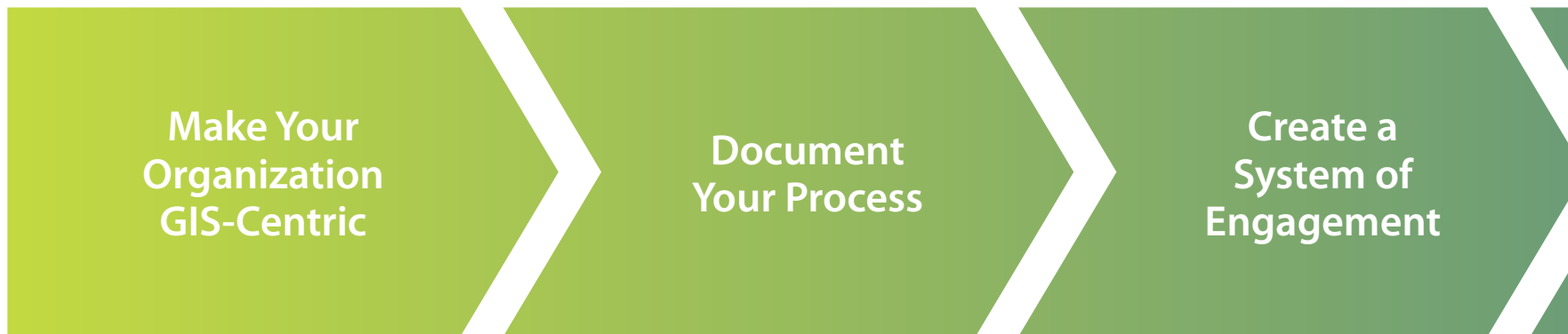


A GUIDE TO ENTERPRISE ASSET MANAGEMENT

For Local Governments, Public Works, and Utilities

ARE YOU MANAGING YOUR ASSETS OR ARE YOUR ASSETS MANAGING YOU?

A Process of Ongoing Improvement



Improving community infrastructure involves more than just repairing and replacing assets. It requires a forward-looking asset management strategy focused on levels of service and customer care. Local government, public works, and utility agencies often find themselves in reactive maintenance backlogs due to strained budgets, legacy systems, and workforce challenges.

A good asset management strategy starts with good data, and GIS offers the most robust and accurate representation of infrastructure assets. Cityworks® is the original and leading GIS-centric asset management system built exclusively on Esri's ArcGIS®. Our platform is designed to help organizations manage public assets and their associated data, work activities, and business processes.

Together, Cityworks and ArcGIS help organizations work smarter to implement effective asset management strategies—building more resilient, sustainable, and safe communities.





MAKE YOUR ORGANIZATION GIS-CENTRIC

- 📍 Establish an authoritative system of record
- 📍 Understand where assets are located
- 📍 Geocode your assets, features, and work activities

Enable the Power of Where™

To effectively manage public assets, you need to know what they are and where they are located. Asset management can only be performed with an accurate asset inventory. That's why Cityworks is built exclusively on Esri's innovative ArcGIS technology. By using ArcGIS as the authoritative system of record, you can:

- Understand exactly where assets are located
- Track historical work
- Monitor associated costs
- Establish and streamline workflows
- Schedule preventative maintenance
- Create powerful data visualizations and map dashboards

Maps make your public asset data come alive. Cityworks and ArcGIS together form the authoritative system of record for public asset management. A GIS-centric system Enables the Power of Where™ for improved operations and insights.

“Knowing where things are, and why, is essential to rational decision-making.”

***–Jack Dangermond,
President, Esri***

WEB GIS-CENTRIC CHARACTERISTICS



No Redundancy

The ArcGIS geodatabase is the authoritative asset database.



Configurable

Allows for maximum flexibility in designing the asset database for any asset, dispersed or condensed.



Non-Proprietary

Buils on the geodatabase as an “open” asset database, inherently spatial, with understood data structure elements. The organization fully owns their data and controls it.



