Esri News
for State & Local Government
Summer 2025

Award-Winning App Redefines Trail Accessibility for Hikers

The Midpeninsula Regional Open Space District (Midpen), an independent special district in the greater Santa Cruz Mountains region of Northern California, preserves a regional greenbelt of more than 70,000 acres of open space land. Midpen also facilitates opportunities for environmentally conscious public recreation and learning, including a 250-mile trail network. The award-winning geographic information system (GIS) team at Midpen is responsible for providing all departmental staff, partner organizations, and the community with highly accurate geographic data and innovative solutions.

To effectively fulfill the mission of providing exceptional outdoor opportunities to the community, the Midpen GIS team conducted visitor use surveys to better understand the preferences of their trail visitors. The survey results highlighted a strong desire for more detailed trail information, particularly regarding trail difficulty levels.

↑ The Trail Explorer app engages visitors and serves as a tool for them to "know before they go."

Community Needs at the Forefront of Innovation

Jamie Hawk, the GIS program administrator at Midpen, emphasized the complexity of tailoring trails to individual preferences, which led to extensive internal discussions and collaboration with the planning department. One significant project that emerged from this discussion and the user surveys was the need for a web-based app, which became Trail Explorer. This ArcGIS® Dashboards app is powered by a comprehensive trail information system involving the GIS team, the planning department, and the land stewardship and trails department, and works on mobile devices and computers. Public access to the detailed trail data is

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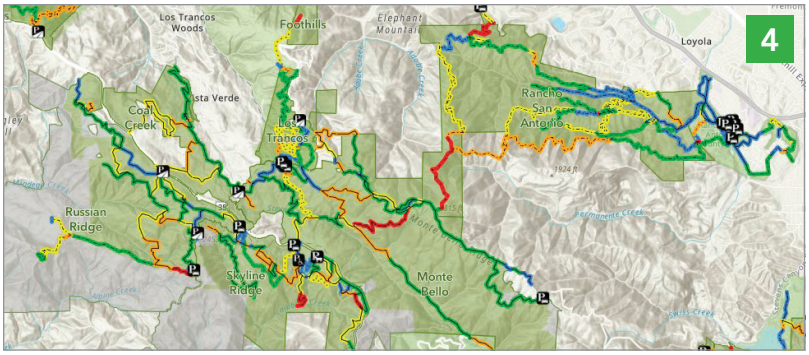

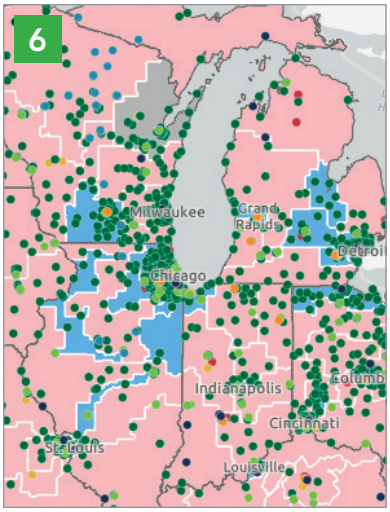

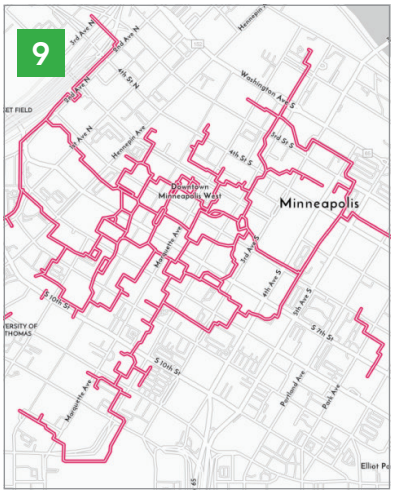

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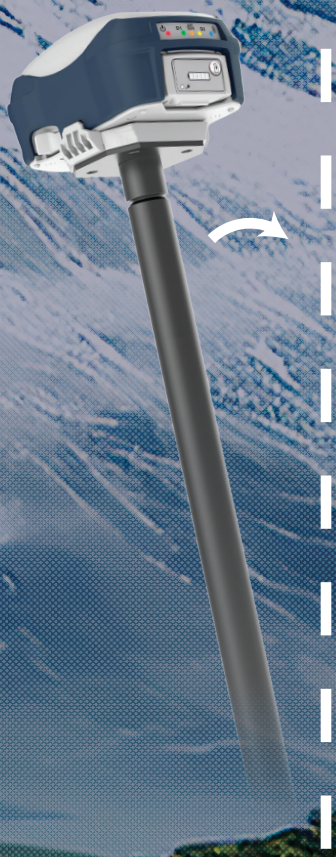

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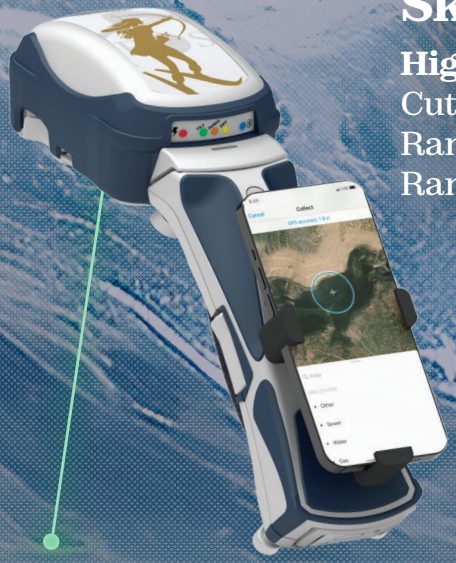

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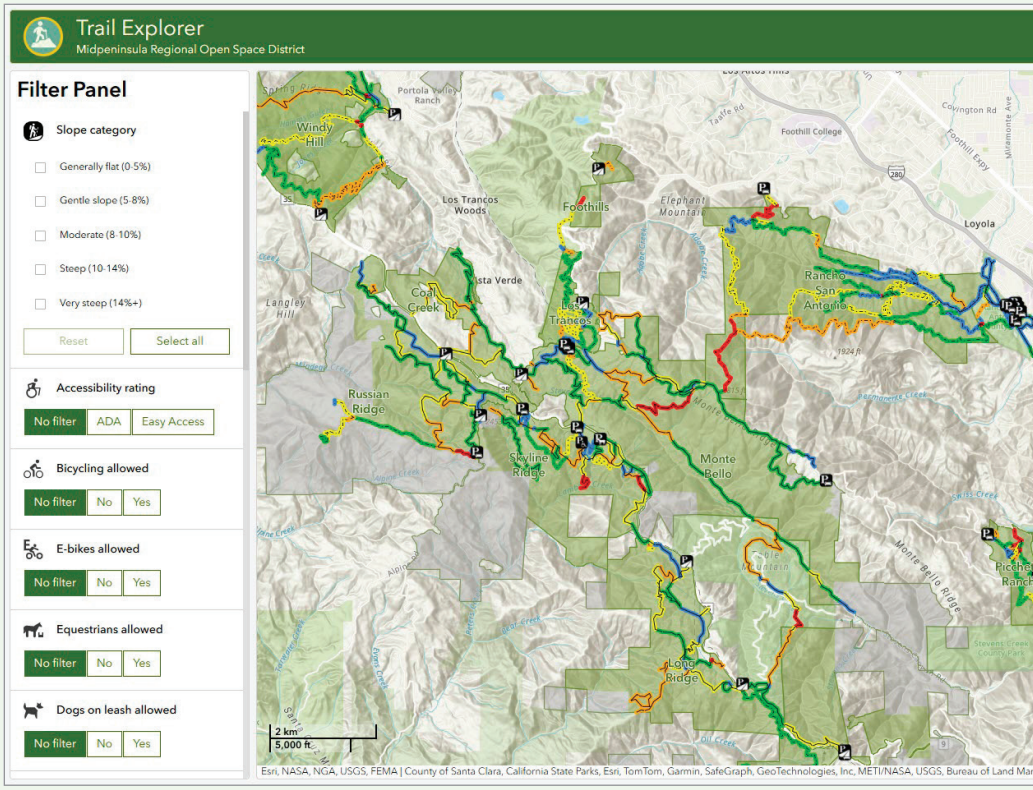
Award-Winning App Redefines Trail Accessibility for Hikers continued from cover

available via their open data site built with ArcGIS Hub.

Two-thirds of the surveyed visitors agreed that slope, or trail steepness, is critical to trip planning. Sun exposure and trail width were also ranked highly. These results subsequently informed the trail database design, data collection strategy, and web app functionality.

From 2020, Midpen has hosted interns and tasked them with collecting point data along Midpen's trails using ArcGIS Field Maps. The 8,000 data points collected include trail characteristics like tread type, surface, and cross slope at 500-foot intervals. During field data collection, interns document trail conditions and obstacles through photographs. Subsequently, the GIS team processes this point data, synthesizes it, and color-codes the average values onto the trail feature class to make the data user-friendly. This process integrates slope elevation and canopy cover information into the GIS.

When planning a visit to the trails, members of the community can now access comprehensive trail information through the app. The trail slope is featured prominently on the map with bold and intuitive colors. Visitors can filter for up to 10 different trail criteria including slope, cross slope, width, surface type, sun exposure, accessibility, and more.



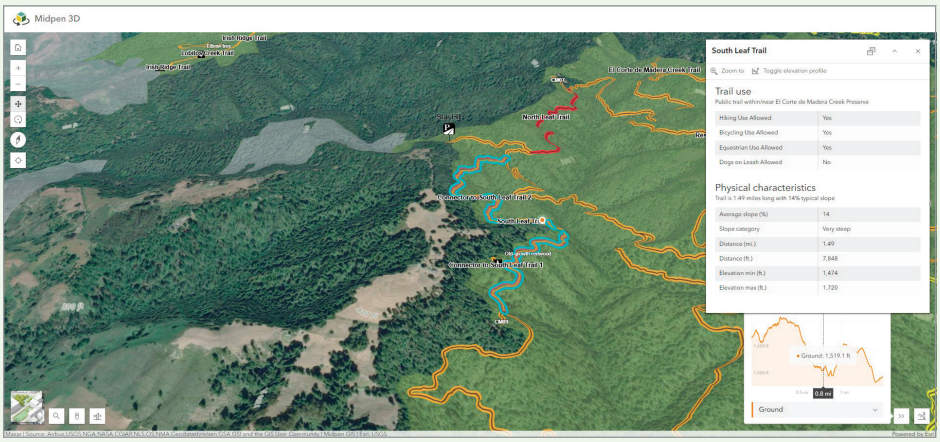
↑ Visitors can filter through trail preferences in the Trail Explorer App to create their own unique experience.

