



Your Journey to Enterprise GIS for Public Works

Eight Ways to Maximize Your Investment



Why GIS is Essential

Public works is a location-driven operation where every asset, service, and project happens somewhere. GIS applies spatial thinking to organize data, reveal patterns, and improve how work gets done. ArcGIS® extends this approach across the enterprise by connecting people, assets, and workflows into a single system. This guide outlines eight practical ways to apply GIS to solve problems, improve operations, and enhance the community.



1 Move Beyond Paper with Location-Driven Data

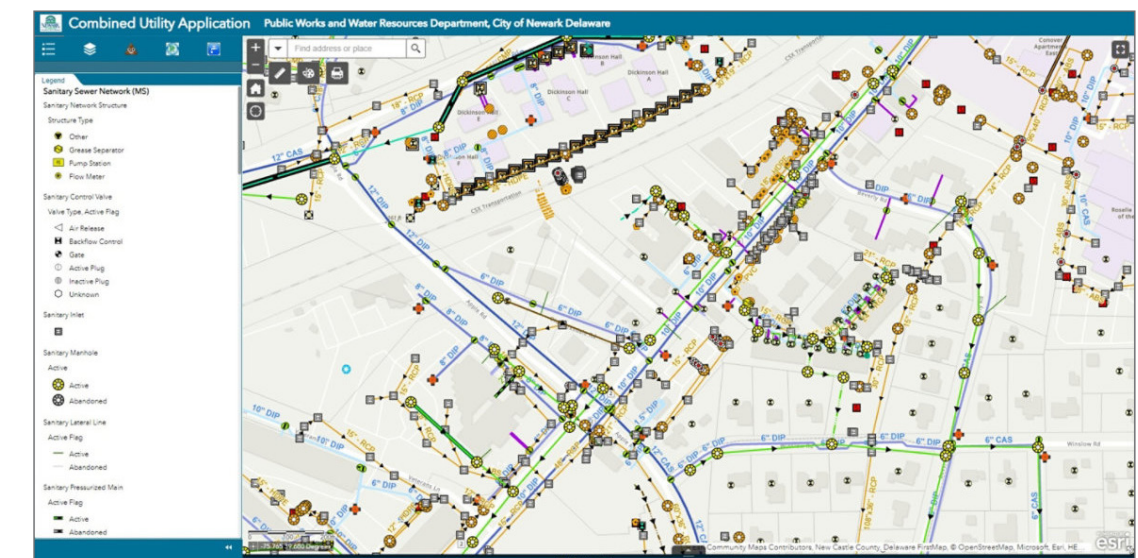
Many public works organizations rely on decades of paper plans, PDF records, spreadsheets, binder notes, and personal knowledge held by longtime staff. These disconnected materials slow work, limit accuracy, and increase risk when institutional knowledge walks out the door.

ArcGIS transforms these legacy datasets into an authoritative system of record used across public works. Staff can access accurate maps, asset attributes, and historical information instantly in the field and in the office. Digital workflows replace outdated manual processes.

Success from the field: GIS provides a trusted system of record.

“The application allows management to quickly identify all of the City’s public works assets in one solution. In our industry, most of the infrastructure is buried, so having the confidence in the type and location of these assets is invaluable, especially in emergencies.”

—Mark Neimeister
Water Operations Superintendent, City of Newark, Delaware



Newark, Delaware centralizes infrastructure records into a single system of record.

2 Use GIS to Turn Goals into Measurable Outcomes

Public works goals drive investment and continuous improvement. Whether reducing missed solid waste pickups, improving pavement conditions, expanding Americans with Disabilities Act (ADA) accessibility, or optimizing routes—these goals define the data and workflows required for success.

ArcGIS connects performance goals to operational workflows. Dashboards track key performance indicators (KPIs), field apps standardize work, and maps help visualize progress. This helps crews execute consistently in the field while leaders track performance, budgets, and service levels with confidence.

Success from the field: GIS provides clear insight into where investments deliver the greatest impact.

