Esri News

for State & Local Government

Seattle Implements Accessory Dwelling Unit Strategy with GIS to Expand Housing Choices

Seattle, Washington, has proved to be one of the fastest growing large cities in the US, having shown increases of 25 percent in population and 34 percent in jobs, all since 2010. Due to the rise in population, the number of housing units also went up 22 percent since 2010. For middle- and low-income communities in Seattle, finding access to more housing choices has been a challenge due in part to a lack of available affordable housing units. To combat this issue, Seattle's Office of Planning and Community Development (OPCD) promoted accessory dwelling units (ADUs), a small, secondary living unit that can be built on a homeowner's property. OPCD used ArcGIS Hub, a location-based community engagement tool, to develop ADUniverse, a website that helps residents learn more about these ADUs to provide diverse housing options in Seattle.

Creating Enough Housing to Meet the Demand

A wide range of people looking for a home within their budget were older adults looking to downsize, seniors with fixed incomes, homeowners with disabilities, multigenerational families, or other lower- and middle-income households. The housing options in Seattle were limited in terms of affordability, availability, location, and convenience, so finding a way to provide easy access

Aligning with Federal Stimulus Programs

A geographic approach is key to your community's recovery efforts. See how others are using GIS to achieve the objectives of recent federal funding programs. See pages 12–23.
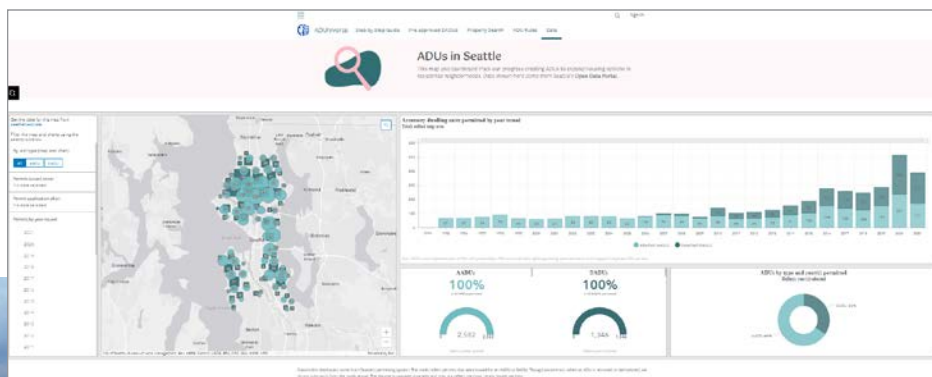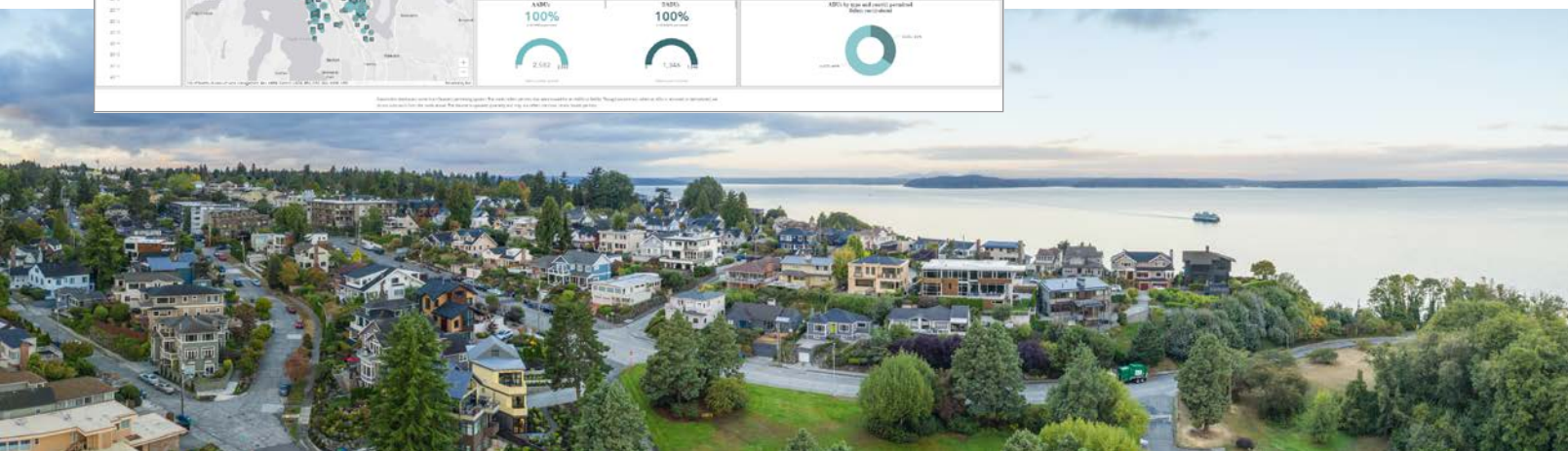
to those in the population that were struggling financially was a key factor for Seattle to consider. The OPCD needed to make sure that the housing solution it provided took these factors into account while also diversifying housing options to offer more housing choices and improving housing outcomes.

New Tools to Promote ADUs

As part of a comprehensive strategy to respond to the housing crisis in Seattle, OPCD decided to promote ADUs, a

↓ This tool uses existing property data to create a preliminary assessment of ADU feasibility.

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housing option that would benefit those looking for something more affordable as well as current homeowners looking to make supplemental income. To provide more information about ADUs to the public and how to get started on building them on a resident's property, OPCD and the Seattle Department of Construction and Inspections (SDCI) created ADUniverse, a hub site built using Esri's ArcGIS Hub. The ADUniverse site included information on what an ADU is, what types of ADUs exist, how to get started on creating an ADU with a step-by-step guide, an interactive map to show people which ADU is possible on their property, preapproved detached ADU designs that can be used for a resident's lot, and a map to explore currently permitted ADUs in Seattle.

"We do a lot of GIS [geographic information system] work on where development is happening in Seattle in general and analyze that as well as housing affordability data we get. Many of our projects use GIS," said Nick Welch, senior planner for City of Seattle, OPCD.

On the hub site, the property search tool uses existing property data to create a preliminary assessment of ADU feasibility for a lot. It allows potential customers to search their address and learn about the feasibility of creating an ADU on their property given its zoning, location, and property characteristics. With GIS technology integration, residents can see information based on their address to get them started on building an ADU.