"Visitors sometime tell our rangers, 'I wish I knew how steep that trail was going to be,' or ask if there is a good place to take small children for an easy walk, or maybe they want a challenge because they are training for Mount Whitney," explained Brian Malone, assistant general manager at Midpen. "Now they can get all that info instantly, before they head out, on Midpen's Trail Explorer tool, an easy color-coded guide map to the difficulty of all the preserve trails."

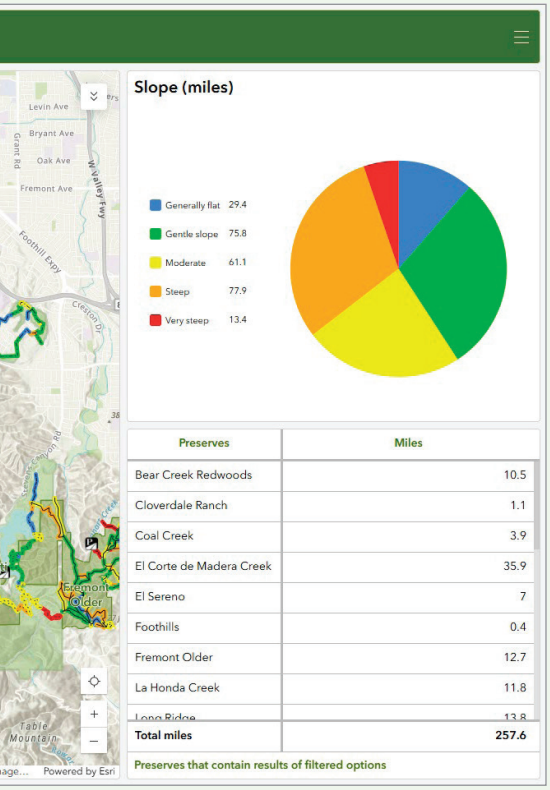
This alternative approach to a traditional trail difficulty ranking system is unique and inclusive, allowing visitors of all mobilities and backgrounds to make informed decisions when planning an outing to the preserve.

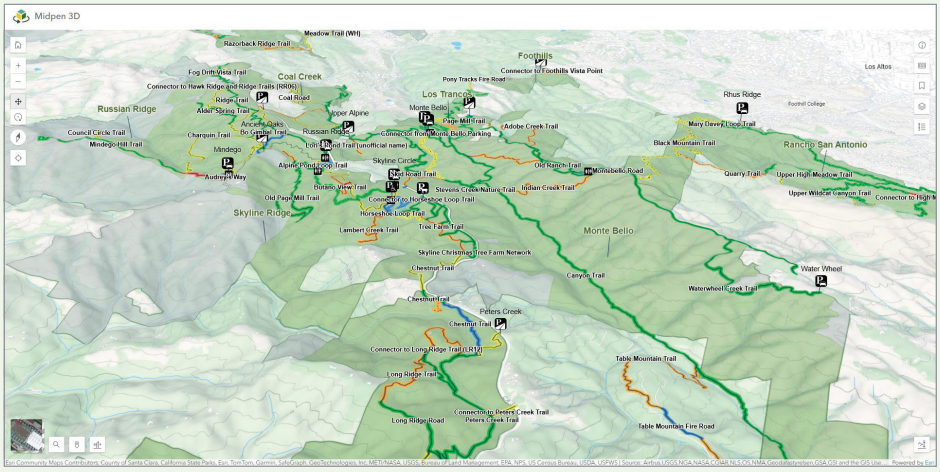
"It [the app] includes filters for everything from accessibility to trails for bike, horse, or dog access, giving everyone tools to plan an enjoyable visit," said Malone. He added that a lot of technical and field work went into the development of this new tool, as it can be difficult to interpret terms like grade and slope and translate them into color-coded ranges, from generally flat in blue (0–5% grade) to very steep in red (≥14% grade).

The positive reception since the app's launch has validated these decisions, with users expressing enthusiasm for the inclusion of slope and the numerous



↑ Visualizing the trail network in a 3D environment grants new and returning visitors a heightened experience when planning their hiking routes.





↑ Alternative view of 3D trail network

filterable trail characteristics.

"The Trail Explorer web application makes it easy for a member of the public to find exactly what they're looking for," said Fran Lopez Tapia, data analyst at Midpen.

Continuing a Tradition of GIS Excellence

Making the app is one step; promoting it is another. To maximize the impact of the app, the GIS team created a flyer with a QR code guiding readers directly to the app, then posted the flyer at the trailheads. In addition, Trail Explorer was announced via Midpen's social media accounts, their electronic and print newsletters, a story in the local newspaper, and via a video tutorial featured on their website. Now that the app is up and running, a feedback loop via an ArcGIS Survey123 form allows users to rate their experience with the app and suggest improvements.

The results have been remarkable. Midpen has won four awards for Trail Explorer: an Esri Special Achievement in GIS Award, second place in the Dashboard category at the Esri User Conference Map Gallery, a California Trails and Greenways Merit Award in Technology, and a high commendation from the California Geographic Information Association for Excellence and Innovation.

The Midpen GIS team has not stopped there regarding GIS resources for trail users. They also provide public access to an interactive 3D web scene that allows viewers to use elevation profiles to get valuable, detailed information for hike planning.

The success of Trail Explorer is just one example in the history of enterprise GIS excellence at Midpen. Their GIS team has been around for over two decades and consists of four full-time staff. They maintain a comprehensive ArcGIS deployment that supports various innovative applications for departments across the organization, their partner organizations, and the public.

In addition to the four awards they received for Trail Explorer, Midpen has won six other awards for their work, including awards from the California Special District Association and Government Technology magazine. They are active in the industry via multiple articles and presentations. It will be exciting to see the additional innovations they develop in the future.

How to Emulate This Success

Parks and recreation is a location-based business, and professionals apply GIS to the full range of their work, including:

- Planning and design
- Smart operations
- Education and outreach
- Community health and well-being
- Equity
- Climate resilience

For organizations aiming for success like Midpen, ArcGIS is the mission-critical enterprise IT business system that transforms location data into valuable insights, enhancing decision-making and delivering significant business value.

To discover why parks and recreation is a location-based business, please visit **go.esri.com/MidpenTrails**.

How ArcGIS Transforms Data Management for the Arbor Day Foundation

For more than 50 years, the Arbor Day Foundation has been inspiring people to plant, nurture, and celebrate trees. In that time, the mission blossomed into a nationwide movement with millions of trees planted. A key component of the nonprofit's growth has been its ability to leverage data to tell a story of impact.

But managing that vast amount of data has become increasingly complex as the Foundation's network of programs and partners continues to expand.

That's why the global nonprofit utilizes geographic information system (GIS) technology, powered by ArcGIS Enterprise, to harness huge volumes of information, streamline its operations, and enhance data visualization.

Challenges of Legacy Business Practices

Historically at the Arbor Day Foundation, people across multiple departments collaborated to gather key insights from the nonprofit's marquee programs, including Tree City USA, Tree Campus K-12, Tree Campus Healthcare, Tree Campus Higher Education, Alliance for Community Trees, and Tree Line USA. In total, there are more than 4,000 recognized partners of these programs in the United States.

"Understanding the full scope of our program's reach empowers us to identify the communities still in need of support," said Arbor Day Foundation program manager Lauren Weyers. "So, we need a clear picture of what's already happening on the ground. It helps us to know where our partners are, which communities they're serving, and how many trees they're planting."

In the Foundation's previous process, the nonprofit used reporting from partners to collect information. Then, the nonprofit exported the information into spreadsheets and manually derived comprehensible data points. It was a time-intensive process subject to potential human error. After the key findings were identified, team members would input those data points to create national-scale PDF infographics for each of the six programs, as well as individual infographics for all 50 states.

"It was a really challenging and demanding process for our whole team, every year. Because of that it was also difficult to be able to provide our leadership with timely insights about the impact of our programs," said Weyers.

Recognizing the need for a more efficient system, Weyers and other Foundation leaders turned to the nonprofit's internal GIS team for a solution.

