

Esri News

for State & Local Government

Fall 2022

Driving toward Equity in Addressing Community Mobility

With a strong focus on creating a more equitable and connected transportation system, Centralina Regional Council has created a geographic information system (GIS)-based planning portal containing a wealth of data and analysis, all designed to help transportation and land-use planners address equity issues in their communities.

Centralina Regional Council, together with the Charlotte Area Transit System (CATS), created the CONNECT Beyond Regional Mobility Plan, designed to help address the comprehensive mobility issues of a rapidly growing but diverse

region. CONNECT Beyond's project area includes 12 counties and spans across North Carolina and South Carolina. A principal aim of the plan is to help incorporate equity information into the planning and funding of transportation-related decisions.

While conceptions of equity may vary from community to community, one of the goals of the plan is best stated on its website:

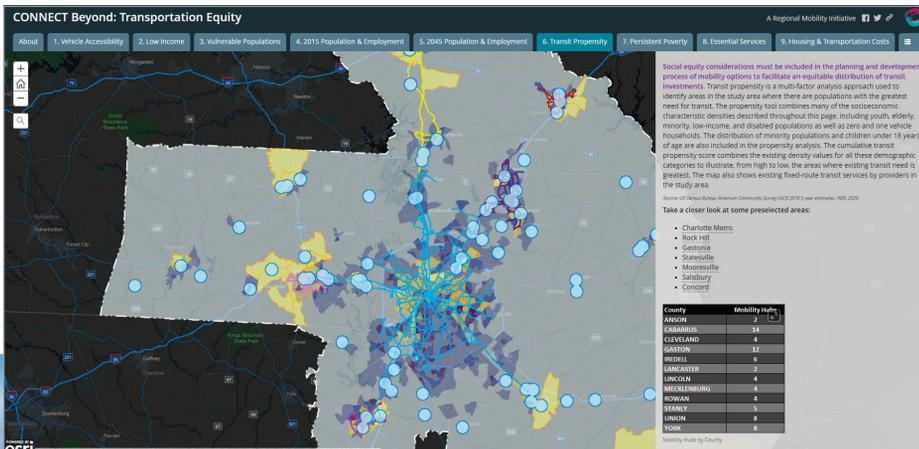
"While there is no single solution to tackling economic inequalities, focusing on improving transportation choices, accessibility and increasing affordable

As the opportunities around infrastructure funding investment increase, how do you advance the uses of GIS to answer your community's needs? Go to page 12 to learn more.

housing is a step in the right direction to enhancing equity in our region. Transportation access is a crucial element in providing access to education, jobs and housing as a means to increase one's economic and social mobility."

Improving mobility options is one part of a larger effort to tackle a range of growth-related challenges for the region, identified through a collaborative forum called CONNECT Our Future. Michelle Nance, regional planning director at Centralina, explained: "We assist local government agencies on issues of shared concern. Transportation is a big priority as we're a rapidly growing region, but we also help with issues such as economic development, land use, energy, and the environment. Across four Metropolitan Planning Organizations [MPOs], we

continued on page 16



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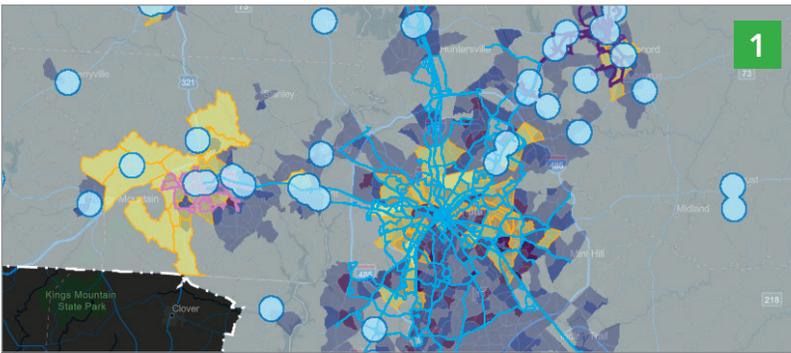
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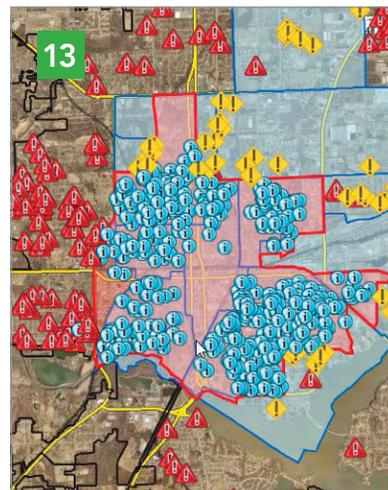


- 1 Driving toward Equity in Addressing Community Mobility
- 4 Leveraging GIS Solutions for a Powerful Approach to Snow Events
- 6 Decatur, Illinois, Uses GIS to Prioritize \$5 Million in Federal Funding to Revitalize Neighborhoods



- 8 Houston Police Department Tackles Crime with Maps and Apps
- 10 City of Hastings: Going All In with Esri's ArcGIS Utility Network
- 12 Infrastructure Is a Term for Everything Governments Do Every Day
- 14 Does Your Work Measure Up?
- 18 Stark County, Ohio, Deploys GIS Solutions to Tackle Complex Health Crises

- 20 New Mexico Maps Climate Risks to Inform Climate Action
- 22 Esri SAG Award Winners Announced at 2022 Esri User Conference



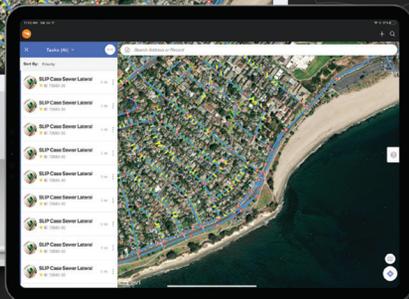
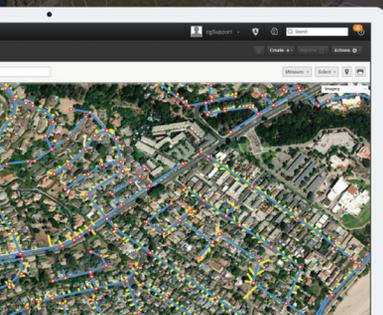
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Leveraging GIS Solutions for a Powerful Approach to Snow Events

Located northwest of Atlanta and overseeing approximately 2,500 miles of centerline roadways, the Cobb County Department of Transportation (Cobb DOT) manages the second-largest county-owned road network in Georgia. And while the Peach State isn't known for being the snowiest state in the US, Cobb County does face winter weather events that have a major impact on its team and residents.

Whether it's an inch of snow making for an unexpectedly slick commute, or a full-blown ice storm shutting down highways, the forward-thinking GIS team members of Cobb County recognize the complexity of winter weather events—and the importance of reacting quickly and efficiently to keep their roadways as safe as possible.

When setting out to build their readiness plans for winter weather, Cobb DOT staff focused on creating predefined treatment routes, maintaining proper

equipment for de-icing and snow removal, and establishing multiple staging areas for salt.

Knowing the challenges that are associated with any major snow event, the county also recognized the need for technology to efficiently plan road maintenance and allocate resources during inclement weather. County staff set out to find an asset management solution that would leverage the comprehensive GIS data already housed in ArcGIS.

They were looking for a solution that would address three key needs:

- A better system for documenting the progress of spreader trucks and plows—helping county leadership predict when specific roads would be cleared
- A tool for accurately planning road maintenance routes so the busiest and most crucial roads receive priority plowing and salting
- A process for informing residents when

to expect local streets to be plowed, salted, and restored to a safe travel condition

Ultimately, the county paired ArcGIS with the Cartegraph operations management system. County staff seamlessly connected the road segments feature class and traffic counts event layer in ArcGIS to their asset management software.

GIS team members used the data and mapping tools to create a response plan that ensured arterial and major routes would be prioritized and cleared first. They also prioritized services on minor roads through segment slope and traffic volume analysis. Finally, they set up web maps to communicate live, up-to-the-minute information to residents.

"Our weather events are just so different," says Lynn Biggs, GIS manager for Cobb DOT. "You never know if it's going to be snow, ice, floods, or downed trees. But whatever is happening, we need to

respond efficiently and communicate effectively. These tools help us do that.”

Also, the Cobb DOT GIS team used ArcGIS Dashboards to create a proof-of-concept dashboard that pulls automated vehicle location (AVL) tracking information in through ArcGIS GeoEvent Server. The status of routes that were cleared is updated as tasks are opened and closed in Cartegraph. The team is also testing ArcGIS Velocity to stream AVL data in the future.

When in use during a snow event, the dots in the AVL feed would update to show whether a vehicle was stopped or moving. Meanwhile, the main map in the center of the dashboard will display the status of every snow route in the county, with the color changing based on when the surface was last treated.

Cobb County’s inclement winter weather dashboard also includes gadgets with surface temperatures from Georgia Department of Transportation (GDOT), links to live camera feeds of road conditions, and real-time weather reports from Waze.

“During winter weather events, it’s really

important for our crews to know road temperature,” explains Biggs. “GDOT monitors that, and we pull that data directly into our dashboard. Those gadgets are in the upper-right corner.”

She adds that the gadget in the corner displays the work that the crews are doing, including which tasks are planned, completed, and in progress. This data is a live feed of real-time work tracking that is happening in Cartegraph.

Biggs says Cobb DOT crew members appreciate having their mission-critical data sources in one place. During snow events, they intend to display this dashboard on the big screen in their war room, so they can closely monitor the situation.

“We did a trial run this winter when there was a chance of a snow event heading our way,” notes Biggs. “Even though they weren’t actively running snow routes that day, team [members] had it up so they could keep an eye on things in case the weather shifted, and they needed to do a full-blown response. We got some great feedback on it.”