The goal of ADUniverse was to make it as easy as possible for residents to get a permit to build an ADU. The ADUniverse hub site makes the process of getting an ADU simple to understand. By including a step-by-step guide for ADUs on this hub site, OPCD can walk a customer through the entire process for building an ADU, creating more efficiency in providing more housing to the public. OPCD is also able to communicate the

importance of ADUs, why it encourages them, and how building one on the resident's property is helping to address the much larger housing crisis in Seattle.

"The ability to present all this in one place with Hub, and to do so without needing much technical coding expertise, was attractive," said Welch.

Policy Changes and Resources Lead to Rising ADU Numbers

After 2019, the OPCD reformed its ADU regulations and launched ADUniverse in 2020. OPCD has been monitoring the hub site to see if it was making a difference in ADUs being built. Within a week of its public launch, ADUniverse had attracted approximately 8,000–10,000 people. By implementing more flexible regulations, providing a centralized source of information on ADU construction and plans, and employing a geographic-based approach using ArcGIS Hub to create ADUniverse, the OPCD has seen a big jump in permitted ADUs—roughly 60 percent. Since ADUniverse launched, the traffic and attention to the hub site have contributed to almost 4,000 permitted and built ADUs, including attached and detached units.

"GIS helps us understand how development is playing out and affecting

socioeconomic and demographic conditions in Seattle," said Welch. "It is a useful tool that helps us visualize how growth and change interact spatially with neighborhood conditions, which we assess through zoning information, historical context, and census data."

In addition to improving the options for affordable housing, Seattle is also moving in a more equitable direction. The GIS data collected for residents from the Seattle GeoData portal allowed OPCD staff to see information spatially at the neighborhood scale so that they could see who benefits from the ADUs. By using Esri's ArcGIS Hub and dashboard technology, OPCD can provide a repeatable example to other cities around the world enduring a housing crisis.

"I can't think of a project or policy effort related to housing where we haven't been asked to analyze things spatially or consider how a proposal would affect a certain area. It's totally part of our process to understand that spatial dimension," said Welch.

Interested in using the latest available mapping technology to ensure sustainable housing in your community? Learn the five steps planners and policy makers can take to address housing affordability at go.esri.com/SeattleADUstory.

↓ This dashboard tracks the progress of creating ADUs to expand housing options in residential neighborhoods.
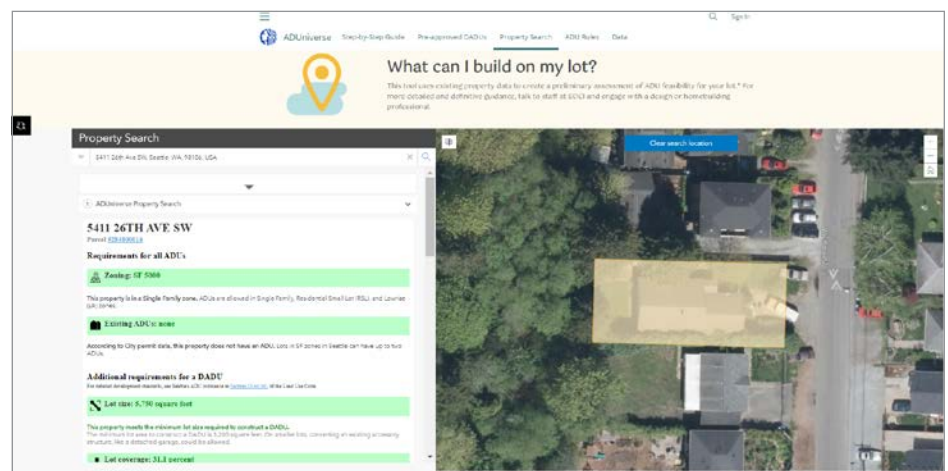
West Dakota Water: Optimizing Asset Management with GIS

West Dakota Water (WDW) wanted to fully utilize Esri technology, build a robust GIS foundation for each of its four departments, and make its data more user-friendly, but it lacked the requisite in-house GIS expertise to do so. So the organization hired Pro-West to function as its GIS department and collaborate to achieve its goals.

Challenge

West Dakota Water was faced with a number of challenges that the implementation of a modern, robust GIS would help solve. First was the lack of in-house GIS expertise that would enable the implementation of a modern GIS. This prevented WDW from knowing how to achieve its goals or whether doing so was even possible. Second, WDW's data was not in a format that was sustainable for growth of the GIS or the expansion of operations. Paper maps were the status quo, and the organization did not have a visualization of its infrastructure in GIS. Third, valves along WDW's pipe route weren't routinely inspected, and when they were,

many more were found to be in need of repair or replacement than anticipated. Implementation of a modern, robust GIS would make the data more user-friendly, enable a streamlined inspection solution, and increase operational efficiency.

Partner

Pro-West is a GIS services business that serves local, state, federal, and tribal government and commercial organizations to empower them with location-based technology. It supports utilities and infrastructure clients across both government and the private sector, providing data services, solution configuration, enterprise implementation, and more, to meet clients' GIS and organizational goals.

Solution

A set of three applications was configured and deployed, enabling WDW's Layflat & Transfer Department to use modern GIS technology to become more efficient, work with and manage data more effectively in the field, and better

understand the locations where staff were working:

- **Layflat & Transfer Manager**—This app has a swipe tool that allows users to explore historical imagery when scoping out locations for laying hose across privately owned property. A connected field map enables staff to collect data in the field, while the web solution allows for understanding of the whole system and its data attributes.
- **Valve Inspection Manager**—This app includes an ArcGIS Survey123 form configured to conduct inspections in the field and a dashboard that provides a summary of inspections conducted, giving users the ability to explore individual inspections.
- **Asset Manager**— This app supports monthly meter readings and, in addition to collecting the reading, allows for the meter's condition to be recorded along with a photo and exports a table every month that is consumed by a third-party business system within the organization. Smart Editor can be used to edit asset data in the app while

working in the field. Asset Manager is paired with a field inventory in ArcGIS Field Maps and Survey123.

Result

The solutions are enabling WDW to be more efficient in planning maintenance and repair.

The Layflat & Transfer Manager app provides greater insight and efficiency for mobile staff, enabling them to quickly understand and evaluate locations when laying hose.