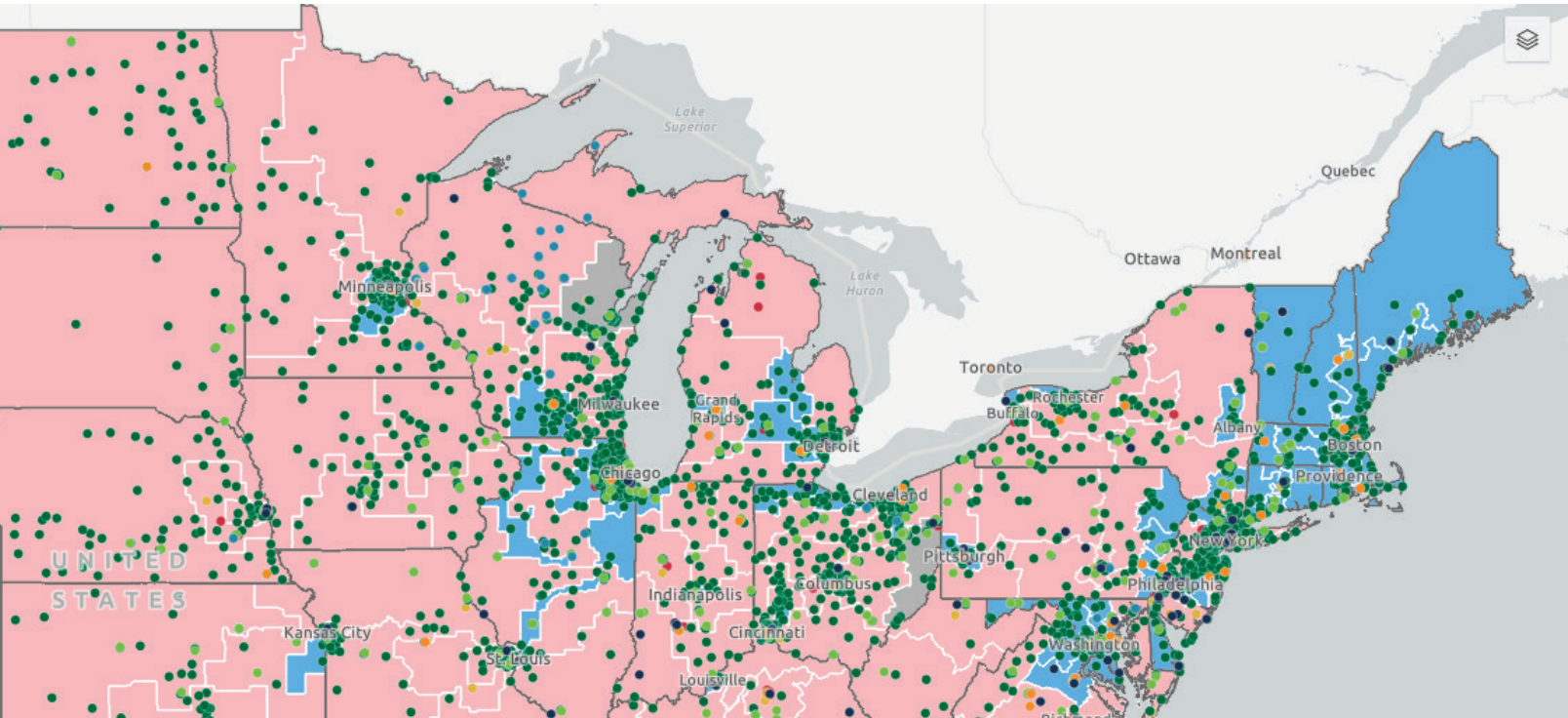
ArcGIS as a Solution

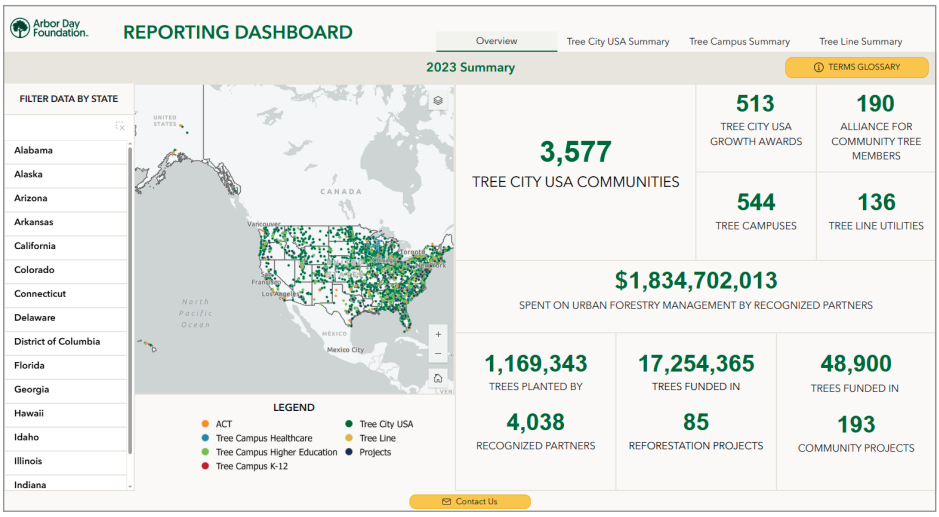
GIS director Derrick Frese said he was excited when the project was brought to his team.

"This was an opportunity to really showcase the broad capabilities of GIS technology. We can use it to not only visualize data on a map but also tell a robust story about the impact of our organization, while simultaneously improving our internal process," Frese said.

Frese and his team developed an

↓ The interactive map enables users to overlay congressional district boundaries. This feature assists congressional aides, state foresters, and others in identifying the Arbor Day Foundation's work efforts, and facilitates collaboration with stakeholders to enhance growth in each program.





↑ The Reporting Dashboard delivers answers to the questions partners are receiving about their tree planting efforts. Here is an overview of Arbor Day foundation's entire tree planting operations and key programs.

automated workflow that extracts data from multiple systems, organizes it, and integrates it into the Foundation's enterprise GIS. This data is then uploaded to ArcGIS Online, a cloud-based mapping and analysis solution, where it can be stored, updated, and visualized in real time. Additionally, using ArcGIS Experience Builder, the team built a Reporting Dashboard that provides instant access to tree planting metrics and allows users to zoom into specific cities, states, or regions to see localized impacts.

"This interactive tool transforms how we can communicate about our programs," Frese said. "It's one thing to say we've planted over 12,000 trees in Iowa, but it's more powerful when we can zoom into a specific community and show exactly where and how we're making a difference."

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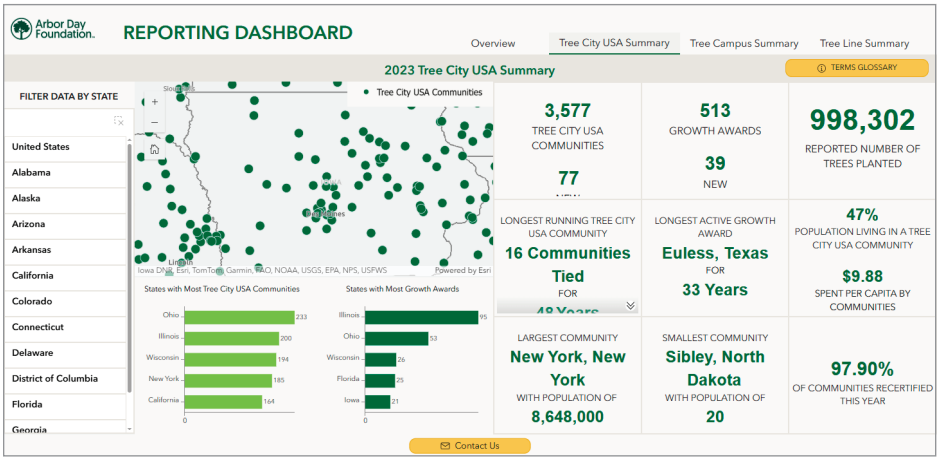
Derrick Frese
GIS Director, Arbor Day Foundation



↑ Looking at the Tree City USA program, stakeholders can zoom into their community to get detailed information about the trees planted nearby.

A Model for Innovation and Growth

Since adopting ArcGIS technology, the Arbor Day Foundation has experienced a transformation in how it manages data, reports progress, and communicates impact. What began as an effort to streamline reporting has evolved into a broader interest in the opportunities of GIS technology.

"When other departments across the organization saw the finished product and time it saved, they started coming to us with their own challenges. They wanted to know what GIS could do for them," Frese said. "Now, when there is a need to tell a story with data or streamline a complex process, the Foundation looks to our team for help."

By replacing legacy business practices with cutting-edge solutions, the Arbor Day Foundation is well-positioned to remain a leader in data-driven environmental impact, ensuring that every tree planted is part of a larger, smarter strategy to restore our planet.

To explore more resources for nonprofits, please visit go.esri.com/DownloadNPO.

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Building Resilient Communities: Insights from the 2025 Infrastructure Report Card

By Ross Donihue and Linda Foster

Infrastructure is essential for the functioning of cities and communities across America. It ensures safety and supports daily activities, like driving over bridges or flying to destinations. The quality of infrastructure is crucial for our safety.

The 2025 Report Card for America's Infrastructure by the American Society of Civil Engineers (ASCE) offers a detailed look at America's core infrastructure, including bridges, roads, ports, and more. It uses geospatial data to provide a comprehensive overview. This year's report is notable for showing the impact of increased federal investments from the Infrastructure Investment and Jobs Act (IIJA). ASCE is using ArcGIS StoryMaps℠ for the first time to present the findings.

We spoke with Caroline Sevier, managing director of government relations and infrastructure initiative at ASCE, about the report and the role of geospatial data in evaluating infrastructure. The conversation has been edited for clarity and brevity.

Q. It's wonderful to speak with you again, Caroline. Can you please share a little about ASCE and your role there for our readers?

I'm the managing director of government relations and infrastructure initiatives at the American Society of Civil Engineers (ASCE), which represents about 160,000 individual civil engineers around the world from the public sector, private sector, and academia. I oversee all federal and state lobbying and advocacy work at ASCE, as well as our policy reports that help inform that advocacy work. Our hallmark report is the Infrastructure Report Card.

Q. Can you tell me more about what goes into making the Infrastructure Report Card and why this 2025 report is so significant?

The Infrastructure Report Card is a national assessment with corresponding state report cards compiled by representatives from each state. They are developed from public national datasets like the National Bridge Inventory. These datasets provide comprehensive information about the quality of the infrastructure category. A team of 52 engineers across the country analyzes the data to identify trends and determine grades based on key criteria. This allows us to answer the question, "Is our infrastructure getting better or worse from year to year?"

The 2025 Infrastructure Report Card will be the first assessment of our nation's infrastructure systems since the federal government significantly increased its investments in them. Our last report card came out in 2021, so this is going to be the first insight into the momentum we've gotten from those increases.

We're delighted to see that, for the first time, the overall report card GPA increased from a C- to C. It's the highest grade we've ever gotten on the overall report card.

We're starting to see really positive momentum from those increases in federal dollars.

Q. Can you describe how ASCE members use GIS technology and geospatial datasets in their work?

Technology like GIS and real-time data feeds are really allowing engineers to track the condition and performance of our

infrastructure assets. By having these tools, they're able to do more predictive maintenance and ensure that limited public dollars are going to the projects that have the greatest need, making it less likely that we're going to see an infrastructure failure down the line. These tools and datasets really have become an integral part of the civil engineering process and are making sure that we are making wise investments overall.

Q. This is the first year you've used ArcGIS StoryMaps to showcase infrastructure in America. Can you explain how maps can help tell the story of infrastructure?

Our infrastructure is vast, and it's hard for people to understand. When we discuss what the funding needs are and people see an overall funding gap of $3.7 trillion to address all these structures, we really need to help people visualize what we're talking about. I think ArcGIS StoryMaps can really help us do that.

By showing people how all these infrastructure systems are actually playing a role in their daily lives and how they're impacting their communities, we can make the case for investing in infrastructure. I also think it really helps show this overall system of systems approach to infrastructure and how it's all interconnected. ArcGIS StoryMaps helps us visualize these issues and look at infrastructure at multiple scales.