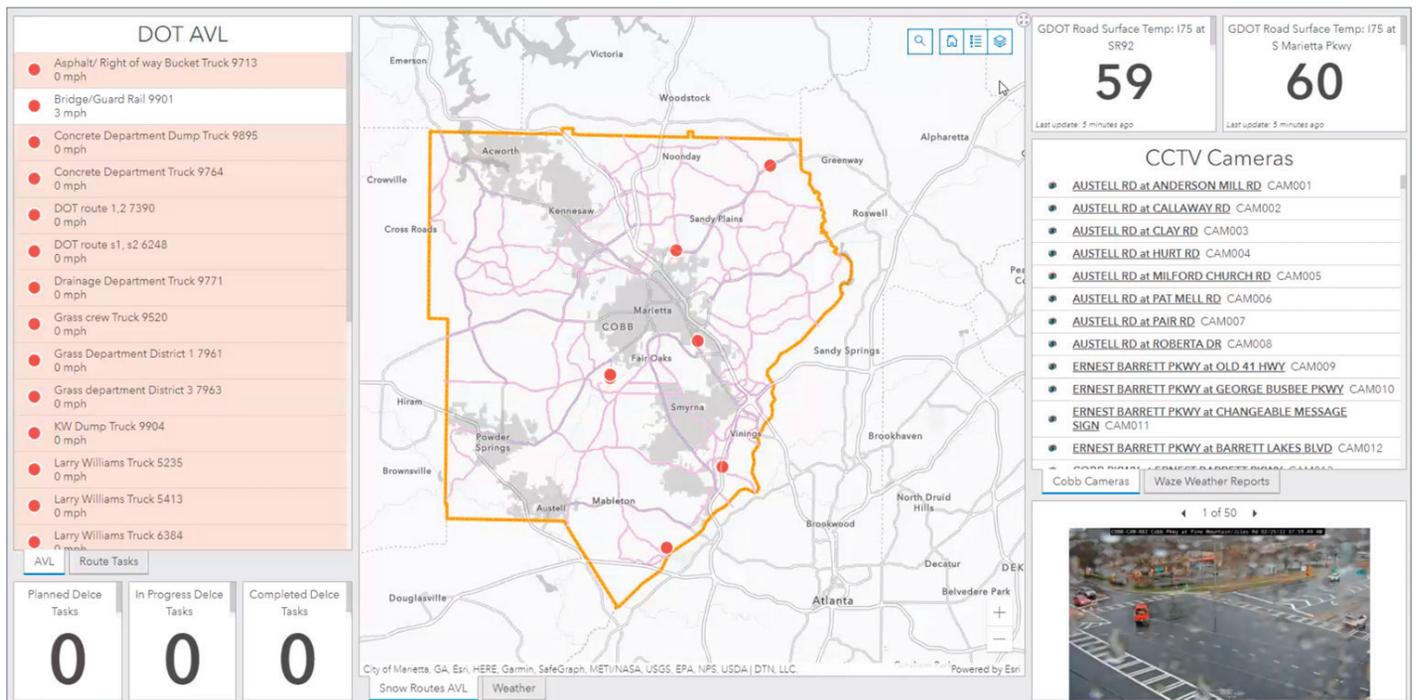
Much of the data on the internal dashboard is also available to residents

“This is truly an example of using technology to work smarter. Leveraging these technologies helped Cobb DOT streamline our response to winter weather. It’s a game changer.”

Lynn Biggs
GIS Manager, Cobb DOT

via Cobb Commute, a public-facing web map with real-time road conditions. Anyone can see when their street or route to work has been treated or when they can expect it to be safe to drive on. This keeps everyone informed and safe.

For more information on how to effectively mobilize your field crews and ensure fleet optimization, visit go.esri.com/GIS4Fleet.



↑ Cobb DOT uses this dashboard, created using ArcGIS Dashboards, to monitor its response to winter weather events. It includes a live AVL feed from ArcGIS GeoEvent Server, a real-time look at work being completed in the Cartegraph asset management system, and other critical data sources.



Decatur, Illinois, Uses GIS to Prioritize \$5 Million in Federal Funding to Revitalize Neighborhoods

The City of Decatur, Illinois, is like many cities in the Midwest in that it has seen a significant population decline. Since 1980, the city has lost over one-fourth of its population. This led to blight issues and a lack of economic activity in its downtown area. To counter this problem, the city undertook a successful downtown revitalization plan in 2017, adding new commercial projects and a new community care center, and demolishing about 90 abandoned and derelict structures.

While the downtown has seen a rebirth and the outlying areas of the city are prospering, a ring of neighborhoods in between has continued to suffer blight and lack of economic growth. These neighborhoods include about 9,000 residences, or roughly one-third of all properties in the city. Economic and Community Development director Cordaryl "Pat" Patrick and leaders at the city found an opportunity to remedy this with the release of American Rescue Plan Act of 2021 (ARPA) funds, specifically, the State and Local Fiscal Recovery Funds (SLFRF) through the US Department of the Treasury. About \$5 million of

the award was set aside specifically for residential rehabilitation grants, which can be used by individual homeowners or landlords. The looming question was, how should the funds be distributed?

That's where the city's geographic information system (GIS), led by the city's GIS administrator Seth Stark, came into play. In May 2022, the city used ArcGIS Survey123 to publish an app to the public that allowed residents to quickly and easily apply for money to rehabilitate their homes for projects such as a new roof, air conditioning, accessibility improvements, and structural repairs. Within the first day of the release of this survey, the city had received 200 applications, and over 400 by the end of the first week.

To process the applications, Stark utilized a dashboard created in ArcGIS Dashboards. This showed the number, location, and type of applications in near real time. After the applications were reviewed in mid-July, the dashboard was updated to show the status of the rehab grant applications and made available to city leaders and the public to provide transparency about the grant process. As the projects are undertaken and

completed, this information will also be updated in the dashboard. The GIS can also be used to break down activity by neighborhood boundary, census tract, and so forth.

"GIS was the right choice for tracking these residential rehab lottery

ARPA Landlord Rehab Loan Program

Property Owner(s) Name(s)*

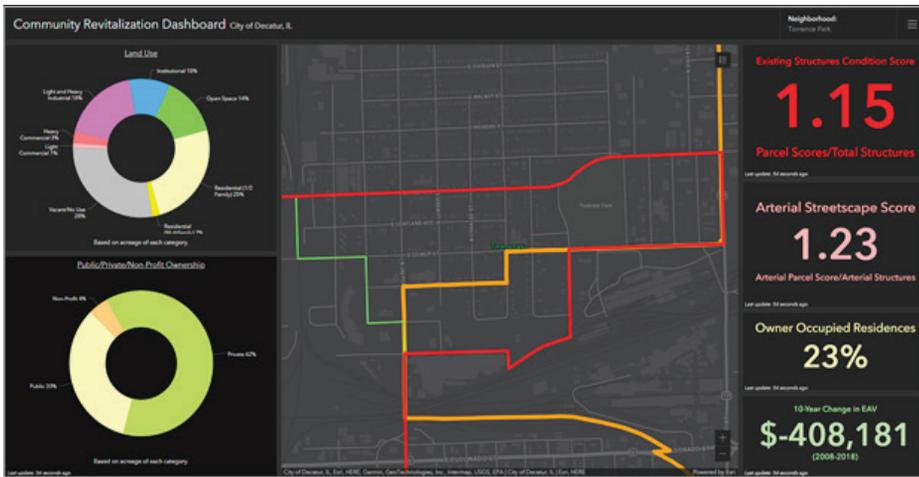
Property Address*
Zip Code
Phone Number*
Alternate Phone Number
Email Address
What type of assistance do you need most? (Check all that apply.)

Repairs (roof, porch, exterior stairs/steps, painting, masonry, foundation)

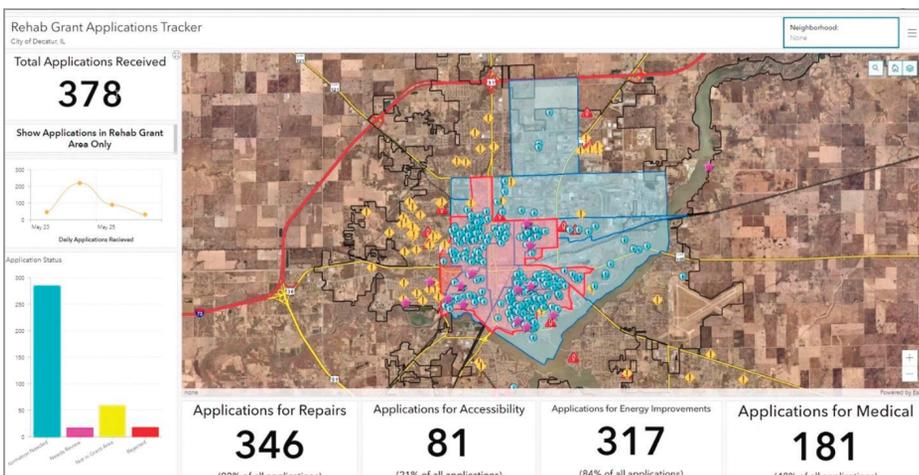
Accessibility (ramp, widening of doors, grab bars)

Energy improvements (insulation, windows, doors, siding)

[↑ ARPA Owner-Occupied Rehab Program Lottery Survey Application](#)



↑ 2019 Housing Condition Survey Dashboard (Torrence Park Neighborhood)



↑ Rehab Grant Applications Tracker Dashboard

“In 2019, we conducted a GIS-based housing condition survey, which helped us determine what areas of Decatur needed the most help with regards to revitalization. Now, we’re building on that foundation to expand on the successes we’ve had with our downtown revitalization by spreading our resources into our urban core neighborhoods. GIS continues to be the tool that simplifies collecting and analyzing information so we can make data-based decisions in our efforts to move the needle towards success in Decatur.”