Valve Inspection Manager enables a process—which could not previously be conducted on a regular schedule—to happen twice a year. Results that are collected and understood quickly allow for accurate and efficient planning; more timely repairs; and, ultimately, assets that are in better condition:

- The Valve Inspection Manager dashboard provides a way to efficiently understand inspection outcomes and maintenance needs. A robust inspection schedule is now in place, thanks to GIS.
- For the first time, WDW can understand the condition of its entire system and is therefore empowered to plan more effectively. This is a huge efficiency transformation. Before implementing the GIS solution, inspection data was not collected on a regular schedule and, as a result, was often inaccurate.
- Asset Manager uses GIS to add a valuable component to an existing process (meter reading). It provides time savings not just in conducting the original meter reading process but also in leveraging that process by using GIS tools to collect more data.

WDW is getting greater value from its data by making it more user-friendly and focused on addressing the organization's needs, thanks to the right expertise. With datasets now in an updated format, WDW can extend the amount of data point and attribute information collected in the field or modified in the office to gain an understanding of where more

data is needed or where data is not providing value. All data is now stored in ArcGIS Online, where its security is assured and it is organized for planning operations and management of mobile workers.

In addition, WDW was able to deploy ArcGIS Web AppBuilder (developer edition) to utilize a custom version of the Elevation Profile Widget to help with hydraulic calculations. Being able to download latitude and longitude point locations with elevation saves the planning department the time and effort of loading this kind of data into other systems.

The benefits—gained by the implementation of ArcGIS—and the support from industry experts continue to grow.

"West Dakota Water utilizes ArcGIS Online daily for planning, operations, and management of company fixed assets. ArcGIS has become an essential tool for all of our company divisions to carry out our day-to-day operations."

—Ryan Waters, Director of Water Systems and Sourcing, West Dakota Water

↓ Valve inspections are depicted in lists by type and status of the valve asset.

↓↓ The Valve Inspection Manager dashboard visualizes inspection outcomes and maintenance needs.
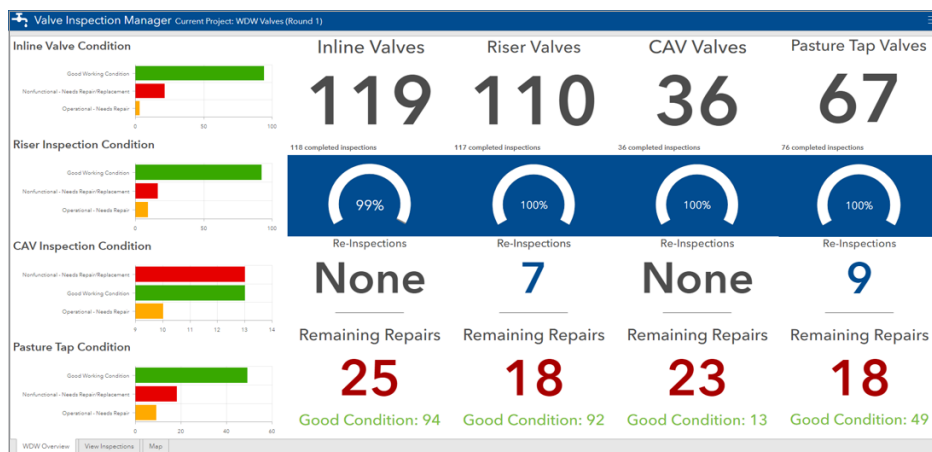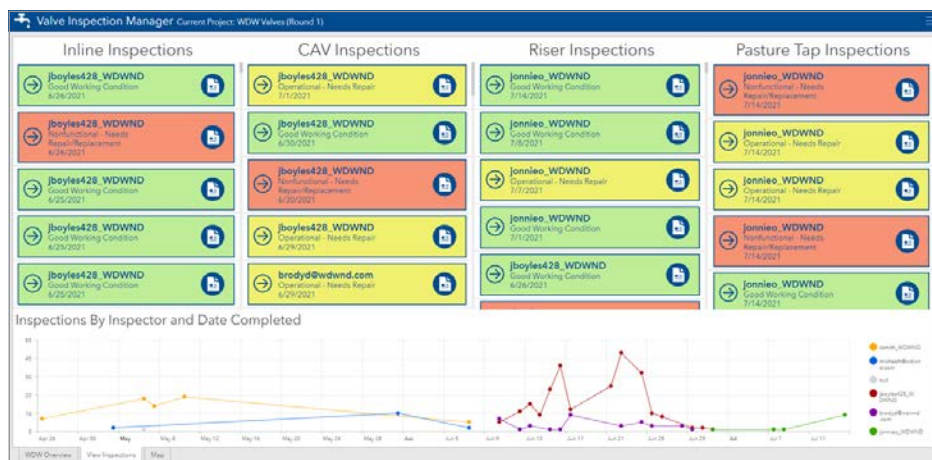
Making It Easier for You to Select the Right Partners for Your Needs

By Francis Kelly, Global Partner Programs Manager – Esri

As a former Esri partner who now focuses on working with our partner community, I am always working to elevate our users and alert them to our partner community. During a recent interaction with some of our most active and innovative customers, it occurred to me that our customers may not have a solid understanding of how to determine the best partner to work with. In particular, greater focus needs to be given to the Esri partner specialties, including why we have them; what this means for you, our customers; and why you should be making meaningful connections with Esri partners who hold these specialties.

Over the next several blog posts, I'd like to highlight the Esri Partner Specialty Program; the different types of specialties; and where you can find, connect, and match with these key partners. I will also showcase examples of the inspiring work of partners with specialty designations to demonstrate the value and return on investment (ROI) these partners bring to our user community.

So let's get started. In this blog, I will provide an overview of the program, the different specialty designations, and the reasons why it's so important to you and your success to work with Esri's specialty partners.

First and foremost, partners who hold specialty designations are really our best, brightest, and most aligned partners. They can help you achieve your goals and vision with ArcGIS!

The Esri Partner Specialty Program validates, recognizes, and promotes partners who are aligned around a specific technology, industry sector, or both. Esri specialty partners are required to maintain their skills and are assessed on that knowledge to keep current with both the evolution of the technology and our shared business goals.

Three Types of Specialties

We've organized our specialties into three types: Foundation—Release Ready, Technology, and Industry. Release Ready is the foundation of our specialty designations and is the starting place for all aligned partners. This specialty validates that these partners are current on and can sustain pace with Esri technology.

Technology specialties are focused around specific Esri products. Partners who carry a technology specialty are expected to

be subject matter experts (SMEs) for that specific offering and its capabilities, and able to demonstrate a business and technical understanding of both.