Updates

Relies solely on ArcGIS feature services to update the authoritative asset data to ensure data integrity.



Web Map

Any application can access an ArcGIS web map without constraints. The apps are configurable to use the web map as is.



Single Sign-on

The software supports a single sign-on identity. All associated apps will support the preferred identity storehouse—AGOL or Portal for ArcGIS.



DOCUMENT YOUR PROCESS

- 📍 Identify and define desired outcomes
- 📍 Review and refine workflows
- 📍 Establish a regular schedule for ongoing process review

From 'Where' to 'Why'

Every organization has a process. Not every organization asks *why* these processes are in place or *what* they accomplish.

The biggest hurdle to implementing an effective asset management strategy is resistance to change. Thankfully, there's a solution. By including management and staff at all levels of your organization, you can help inspire employee buy-in.

1. Be Inclusive.

Create stakeholder groups that include staff at all levels of your organization: field technicians, administrators, supervisors, and directors. Some employees will immediately see the benefits of change and offer new ideas.

2. Train Early and Often.

When you empower employees to make new technology their own, they'll become eager contributors to your asset management strategy.

3. Review and Revisit.

Once your asset management strategy is in place, create a schedule for revisiting and refining workflows as needed.



Arlington Heights, IL

It Takes a Village

When the Village of Arlington Heights decided to overhaul their asset management system, they took an enterprise-wide approach. Arlington Heights wanted a platform that could expand beyond the public works department while still being cost effective.

In January 2017, the village partnered with Ritter GIS, Inc. to implement Cityworks AMS. They created a project leadership team that worked closely with Ritter GIS throughout the implementation.

The team met biweekly to conduct interviews, compile existing records, and talk through process changes. They documented several hundred existing practices, developed new workflows, and solidified desired outcomes. Ultimately, this commitment allowed Arlington Heights to realize the full potential of their new system.

"Employees were excited to enter their information into Cityworks from multiple platforms," said Steve Mullany, public works services coordinator. "It was evident right from the start. Since then, we've expanded beyond the eight public works divisions to all other village departments."

Get the full story online at cityworks.com/arlingtonheights



CREATE A SYSTEM OF ENGAGEMENT

- 📍 Implement technologies that promote ease of use
- 📍 Improve access for field crews and supervisors
- 📍 Empower residents to contribute and stay informed

The Phases of Public Asset Management

More than ever, residents want to help improve their communities. Public service employees also have access to better technology tools that support their work in the field and office. However, many communities still rely on legacy systems that create service backlogs and reporting headaches.

When you provide effective GIS-centric tools to your employees and residents, they become valuable participants in the care of your community.



PAPER

- LOCATION:** Requires physical storage
- BUSINESS PROCESS:** Data entry backlogs, duplication of work
- DATA ACCESS:** Limited by lost paperwork, institutional knowledge
- DATA CONFIDENCE:** Data often incomplete
- DECISION SUPPORT:** Reports are time-consuming, difficult to produce
- CIVIC ENGAGEMENT:** Low customer satisfaction



SPREADSHEET

- LOCATION:** Migration from physical file folders to electronic file folders
- BUSINESS PROCESS:** Requires separate tools to view customer call history, inventory, etc.
- DATA ACCESS:** Difficult to navigate large spreadsheets
- DATA CONFIDENCE:** Data structures lack consistency
- DECISION SUPPORT:** Reports are time-consuming, difficult to produce
- CIVIC ENGAGEMENT:** Low customer satisfaction



GIS - GEODATA

- LOCATION:** GIS enables asset geolocation
- BUSINESS PROCESS:** Organizations establish asset hierarchy
- DATA ACCESS:** Asset stewards can search by asset class, system, or service
- DATA CONFIDENCE:** Data collection and spatial awareness improves
- DECISION SUPPORT:** Organizations can easily understand their data visually on a map
- CIVIC ENGAGEMENT:** Residents can access information visually on a map