Cordaryl “Pat” Patrick
 Director, Economic and Community Development, City of Decatur

applications,” said Stark. “The qualifications for grants are based on where you live within Decatur, so accepting the applications through Survey123, tracking their statuses, and analyzing where it is that the most help is needed was a natural fit for GIS.”

The goal is for the rehabilitation to include all the residents of these designated neighborhoods, which in turn will benefit all city residents, as they will see increases in property values; neighborhood attractiveness; and, likely, economic growth and development.

For updates on and examples of using GIS to align recovery efforts with federal funding objectives, visit Esri’s web page at go.esri.com/SLNstimulusfunding.

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A night-time photograph of the Houston skyline, featuring several illuminated skyscrapers and a large, modern building with a textured facade in the foreground. The scene is lit with city lights, creating a vibrant urban atmosphere.

Houston Police Department Tackles Crime with Maps and Apps

GIS technology has long been used by police to help identify crime patterns and make decisions about where and when to assign resources. But modern GIS technology can help police do much more by giving agencies the ability to create an enterprise environment that supports every police mission, including advanced analytics, dashboards to fit many needs, public engagement apps, and maps and apps that provide real-time situational awareness for officers in the field. The Houston Police Department (HPD) is one of these agencies, using enterprise GIS to save time, streamline operations, and

better serve the Houston community.

As with many other cities, Houston started 2020 enjoying a vibrant economy, but as COVID-19 continued to spread and stay-at-home orders were issued, businesses shut down and unemployment claims rose. As spring dragged into summer, many American cities, Houston included, began to experience increases in crime, including an alarming year-over-year increase in gun violence and homicides. HPD also began seeing the rising incidence of street robberies and burglaries associated with two very specific methods of identifying and targeting

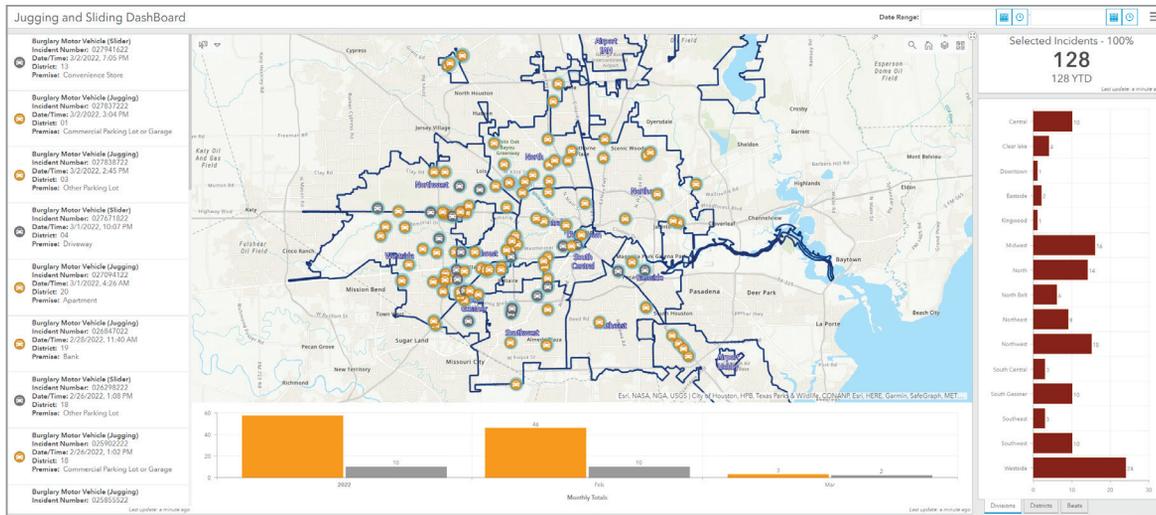
victims. These methods are known as jugging and sliding.

Jugging is when an offender identifies a potential victim whom they suspect is carrying money. Jugging is often perpetrated by watching locations such as ATMs or bank drive-throughs for potential targets. The offender then follows the victim to another location with the intent of robbing them or burglarizing their vehicle or residence. The common factor in jugging is not the crime incident type but how the victim is identified and followed before the commission of the crime. Tracking jugging incidents can be difficult because the victim will not typically know that they were followed, and the incident will be reported as either a robbery or a burglary.

Sliding is another crime pattern that has increased in Houston, in which offenders target victims while they are stopped at gas stations and preoccupied with paying and filling their tanks at fuel pumps. The modus operandi of these kinds of thefts usually involves two or more perpetrators. The suspect vehicle, often with tinted windows to conceal a back seat passenger, pulls alongside the



↑ HPD officers are able to analyze patterns and incident hot spots by using purpose-driven maps and apps.



← Understanding where incidents occur helps HPD save time in addressing crime surges and allocating resources.

victim's vehicle; the perpetrators then quickly enter—slide into—the targeted car and steal whatever they can grab while the victim is distracted at the pump. The suspects then drive away before the victim even knows what has happened. As with jugging, sliding can be hard to identify, and incidents are often underreported or reported as other crime types.

In response to these new and disturbing crime trends, HPD's GIS unit needed to get data and analysis into the hands of officers as quickly and efficiently as possible. The HPD crime suppression teams (CST) are dedicated tactical units that consist of one sergeant and eight officers who work together using analysis to identify crime trends and patterns and proactive policing methods to reduce

The primary goal for our unit is to make our customer's life easier. The application made our patrol officers' jobs much easier and more efficient while they were out in the field. Being able to add new information is a huge improvement.

Lt. Fredrick Croft
Houston Police Department

criminal activity. But they needed a better way to put analytical products into officers' hands. The HPD GIS unit was tasked with creating a mobile application that would help the officers get the most current information and promote situational awareness for all team members. The finished product is a dashboard that provides CST officers with an all-in-one self-service app that includes a map of current and historic jugging and sliding incidents and the ability to filter by incident type. Officers can also read reports within the dashboard without having to open another application. CST members can now have access to all of the information and analysis they need in the field where they need it.

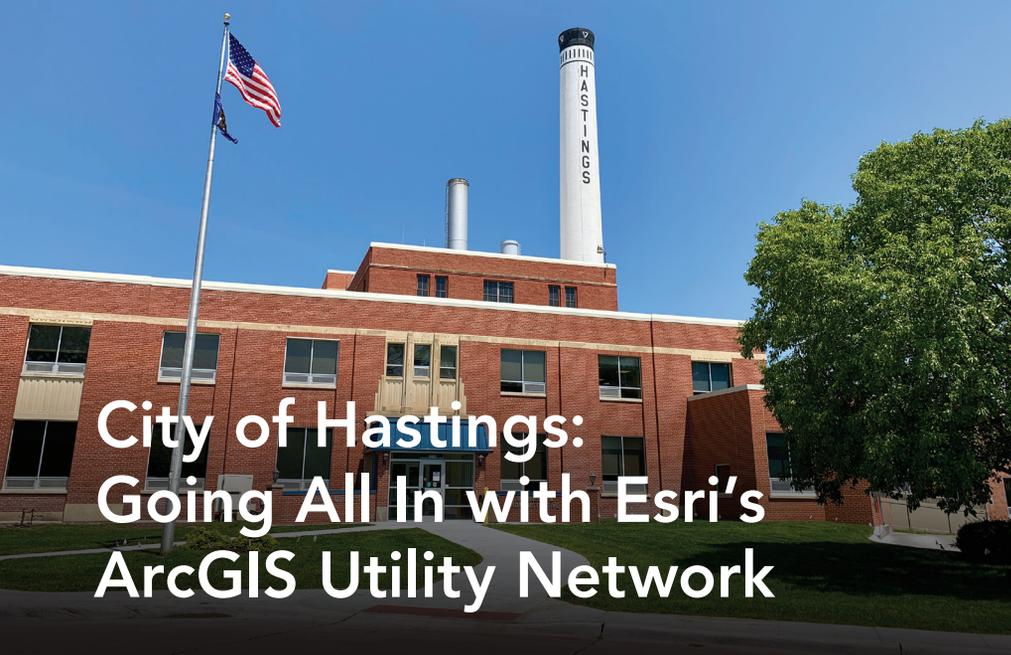
According to Lt. Freddy Croft, the GIS unit supervisor, "Staff wanted a way to do things out in the field such as capturing data on-site and taking photos. The new app made data management much easier. Officers can use the app in their cars when on patrol. This saves time on data gathering, organizing, and presentation by the analysts. To get the information that is now automated through this application, analysts would spend two hours a day providing what this application offers instantaneously." Officers now have the tools they need to answer *when* and *where* questions so that they can focus on the *who* while conducting investigations.

This mission-focused app put the power of analytics in the hands of

nontechnical users, but a one-size-fits-all approach doesn't work for all the agency's needs. Using the same technology, the GIS unit has the flexibility it needs to build purpose-driven apps that fit the needs of the current agency missions it is supporting today, as well as the unforeseen missions of tomorrow. As new projects and requests come in, the GIS unit responds by identifying the appropriate tools to fit new missions and end-user needs. Other applications they have created include dashboards that show recent crime hot spots, current calls for service, and gang information—all of which is available at officers' fingertips on their in-car computers or via their mobile devices.

As the HPD GIS unit has become more proficient at building these types of apps, staff have also been able to assist units and teams within HPD and help them identify the best GIS applications to fit specific agency needs. Many of the ideas generated by the creation of the CST app are also making it possible to share information and best practices with other agencies and GIS users in the Houston community. The technology has the flexibility to fit any mission; the key has been starting the conversation and identifying the need.

To learn more about how ArcGIS can meet your law enforcement mission, visit go.esri.com/Houston-PD-GIS.