Industry specialties promote partners who are aligned to a specific business sector and understand the unique needs, nuances, and workflows of users in that sector. These partners have developed, maintained, and sustained offerings, services, and expertise in that specific area of focus. At the start of 2020, we evolved the ArcGIS for Local Government Specialty into the ArcGIS State and Local Government Specialty and launched the new ArcGIS Nonprofit Specialty—both created to meet the demands of customers who depend on highly aligned partners in these two markets.

Where Your Next Partner Search Should Begin

Whether you are looking to complement your ArcGIS work with solutions, services, or content, or you want to identify the best partner to support your specific mapping and content requirements, you should engage with the partners who hold Esri Partner Specialty Program designations.

So how do you find these partners? Always keep your eye out for Esri partners with any of the specialty logos (which are shown in the image below), or head over to the Esri Partner Directory (go.esri.com/partner-lookup) and filter your search by specialty to connect with key partners to help you achieve your goals.

↓ Understanding the Three Types of Partner Specialties

Social Equity Analysis Solution

Governments across the globe struggle to ensure that residents have opportunities to continue their education, secure a well-paying job, find healthy foods, access affordable health care, and locate housing options in safe neighborhoods. Governments face many challenges due in part to systematic and structural barriers that constrain access to opportunity. One example is the practice of redlining, which targeted specific neighborhoods and led to the disinvestment of these communities. This disinvestment exacerbated racial and cultural inequities, including educational attainment, opportunity, health, environmental hazard exposure, and crime. These inequities were highlighted by the coronavirus disease 2019 (COVID-19) pandemic.

To understand what is needed in the equity space, Esri partnered with the Government Alliance on Race and Equity (GARE), a national network of governments that are committed to improving social and racial equity. The social equity movement aims to understand how systems negatively affect certain groups, and to level the playing field by making investments aligned with the severity of needs. GARE reached out to member communities, and as a result, several participated in defining the needs for an equity mapping solution.

Esri's new Social Equity Analysis solution was released in November 2021. Social Equity Analysis delivers a set of capabilities that help equity offices understand community characteristics, analyze community conditions and actions, and generate an equity analysis index that can be used to educate internal and external stakeholders. Understanding social equity is an inherently spatial challenge. Being able to identify where need is
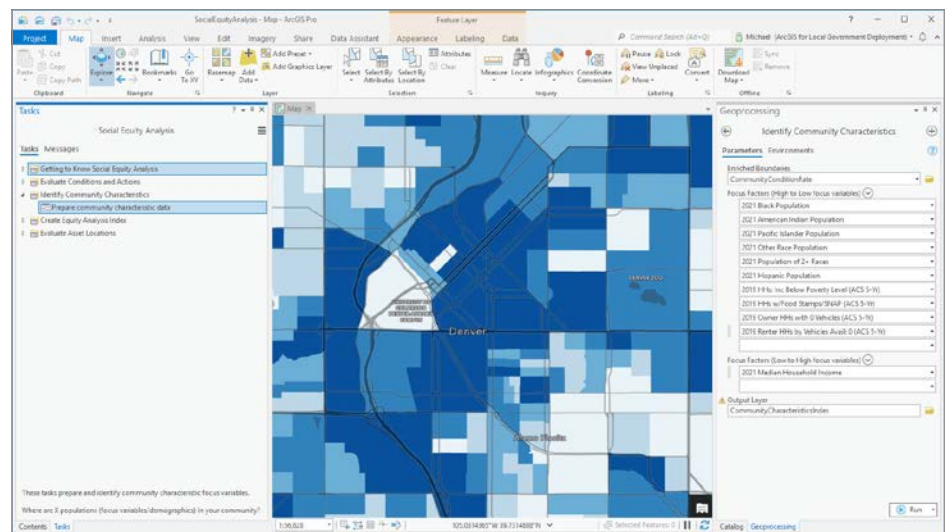
↑ This ArcGIS Pro project can be used to analyze community conditions or outcomes in relation to community characteristics.

concentrated can lead to better planning, informing budgeting and community investment decisions to address these myriad challenges.

Social Equity Analysis is configured to enrich user-designated reporting areas (block groups, council districts, etc.) with demographic information specified by the user. Users can aggregate community condition and action data onto these same reporting areas. Users then choose focus community characteristics to identify areas where there are greater concentrations of people with these characteristics. Finally, analysts can then compare focus community characteristics to the condition rate by creating an equity analysis index. The resultant map helps equity analysts identify where the areas of highest need are located and focus investments where they are needed most. Optionally, the equity analysis index can be used to evaluate existing asset locations as well as determine

which candidate asset locations would best meet community needs.

Organizations seek to allocate interventions and effect policy changes that reduce burdens for marginalized communities and equitably increase benefits for all. For example, understanding where people have access to high-speed internet at home can inform a local government where it would be best to install public Wi-Fi access points or where there is a need for broadband internet infrastructure. Being able to aggregate and disaggregate demographic data can help analysts understand who has access and who does not.

Many governments and organizations are making a commitment to social equity. They want strong, equitable communities that provide opportunities for all. To begin their journey, they must understand the unique characteristics and conditions that exist and how the actions they are taking impact communities' needs.

Unlocking the Power of GIS in a Utility Network Journey

Key Takeaways

- **Challenge:** To keep customer rates low, leadership at Hull Municipal Light Plant looked at ways to improve efficiency and trim costs. After discovering inefficient processes and data integrity challenges, it decided it was time for a digital transformation.

- **Solution:** Hull Light partnered with Patrick Engineering to implement ArcGIS Utility Network for a comprehensive utility management system.

- **Results:** Hull Light achieved its digital transformation. It created a common operating picture, improved data integrity by 80 percent, and enhanced business decision-making by 25 percent.

With a population of just over 10,000, the Boston suburb of Hull, Massachusetts, is most known for its beaches comprising the Nantasket peninsula. Since 1894, Hull ratepayers have received power from Hull Municipal Light Plant. In its more than 120-year history, the utility has advanced its capabilities using technology and process improvements. To continue providing residents with lower rates, Hull Light led a digital transformation of its business practices and asset management system.

In 2020, leadership at Hull Light did an internal analysis to see how it could keep customer rates lower and trim operational costs. This audit shed light on inefficiencies in day-to-day operations, such as outdated technologies and siloed workflows between office and field staff. Often, staff members were doing twice the work interpreting field data because of paper forms and manual inputs.

Additionally, much of the field data existed in computer-aided design (CAD) files and spreadsheets. While the old systems provided some visual information, staff could not perform network tracing. They lacked a common operating picture when discussing assets. The data was managed in too many places, causing slower customer response and leading to

higher rates.