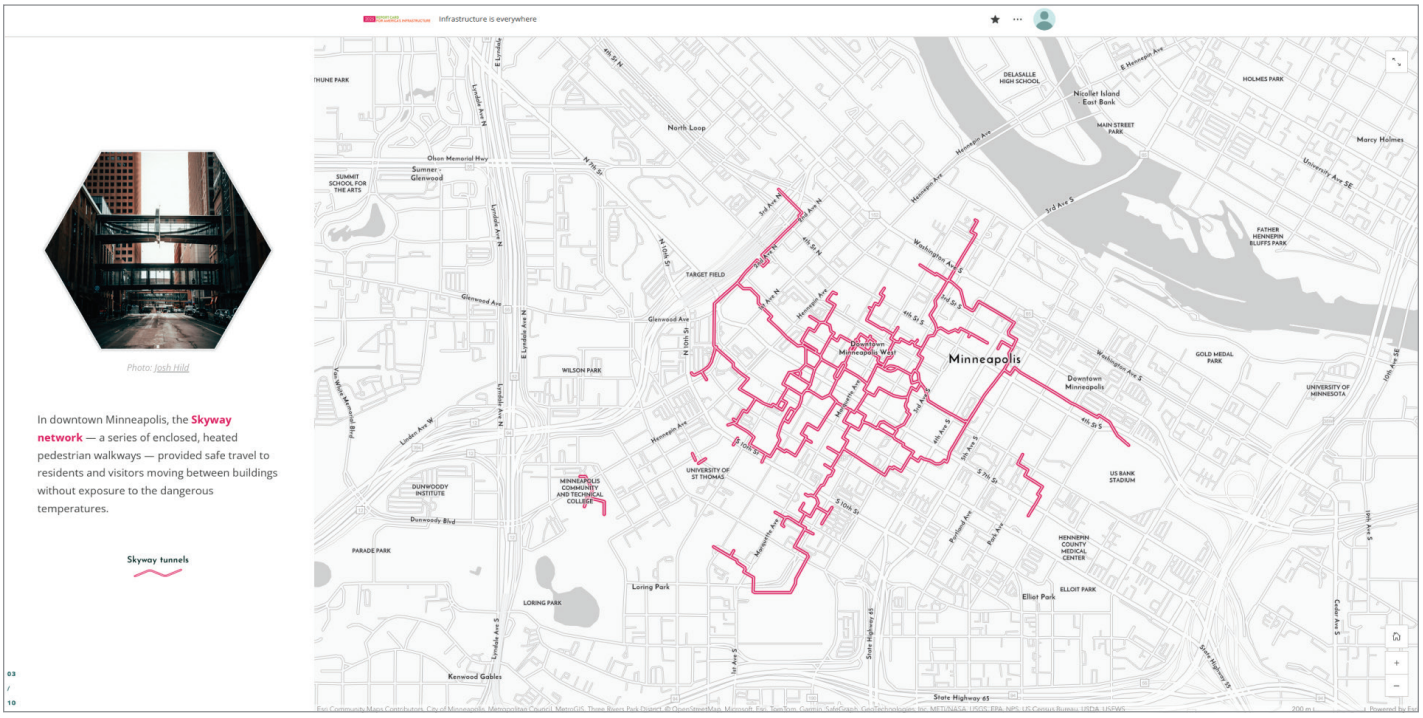
It's really about making people feel connected to their infrastructure systems so that when we talk about a large investment down the line, they can understand how it impacts their own community.

At ASCE, we try to make it easy for members and the general public to engage on infrastructure issues, and that's why the national Report Card is structured in a simple A through F format—it's really a way for the general public to understand it. If we start talking about technical bridge conditions, like decking, people won't understand that unless they're engineers. If we say, overall, our bridges are graded as a C, people might say that's not good enough. My child is taking a school bus over that bridge every day, and I want it to be better than a C. Being able to have people understand infrastructure in this simple format helps educate the public and policymakers.

Q. Is there anything else you would like people to know about ASCE or the Infrastructure Report Card?

We're coming to a critical point with infrastructure in America. The Infrastructure Investment and Jobs Act expires in September, so Congress is starting to consider how we will invest in infrastructure going forward. We hope this Infrastructure Report Card can help detail where we are and how we've seen positive momentum when the federal government chooses to increase investments. However, we'll need to sustain these investments to continue seeing progress. We must make sure, as a nation, we're prioritizing the resilience of these systems so that when we're building them, they will be here for the next 100-plus years to sustain future generations.

To discover innovative infrastructure solutions driving better decision-making, please visit **go.esri.com/ASCEUpdate**.



Enhancing Road Closure Management with Esri's Community Maps Program

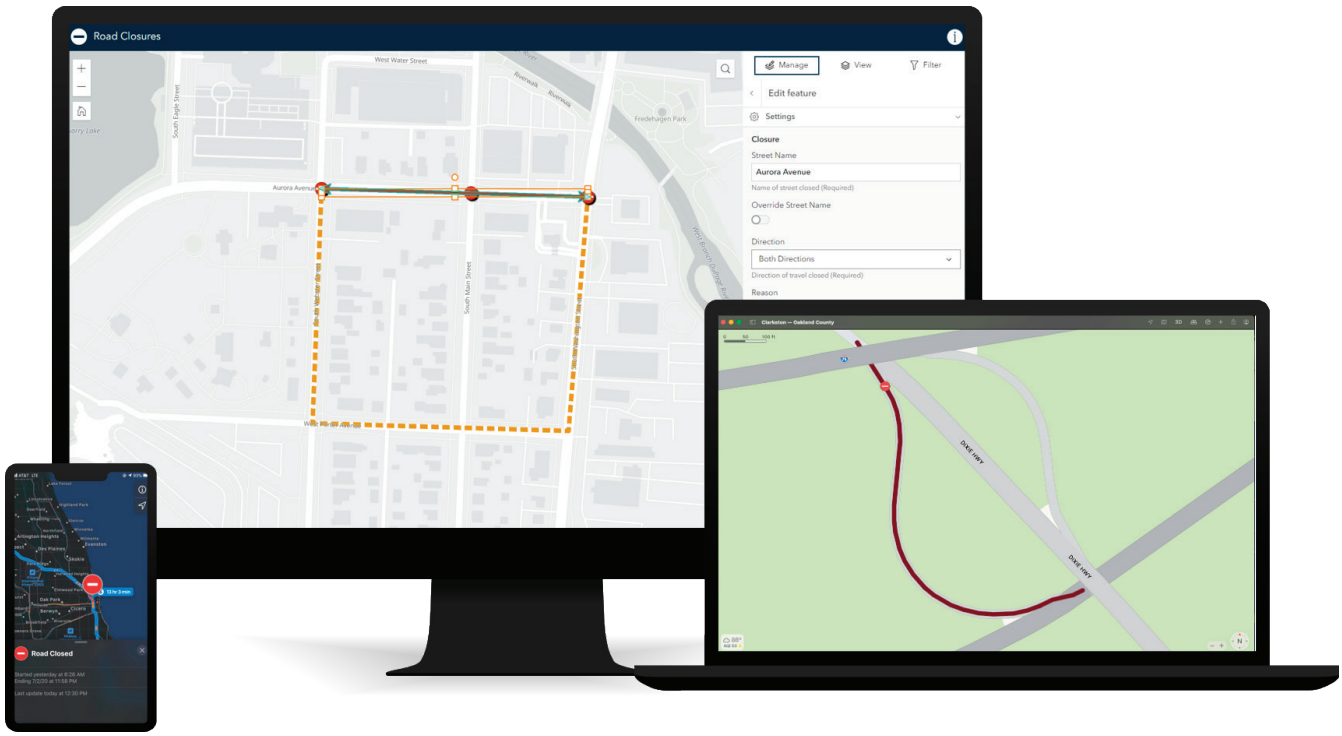
Esri has enhanced its popular Community Maps Program to make sharing of road closures much easier with the Road Closures solution. The solution bridges the gap between government agencies managing timely road updates and the public, who rely on mapping apps for real-time navigation.

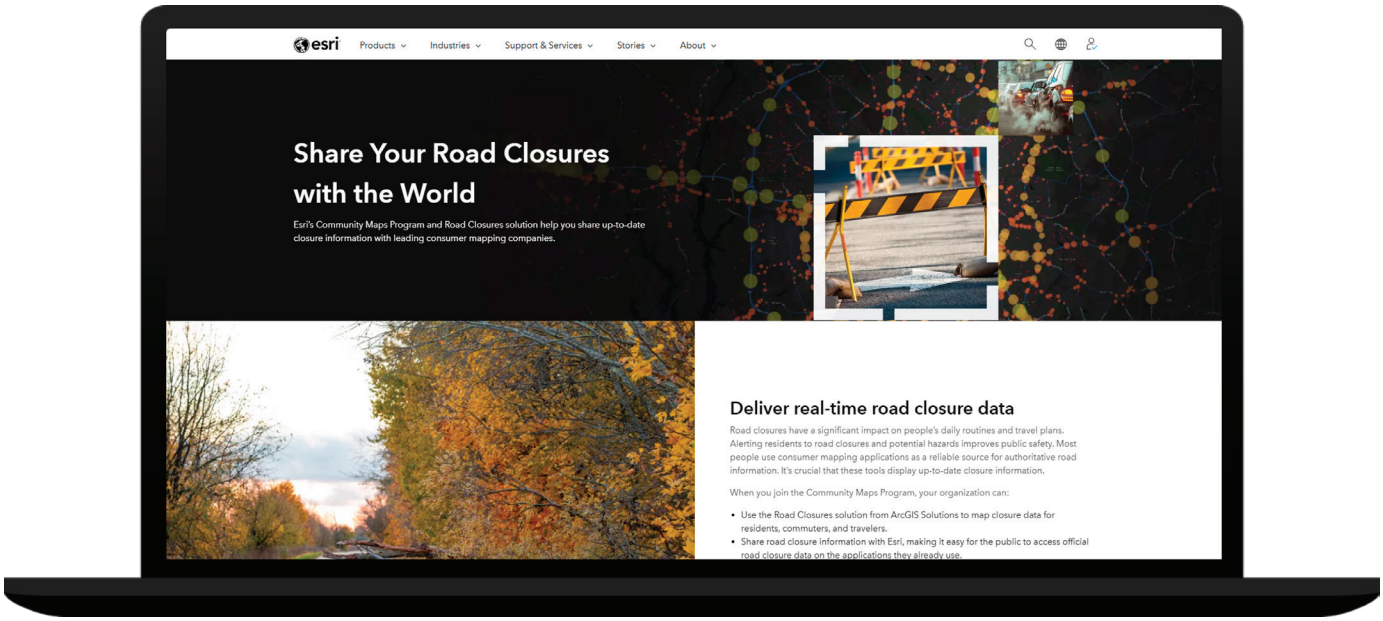
Thousands of Esri's ArcGIS software users—including state and local governments and national mapping agencies—create and share authoritative, accurate road data through the Esri Community Maps Program. Now, they can share live road closure data as well. Public works and public safety departments close roads for construction activities, special events, and public safety incidents, often creating detours for drivers. Proactively managing and communicating closure and detour information helps residents and drivers navigate an altered road landscape and avoid unnecessary congestion. Road Closures is typically implemented by public works and public safety agencies that want to have a single catalog of roads impacted by construction activities, events, and incidents, and share this information with the public.

"Through the Esri Community Maps Program, we've been assembling authoritative data about city infrastructure from the ArcGIS community for over a decade," said Deane Kensok, chief technology officer for ArcGIS content at Esri. "We're delighted to expand the program to include road closure data and help our user community make this critical information more easily accessible to consumer mapping providers that we're working with so it can reach the most people."

One of the key highlights of this solution is its simplicity and ease of use. The Road Closures solution provides a low-friction experience that enables governments of all sizes to easily map, manage, and communicate road closures, hazards, and detours related to special events, construction, emergencies, and other traffic disruptions. All current ArcGIS users have access to this functionality at no additional cost.

"Using the Community Maps Program and the Road Closures solution changes how our city handles road closures, making it easier for everyone in our city government to share information about





road problems," said Jim Alberque, GIS and emerging technology manager for the City of Raleigh, North Carolina. "The process of putting in data is simple and familiar, so lots of different city staff can help. By gathering data from different parts of the city and sharing it with consumer mapping applications right away, we'll give our residents better info to get around safely and quickly."