INTELLIGENCE

- LOCATION:** Work, labor, and cost are tied to assets in the geodatabase
- BUSINESS PROCESS:** Historical and service analyses enable predictive maintenance
- DATA ACCESS:** Field crews, supervisors, directors, and the public can engage with the data
- DATA CONFIDENCE:** Data collection is consistent and reliable
- DECISION SUPPORT:** Organizations use data to optimize strategic approaches
- CIVIC ENGAGEMENT:** Residents engage in the communication process



REFINE YOUR DATA

- 📍 Transform your data into a useful format
- 📍 Establish metrics and calculations for data modeling
- 📍 Develop data visualizations to support decision-making

You've started collecting data. Now what?

Your asset management system helps you collect and visualize GIS data for improved decision making. Legacy data, human error, and inconsistent processes could still create gaps in the information you rely on. From the beginning, your gauge for data validity should combine reliability and accuracy.

Ask yourself:

- How was my data collected?
- Is my data consistent?
- Is my data relevant?
- Why am I collecting this data? What's the purpose?
- Of the current data I possess, what's missing?

Create a data improvement plan:

- What existing tools can I use to review and improve my data?
- How will missing data be collected?
- When will it be collected?
- Who will be responsible for maintaining this data?

Cityworks and ArcGIS together provide useful tools for collecting, refining, and updating public asset data.



Not All Data is Good Data

In West Jordan, Utah, unreliable asset data led to expensive problems. The city used to rely on institutional knowledge and as-builts to mark the location of water, sewer, and storm systems. Then, a water line broke and crews couldn't find the shut-off valve to stop the water. It was clear that having a general idea where assets are buried was not enough.

The city decided to implement a system with GIS-centric asset management capabilities. GIS specialist Spencer Munson set to work creating spatially accurate data. Using a combination of as-builts, drawings, GPS points, CCTV records, and institutional knowledge, Munson combed through the data and marked places to be verified. He then worked with each department to survey assets in the field.

"The new platform gave our staff a better appreciation for what GIS can do," Munson said. "Our data became more accurate because our users had a stake in making sure their field observations matched what was in the GIS."

To find out more, watch the video at cityworks.com/westjordan



IDENTIFY AND PRIORITIZE RISK

📍 Incorporate operational insights

📍 Calculate business risk exposure

📍 Prioritize capital investments

Put Your GIS Data to Work

As infrastructure assets age, maintenance costs increase. At some point, all organizations must decide whether to replace an asset or continue to maintain it. The key to an effective asset management strategy is determining which assets are critical and why.

Probability of Failure (POF)

Critical assets require a scoring methodology to identify how and why they might fail. GIS attribute information, maintenance data, and failure histories track the likelihood of asset failure across your entire system. Assign your probability factors a scoring scale of 1 to 5.

Consequence of Failure (COF)

The consequences of asset failure include financial, social, and environmental costs, as well as impacts on major users and critical crossings. Each of these consequences can also be assigned a scoring scale of 1 to 5.

RISK CLASS	EXAMPLE OF ACTION AND NEXT STEP
EXTREME	High Priority In CIP/ Annual Operational Frequency
HIGH	Standard Priority In CIP/ Bi-Annual Operational Frequency
MEDIUM	Low Priority In CIP/ 1 In 5 Years Operational Frequency
LOW	1 In 10 Years Operational Frequency
NEGLIGIBLE	Wait for a problem to arise

Using a 25-point matrix, an organization can set its own priority levels and risk tolerance.