City of Hastings: Going All In with Esri's ArcGIS Utility Network

The City of Hastings, Nebraska, serves a community of 25,000 people with all their utility needs: water, sewer, gas, and electricity. With Hastings' expanding and aging utility infrastructure, the city wanted to take its GIS to the next level in order to provide extensive data to employees in the office and the field; be able to provide analytic data for project planning, replacement programs, and inspections; and integrate electric service with outage management and advanced metering infrastructure (AMI) systems. All of this would require eliminating paper-based workflows and moving to digital data collection in the field so that updates are made and viewable by staff daily.

Lindsey Stone, GIS coordinator for the City of Hastings, had started at the city using GIS for land management. Her role grew when she began managing the utility GIS data as well, and there was work to be done in order to achieve the goals the city had identified.

GIS infrastructure for utility services was previously maintained using a combination of CAD drawings, GIS records, paper forms, and Excel documents. The data was not organized in a consistent manner, which caused concern about reports' accuracy. Also, there were several aspects of data completely missing from the GIS dataset and only being kept on AutoCAD files. For example, the electric system only had medium-voltage lines and no devices in the GIS. In most

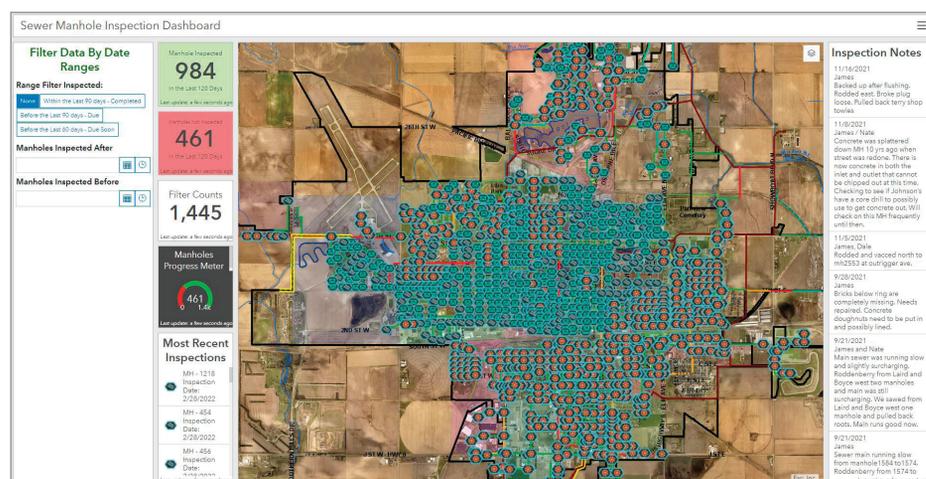
cases, updates regarding the types and locations of assets were being given via paper forms and hand-drawn pictures and, at times, took months to be entered into GIS. This way of doing things was not going to support requests made by staff. The city needed to undertake a massive cleanup and collection of data to fill in the gaps.

Paving the Way Forward

Stone knew she wanted all four of the services to have similar database structures and naming conventions. This would make data maintenance consistent across all services. In addition, staff requested the ability to do inspections and run reports for replacement programs. To determine the best way forward, Stone reached out to several

utility companies and municipalities in the Midwest, asking them how they maintain their utility services and what they did to get their data into GIS. Several companies reported that they were currently using Esri's geometric network and would be converting to Esri's ArcGIS Utility Network due to the geometric network's upcoming end of life. She also talked with several companies on how to convert the city's current CAD drawings into GIS or GPS data in the field, knowing that it would take years to complete if staff relied solely on an already busy workforce.

Ultimately, Hastings decided to convert its data into ArcGIS Utility Network because it provided technology that would support the city's multiple utilities for years to come. In addition, ArcGIS Utility Network has an out-of-the-box data schema with preloaded fields and domains for each service as well as the similar setups the city was looking for. This schema would allow for the consistent data management that staff wanted, along with the capabilities of built-in inspection and maintenance-related tables that could be utilized in the field. In addition, it opens up the opportunity for the GIS to be expandable, with many fields and domains already in place for data that Hastings doesn't currently collect but could in the future as the GIS develops.



↑ Dashboards are used to monitor and prioritize work.

Partnering Up

In order to reach the goals of converting all four utility services to ArcGIS Utility Network and obtain the massive amount of missing data from within the electric system, Hastings staff knew they needed help without overloading the budget.

First, staff needed knowledge on how to deploy ArcGIS Utility Network—which they had no experience in—for each of the utility services. After several interviews with Esri, ArcGIS Utility Network users and other specialists, Hastings decided to collaborate with GISinc—now known as Axim Geospatial—because of the company’s unique product, called Jumpstart Package. Axim would teach city staff as well as guide and review one deployment of ArcGIS Utility Network side-by-side with Hastings, instead of just doing all the work and then handing it back to Hastings. This placed the workload in Hastings employees’ hands, enabling them to learn as the ArcGIS Utility Network deployment was developed. Since the water dataset was the most complete, they started with that, and by the end of the project with Axim, Hastings staff were able to understand the requirements, configure and migrate the existing data, deploy a brand-new ArcGIS Utility Network implementation, and maintain it all by themselves. This gave the City of Hastings the opportunity to deploy ArcGIS Utility Network in the sewer and electrical utilities without spending additional budgetary resources on any outside companies’ assistance.

Secondly, the City of Hastings knew it needed to get all its missing electrical data into GIS in a timely manner. Since staff resources were limited, Hastings contracted with Midland GIS Solutions—now known as SAM, LLC—to locate and map the city’s entire electric network. SAM used GPS devices to collect asset locations and data for over 12,000 poles and devices attached to poles or pad mounts and over 300 miles of high-, medium-, and low-voltage lines. This gave Hastings an extreme leap ahead in terms of the data that staff needed

in order to implement ArcGIS Utility Network and meet the requirements for a future outage management system.

Improving Workflows

With the water and sewer utilities’ deployments of ArcGIS Utility Network, Hastings has given employees the data they need with a high level of detail viewable in the office and the field. What used to take employees days to filter out through dated drawings and Excel spreadsheets can now easily be filtered through GIS, giving them greater resources for project planning and replacement programs. Field crews use ArcGIS Field Maps on iPads that are paired with external GPS receivers. The crews collect service line and device locations along with information such as size, installation dates, and models at the time of installation. This process increases the level of accuracy of spatial and attribute data and gives the updated information to all employees instantly via web maps, instead of taking months to get updates via handwritten forms and maps from the field to GIS. The water and sewer services have taken their inspection programs from paper forms and lists to inspections being inserted directly into ArcGIS Utility Network technology-related tables via Field Maps. Supervisors and staff then use ArcGIS Dashboards to pinpoint where they need to go next as well as to see any patterns of problem areas. The electric service has deployed streetlight replacement programs that utilize Field Maps and Dashboards; previously, staff used Excel worksheets and paper forms to track the programs’ progress. The staff mindset of using the GIS has gone from thinking, “Here is a nice map of where the service is,” to envisioning what GIS can do next to improve efficiency and quality of work.

“We’ve utilized the GIS software to provide exclusive, interactive maps for our two most severe events in water/sewer. We have generated a water main break map with about 35 years of data and a sewer main backup map utilizing about

25 years of paper reports. With these tools, we are able to report new events in real time direct to the software, [and] we are able to visually inspect the community for patterns/problem areas and more efficiently plan for budgets regarding system upkeep and replacement,” said Brandan Lubken, Water and Wastewater superintendent at the City of Hastings.

Discovering What the Future Brings

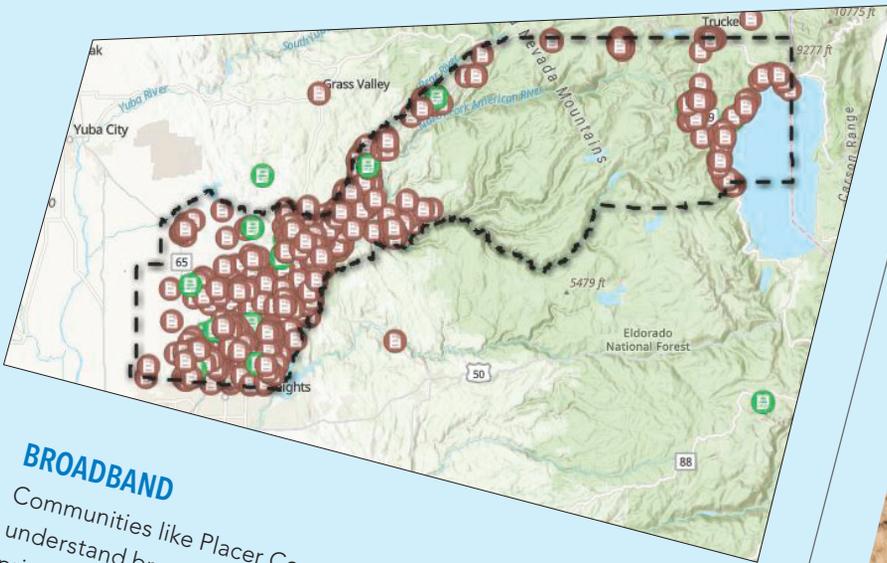
Currently, the City of Hastings is collecting additional data required by its outage management system vendor and plans on having that system deployed this year. Staff have already been discussing the implementation of an additional maintenance and inspection program for the electrical system. Hastings has started deploying ArcGIS Utility Network for the gas service—the last of the city’s four utility services—and plans on completing the deployment by the end of the year.

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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.

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BROADBAND

Communities like Placer County, California, are leveraging GIS to understand broadband coverage, address gaps in service, and prioritize funds to address vulnerable populations.



TRANSPORTATION

Massachusetts Department of Transportation developed the Massachusetts Project Intake Tool (MaPIT), a GIS-based application that simplifies project review, approval, and execution. MaPIT allows decision-makers to mitigate issues early on, monitor environmental impacts, better coordinate with local governments, and ensure equitability.