To better serve customers, Hull Light staff needed an updated solution that could reduce inefficiencies.

Hull Light chose Patrick Engineering, an Esri partner with GIS expertise in electric and utility networks. Patrick Engineering serves a wide range of clients in the rail/transit, highway, aviation, manufacturing, utility, renewable energy, education, and health-care markets across all 50 states. The firm's focused and step-by-step approach ensured smooth transitions in system and data changes. Additionally, since Hull Light is a smaller utility without in-house GIS staff, Patrick Engineering provided support and guided staff education in GIS.

Hull Light staff wanted to ensure their GIS would meet business needs across the organization. The GIS solution would affect asset management, field crew data

collection, billing, customer service, and more. The goal was to create a common operating picture where office staff and field teams could see the same data, at the same time, to make the right business decisions. Patrick Engineering recommended a three-phase operation to migrate Hull Light systems to ArcGIS Utility Network. The custom network leverages ArcGIS Pro and ArcGIS Enterprise for advanced asset modeling, analysis, business integration, and communications.

The first step was implementing ArcGIS Enterprise and using ArcGIS Pro. The rest of phase one focused on converting existing CAD, spreadsheets, and other forms of data into a consolidated geodatabase for ArcGIS Enterprise services, maps, and web apps. The six-week process identified other data and process barriers for the project team to

are now locating each meter, replacing it, and collecting individual meter data (including imagery). This information will feed into the ArcGIS Utility Network dataset.

"Patrick Engineering took the time with us to optimize the Survey123 application for workers in the field. Working out the fine details of the survey has allowed mobile workers to be as efficient as possible," says Michael Schmitt, assistant operations manager at Hull Light. "This streamlined survey will be very beneficial and add time savings to our AMI [advanced metering infrastructure] meter system deployment and future Utility Network needs."

The meter data in the Utility Network also feeds into Salt Creek Software's PowerManager. This power billing software will improve billing accuracy.

While Hull Light is just now moving into the later phases of its Utility Network journey, staff are already seeing positive results from ArcGIS. After the ArcGIS Enterprise implementation, Hull Light management noted that decision-making, data quality, and field operations efficiencies improved by 25 percent. Using ArcGIS Enterprise and Survey123, staff reduced time collecting field data and updating the billing system by 80 percent. Additionally, Hull Light achieved the goal of creating a useful common operational picture for staff.

The benefits of Hull Light's digital

improve. The goal of phase one was to create a foundation model for the ArcGIS Utility Network. The model included all assets, data, and necessary information.

"From the beginning, this collaboration was about implementing enterprise-wide unity for Hull Light to embrace all the capabilities of ArcGIS and the Utility Network," says Scott Fierro, GIS consultant at Patrick Engineering.

Phase one also revealed Hull Light's 6,000 smart meters that needed to be documented and updated for the new system. Phase two has focused on helping Hull Light staff with this process. Using ArcGIS Survey123, field crews

transformation to ArcGIS Enterprise and the ArcGIS Utility Network will include outage traceability for quicker response time, in-depth analysis, and proactive asset monitoring.

"Digital transformation often sounds like there is a lot of effort involved in there. As a company, we show our clients that they can achieve it regardless of the size of their organization or the number of residents they serve," says John Young, director of geospatial services at Patrick Engineering. "At the end of the day, organizations have some of the simplest things to overcome or sometimes the most complex. But it starts with committing to the transformation and getting started on the foundation."

Working with Patrick Engineering and ArcGIS, Hull Light created a foundation for success with accurate data, lower costs, and a more efficient business.

To learn more about the capabilities in ArcGIS for utility mapping and spatial analysis, visit Esri's web page at go.esri .com/HullLight.

↓ A Map of Hull Light Meters and an Electronic Tablet with Information about Meters
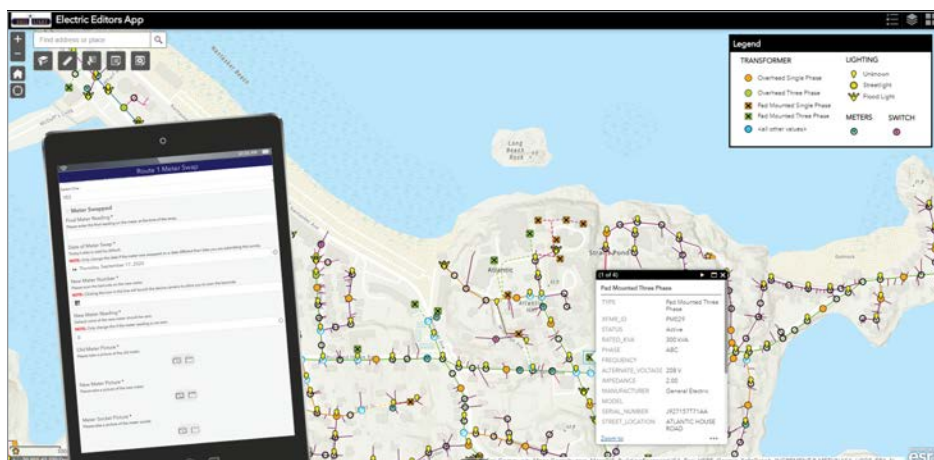
St. Louis Police Share Maps, Apps, and Dashboards to Improve Public Safety

Key Takeaways
- St. Louis Metropolitan Police Department deploys maps and apps across the force.
- GIS analysis aids allocation of police personnel to areas with high crime concentration.
- Officers use dashboards to adjust to shifts in crime during and after the pandemic.

By John Beck, Director of Law Enforcement Solutions – Esri

At times, the crimes are so brazen, so out in the open. "They just don't care," said Captain Christi Marks, a commander with the St. Louis Metropolitan Police Department. "They don't seem afraid of getting caught or of the consequences."

In response to what's now a near daily occurrence of bold retail crimes in St. Louis, Marks and her team have taken a geographic approach—using maps and dashboards to locate crime patterns and allocate resources where they are needed most.

Mapping Crime to Find Trends and Protect Residents

Marks has long used maps to understand crime trends in the city, beginning with a paper map and different colored push-pins she would use to mark each crime by category. This was in the early 2000s when Marks was a public affairs officer for the downtown district.

"As you can imagine, by the end of the year that map had thousands of holes in it," she said. "I told my captain, 'There has to be a better way.'" After investigating crime analysis and visualization tools,

she took GIS training to compile data and make digital maps.