“We’re taking action by investing in cost-effective measures to make our roads safer and working closely with our community partners. And because we know that certain areas are affected more severely, we’re making sure to direct a significant portion of our resources—74 percent—toward those communities.”
—Jane Castor
Mayor of Tampa, Florida

VISION
ZERO
TAMPA

MOBILITY
FOR ALL

ECONOMIC
OPPORTUNITY

VISION
FOR STRONG
NEIGHBORHOODS

TRANSPORTATION
EQUITY

SAFETY

Everyone should have access to quality transportation choices.

Connect people to jobs and economic opportunities.

Be visionary and dream big! Create a healthy, sustainable, and resilient future.

Remove barriers and improve transportation for people who need it most.

Safety is our first priority. One death or injury on our streets is one too many.

Mayor Jane Castor

Transforming Tampa's Tomorrow

Tampa, Florida aligns safety and equity goals with data-driven decisions.

3 Give Decision-Makers the Insight to Act with Confidence

Aging infrastructure, staff shortages, increased service expectations, and disconnected systems create inefficiencies and maintenance backlogs.

ArcGIS brings asset data, service requests, inspections, and work management into a unified operational picture. Leaders gain insight into bottlenecks, hot spots, and resource needs, improving planning and daily decision-making.

Success from the field: GIS turns fragmented data into clear operational insights.

County staff estimated taking six months to inventory all ADA curb ramps. The GIS-enabled AI model identified the ramps in about 12 days.

“This model has been a great tool for identifying ADA curb ramps that we missed in our initial collection. This time-saving model allowed us to shift human labor from this project to other projects that needed more assistance.”
—Todd Spark
Maintenance Superintendent, City of Omaha, Nebraska



This image shows the GeoAI-extracted ADA curb ramp features, outlined in red, compared to manually entered point data, symbolized by yellow crosses.

4 Plan, Respond, and Recover with Location Intelligence

Flooding, heat waves, heavy storms, and extreme weather events strain aging systems and disrupt operations. Public works organizations need tools that support proactive planning and rapid response.

ArcGIS integrates models, weather feeds, flood data, terrain data, and field observations. Agencies can identify vulnerable areas, prioritize improvements, and clearly document risk, impact, and need—supporting faster access to government funding. GIS is essential for building resilient communities.

Success from the field: GIS provides actionable damage assessments to support recovery decisions.

“Whether or not we would qualify for a declared disaster and receive reimbursement from FEMA [the Federal Emergency Management Agency], we built the damage assessment so we could send information to the county or the state or the federal level. I think events like this show that GIS can be more than a map, and that it can be a core solution to help us improve our business decisions.”

—Daniel Brown
GIS Supervisor, Salem, Oregon



Executives use GIS dashboards to assess damage and guide response decisions.

5 Better Protect, Enforce, and Maintain Right-of-Way

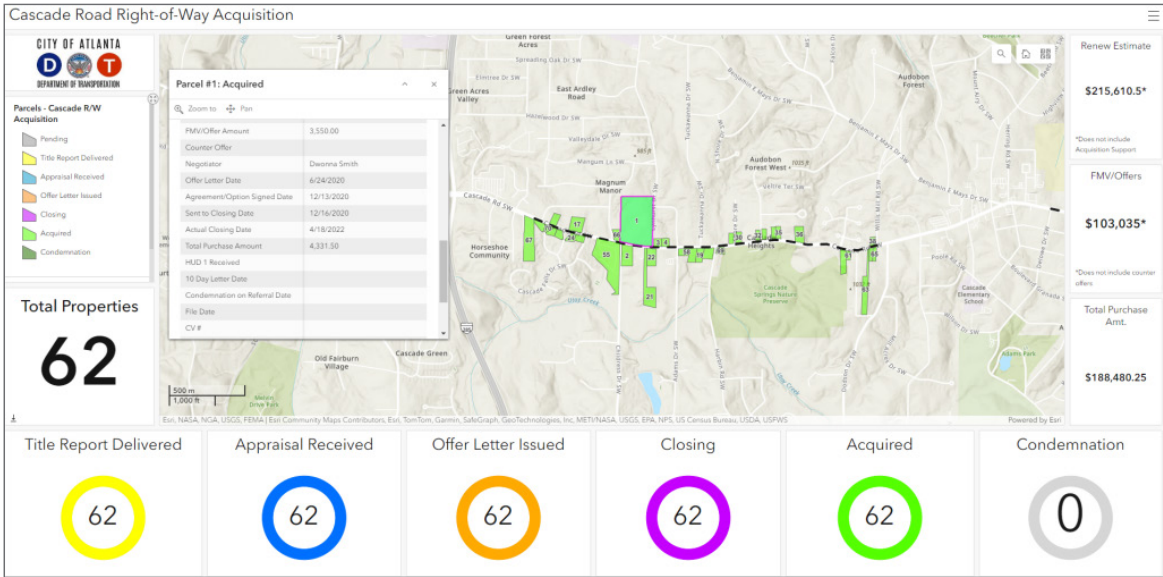
The public right-of-way (ROW) contains streetlights, signals, signage, sidewalks, utilities, and active construction. Managing these elements manually leads to permitting conflicts, delays, and inconsistent communication.