WATER

With new federal rules aimed at ridding US drinking water of lead contamination, communities like Benton Harbor, Michigan, are turning to GIS to accelerate data collection and coordination of pipe inventories and to manage the replacement of lead service lines.



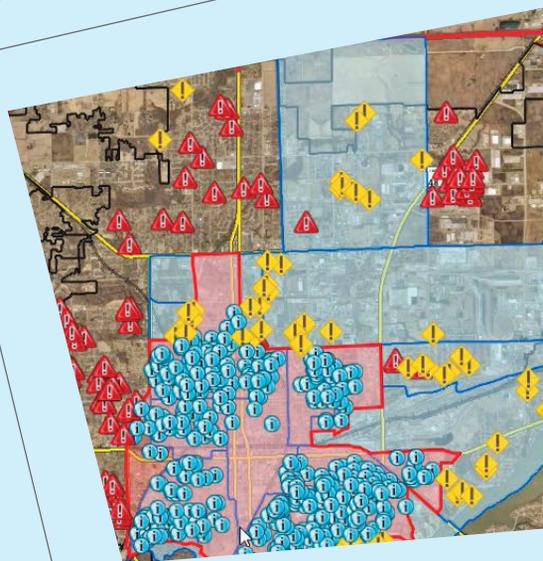
INFRASTRUCTURE IS A TERM GOVERNMENTS DO EVERY DAY

Governments must maintain, expand, and improve our physical and organizational structures to provide a better quality of life for residents. These infrastructure systems allow us to deliver services and utilities, improve mobility, address the digital divide, attain health equity, achieve affordable housing, and establish a balance between the natural and built environments. None of this is new; but what is new is the recent hyperfunding, the heightened attention, and the emerging technologies and advancements—like broadband and electric vehicles (EVs)—that are forcing governments to not only rebuild our infrastructure but also rethink and reimagine what it should be.



RIGHT-OF-WAY

Governments must have their right-of-way (ROW) mapped and the process streamlined, or they will likely encounter roadblocks that deter and slow investment. Utah Department of Transportation (UDOT) has integrated GIS into ROW management to ensure streamlined land acquisition, understand how assets and projects impact surrounding parcels, and increase revenue opportunities by leasing unused properties.



PLANNING

The City of Decatur, Illinois, secured \$5 million in American Rescue Plan Act of 2021 (ARPA) funds and launched a GIS application that simplified the process for homeowners to apply for monies to rehabilitate their properties.

M FOR EVERYTHING DAY

Jurisdictions that continue to take advantage of GIS and its capabilities will have a quick solution to infrastructure challenges in their communities. GIS has always been and will always be a decision-making tool to help governments understand needs, prioritize resources, address equity, and ensure sustainability. And it will continue to help governments address federal priorities. The following are just a few examples of proven ways GIS has supported and can continue to support the infrastructure systems in our communities (but we're guessing you already knew all this).

For more information on how Esri technology aligns with funding objectives to help communities maintain and repair their infrastructure, visit

go.esri.com/GIS-Infrastructure.



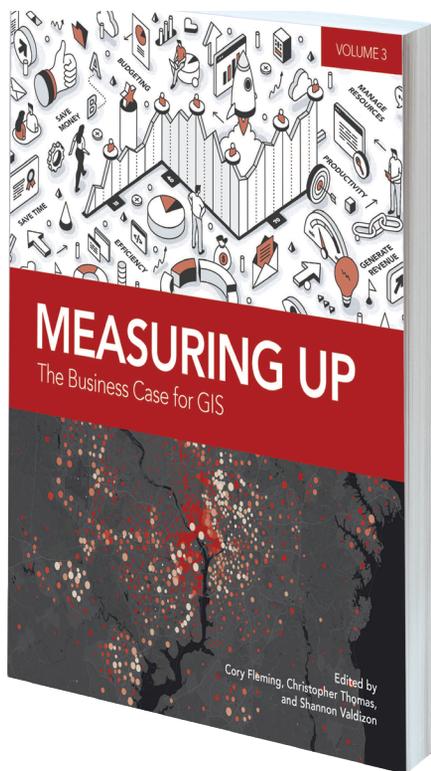
ENVIRONMENT AND NATURAL RESOURCES

The Montana Department of Natural Resources and Conservation was tasked with distributing \$900 million in ARPA funds and used maps and dashboards to strategically manage allocation of funds to both larger and smaller communities.



HEALTH AND HUMAN SERVICES

Organizations like San Bernardino County, California, Department of Public Health are tasked with doing more with less. Challenged by a large homeless population, the county leverages GIS tools to conduct point-in-time counts, identify gaps in services, and bring resources directly to those needing assistance.



Does Your Work Measure Up?

If you're reading this, you likely already know that GIS is a prolific technology. It has helped thousands of organizations unlock the full potential of their data to remain agile, improve services, and meet new challenges. But sometimes, we forget the importance of sharing and promoting our GIS work. We forget to stop and take the time to analyze what is working, what is not, and if anyone else is seeing our work.

Many years ago, we recognized this common challenge and wanted to help GIS professionals and their organizations be better equipped to demonstrate the return on investment (ROI) that can be realized with GIS. This culminated in the first edition of *Measuring Up: The Business Case for*

GIS, a resource that helps demonstrate the benefits of GIS to your leadership, shows best practices of GIS use that can help others justify expenditure on the technology, and provides you with examples to help calculate and document return on investment from GIS.

We just released the third edition of this wildly popular resource, *Measuring Up: The Business Case for GIS, Volume 3*, with updated content, stories, and best practices. In it, you will find the 10 most common and repeatable benefits organizations have realized from GIS, accompanied with examples from your peers.

Get your copy today, and see how your peers are making the business case for GIS within their organizations: go.esri.com/GIS4MU.

Ten Ways to Demonstrate Return on Investment from GIS

1. SAVING TIME

Time saved is typically the first and most reported benefit. It comes from automated mapping, mobile data collection, and a move to real-time decision-making.



Arizona Department of Environmental Quality solid waste team (SWT) inspects 1,500 facilities statewide. Using GIS tools and web apps, they demonstrated a 35 to 65 percent reduction in field inspections.

2. SAVING MONEY

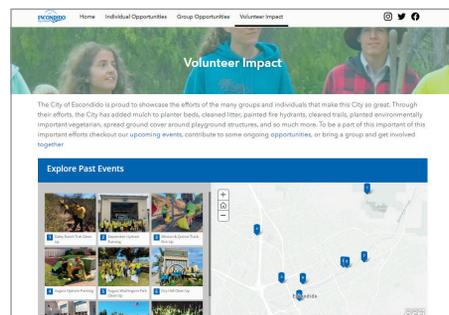
Monies can be saved by removing duplicated data entry, implementing self-service information models, improving navigation to reduce the number of vehicles needed, and optimizing location of services to eliminate poorly performing or less-trafficked locations.



Rural Lorain County Water Authority (RLCWA), Ohio, leveraged GIS to switch out 19,000 existing water meters with new smart meters, enabling the water district to save \$1.5 million.

3. AVOIDING COSTS

Bringing GIS operations in-house can eliminate costly third-party support, improving maintenance routines can prevent costly breaks or repairs, and optimizing routing can reduce fuel and mileage costs.



The City of Escondido, California, has secured the talent and time of over 1,500 volunteers who donated 60,000 hours of community service using ArcGIS Hub, which resulted in a cost avoidance of \$1.5 million.

4. INCREASING ACCURACY

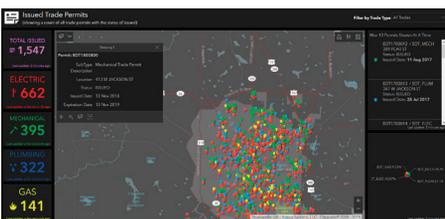
Integrating new precision-support technologies, such as drones, remote sensing, GPS/Global Navigation Satellite System (GNSS), and laser measurement devices, increases the validity of GIS databases. Data derived from location-aware apps and sensors is replacing reliance on paper and providing greater situational awareness.



Sarasota, Florida, uses GIS to increase accuracy while traditional workloads decrease during the COVID-19 crisis.

5. IMPROVING PRODUCTIVITY

GIS can increase the number of assets inventoried or number of inspections handled in a day. It can help maximize staff output by enhancing the accuracy of data collection, reducing decision-making time to mobilize staff and allocate resources, and allowing the use of complementary technologies to augment workflows.



City leaders in Thomasville, Georgia, calculated that several utility departments spent 456 hours each year looking through paperwork to find work history data. With the implementation of its new GIS apps, the city estimates a 25 percent productivity gain overall, with a cost savings of just under \$20,000.

6. GENERATING REVENUE

GIS ensures that revenue collections are optimized and individuals and businesses are being fairly taxed. Geoaudits can help find escaped monies or identify unlicensed businesses and their associated taxes. Organizations can manage the taxing of drone flights or levy fines on displaced e-scooters and bikes.



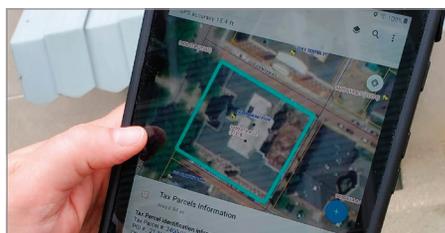
Tippecanoe County, Indiana, identified an additional \$1.86 billion in property value between 2019 and 2020 by conducting more accurate property assessments.

7. INCREASING EFFICIENCY

Efficiency measures the optimization of resources. Improved routing can reduce the number of vehicles and drivers required. Applying GIS for modernization can lower response times in calls for emergency service or pothole patching.