"I remember how proud I was when I bound up all these crime maps into booklets," Marks said. "Other captains were saying, 'Where did you get that?'"

Since 2007, the St. Louis Metropolitan Police Department's dedicated crime analysts have been using GIS daily to inform patrol plans, aid investigations, and assist with resource allocations. The agency expanded access to GIS at the enterprise scale, giving the force of 2,000 people access to location intelligence.

Emily Blackburn, the Crime Analysis Unit manager, worked with crime and intelligence analyst Lindsay Maier to create interactive data dashboards with built-in filters anyone on the force can use to focus on specific locations or trends.

Blackburn understands what other crime analysts and researchers have learned: crime is highly concentrated, with 5 percent of the locations in a city accounting for 50 percent of that city's crime. They also know that repeat offenders commit most of the crimes. These patterns inform decisions to increase

police presence where it's needed most.

One of the GIS tools Blackburn and her team created is an application that combines data such as details from field interviews about crimes and information about the people who may have been involved. Officers can search the app to track down suspects and solve open investigations.

"We can look up any suspect's street name in St. Louis, and you can use that or any alias in the app to get all frequented locations," Blackburn said. "It really creates a good picture of a suspect, where they might be, and if they might be the person [we're] looking for."

Another app Blackburn and Maier created for police commanders shows a side-by-side map of crimes and police activity. "Now they can really see, almost in real time, if officers are where the crime is," Blackburn said.

Data-Driven Public Safety during the Pandemic and Beyond

The pandemic brought new challenges to the crime analysis team members but also new opportunities to socialize

their work and offer support for COVID-19-related shifts in crime patterns. They also used the time to improve their data consolidation and automation.

"It gave us back our commute time, so we had time to think creatively and do more with our data," Blackburn said. "We also pulled back from police-initiated activity until we learned how to manage COVID-19." The shift gave the department time to focus on taking GIS to every officer.

The rising popularity of public health dashboards increased awareness and adoption for police officers. Blackburn explained, "When I shared the dashboards, everybody said, 'Oh, this is like the COVID-19 dashboard.' And I said, 'Yes, except for crime.'"

The police dashboards quickly oriented officers on how COVID-19 was impacting the areas they patrol. Maps show, for example, the number and locations of domestic violence incidents as well as suspicious deaths and overdoses—all of which became even more concerning during the pandemic.

"I get on the dashboards every morning for the daily stand-up meeting with all the commanders, captains, majors, and colonels—Monday through Saturday," Marks said. "I can never be blindsided because every single incident that's reported pops up, and it also tells me what's up or down. I know exactly where everything happened, and I can click on just the dot to learn more."

Now that many US cities are recovering from the pandemic, Marks hopes the added awareness from GIS apps and dashboards will keep residents safe and help return her city to vitality.

"You can go downtown on a night where there's a baseball game, and you'll see thousands and thousands of people," Marks said. "And when I see that, it makes me so proud, because that's my city and that's what I want to see. I want to see the commerce. I want to see people coming to downtown. I want a thriving city."

Visit Esri's web page at go.esri.com/stlouismpd-maps and learn how law enforcement agencies can use GIS to track and understand public safety incidents.
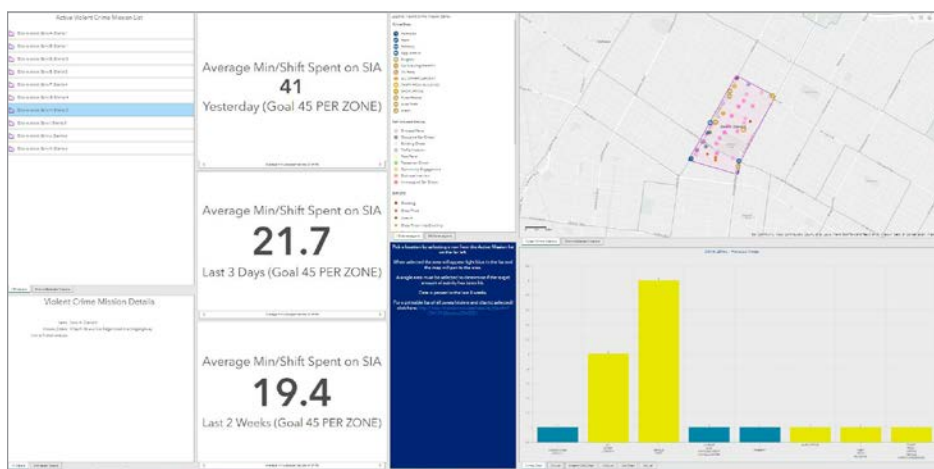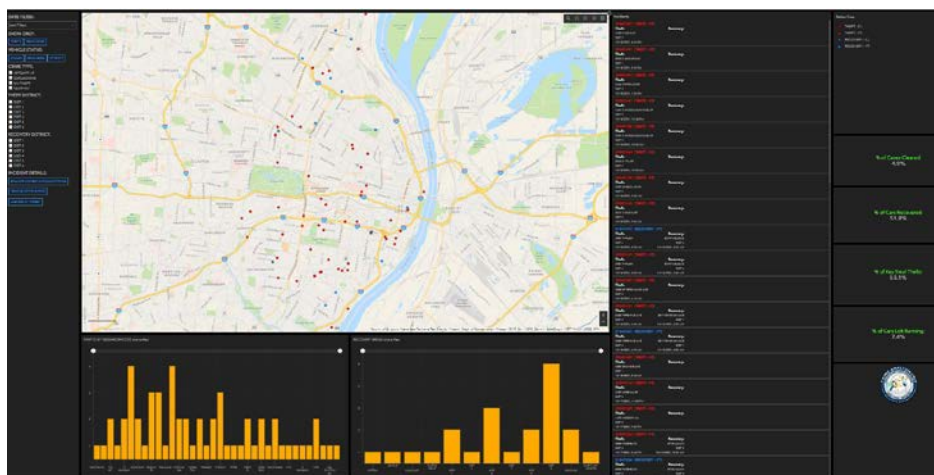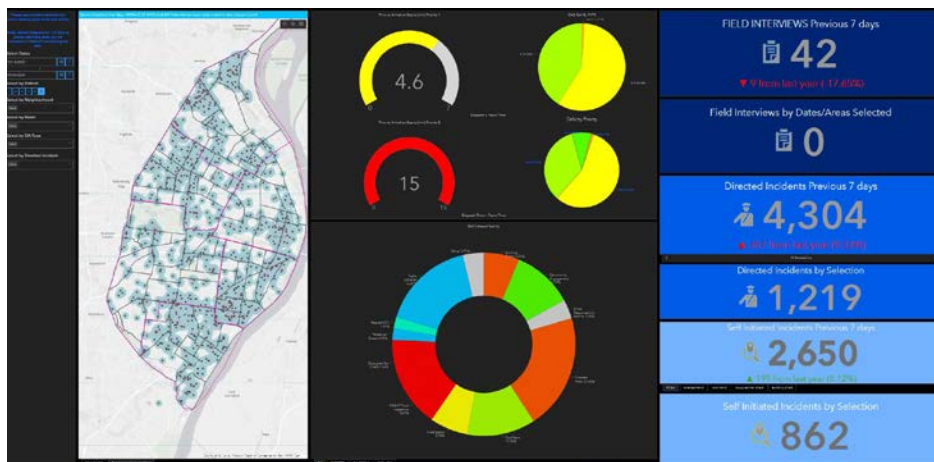
↖ St. Louis Metropolitan Police Department's dashboard shares details on crimes and calls for service.