The Road Closures solution is one of many ready-to-use solutions included with ArcGIS. These industry-specific solutions help organizations leverage GIS to improve operations, gain new insights, and enhance the services they provide.

To learn more about Esri's Road Closures solution, please visit **go.esri.com/RoadClosuresNL**.

How to Raise the Grades in ASCE's Infrastructure Report Card with GIS

By Adam Carnow, Industry Solutions Specialist at Esri & Linda Foster, Industry Solutions Specialist at Esri

The United States has long been one of the top global economies and has one of the highest levels of quality of life. Much of that historical success can be attributed to the health and continued expansion of American infrastructure. This infrastructure is so critical to our nation's prosperity that it is important to monitor its status, plan its future, and fund it accordingly to maintain our global position. Geographic information system (GIS) technology is an essential part of this process for maintaining and improving our infrastructure.

The ASCE Report Card for America's Infrastructure

The American Society of Civil Engineers (ASCE) was founded in 1852 and represents over 160,000 members dedicated to protecting public health, safety, and welfare. Every four years since 1998, ASCE has issued an assessment of the United States' infrastructure, known as the Report Card for America's Infrastructure. The ASCE Committee on America's Infrastructure developed this comprehensive assessment of infrastructure categories. The report uses a school report card format, with A being the best and F being the worst. Current infrastructure conditions and needs are examined, grades are assigned, and recommendations are made to raise the grades. Criteria include capacity, condition, funding, future needs, operation and maintenance, public safety, resilience, and innovation.

Of the eight reports in the series, the 2025 edition gets the best overall grade of a C. Previous overall grades had been a D or D+, except for the last one in 2021, getting a C-. Here are the 2025 grades for each category:

Category	Grade	Category	Grade
Aviation	D+	Ports	B
Bridges	C	Public Parks	C-
Broadband	C+	Rail	B-
Dams	D+	Roads	D+
Drinking Water	C-	Schools	D+
Energy	D+	Solid Waste	C+
Hazardous Waste	C	Stormwater	D
Inland Waterways	C-	Transit	D
Levees	D+	Wastewater	D+

The goal is to achieve a state of "good repair," which equates to a grade of a B. The increase in infrastructure investment in recent years is the main reason for the improvement in grades, but many categories are still lacking.

As a companion study, ASCE develops a report called Bridging the Gap, which estimates how much investment is needed to realize a B grade for each infrastructure category. This report estimates a funding gap of $4.4 trillion. Additionally, Bridging the Gap estimates the economic harm caused by the underperforming infrastructure to be $5 trillion lost in gross economic output, a reduction of $244 billion in US exports, and $1.9 trillion in lost disposable income over 20 years, as well as a loss of 344,000 jobs in 2033.

The Role of GIS in Infrastructure Life Cycle Management

While all this can seem a bit daunting, there is some light at the end of the tunnel. And don't worry, it's not a train. The Report Card includes three strategies to raise grades, sustain investment, prioritize resilience, and advance policy and innovation.

One thing all infrastructure has in common is location, no matter what it is, what it does, or when it was created. Where it is located is crucial in understanding the context of its life-span. GIS is the mission-critical enterprise IT system designed to turn location data into insight, powering better decision-making and delivering significant business value.

If the owners entrusted with the infrastructure that forms the backbone of our quality of life are to maximize its life-span and accurately plan for its expansion, they must utilize GIS. This was evident when the Governmental Accounting Standards Board (GASB) issued Statement 34 in 1999, which required state and local governments to report annually on the value of infrastructure with related depreciation or preservation costs.

To meet the requirements of GASB 34, state and local governments embarked on an asset management life cycle journey to document the value and status of their infrastructure. This meant inventorying and mapping the infrastructure with its details, costs, and condition. Target levels of service are set, along with assignment of risk, development of maintenance and operational strategies, and capital improvement plans. Then, a financial strategy can be created.

Improving the Grades

If we are going to raise infrastructure grades via sustaining investment, prioritizing resilience, and advancing policy and innovation, we need to understand how GIS can help. We can do this by looking at how agencies are successfully improving their infrastructure life cycle management with GIS.

Sustaining Investment

Regarding the sustaining investment strategy, the Report Card states, "Infrastructure investments must be consistently and wisely allocated." Location is a key part of infrastructure investment planning. Infrastructure needs must be mapped, analyzed, and prioritized. Conflicts must be identified and reconciled. Reviews must focus on equity, resilience, sustainability, and also consider justification, transparency, and accountability. Across the country, GIS is being used by all types of agencies as the tool that can support all this. Here are some examples:

- In Ohio, when it came to closing the digital divide with broadband expansion, the Federal Communications Commission (FCC) estimated that 190,000 households lacked broadband access. After applying GIS analytics to internet speed test data from across the state, there were 800,000 households identified that did not meet the minimum speed standard. This improved data was then used to identify proposed fiber expansion locations and to increase funding requests.
- Wyandotte County, Kansas, was battling multiple Capital Improvement Program (CIP) challenges, like needs exceeding budget, no transparency for project prioritization and selection, no understanding of project impact magnitude, and public perception that project decisions were political. GIS was used to create a data-driven prioritization using population, property value, traffic counts, sales tax, asset condition, and network capacity data. Criteria like cost, return on investment, condition, safety, capacity, population served, economic impact, etc., were weighted by elected officials, creating a much more accurate CIP, resulting in an improved use of funds.
- Topeka, Kansas, uses a GIS-powered Neighborhood Health Map that rates neighborhoods based on crime, poverty, homeownership, blight, and property value to assist in the identification and data-based prioritization of infrastructure projects. The city also uses GIS to share the story with the public on its pavement management program.

Prioritizing Resilience

Recent trends across the country show that natural disasters are increasing in intensity and frequency, significantly driving up the price tag for the resulting damage to infrastructure. To mitigate these impacts, agencies are focusing on resilience strategies. This tactic pays off, as a 2024 study shows that every dollar spent on resilience and preparedness saves $13 in post-disaster costs. GIS is a valuable tool in implementing resilience strategies.

- To help US agencies utilize resilience strategies, the federal government provides the Climate Mapping for Resilience and Adaptation (CMRA) website. This site offers the US Climate Resilience Toolkit, which explains the six Steps to Resilience framework: Get Started, Understand Exposure, Assess Vulnerability and Risk, Investigate Options, Prioritize and Plan, and Take Action. It also includes the CMRA Assessment Tool, a GIS-powered interactive web application that provides climate projection maps, data, and reports for various hazards, such as extreme heat, drought, wildfire, flooding, and coastal

continued on page 14

Visit our Parks and Recreation web page

go.esri.com/GIS4SmartParks

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We Want Your Stories

Partners, startups, nonprofits, and customers are encouraged to submit an article for inclusion in Esri's state and local government publications. Tell readers across the country how your organization or customers have saved money and time or acquired new capabilities through using GIS.

go.esri.com/sharestory

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How to Raise the Grades in ASCE's Infrastructure Report Card with GIS

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inundation. These can be used for the understanding of a community's infrastructure exposure to disaster-related damage.

- The Maryland DOT State Highway Administration has developed a GIS-powered Climate Change Vulnerability Viewer that showcases data related to climate change and the potential impact on their transportation infrastructure. The goal is to support transportation professionals in utilizing data to mitigate against, avert, and adapt to potential impacts of climate-change-related hazards. It assists users in identifying potentially vulnerable assets and prioritizing areas of concern.
- Fairfax County, Virginia, uses flood risk analysis tools powered by GIS to help predict impacts of future events, and prepare plans to improve response and increase resilience. These tools focus on mitigating sites where the stormwater system is repeatedly overwhelmed by flooding events. The model shows where the water flows when the system cannot manage it, which is used to assess the impact of potential flooding and assist with planning future improvements.

Advancing Policy and Innovation

In addition to new policies required to accommodate emerging societal trends and environmental conditions, we need innovations to improve project delivery and enhance safety. This includes the reduction of delays related to project permitting. There are many types of innovative technology that can assist, such as artificial intelligence (AI), digital twins, and vertical asset management. GIS is being used as a gateway to integrate these advanced technologies into the infrastructure life cycle management process.

- Douglas County, Nebraska, used AI and GIS, also known as geospatial artificial intelligence, with digital aerial imagery to automatically identify and locate over 34,000 Americans with Disabilities Act (ADA) curb ramps, saving six months of staff time.
- Charlotte Water in North Carolina uses GPS-enabled, 360-degree, vehicle-mounted cameras and geospatial AI to automatically identify and locate water meters with an expected annual savings of $300,000.
- Raleigh Water in North Carolina uses three-dimensional digital twins for vertical asset management of their water and wastewater treatment facilities, both indoors and outdoors, which enable improved preventive maintenance through integration with their computer maintenance management system.

Making the Grades with GIS

Since 1998, the US has used the ASCE Infrastructure Report Card as a measurement tool to make advancements in improving our infrastructure networks, but the work is far from complete. There is a lot of work to be done to raise and maintain the grades for all infrastructure to a B. Of all the infrastructure categories, only Ports and Rail are in the B range. Seven of the categories are in the C range, and the remaining nine categories are getting Ds.

The American quality of life is directly tied to the health of its infrastructure. It is paramount that we continue to fund, operate, maintain, and expand our infrastructure to meet the needs of today and the future. To do this, we must sustain investment, prioritize resilience, and advance policy and innovation. For decades, GIS has been an integral part of best practices for implementing effective and proactive infrastructure life cycle management. We must continue to advance and expand our use of GIS if we are to provide adequate infrastructure to maintain and improve our quality of life for future generations. Start by contacting your GIS staff now.

Virginia Department of Conservation and Recreation Improves Data Sharing with GIS

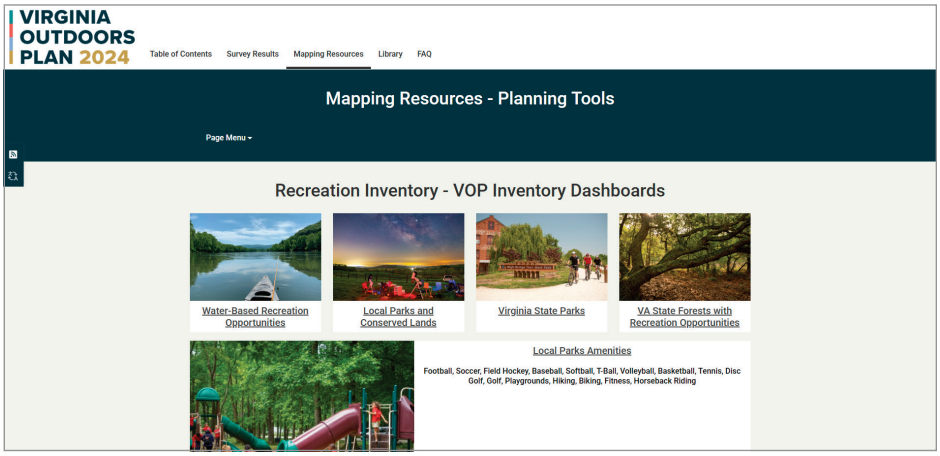
The Department of Conservation and Recreation (DCR) is the Virginia's lead natural resource and conservation agency. Virginia State Parks is responsible for the management of over 40 parks, each with unique natural and historical assets. Staff at each location experienced difficulties communicating updates to their respective parks. The new parks director, Dr. Melissa Baker, had a goal to make more data-driven decisions. In particular, more efficient and effective collaboration between parks, the Virginia Natural Heritage Program, and the Virginia Department of Historic Resources was important.

