. It includes embedded analytics and machine learning tools that find asset vulnerabilities and deliver impressive predictions. Fresh insights allow utilities to provide the highest levels of service.

Location intelligence brings a key component to understanding asset information. Insight is gained through the power of *where*:

- **Where** are the assets?
- **Where** are the network vulnerabilities?
- **Where** is the future growth of the network?
- **Where** are the priority assets that need replacing?
- **Where** is the critical infrastructure?

By understanding *where*, utilities can begin to answer questions that have been difficult in previous years.

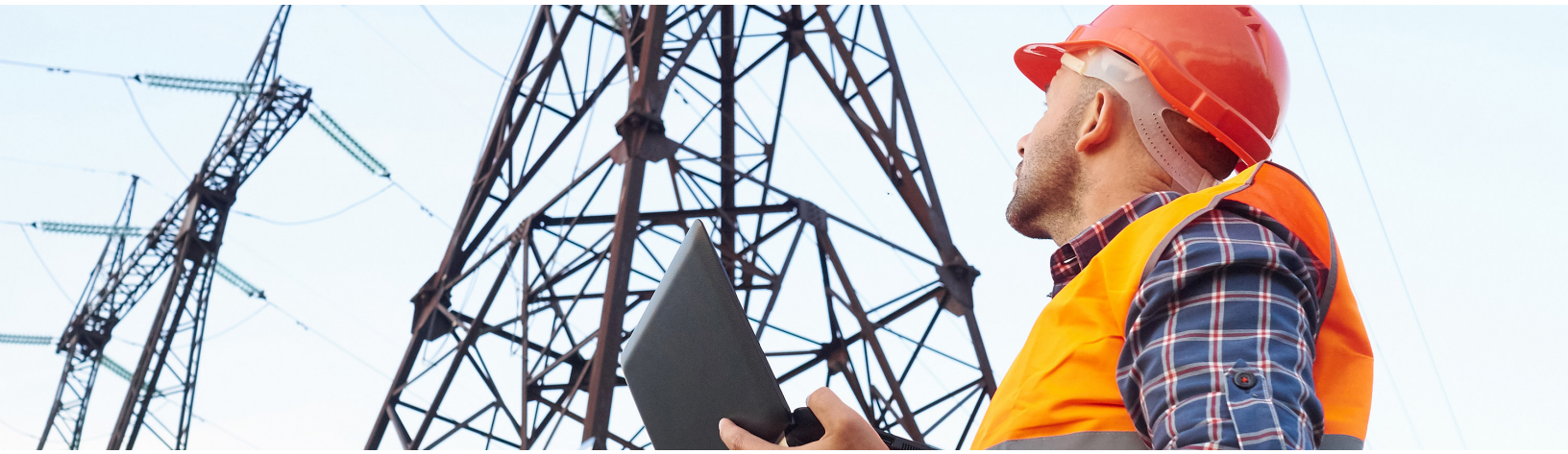
It is about discovery. Uncover asset patterns and behaviors. See the factors that impact assets' operation. Bring disparate data types together, organized by location. Bring to light connections that otherwise could not be seen.

New connections help balance asset performance against cost, resources, risk, and regulatory compliance. Retiring an asset too soon is costly and wasteful. Waiting for it to fail not only is costly but also negatively impacts customers.

Greater insights are required to support informed decision-making. As utilities move from operational to strategic asset management, they strive to optimize their efforts.

Location technology is the enabler to embrace optimized asset management.

Customer Example
SoCalGas integrates many forms of vital asset information in ArcGIS.
View Video



Asset Transparency

Asset information must be easily accessible to those that use it. Once assets are in service, they see ongoing cycles of field inspections and maintenance.

Today, fieldworkers want intuitive mobile apps to help them work effectively—apps that put all the information at their fingertips without the need to call the office or refer to dated paper sheets. Modern apps inherently manage work assignments and simplify routing. Using GIS this way is easy, productive, and designed with the end user in mind.

These location-aware apps modernize outdated workflows. They capture information once, validate it, and make it immediately available to the enterprise.

Users across the enterprise also want to understand information like an asset's condition since the last inspection. ArcGIS helps planners, engineers, and executives alike connect to the exact information they need. They reference live web maps, real-time dashboards, and modern apps to work better. A common view streamlines operations and increases the efficiency of asset management activities. It allows people to quickly share data across the enterprise, using apps they enjoy.

FACT Less than 20 percent of utilities use mobile apps for data editing workflows—2019 Energy Acuity grid modernization survey

Customer Example

Inspection data is available quickly and readily accessible to all the users who require it, reducing risk, adding revenue, and driving efficient work processes at Hart EMC. View Story

"The experience we gained from that first deployment of Collector [for ArcGIS], and its success, has given us confidence to envision, build, and deploy apps at will and often."