ArcGIS provides a complete view of assets, permits, work zones, and construction. With ROW mapping and coordination, agencies improve safety, reduce conflicts, streamline permitting, and plan maintenance more effectively.

Success from the field: GIS provides visibility into active permits, assets, and construction activity.

“Managing right-of-way permits has become much easier with our new GIS-based system. We can use filters to quickly see active or inactive permits, rather than trying to organize paper documents or look up individual permits. It’s made my life much easier, reducing the time I have to spend on permit management and allowing me to focus on other priorities.”

—Benji Schwartz
Right-of-Way Manager, West Fargo, North Dakota



West Fargo, North Dakota gains visibility into permits and ROW activity.

6 Transform Your Facility Management and Operations

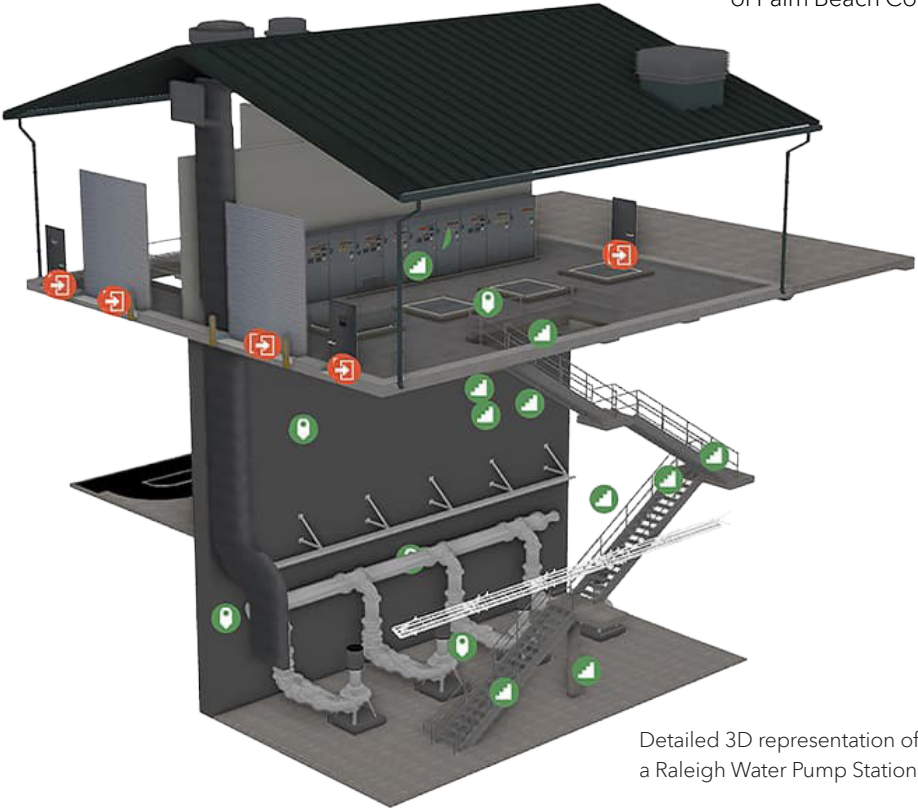
Public works departments manage buildings, maintenance yards, fueling stations, fleet garages, and community facilities. Understanding how these spaces are used is essential for safety, planning, and operational efficiency.

ArcGIS supports indoor mapping, asset tracking, safety planning, and maintenance management within and around facilities, giving agencies clearer visibility into space utilization and facility conditions. This enterprise foundation also enables future-ready capabilities such as 3D visualization, digital twins, AI-assisted analysis, and permitting workflows, helping public works and parks and recreation agencies plan

facilities more effectively, manage assets with confidence, and prepare for evolving operational needs.