"Virginia State Parks and the Virginia Natural Heritage Program are working together towards a robust biological field inventory of the parks, enabling spatial analysis, enterprise data sharing, and expanded collaboration," said Jason Bulluck, director of the Virginia Natural Heritage Program at DCR. "This informs and empowers park managers to make decisions that can optimize rare species habitats and visitor experiences."

DCR staff turned to their existing geographic information system (GIS) technology resources to implement innovations.

"We've had an enterprise agreement with Esri for a number of years as an agency, but for state parks staff, we really only had about 6 to 10 users," said Joshua Ellington, chief of resource management for Virginia State Parks.

Maps had previously been created manually or by using legacy software, with staff keeping datasets on local hard drives, making them inaccessible to other park locations. Updating their system to ArcGIS Online, a modern web GIS technology, made the maps and data available across departments and at different locations. This enabled personnel to remain connected to enterprise data with a mobile device while on-site.



↑ The Virginia Outdoors Plan Statewide Comprehensive Outdoor Recreation (SCORP) helps state agencies, local governments, NGOs, and the public to collaborate and make informed decisions about recreation resources.

Scaling Up a Mobile GIS Workforce

"My position was the first ever career GIS position for state parks," said Peter Lostritto, Virginia State Parks GIS manager. "Before me, there was no designated GIS person, and none of our data was centralized anywhere."

Since hiring Lostritto, Virginia State Parks has embarked on a transformative journey with their custom GIS portal, called the Virginia State Parks portal. Released in February of 2024, it serves more than 300 full-time state parks employees. The portal has standardized important datasets like park acreages and trails, bear activity, invasive species mapping, and census data at a range of 60-to-120-minute drive times from each park. It has changed how staff across the parks division access and share information with each other and other organizations.

"We wanted to understand how we would communicate with the staff, and how we were going to get people to adopt GIS," said Ellington. To create the portal, the resource management team used ArcGIS Hub℠, a configurable community engagement platform to share data and insights, and track progress at all their parks. "From his previous work experience, Peter knew that a hub product would be important to readily share information," continued Ellington.

Staff also incorporated ArcGIS StoryMaps into the portal. This tool lets users combine maps, 3D scenes, and multimedia content into a storytelling format, making it easier to share and understand. The hub site now contains dynamic park maps, key performance indicators, programmatic tools for staff, and over 100 StoryMaps stories. Viewers can look at all the 40-plus parks, see parcel data linked to SharePoint, and view natural resource plans. Visitors can also use ArcGIS Survey123, a form-centric data collection application, to request the maps they need.

Ellington explained that in the past, when staff requested a map, it would take at least a week to locate the hard drive containing the necessary dataset and complete the task. Now, with ArcGIS Online, staff in different park locations can access information on the portal from a desktop, tablet, or phone. "This hub site has allowed us to create a really

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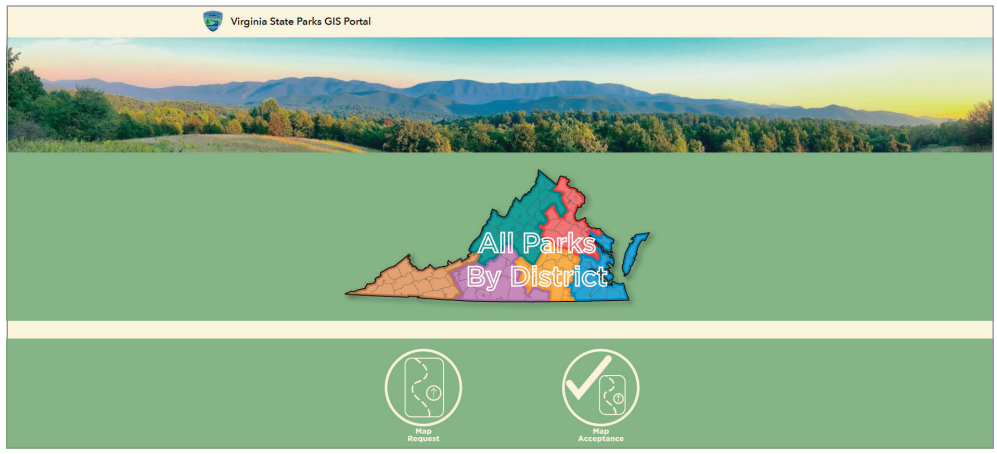
easily accessible, view-only type of structure that puts a lot of data in [parks staff] hands," he added.

Another challenge that Virginia State Parks staff faced was a set of natural resources plans overdue for updates since 1998. "We were looking at these text-heavy documents that would sit on a shelf, so at the park-level, we used Hub to lay out priorities geospatially," explained Ellington.

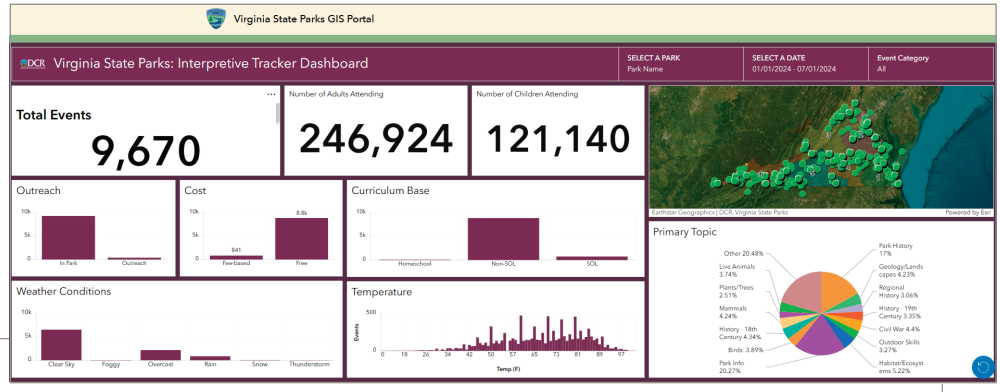
By viewing points and polygons on a map, for instance, parks staff can see the types of invasive species that need treatment. "Everything in the portal means something to the parks, so if staff is tracking an agricultural lease, a bear report, prescribed burn, or community program, not only does it have a text, but it's tied in spatially," said Ellington.

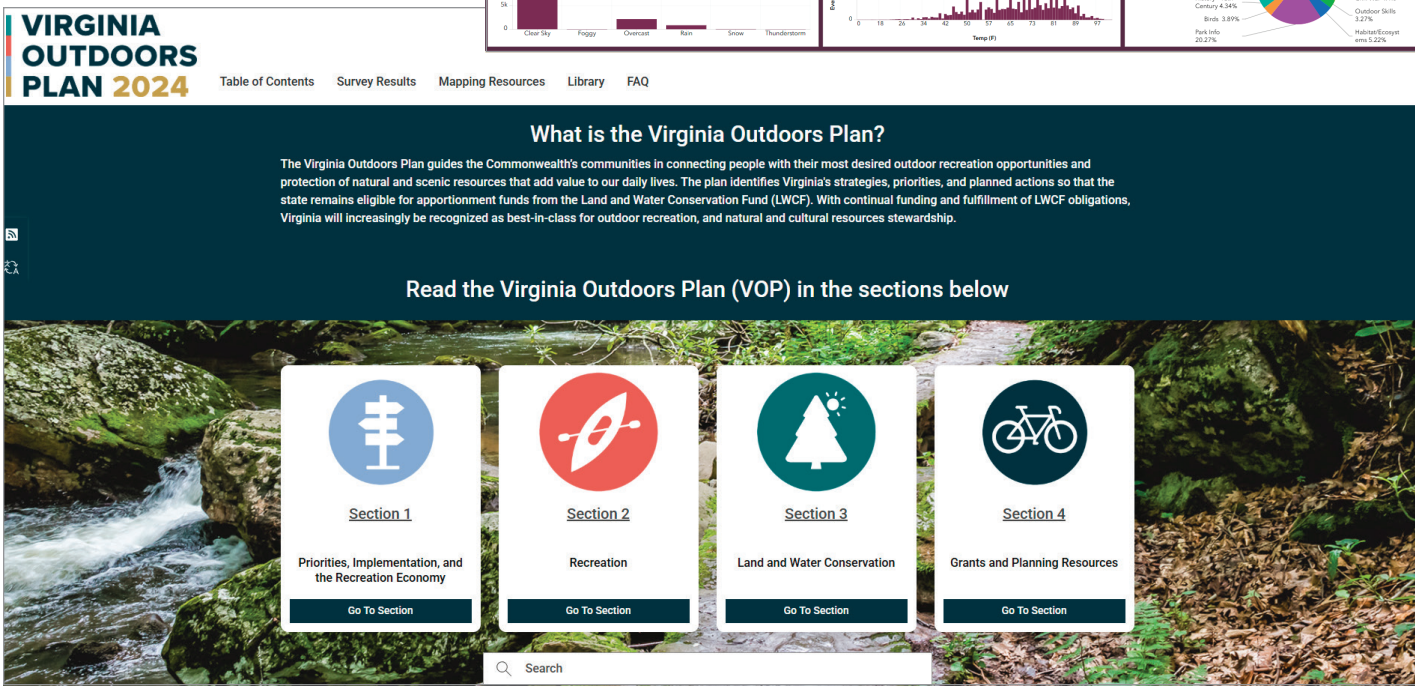
Organizing data by location helps staff make better, faster decisions. Another example is the Resource Assessment Process for Internal Decisions (RAPID) tool. Staff use RAPID to simultaneously screen multiple datasets in the early stages of project evaluation. This allows



↑ The portal also includes an ArcGIS Survey123 form to allow staff to easily request maps they need, and now with ArcGIS Online, they can easily fulfill the request in much less time.

↓ The award-winning Virginia State Parks GIS Portal, built with ArcGIS Hub, allows park staff to readily share data and insights, and track progress at all their parks.