← The Stolen Car dashboard was developed to zero in on vehicle theft, including details on how and where a stolen car was taken and where it was recovered.

↙ The Active Violent Crime Mission dashboard details department activities and time spent compared to goals.

Align Economic Recovery Efforts with Stimulus Funding

Moving the Nation Forward with GIS

As the nation begins to bounce back from the pandemic, government organizations are using a geographic approach to speed up their economic recovery. Esri, the global leader in GIS technology, provides the most advanced mapping technology governments can use to align their economic recovery efforts with stimulus funding.

This portion of the *Esri News for State and Local Government* newsletter will explore real-life examples of and guidance on how GIS can align recovery efforts with funding goals to build a resilient community for the future.

For additional updates on and examples of using GIS to align your recovery efforts with federal program objectives, visit Esri's web page at **go.esri.com/SLN-StimulusFunding**.
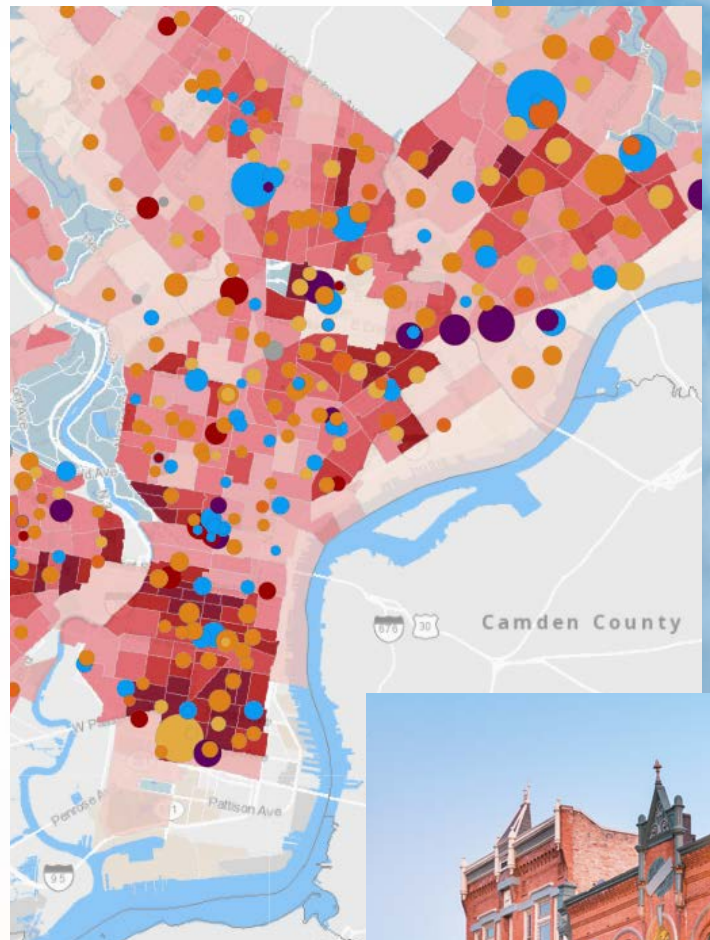
Tackling the Digital Divide with Ready-to-Use Content and Policy

By Lisa Berry, Senior Product Engineer – Esri

Millions of Americans do not have reliable or affordable high-speed internet. Depending on the source, the estimated number of households without access is anywhere between 24 million and 42 million. Considering that households can have multiple residents in need of the internet, Microsoft estimates that over 160 million people do not use the internet at broadband speeds. This disparity has interested policy makers, telecommunication companies, not-for-profit organizations focused on equity, and many others. To overcome these staggering numbers, various policy initiatives and billions of dollars in federal funding have recently been put in place or proposed over the years to expand broadband internet availability.

Most recently, the Infrastructure Investment and Jobs Act establishes three new broadband internet programs. The American Rescue Plan of 2021 includes $360 billion for state and local governments that can be used to expand broadband internet access and adoption. There are many other successful broadband internet initiatives and emerging policies such as the National Telecommunications and Information Administration (NTIA) BroadbandUSA program and the United States Department of Agriculture (USDA) ReConnect loan and grant program.

The Federal Communications Commission (FCC) Rural Digital Opportunity Fund has allocated $9.2 billion so far to bring broadband internet to rural areas, and additional phases of funding are planned to further these efforts.

But Where Will Policy-Allocated Funding Make the Greatest Impact?

These are just a few examples of broadband internet-related policies, but many agencies and policy makers are asking this same question. As any GIS professional will tell you, the most effective way to distribute resources is to use the power of location. Recognizing where there is need by mapping the important aspects can often be the first step to success. Finding the areas of need first requires spatial data to be accessible.

Finding Content in ArcGIS Living Atlas of the World

There are many different spatial data layers available in ArcGIS Living Atlas of the World—the foremost collection of geographic information from around the globe—which can be used to map broadband internet availability. These datasets and layers cover a wide range of topics related to broadband internet—equity, accessibility, infrastructure, and more. Let's point out some of the crucial layers that can be used to assess broadband internet need throughout the US.

FCC Layers

FCC layers provide a broadband internet score based on the availability of broadband internet offerings and their speeds. The data offered by the FCC helps us determine if an area is served or unserved according to the minimum standard of 25 megabits per second (Mbps) for downloads and 3 Mbps for uploads. This data is offered as a layer in ArcGIS Living Atlas at multiple geography levels: state, county, tract, block group, and block.