Success from the field: GIS provides real-time visibility into facility repairs and maintenance activity.

“We went from paper and pencil that took days and days to get mapped and sent out to everybody. But now, from upper management down to the guys in the field, real-time repair helped us cut down on an unquantifiable amount of cost and time for a given job.”
—Josephine Rudd
GIS Manager, Solid Waste Authority (SWA) of Palm Beach County, Florida



Detailed 3D representation of a Raleigh Water Pump Station.

7 Turn Live Sensor Data into Real-Time Awareness

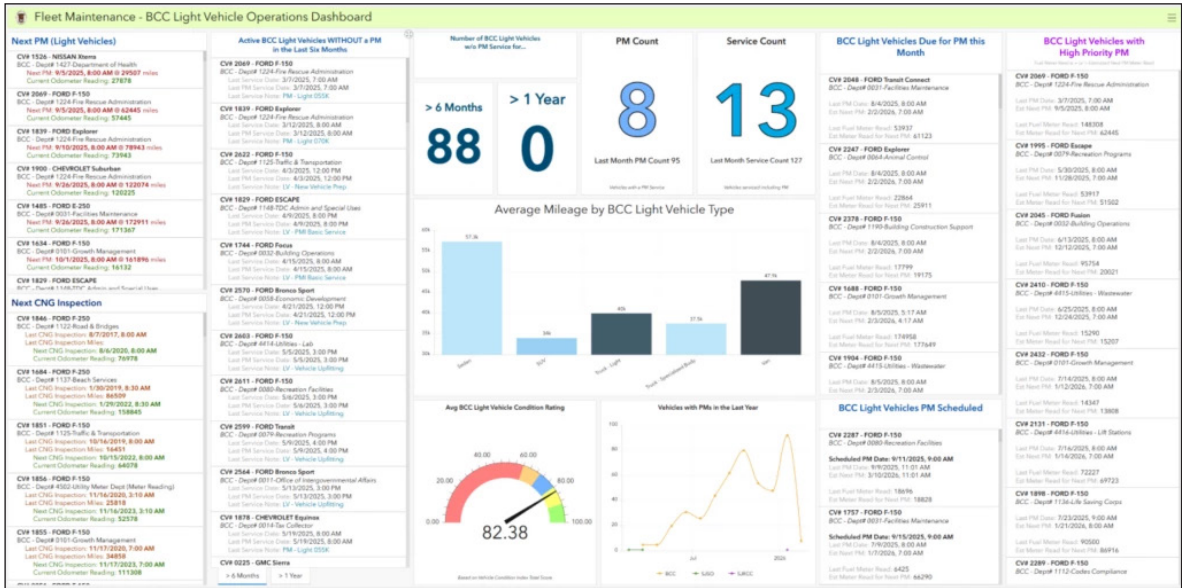
Public works departments depend on real-time information to monitor conditions across the community. Sensor networks such as flood gauges and automated vehicle location reveal current conditions and help teams respond faster.

ArcGIS connects sensor networks into a single operational picture, bringing together flood gauges, automated vehicle location (AVL), and other live data feeds to improve visibility into current field conditions and operations. This shared view supports faster coordination during events, improves safety, and helps supervisors adjust resources as conditions change.

The same approach can extend to parks and recreation, using trail counters and facility sensors to better understand usage patterns, guide maintenance, and enhance the visitor experience.

Success from the field: GIS provides live operational awareness to support faster response.

“We’ve moved from guesswork to real-time, data-driven decisions. Now, every dollar we spend on fleet is backed by solid data.”
—Rocky Agbunag
Information Systems Officer, St. Johns County Public Works



ArcGIS Dashboards provide St. Johns County Public Works real-time visibility into compliance and overdue maintenance alerts.