—Russell Shirley, Hart EMC, Manager, Technical Services

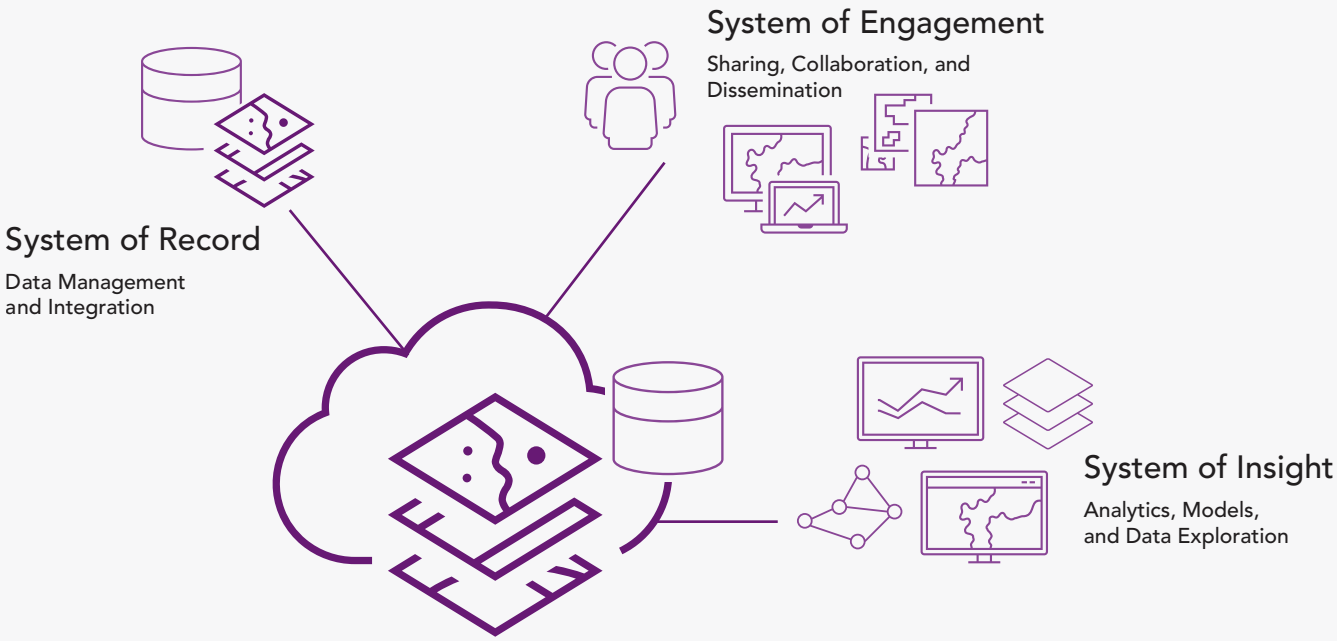
Industry Best Practices and Standards

ArcGIS for asset management supports industry best practices and standards. The ISO 55000 family of international standards is for asset management. ArcGIS aligns with the ISO guidelines.

ISO 55000 provides terms and definitions. ISO 55001 specifies requirements for effective management. And ISO 55002 provides implementation guidance. Data quality, change management, and communication are all focus areas in ISO 55000.

ArcGIS enables real breakthroughs in communication. Asset information is accessed and updated directly. This dramatically reduces information latency. It breaks down silos, allowing every stakeholder secure access to the information they need, based on their role.

The built-in quality assurance rules in ArcGIS ensure high-quality data and relationships at all touchpoints. Because of its open services-based architecture, ArcGIS integrates tightly with vital IT/Operational Technology (OT) systems. This provides a cohesive solution. Using core analytics, it moves asset management beyond simple time-based methodologies. It helps align asset activities with industry best practices for management and communication.



The Complete GIS—
Supporting Asset Management

Most utilities already use GIS for asset management in some capacity. Yet how they use it is changing. ArcGIS is a complete GIS. "Complete" means it contains all the elements needed to meet asset management challenges, not just to make conventional maps.

ArcGIS supports real-world modeling. It delivers rich analytics with artificial intelligence (AI), and immediate communication with mobile apps and web browsers. It maintains key asset information, discovers its meaning, and distributes it to everyone who needs business intelligence.

These capabilities unite different types of asset information. Combining asset health data and real-time feeds shows how the network is performing. With location as the centerpiece, a total view bonds maintenance, capital, and operational strategies to improve key performance indicators and business results.

Utilities face considerable challenges today and will continue to do so into the future. ArcGIS brings exceptional value to every utility's asset management practice regardless of its history, current state, or future plans.

ArcGIS is an extensive information platform that enables new asset management results. Learn more about digitally transforming utilities with a complete GIS in our e-book.
View E-book

About Esri

Esri, the global market leader in GIS software, offers the most powerful mapping and spatial analytics technology available. Since 1969, Esri has helped customers unlock the full potential of data to improve operational and business results. Today, Esri software is deployed in more than 350,000 organizations including the world's largest cities, most national governments, 75 percent of Fortune 500 companies, and more than 7,000 colleges and universities. Esri engineers the most advanced solutions for digital transformation, the Internet of Things (IoT), and location analytics to inform the most authoritative maps in the world.

Esri supports utilities in achieving their performance and visibility goals with skills, knowledge, and resources in the following:

- Mapping
- Spatial analytics
- Data-driven insights
- Real-time situational awareness and alerts
- Visualization

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