8. AUTOMATING WORKFLOWS

Field data collection is feeding central repositories and business systems; mobile workers are reducing time spent



The assessor's office in Crawford County, Pennsylvania, improved its manual assessment workflows with mobile GIS tools, thus saving the county \$17,000 a year for the cost of mobile work.

in the field through access to information on-site; routine analysis and queries are being automated; and inquiries from the public are handled through GIS-based personal assistant queries. Machine learning and artificial intelligence are automating and predicting workloads and maintenance.

9. MANAGING RESOURCES

GIS is helping bring back declining habitats, restoring and protecting endangered species, and mitigating wildfires and flooding. GIS is critical for asset management, helping organizations design, inventory, and maintain control over infrastructure. GIS is helping to forecast and control materials and funding. And indoor GIS is improving facilities management.

10. AIDING IN BUDGETING

GIS can help calculate fee structures, estimate revenue streams, and forecast expenditures. It helps organizations understand where revenues come from. Place-based budgeting allows the comparison of past budget allocations to address social equity, civic inclusion, and accessibility.



Potter County, Pennsylvania, is using GIS to understand gaps in broadband coverage in order to identify where the need is greatest and negotiate with area service providers to expand access.

Driving toward Equity in Addressing Community Mobility

continued from page 1

jointly plan, fund, and implement regional initiatives.”

One challenge for Centralina is the diversity of the region, comprising not only cities but also rural areas that want to preserve their unique character. As Nance put it, “A core value of this work was ensuring that communities are able to retain their individual identities, which includes understanding populations in terms of their numbers and population makeup.”

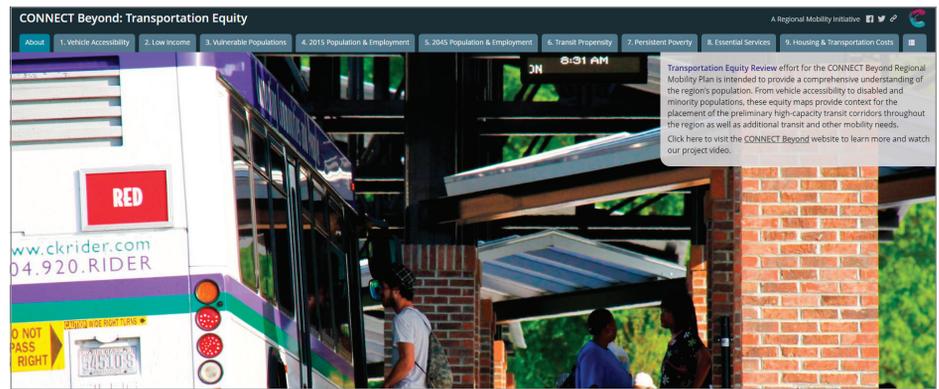
“Equity and inclusion are fundamental components of the American Institute of Certified Planners’ [AICP] ethical principles,” Nance said. “Those principles encourage practitioners to plan for those here now, plan for those in the future, and serve both the public interest and disadvantaged communities.”

Addressing mobility and equity for a highly diverse region is not a clear and simple task. “When you talk about transit, there’s the question of who, regionally, really needs it,” Nance said. “We needed up-front data to better understand, and that’s the need that this equity website helps us address.”

Understanding Equity

When addressing equity and accessibility of transportation in the region, the area’s diversity is itself a challenge. The Charlotte region can be defined by its metropolitan center. However, across CONNECT Beyond’s region, 75 percent of communities have 10,000 residents or fewer, with a very rapid transition from downtown into a surrounding ring of communities, towns, and villages.

Key to that process was understanding the unique character of each community and its demographics. “It’s not just about how communities look but also about their economic drivers,” Nance said. “Many of our smaller communities are very focused on manufacturing. The assumption throughout the pandemic has been that suddenly we’re all working from home, but that’s not the case. In



addition to essential workers in schools and hospitals, there are those who need to be somewhere because they actually have to make something.”

Safety was also a major consideration. “We’re in the southern part of the US, and oftentimes equity discussions are limited to race or economic station, but there were other equity components built into the transit work,” Nance said. “Gender, for example, is another criteria; safety is an issue, whether real or perceived, and we wanted to make sure that women felt safe using transit.”

That had less to do with previous issues, she notes, and more to do with being able to address any concerns head-on and proactively. It led to core recommendations relating to the built environment around transit stops/stations and mobility hubs, such as lighting and the proximity of call boxes—granular considerations in some respects, but resulting in the kind of ground-level outcomes that truly influence public acceptance and support.

The needs of a significant rural population highlight the importance of cross-county connections. Not all counties have hospitals with maternity services, for instance. Access to education was another major influence, as several counties have no public four-year university. Transit facilitates social activity and social mobility.

“It’s hard for many of our folks to see past the two-year degree,” Nance states, “but if we can improve our cross-county

transportation connections, then people will be able to save money by living at home and still gain a better education. That’s important because even in a pandemic setting, not all courses have become virtual.”

HDR, a consulting agency, supported the plan’s development, including providing analysis to identify areas of greatest need. “We had a panel that worked through the meaning of equity, including jurisdictional equity,” said Jorge Luna, HDR’s CONNECT Beyond project manager. “A question [the panel] addressed was, ‘What improvements are coming to my area in comparison to the greater region?’”

Luna added they were trying to identify the most transit-dependent areas and prioritize improvements in those areas.

“With the Center for Neighborhood Technology, we looked at how much money individuals in each area spent on housing and transportation,” Luna said. “The rule of thumb here is that it should be no more than a third of a household’s income. People were spending too much in areas that were transit dependent. As a result, we looked at how to align the recommendations to ease that burden and allow access to opportunities inside a 30–60 minute transit window.”

Another aspect is seniors and their locations. The aim is to enable people to retain their independence as late into life as possible without dependency on caregivers. Each of the 12 counties

in CONNECT Beyond's region has its own human services transit agency, and in a cross-county environment, better coordination is a must. Travel must be seamless, with each human services agency understanding how to merge into the fixed-route systems for travel to major destinations. That requires a high level of coordination and integration of timetables across multiple transit agencies (17 in this case) and, in turn, highlights the need for better integration and reconciliation of payments and fares between agencies.

Data and the Website

Luna and Nance both note that it was important for individual communities to be able to see themselves within the overall plan. This was not necessarily straightforward, as each community was at a different developmental stage.

CONNECT Beyond's portal was created to host project information and be used by counties as a resource for future planning—"empowering them when going after grants," states Jason Wager, Centralina assistant regional planning director and CONNECT Beyond project manager. "[The intent of the portal] was to help find areas of persistent poverty to which the federal government is more inclined to give grants; to search out transit deserts or disconnects; or to locate where future population growth was forecasted but no transit [was] currently planned."

"Providing that visibility resulted in a

big range of data tools to fit the perspectives of each community within the region," Luna said. "There's also a menu of recommendations for each local agency within the plan."

The use of data came to the forefront when deciding where high-capacity transit lines should be located. The existing CATS 2030 Transit Corridor System Plan provided a good basis on which to build in terms of where to extend high-frequency light-rail and bus rapid transit services.

"We had to be able to point to data to show where the one-car households, the areas of persistent poverty, and [the] high concentrations of senior citizens are," Nance said. "Those hot spots led to the creation of mobility hubs along existing and future transit corridors."

"In terms of the data, it was fascinating to correlate census information with all of the other elements," said Bridget Wagner, HDR's GIS manager for the CONNECT Beyond project. "Bringing it together with the housing/transportation affordability index and regional data on population and employment resulted in standardized data, but with some very specific regional variables."

Not only has that enabled the planning team to extrapolate need out to 2045, it has also led to the creation of a Transit Propensity Index—extremely useful for planning purposes. The planning team, Wagner continues, was fortunate in having a relatively large study region to work on. In this instance, size was a

blessing because it enabled overlays of data and helped true patterns emerge.

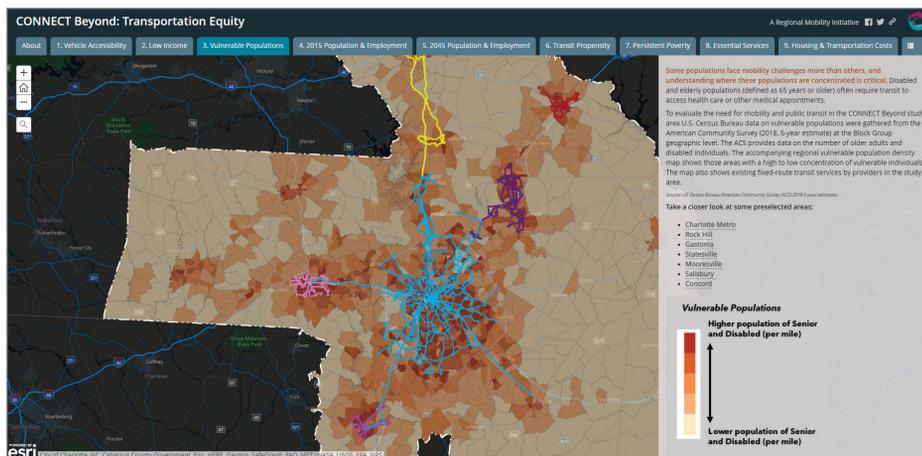
Transit propensity is a multifactor analysis approach used to identify where in the study area there are populations with the greatest need for transit. The Transit Propensity Tool combines socioeconomic characteristics including minor, senior, low-income, and disabled populations as well as zero- and one-vehicle households. The distribution of vulnerable populations and children under 18 years of age are also included in the propensity analysis. The cumulative transit propensity score combines the existing density values for all these demographic categories to illustrate, from high to low, the areas where existing transit need is greatest.