8 Integrate GIS with Core Business Systems

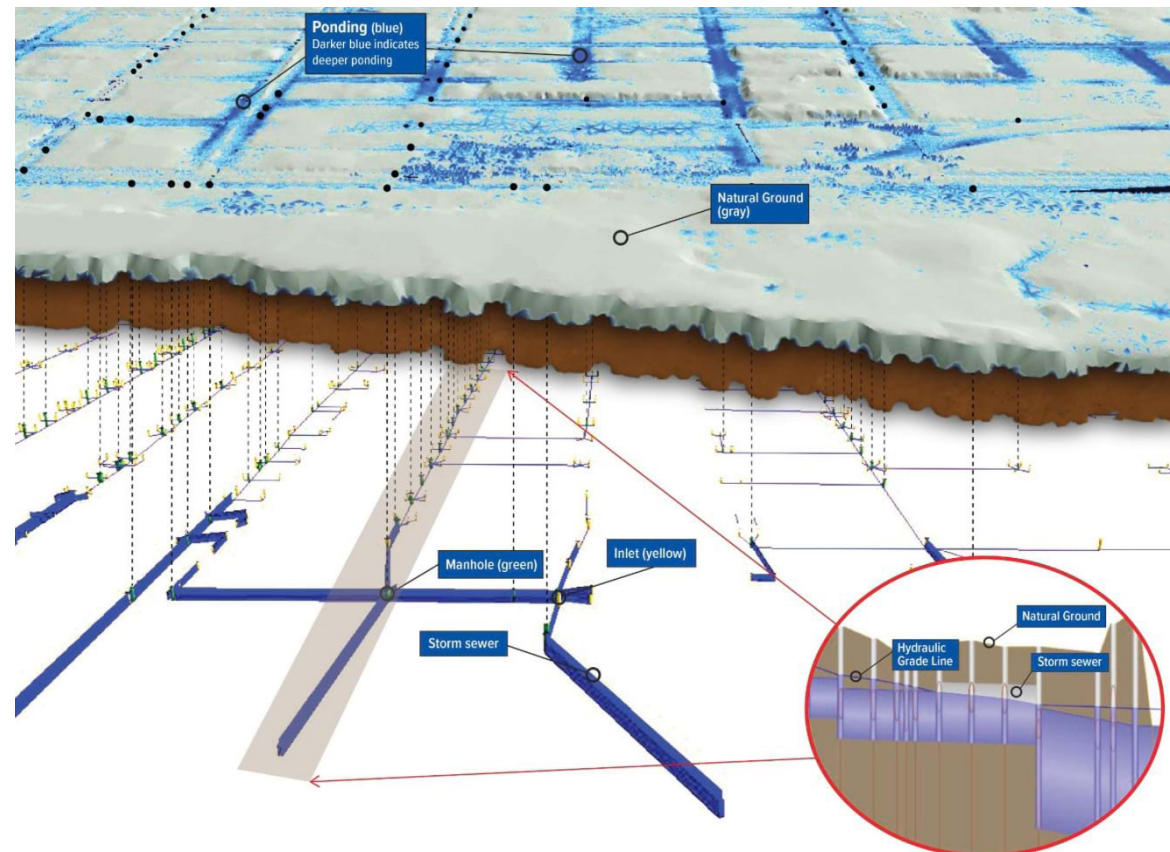
Public works uses asset management, permitting, financial management, client relationship management (CRM), and work order systems. When these systems operate independently, data becomes siloed and inconsistent, and workflows are inefficient.

ArcGIS enables mapping and spatial analysis of other enterprise business systems, transforming tabular data into actionable location intelligence. This approach ensures consistent data across systems, reduces duplicate workflows, and gives leaders a shared operational picture for planning, permitting, and investment decisions.

Success from the field: GIS provides live operational awareness to support faster response.

Houston Public Works integrates GIS with engineering records, field data, and city systems to support coordinated operations. A GIS dashboard displays real-time updates such as signal outages, traffic conditions, tree limb removal progress, and alerts from calls to 311.