Business Risk Exposure (BRE)

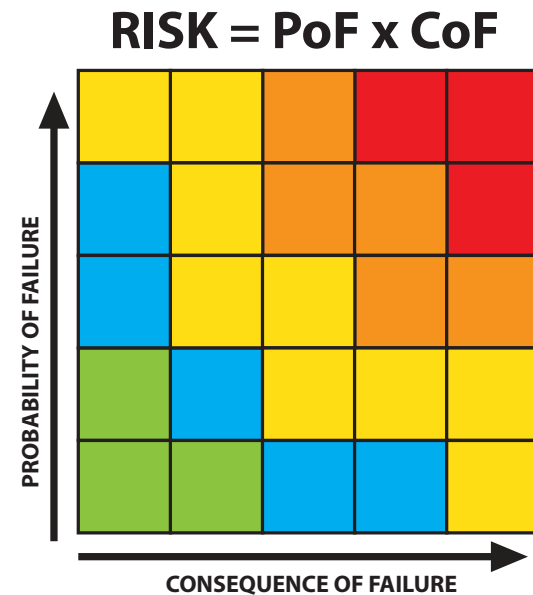
Once you've calculated the POF and COF for each asset, you can determine the product of the two. This calculated value represents the business risk factor for each asset.

Maintenance Strategy

It's also helpful to establish proactive maintenance thresholds for each asset. When you track the number of work orders created for each maintenance type, you can more easily identify which assets are under-maintained or over-maintained.

Risk Mitigation

Identify and implement effective strategies to reduce the impact of an asset failure. Be sure to periodically review your analysis and make adjustments to account for changes in the POF and COF.



A person is working at a desk in an office. The desk is cluttered with papers, a printer, and a calculator. A large computer monitor is the central focus, displaying a data dashboard. The dashboard includes a table titled 'Number of Inspections by Type Table' and a bar chart titled 'Number of Inspections by Type'. The table lists various inspection types and their counts. The bar chart shows the distribution of these counts. The person's hands are visible, typing on a keyboard. The entire scene is overlaid with a blue tint.

SUPPORT AND REFINE YOUR BUSINESS PROCESS

- 📍 Inform decision-making
- 📍 Enhance organizational efficiency
- 📍 Build a business case for personnel and resources

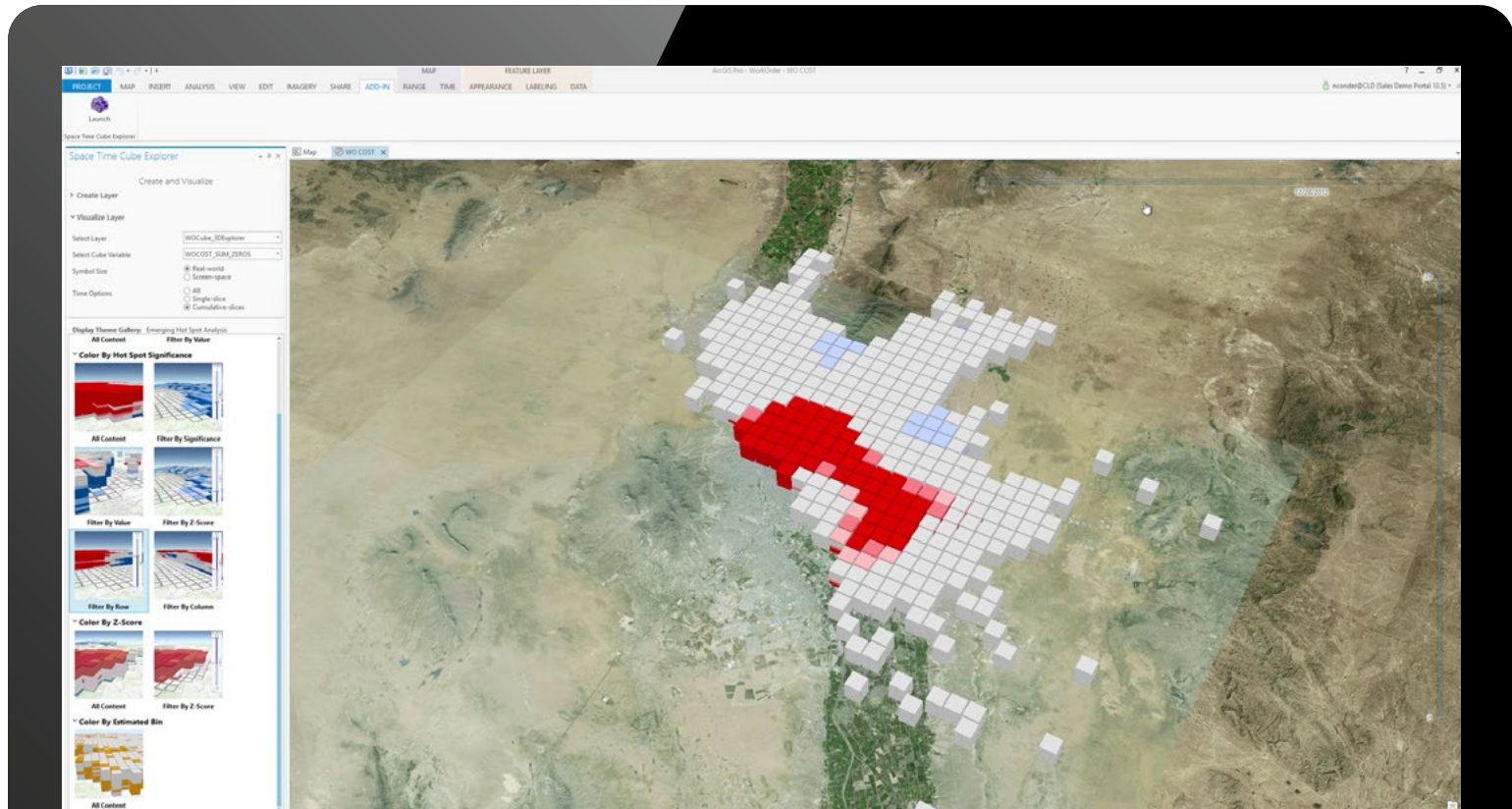
Your Work Doesn't Stop Here.