Wagner said Esri's support was fundamental across the project. "We utilized ArcGIS Online from the start—internally, to share project data and to convey development of the corridors. ArcGIS Web AppBuilder was used for storyboarding purposes, to take information into the public, and to communicate with regional planning organizations and other key stakeholders. This project was planned [before the COVID-19 pandemic] and was to be very much person-to-person. Our entire approach had to pivot and become virtual. The Esri platform was critical to our success."

Timing

CONNECT Beyond comes at an opportune time, according to Nance. "Federal funding opportunities are requiring communities to speak to the equity issue. The hope is that at the local level, communities applying for funding will use the portal—to not have to go to multiple sources, but come to it for the propensity index and use the tool to determine local need," Nance said.

"The MPOs—the subregions—are well-positioned to use the data," Nance continued. "Our hope is that by making this data readily available, areas of need at least receive their share of funding, whereas maybe in the past they haven't."





Stark County, Ohio, Deploys GIS Solutions to Tackle Complex Health Crises

Picture, if you will, your community facing multiple crises all at once. Your response is constrained due to limited resources. At the same time, your teams are facing issues you have never experienced in your career, like an unprecedented pandemic. The crises are equally critical, and you clearly must respond quickly.

This was the exact scenario the Stark County Health Department was facing. Stark County, a rural community in northeast Ohio, was experiencing the highest number of opioid-related deaths on record. Then the COVID-19 pandemic hit, with both crises now impacting and compounding the other. During the triage, the county officials knew they had to get the pandemic under control but somehow still address the numerous deaths and overdoses caused by opioid misuse. Faced with a shortage of resources and staff, the health department leadership needed to find a way to monitor the crises and make better-informed decisions on where to allocate scarce resources.

For the past 15 years, the Environmental Health Services (EHS) at the Stark Health Department has used geographic information system (GIS) technology. Then the department discovered that GIS technology was being used across the country as a mission-critical tool for communicating information and responding to the pandemic. So Stark County decided

to embrace GIS technology to battle the pandemic and opioid crises.

A Need for Location-Driven Solutions

As response times were becoming even more critical due to the pandemic, the health department team partnered with the GIS staff in Stark County's Auditors Office for assistance. The collaboration helped the health team navigate and quickly respond to the pandemic. Leveraging the GIS team's expertise, the health department set up COVID-19 contact tracing protocols and later equitable vaccination distribution that included mobile vaccination clinics to expand access to vulnerable communities. The collaboration also created its first public communication tool, the Business Safety Initiative, which allowed businesses to apply for items needed to improve safety during COVID-19. The team used ArcGIS Hub, an easy-to-configure cloud platform that organizes people, data, and tools, to create its site.

The next step in developing an effective emergency response system was to take the lessons learned and apply the knowledge to the county's core health functions. While the department had limited health professionals with GIS knowledge, it did have a growing understanding of the power of how a geographic lens could support activities

such as data collection, analysis, decision support, and public engagement.

Seeing how the power of location intelligence created targeted solutions for the pandemic, the health department hired a GIS health specialist to develop GIS solutions to mitigate the effects of the pandemic, including opioid misuse that was still heavily claiming lives in the county.

Leveraging GIS Tools to Combat Multiple Health Crises

In November 2020, the health department hired Jorian Krob, MS, a GIS specialist, to bring the necessary geospatial literacy to help the county combat multiple health crises. She joined the drug overdose prevention team, tasked with tackling the opioid epidemic in Stark County. This team had to understand how challenges such as an absence of social support, family history, socioeconomic status, job insecurity, or peer pressure could push someone to drug misuse. And all these challenges were compounded and magnified by the COVID-19 pandemic.

Krob started by mapping overdose deaths using ArcGIS Pro, a desktop GIS application that can analyze data from multiple sources and visualize it in a single project-based workflow. Determining where the overdoses were occurring allowed the health department to localize its efforts and allocate its resources to the most affected areas.

The health department understood that to combat this health crisis, it could not do it alone; it would need to educate the public on the issue, partner with local groups who could provide resources, and create a space where drug-dependent individuals could seek assistance.

Krob utilized the Opioid Epidemic Outreach solution, a set of preconfigured applications and maps that allowed the county to quickly index local prevention and treatment resources. The solution helped launch Save Stark, a public information site created using ArcGIS Hub. The site allowed the health department to communicate the severity of the

epidemic in the community; promote resources available to those in need; and share real-time data and resources from local health organizations, emergency management, and local nonprofits.

“The Opioid Epidemic Outreach solution allowed us to combat this issue from all angles, which is exactly what we needed. It was so easy to use that other counties are now reaching out and looking to set up their own hub site,” said Krob.

Providing the Community with Tools and Analysis to Make a Difference

A complex issue like the opioid epidemic requires a large effort toward finding a solution. For example, the health department needs to educate the public on the many contributing factors that may lead to drug misuse, help break the stigma around substance misuse, and increase transparency regarding the impact of the epidemic on the local community.

To navigate this complexity, the health department brought on its communications specialist, Chris Cugini, MPH, to help craft the hub site messaging using inclusive language that promotes education and provides knowledge about how to seek help without feeling ashamed or judged for struggling with a substance use disorder.

“Most campaigns we came across talked *about* the people facing addiction instead of *to* the people facing addiction. So we wanted to tailor this differently to break that stigma we see around substance use disorders,” stated Cugini.

GIS allowed Krob and Cugini to work collaboratively and share their location-based solutions to their communities via the Save Stark hub site.

Stark County wanted to provide resources that the public could easily find. Using maps and analysis, the county aligned the hub site around three major areas:

1. Prevention

- To prevent unused medications from being misused, Stark County used



↑ The public-facing opioid awareness maps dashboard provides full transparency on the local status of the epidemic.

the Opioid Resource Inventory to map drug drop-off locators, where the community could search by address or zoom in to an area on the map to find drug drop-off locations near them.

- Preventing addiction is difficult once you have already started taking opioids. So the county built an alternative pain management locator, where the community can find facilities near them that offer alternatives to opioids.

2. Treatment and recovery

- To connect those in need with available resources near them, Stark County mapped treatment and support centers, using the Opioid Resource Inventory.

3. Harm reduction

- Focused on minimizing the harmful effects of drug misuse, Stark County created a locator to find naloxone, an effective tool to help reverse overdoses and save lives. Community members can type their address to find facilities or providers that carry naloxone near them.

GIS Provides Solutions to Complex Issues

Complex issues like the opioid epidemic do not have easy solutions. But by using GIS, finding solutions is made easier. Stark County was able to

inventory prevention and treatment resources, communicate the severity of the epidemic, and promote resources available to those in need all with the Opioid Epidemic Outreach solution. The county also used GIS to find opioid overdose patterns and then tailor its solutions to the trends it was seeing and collaborate internally with other staff to effectively apply these solutions.

Seeing how GIS provides data-driven insight and allows cross-department collaboration, the county is looking to use GIS for many future projects such as their fatality review boards, women’s health initiatives, and smoking cessation programs. Currently this data is being manually recorded and updated via spreadsheets. The county has already received community feedback on important issues and has since launched Dear Stark Women, a hub site created using ArcGIS. The site provides resources and maps for affordable care, reproductive care, and many other valuable resources.

Stark County’s geographic approach allowed it to effortlessly collaborate between internal teams and develop GIS tools to effectively improve public health. The county hopes to leverage the power of GIS for all future health matters.

To learn how you can also combat the opioid epidemic in your community with GIS, visit go.esri.com/stark-health.



New Mexico Maps Climate Risks to Inform Climate Action

Long before Spanish-Mexican settlers arrived in what is now New Mexico, people had farmed the land for centuries. They devised sustainable dry-land farming practices that included irrigation canals and fields rich with porous volcanic pumice to absorb water and slowly release it. Like indigenous people elsewhere, native New Mexicans thrived by working with the unique attributes of their land.

Today those attributes are changing. Drought and rising temperatures are causing wells and drainage ditches to go dry and forcing tough decisions about how to adapt. In some areas of the state, early shutoff of irrigation water, along with steep rises in costs of fuel and fertilizer, mean that many farmers could lose their land.

To help all New Mexicans prepare for uncertain climate outcomes, a team of scientists, technologists, and resource specialists launched the New Mexico Climate Risk Map. Experts at Energy, Minerals and Natural Resources Department (EMNRD) teamed with the Earth Data Analysis Center (EDAC) at the

University of New Mexico. Using geographic information system (GIS) technology, they aggregated and analyzed data to create the interactive map.

The map allows anyone to explore the worst outcomes of rising temperatures—drought, heat, flooding, degrading air quality, and wildfire—noting where and who will face heightened risks from these hardships. Communities can use the map to visualize climate pressures and see where they will have to make hard decisions to adapt.

Taking Climate Action against Compounding Problems

“Fires can harm habitat and create conditions that cause major floods that impact drinking water quality,” said Maria Lohmann, who coordinates the New Mexico Climate Change Task Force led by cochairs EMNRD cabinet secretary Sarah Cottrell Propst and Environment Department cabinet secretary James Kenney. “It’s really important that we start to talk about these repercussions, because New Mexico has some really

special and unique landscapes that are already struggling.”

In addition to the loss of habitat, fire damage poses an immediate threat when rainstorms carry away soil no longer held back by vegetation. This debris can clog channels and culverts, fill up reservoirs and retention ponds, and destroy fields and crops.

To help communities tackle the challenges of climate change, Governor Michelle Lujan Grisham issued Executive Order 2019-003 on Addressing Climate Change and Energy Waste Prevention in January 2019, which led to the creation of the state’s interagency Climate Change Task Force. This group of state experts is focused on issues that need quick attention in each of nine focus areas, ranging from delivering clean energy to creating sustainable infrastructure.

“The strength of this map is its ability to run different scenarios, because everybody has a different focus,” Lohmann said. “Users—whether an agency, a community group, or a local government—can relate it to what’s most important to

them. They can see where the risks are and examine the issues.”