↑ Using ArcGIS Hub, the Virginia Department of Conservation and Recreation's Planning and Recreation Resources Division transformed their SCORP from a thick, static book to an easy-to-access and understandable reference to garner support for outdoor recreation and grant applications.

them to identify potential issues with cultural or natural resources before proceeding to the planning phase.

The success of the Virginia State Parks portal earned the department the 2024 National Association of State Park Directors Innovation Award. The award recognizes and promotes groundbreaking projects and programs within America's state parks. The Virginia State Parks resource management team was honored for their innovation in establishing best practices, displaying exceptional problem-solving skills, and enhancing outdoor recreation and cultural opportunities.

A Successful Communications Tool

During a similar time frame, another division within DCR was also turning to GIS as a solution for communication. The Division of Planning and Recreation Resources is responsible for a diverse set of tasks to support recreation throughout the Commonwealth of Virginia. These responsibilities range from design and construction within state parks to administering multiple recreation-oriented grant programs.

One such grant is The Land and Water Conservation Fund (LWCF), which supports acquisition and/or development of public outdoor recreation areas. To maintain eligibility for federal LWCF grants, every five years, each state must create and publish a Statewide Comprehensive Outdoor Recreation Plan (SCORP). This is created to guide the management and development of outdoor recreation resources.

When the Virginia DCR's Planning and Recreation Resources Division hired Allison Tillett as land conservation assistant, she was asked about using GIS to create the SCORP. "Normally, these plans are put into thick books, with a lot of dense information in it," said Tillett. The Virginia Outdoors Plan SCORP took what other organizations had accomplished with ArcGIS Hub and pushed every boundary possible to develop a product that met and exceeded expectations.

She wanted the plan to look, feel, and function a certain way, and used the available customization tools to build an easy-to-access and understandable reference to garner support for outdoor recreation and grant applications. "We are the very first state to use Hub in this way. We had to get approval from the state governor's office to understand and trust what we were doing," explained Tillett.

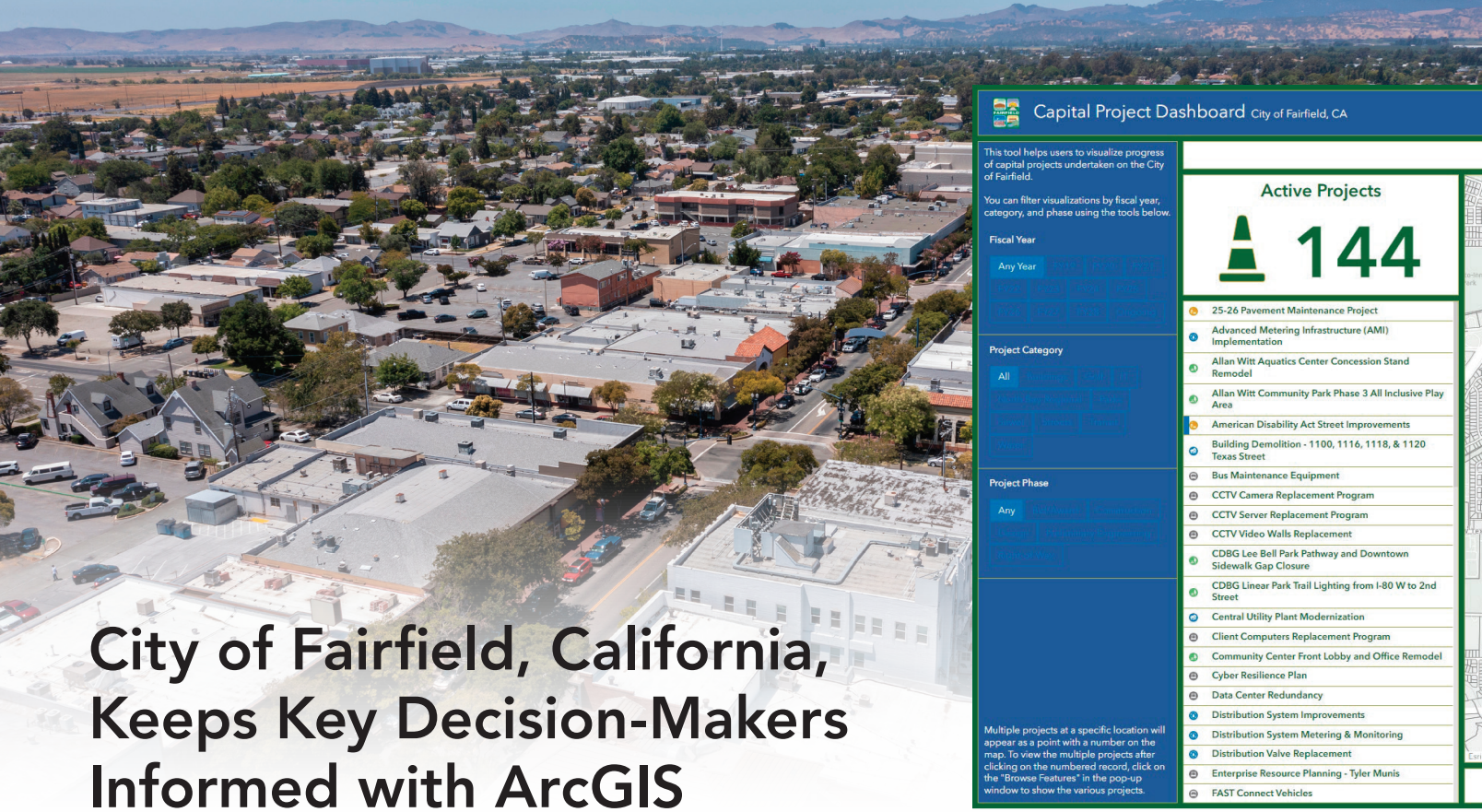
Using ArcGIS Hub for the SCORP allows planners to navigate seamlessly through section content on a StoryMaps story, see priorities in recreation for the next five years, and access survey results. The ArcGIS Hub product ended up being an excellent tool to successfully navigate every challenge that was presented, and the agency moved from the legacy print version to the new digital version. Frank Stovall, deputy director of operations for DCR, further explained, "The Virginia Outdoors Plan is about helping state agencies, local governments, NGOs, and the public make informed decisions about the allocation of limited resources to enhance outdoor recreation and natural and cultural resource protections in Virginia. The innovative approach our staff has taken to create not just a report, but a useful hub for information and toolkit for decision-making, will lead to better resource allocation and outdoor experiences for our residents and those who visit our state."

"Hub is a wonderful opportunity for us to bring everybody in a virtual space where we can share information. Collaborate with us, [and] we can all work together," said Tillett. "We aren't reliant on emails anymore. We have a place where there is ongoing collaboration because gathering data is a high priority across the state. Hub is special—it's a two-way communication platform."

By centralizing and visualizing information using GIS technology, the Virginia Department of Conservation and Recreation staff created tools to transform how their divisions and the public engage with recreation resources, ensuring that decisions are data-driven and impactful. Organizing data by location has sparked a new approach to problem-solving, making it clear what work needs to be done and fosters seamless collaboration across the enterprise.

To discover how GIS aids in protecting natural resources, please visit **go.esri.com/VirginiaParks**.

↑ The Virginia State Parks Portal has streamlined how staff collect, access, and share critical information with each other and other organizations.



City of Fairfield, California, Keeps Key Decision-Makers Informed with ArcGIS

The City of Fairfield, California, is a vibrant environment in Solano County that is home to a diverse community and rich history. The Information Technology Department, in collaboration with the Public Works and Finance Departments, has leveraged the capabilities of geographic information system (GIS) technology to create a data dashboard. This dashboard enhances transparency, provides a holistic visual overview of key project metrics, and facilitates effective communication and decision-making throughout the city.

> Through this innovative platform, we have provided stakeholders and community members easy access to critical information, empowering them to monitor project performance, track progress, and make informed decisions.

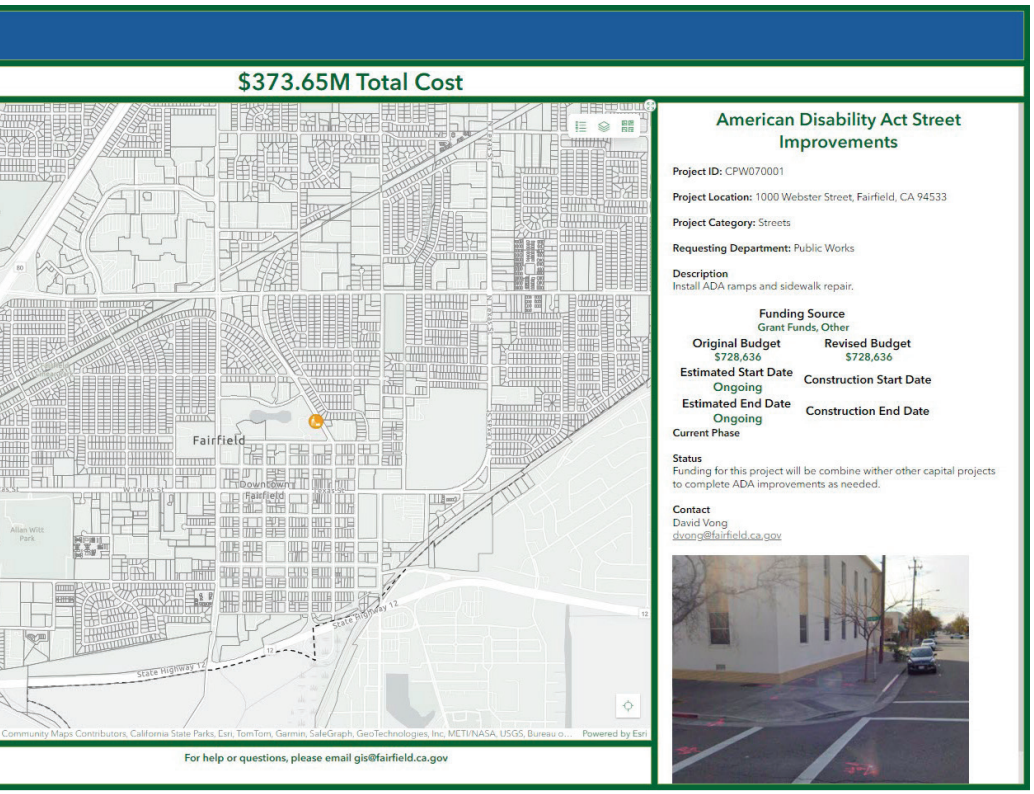
Savita Chaudhary
Assistant City Manager/IT Director,
City of Fairfield

Digitizing the Capital Improvement Project Report

In the past, staff from the Finance Department had to gather data from the Public Works Department to produce the Capital Improvement Program (CIP) section of the budget book, while public works employees created their own separate CIP report. Despite containing the same information, these reports were presented in an unstandardized format. Consequently, the reports were manually compiled into static maps, spreadsheets, and PDF documents for the city's website, resulting in inefficiencies and inconsistencies.