Enterprise asset management is a process of ongoing improvement. Each new work activity and lifecycle plan offers a new opportunity to enhance your operations.

Now that you have a GIS-centric asset management system, you have the numbers to make a strong business case. You have the data to create and share meaningful reports, and the tools to engage and inform your residents. Together, Cityworks and ArcGIS help you build a more resilient, sustainable, and safe community.

Four Questions to Regularly Consider

1. What workflows still need refinement?
2. Can your budget be fine-tuned?
3. Should the size of your work crews increase, decrease, or stay the same?
4. Should your levels of service be maintained, enhanced or reduced?





info@cityworks.com

801-523-2751

cityworks.com

Copyright© 2017 Azteca Systems, LLC. All rights reserved.
Azteca Systems, LLC. 11075 S. State St., Suite 24 Sandy, UT, 84070, U.S.A.

TRADEMARKS: Cityworks®, the Cityworks® logo, and Cityworks® products referenced herein are either trademarks or registered trademarks of Azteca Systems, LLC. Other product and company names mentioned herein may be the trademarks of their respective owners.

CHANGES ARE PERIODICALLY ADDED TO THIS INFORMATION. AZTECA SYSTEMS MAY MAKE IMPROVEMENTS AND/OR CHANGES IN THE PRODUCT(S) AND/OR THE PROGRAM(S) DESCRIBED HEREIN AT ANY TIME. IN NO EVENT SHALL AZTECA SYSTEMS AND/OR ITS RESPECTIVE SUPPLIERS BE LIABLE FOR ANY SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES OR ANY DAMAGES WHATSOEVER RESULTING FROM LOSS OF USE, DATA, OR PROFITS, WHETHER IN AN ACTION OF CONTRACT, NEGLIGENCE, OR OTHER TORTIOUS ACTION ARISING OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF SOFTWARE, DOCUMENTS, OR FAILURE TO PROVIDE SERVICES.

No part of this document may be reproduced or transmitted in any form.