More Heat, Less Rain, and Need for Cooling

The state recently conducted its yearly climate strategy report, which includes details about the state’s transition to renewable energy and the goals to reduce energy costs.

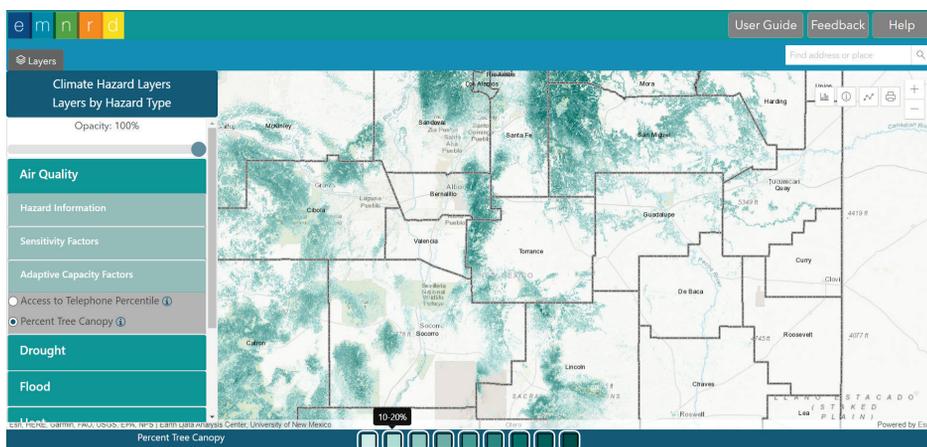
“With extreme heat coming, energy has to be reliable and affordable so people can cool themselves,” said Robert Gomez, resilience coordinator for EMNRD’s Sustainability and Resilience program. “Those kinds of connected factors have to be built into our ongoing resilience and adaptation plans.”

The changes in climate and high fuel loads create the conditions for catastrophic fires. “We have really set ourselves up for some potentially serious situations there,” Gomez said.

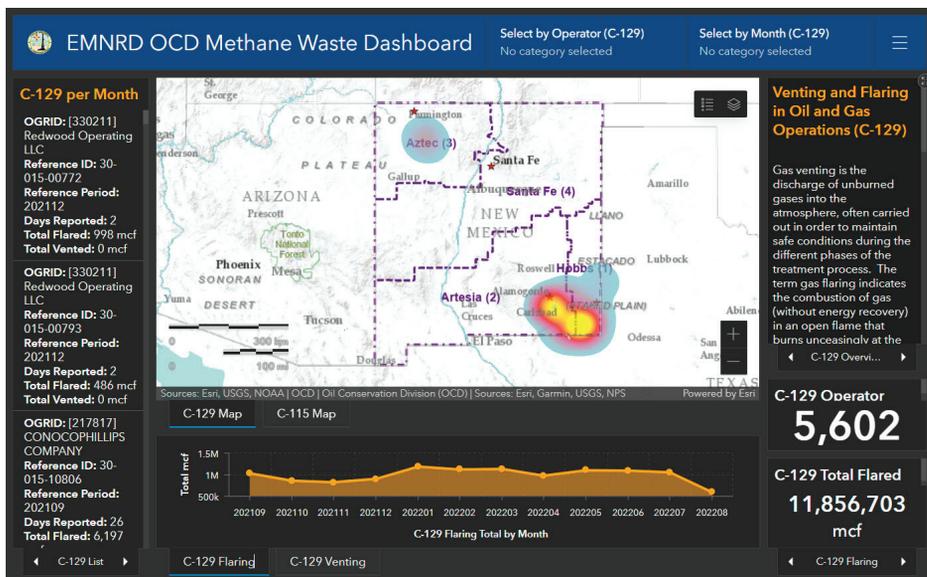
In New Mexico and across the greater Southwest, fuel conditions—coupled with projected increases in seasonal temperatures and decreases in annual precipitation—increase the potential for more frequent, intense, and extended wildfires.

Creating the Interactive Map

The New Mexico Climate Risk Map provides a place to begin to understand



↑ The Climate Risk Map is designed to help New Mexico communities and residents learn more about factors that contribute to their climate change risk.



↑ EMNRD OCD Methane Waste Dashboard

impacts for all areas of the state. People can choose from a list of different climate hazards and sensitivity factors to view those layers on the map. Its real power comes from the reports it can generate for any area of interest by combining details; calculating statistics; generating tables, charts, and maps; and then producing a PDF that can be saved and shared.

Shawn Penman and Tyler Eshelman at the EDAC provided GIS and programming skills to create the interactive map alongside collaborators at EMNRD. One of the resources the team relied on is the *Mapping Resilience* report from the

Asian Pacific Environmental Network.

The climate risk mapping tool they built places an emphasis on equity and addressing the needs of overburdened communities, including demographic factors like race and poverty levels. So far, experts on the task force have been using it to examine equity and come up with five-year action plans. Work is ongoing to get the Climate Risk Map into the hands of community planners, tribal nations and pueblos, and anyone interested in understanding their risk.

There’s also the possibility the map’s scope could be expanded by working with other agencies, including New Mexico’s Department of Health, whose health workers are actively responding to climate-related health effects including respiratory and other conditions due to wildfire smoke and for the prevention of heat-related illness. With the tool, they can also examine equity. “Health outcomes of climate change are important questions we need to ask ourselves,” Gomez said, “and specifically examining who in which areas are particularly vulnerable.”

To learn how other states and localities use GIS to craft climate action plans, visit go.esri.com/NMclimate.



esri **SAG AWARD**

SPECIAL ACHIEVEMENT IN GIS

Winners Announced at 2022 Esri User Conference

Esri acknowledged the achievements of several domestic and international organizations with the Special Achievement in GIS (SAG) Awards ceremony at the annual Esri User Conference (Esri UC) in San Diego, California. The SAG Awards acknowledge innovative and intelligent applications of geographic information system (GIS) technology. Esri users are nominated by Esri leadership and distributor organizations, with finalists selected by Jack Dangermond. These organizations set new standards throughout the GIS community.

Organizations from around the world honored at the Esri UC span industries including agriculture, public works, economic development, education, transportation, health and human services, law enforcement, emergency response, and utilities.

"The SAG Awards highlight extraordinary achievements and efforts to improve our world," said Esri president Jack Dangermond. "Each year, I look forward to being part of this ceremony. It is a tradition that means a great deal to Esri and to GIS professionals."

Here are the domestic state and local government users recognized this year. To see a full list of SAG Award winners, visit go.esri.com/2022SAG-Gov.

US State and Local Government SAG Award Winners

- Pima County, Arizona
- California Department of Health Care Services (DHCS)
- City of Ontario, California, and Airspace Link, Inc.
- County of Los Angeles Dept. of Internal Services and Dept. of the CEO
- Los Angeles County Metropolitan Transportation Authority
- Orange County Registrar of Voters
- San Bernardino County and City of Redlands Police Department
- San Diego Unified Port District
- Colorado Broadband Office—Governor's Office of Information Technology
- Connecticut Department of Transportation
- The Town of Greenwich, Connecticut
- DC Office of Planning
- City of Newark, Delaware
- City of St. Petersburg, Florida, Police Department
- County of Miami-Dade and Miami International Airport
- Economic Development Corporation of Sarasota County, Florida
- Florida Senate Committee on Reapportionment
- Lake Apopka Natural Gas District
- Orange County, Florida, Property Appraiser
- City of Gainesville, Georgia, Department of Water Resources
- Georgia Emergency Management and Homeland Security Agency (GEMA/HS)
- City of Dubuque, Iowa





- Des Moines, Iowa, GIS
- County of Bonneville, Idaho, GIS Department
- Illinois Emergency Management Agency
- Indiana Department of Homeland Security
- State of Kansas Division of Emergency Management
- Kentucky Energy & Environment Cabinet and Kentucky Economic Development
- Louisville Gas and Electric—Kentucky Utilities
- Lafayette Parish Communication District
- City of Worcester, Massachusetts
- Massachusetts Department of Transportation
- West Boylston Municipal Light Plant
- Baltimore, Maryland, Police Department
- US Department of Health & Human Services—Indian Health Service, Office of Environmental Health and Engineering
- City of Rochester Hills, Michigan
- Southeast Michigan Council of Governments
- County of Polk, Minnesota
- County of Jackson, Missouri
- Mississippi Department of Environmental Quality, Geospatial Resources Division
- City of Billings, Montana
- City of Charlotte, North Carolina—Emergency Management
- City of Grand Forks, North Dakota
- City of Hastings, Nebraska
- County of Ocean, New Jersey
- New Jersey State Police, Office of Emergency Management
- City of Rio Rancho, New Mexico
- Nevada Department of Wildlife
- Syracuse, New York—Office of Accountability, Performance & Innovation and Department of Public Works
- Seneca Nation of Indians (SNI)
- Ohio Department of Natural Resources
- Oklahoma County, Oklahoma, Assessor’s Office
- Oregon State Legislature, Legislative Policy and Research Office
- Borough of State College, Pennsylvania, Planning Department
- City of Providence, Rhode Island
- City of Brookings, South Dakota
- Tennessee Division of Forestry
- City of Sugar Land, Texas
- Lower Valley Water District
- Trinity River Authority
- State of Utah, Division of Emergency Management
- State of Utah, Transportation Department
- Charlottesville, Virginia, Fire Department
- Virginia Department of Emergency Management
- Chittenden County, Vermont, Regional Planning Commission and Stone Environmental
- City of Seattle, Washington, Office of Planning and Community Development
- Tacoma-Pierce County Health Department
- City of Marshfield, Wisconsin
- Milwaukee County OEM
- City of Martinsburg, West Virginia



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