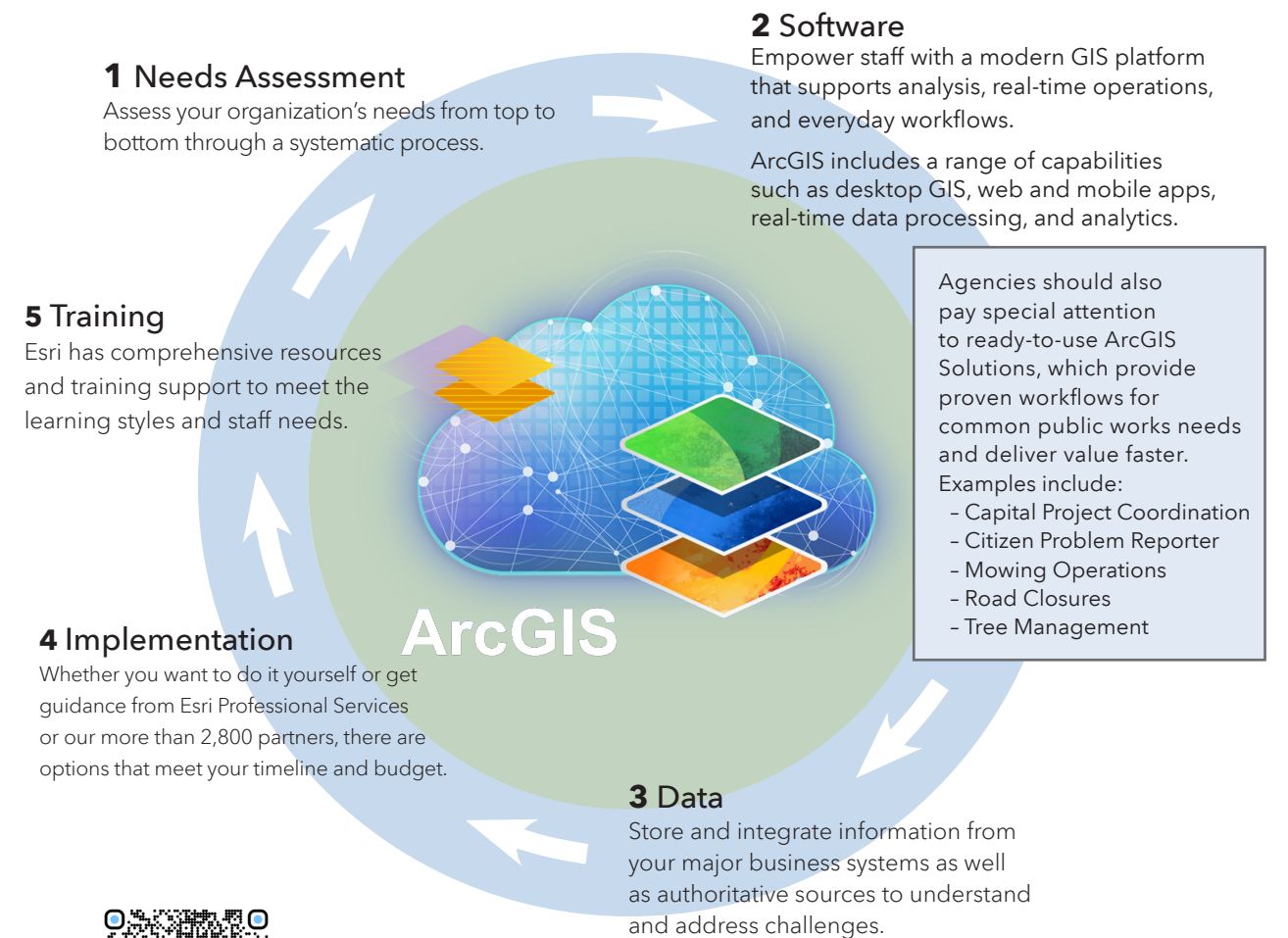
A new hydraulic model connects the areas that receive frequent flooding with the underground stormwater system.



The Path to Enterprise GIS for Public Works

GIS is about more than making maps. It's about using technology to solve problems, improve your organization, and enhance the community. Smart communities like those highlighted in this book provide practical examples of how GIS can help you mitigate challenges, increase efficiency, and equip decision-makers with new insights.

Public works organizations increasingly rely on GIS as a powerful and foundational piece of their strategy to provide better levels of service. This blueprint presents the essential components of an enterprise GIS program, inspired by the collective experience of thousands of organizations, to help your organization lead with purpose and run operations with spatial confidence. Here are the ingredients for excellence:



Explore how enterprise GIS can support your public works journey.

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Contact Esri

380 New York Street
Redlands, California 92373-8100 USA

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

Offices worldwide
esri.com/locations

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