To digitize the report, city staff employed the help of Geographic Technologies Group (GTG), an Esri partner, to develop an integration with its EasyCIP database application, built on the Knack platform. This integration utilized ArcGIS API for Python and ArcGIS Notebooks to automate the extract, transform, and load (ETL) process.

↑ The easy-to-navigate hub site, created with ArcGIS Hub, keeps all the data regarding projects together in a digestible format for users.



> In the digital data age, residents and visitors are ever more interested in city activities. The launch of the Capital Improvement Program (CIP) Hub is a significant step forward in improving our communication with the community and providing a more accountable and transparent government.
>
> **David Gassaway**
> City Manager, City of Fairfield

← The Capital Project Dashboard enables site visitors to explore all active projects around the city.

The new report system features a single point of data entry into the online database, from which standardized reports are automatically generated. This data is then seamlessly ingested and displayed in ArcGIS Online, offering a unified access point via ArcGIS Dashboards and the city's Capital Improvement Program Performance Hub site (CIP Hub), created with ArcGIS Hub.

"The system's user-friendly interface and efficiency makes it easy for CIP report creators to meet their deadlines and streamlines the entirety of the reporting process," said Jasmin Acuna, senior GIS analyst at the City of Fairfield.

Interactive Dashboard Boosts Transparency

By customizing an ArcGIS Solutions template, the city's GIS team was able to rapidly launch a public dashboard for the community. This was a significant milestone for the team, as the city recently conducted a community survey and a GIS survey, both of which exposed the ever-growing need for transparency. The survey results requested updates on the city council's goals and capital improvement projects, which can be viewed online.

Government transparency refers to the openness and accessibility of government actions, decisions, and data to the public. This new way of sharing information aligns with the Fairfield City Council's goals of fostering government transparency. It demonstrates the city's openness and accessibility to government actions, decisions, and data to the public.

Along with presenting projects in the CIP Hub, budgets and project status can be readily displayed through interactive charts and pop-ups. Additionally, the city council and staff can direct the community to the CIP Hub so they can review information at their convenience.

"The response from the community is overwhelmingly positive, and sparks genuine conversations about the projects and spending," said Acuna.

The implementation of this system was a multidepartmental effort for reporting active capital improvement projects around the city. It enhanced internal staff processes by increasing communication and time savings, eliminating redundancies, and promoting public engagement.

"Before, we had to chase project teams for information," said Acuna. "Now, the project owners are familiar with the location of the projects, and if there is a technological issue preventing their project from showing up in the interface, they let us know."

Project managers are proving their accountability by showing their CIP projects and impacts. Productivity has increased since fewer staff members are involved in producing the report, and report production and delivery have become more automated. The city estimates a resulting staff time savings of 8 hours per department in over 10 departments, for a total savings of 80 hours.

To learn how GIS is mission critical to public works, please visit **go.esri.com/PWDownload**.

CIOs Celebrate Their Path to Geospatial Excellence

At the 2025 Esri Public Sector CIO Summit

Each year, Esri hosts CIOs, IT directors, chief data officers (CDOs), and chief technology officers (CTOs) across state, city, county, and regional government and water utilities at the Esri Public Sector CIO Summit. This forum provides IT leaders with a briefing on the latest GIS capabilities, emerging trends, and best practices so they can continue to empower you—their GIS staff—when they return home. Here are some of this year's highlights:

Unlimited Capabilities, Unlimited Possibilities

There were many examples that proved one good GIS project can lead to unlimited opportunities for success. The City of Detroit's street imagery project allows it to create a digital twin of the city as well as challenge the 2020 Census to prove it was undercounted, leading to millions more dollars in funding—all with one dataset. The City of Worcester, Massachusetts, detailed how a collaborative effort to modernize address management benefited the departments of public works, 311, fire, police, economic development, and more.

Secure Cloud Steals the Show

Having a secure platform to share information means organizations can work in a system, not a silo. The San Diego County Sheriff's Office, in partnership with the area's fusion center, the San Diego Law Enforcement Coordination Center, built a secure cloud to share data seamlessly across 157 agencies, kicking off during the 2024 elections to keep voters and voting centers safe across the region.

The Goal Is Data Democratization

Data democratization—getting data into the hands of many—is strategic. Data is the fuel driving AI, cloud computing, modernization, and more. If organizations move data into the hands of all knowledge workers, decision-making becomes easier, and one's strategy becomes more attainable. The Utah Department of Transportation showcased its evolution from an original beta tester of ArcGIS Online to a map-based organization that supports over 2,200 users with 18,000+ maps, apps, and dashboards to achieve digital service delivery. The California Governor's Office of Emergency Services highlighted its cross-agency collaboration efforts to respond to natural disasters and emergencies across the state, including building a comprehensive, real-time view into incidents across all 58 counties, from the recent fires in Los Angeles County to whatever comes next.

You can check out the video presentations:
go.esri.com/2025-cio-recap

2025 Award Winners

Enterprise Approach to GIS

Stephen Heard, interim CIO, and Tamara Davis, interim CTO, from King County, Washington, detailed their vision to support more workflows and departments with GIS. From asset management to transit routing to permitting and real-time tracking, the county GIS team makes it their mission to think GIS first, and build solutions along with tools that improve processes and workflows. The Enterprise Approach to GIS Award was presented to King County by Jack Dangermond in recognition of this work.

Innovations in GIS

Faced with aging sidewalk infrastructure across its community and a requirement to meet Americans with Disabilities Act (ADA) compliance, the City of Lawrence, Kansas, describes its strategic plan to address sidewalk conditions through community engagement and addressing priority areas such as destinations with schools, parks, transit, health care, and businesses. Based on this work, the city was on hand to receive the Innovations in GIS Award, including Melissa Sieben, director of municipal services and operations, Evan Korynta, ADA compliance administrator, and Jessica Mortinger, transportation planning manager.

CIO Priorities by the Numbers

No matter the size of the jurisdiction, IT leaders are facing similar challenges and focusing on the same priorities. In a National Association of State Chief Information Officers (NASCIO) poll of the audience, this is what they said:

In your agency, is GIS managed as an enterprise system or resource?

80%
Yes

What are your top two priorities?*

*Based on NASCIO's State CIO Top 10 Policy and Technology Priorities for 2025

35%
Cybersecurity

29%
Data Management

10%
Legacy Modernization

8%
Digital Governmnent/ Digital Services

What emerging technology will have the most impact on state and local government in the next two years?

59%
Generative AI

21%
Agentic AI

12%
Digital Twins

Notable Quotes

"My job as CIO is to run out and brag and tell everyone what we can do. We have to sell our services, as IT professionals."

Art Thompson
CIO, City of Detroit, Michigan

"The CIO is a broker of information, a connector across departments [to] build trust across the different departments to share information, so that we have an enterprise view of what's going on."

Christine Sakuda
CIO, State of Hawaii

"You'll never see 50 people huddled around a spreadsheet, but you will see 50 people huddled around a map."

Christian Carlson
Director, Esri

Define Your State and Local Government Road Map at the Esri User Conference

Explore Key State and Local Government Activities

Monday, July 14

8:30 AM–3:30 PM Esri UC Plenary Session

Join us for an incredible Plenary Session and set the stage for your UC week. Jack Dangermond will open the plenary by sharing examples of incredible work from the GIS user community, his vision for the future, and advancements in ArcGIS technology. Throughout the day, conference attendees will see GIS technology in action through a variety of presentations and demonstrations showcasing new products and capabilities, ArcGIS updates and enhancements, and the inspiring work of the global GIS community.

3:30 PM–6:00 PM Map Gallery Reception

The Map Gallery opens with an evening reception where you can meet participating map authors and special display organizations, and discuss their work with them.

Tuesday, July 15

8:00 AM–5:00 PM Map Lounge
9:00 AM–5:00 PM Expo

Come to the State and Local Government area to talk to our subject matter experts to learn more about the following:

- Elections
- Environmental and Natural Resources
- Health and Human Services
- Land Records
- Nonprofit Programs
- Public Works
- Transportation

8:30 AM–5:00 PM State and Local Government Technical Sessions and User Presentations

Led by Esri staff, technical sessions are workshops that focus on concepts, best practices, and how the Esri platform and technology work.

7:00 AM–8:00 AM Health and Human Services Special Interest Group (SIG)
11:30 AM–12:30 PM Industry Special Interest Group Meetings

Wednesday, July 16

8:00 AM–5:00 PM Map Lounge
9:00 AM–5:00 PM Expo
8:30 AM–5:00 PM State and Local Government Technical Sessions and User Presentations
11:30 AM–12:30 PM Industry Special Interest Group Meetings
3:30 PM–5:30 PM Esri Awards Ceremony

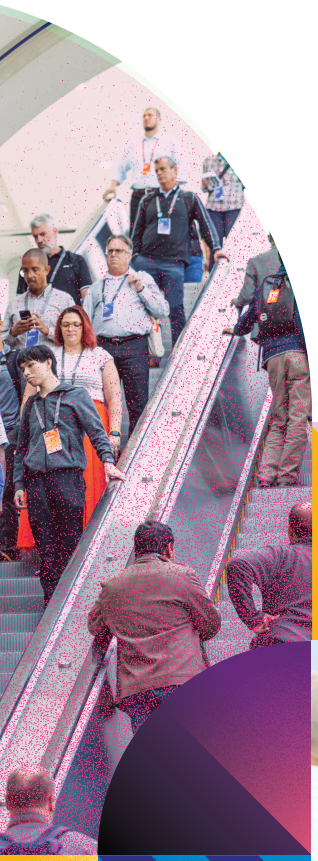
The Special Achievement in GIS (SAG) Award honors organizations for their vision, leadership, hard work, and innovative use of GIS technology. The awards ceremony is an opportunity for us to celebrate them for their work and contributions to GIS.

Thursday, July 17

8:00 AM–5:00 PM	Map Lounge
9:00 AM–4:00 PM	Expo
8:30 AM–5:00 PM	State and Local Government Technical Sessions and User Presentations
11:30 AM–12:30 PM	Industry Special Interest Group Meetings

Friday, July 18

9:00 AM–10:00 AM	Technical Sessions
10:30 AM–12:00 PM	Closing Session



What's New This Year?

Come by the State and Local Government Expo Area to

- Attend a spotlight theater session to connect with industry experts and explore best practices for solving today's most critical challenges.
- Pick up educational guides in the Resource Center to continue your professional development.
- Be interviewed on-site so we can promote your work and share your story in Esri publications.

Each special interest group meeting will also require reservations. To reserve your spot in an SIG applicable to the work you do, please visit **go.esri.com/SLGSchedule**.

To explore what's new in more detail, please visit **go.esri.com/SLGarea**.

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