Detailed block-level data helps us differentiate—neighborhood by neighborhood—where there is need for improvement within cities. Looking at the tract level helps us identify the digital divide by highlighting how broadband internet availability quickly falls off when you move outside a city and into more rural areas. This layer helps us quickly identify areas of need, which can help us direct resources toward the areas that need broadband internet the most. The ability to see the rural-urban divide can help determine eligibility for policies such as the FCC's Rural Digital Opportunity Fund.

While this data helps us quickly identify areas of need, there are additional datasets and tools to help validate the accuracy of this data at local levels, especially in low-density areas. To learn more about this, read the blog post at bit.ly/3y7VvZM.

American Community Survey Layers

The US Census Bureau provides a wealth of information about the US population, housing, and more. Freely available, ready-to-use American Community Survey (ACS) layers in ArcGIS Living Atlas go down to the census tract level. These layers can help identify areas of need by locating various types of population and household types:

- **Internet Access**
  Use layers and maps to see which households lack internet access, sorted by age, race, education, income, and more.

Find all ACS layers about internet, computers, and broadband service.

- **Low-Income Households and Veterans**
  Some policies such as the Emergency Broadband Benefit Program aim to provide affordable internet to low-income households and veterans. There are many ACS maps that highlight information including median household income, population living below the federal poverty line, and veteran population.
- **Racial Equity**
  To address how broadband internet access is impacted by racial inequities, there are many layers and maps that contain information such as population counts sorted by race. Comparing patterns of broadband internet access and race can help address inequity throughout the US.

Detailed Demographics

Need the data at a more granular level? Esri Demographics covers a wide range of behavioral and socioeconomic factors down to the block group level related to the following:

- Income, households, and spending
- Businesses and population
- Behaviors related to computer, TV, and internet usage

To access this Esri Demographics data, you can access ready-to-use layers in ArcGIS Living Atlas, perform an enrichment in ArcGIS, or use one of many other methods depending on your specific GIS workflows.

Infrastructure and Rural Population Layers

Initiatives such as the USDA ReConnect Program invest in high-speed infrastructure to improve connectivity in rural areas. Knowing a population's proximity to a transmission tower is a critical part of assessing the access to broadband internet, especially in rural areas. Knowing where these towers exist is half of the equation. The Infrastructure category of ArcGIS Living Atlas contains many layers representing cell towers and FCC tower locations according to their licensing database.

To investigate where infrastructure and rural populations coincide, the World Population Density Estimate layer helps locate small settlements and rural areas. The layer specifies urban, settled, and rural populations to pinpoint where there might be underserved populations.

Landscape and Environment Layers

When considering the placement of new towers, understanding the landscape and environment is critical. Aspects such as land cover, federal lands, weather patterns, and critical habitats can greatly impact the location in which towers can be placed.

Contextual Layers

As mentioned earlier, proximity is a key component for determining accessibility. ArcGIS Living Atlas contains contextual layers such as schools and libraries to help assess where broadband internet accessibility is impacting children and other at-risk population groups.

Emphasize Areas of Need

On their own, the layers and web maps from ArcGIS Living Atlas help us identify spatial patterns. This is a great place to start. But when these layers and maps are customized, combined visually, or analyzed, it becomes clearer where policy and resources should be focused. Even small changes to your map can help emphasize where there are opportunities to intervene.

Below is an example that uses both overlay and analysis. A 10-minute drive time was calculated from each library to show accessibility by car and—blending modes in the new Map Viewer—visually compare these drive times with FCC broadband internet availability. Within each drive time, the percentage of households without broadband internet was summarized in order to emphasize which libraries were near households in need of internet.

ArcGIS provides tools, layers, and apps that can help show areas of opportunity to those who are controlling policy funds.

Explore and Share Content with Esri Maps for Public Policy

Not everyone needs a custom-made map or application to communicate critical information to policy makers. There are hundreds of ready-to-use maps related to broadband internet available on the Esri Maps for Public Policy site. Explore the site for content about socioeconomic factors or broadband internet availability, and collect maps focused on your area. Choose a map from the collection and share its URL via email or social media, and it will stay focused on your area with the map you chose.

To learn more about creating your own policy-focused maps, visit go.esri.com/how2startmapping.

↓ Analysis shows broadband internet accessibility within a 10-minute drive time from libraries.
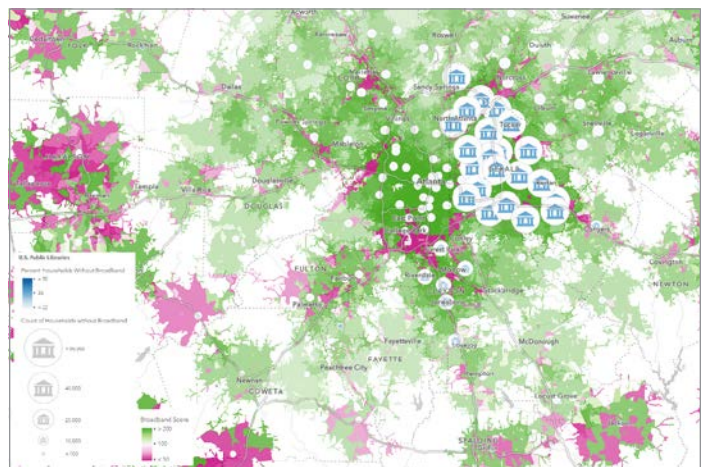
How Dubuque Is Using GIS to Make the Case for Broadband Funding

Giving every US resident opportunities for economic mobility, jobs, education, services, and more, requires equitable access to broadband. Internet connectivity needs to be as common a utility as water, electricity, and gas.

People depend on accessible, reliable broadband for doing everything from submitting a résumé or using telehealth services to attending school or working from home. But how do you balance the needs of business—to offer shareholder value, maintain existing service, and turn a profit—with the needs of people? The answer is a public-private partnership in which governments invest in infrastructure and broadband providers supply the technology.

One community has emphasized such an approach with the local government, using location intelligence from a geographic information system to support residents' efforts to partner with providers, secure funding, and fast-track local broadband investment.

Dubuque's Commitment to Address the Digital Divide

While not quite a rural community, the city of Dubuque, Iowa, experiences rural challenges. Local leaders focus on equity issues such as food deserts and the need for access to neighborhood parks; health care; and affordable, accessible broadband. The city also possesses massive opportunity for economic growth and business expansion. Addressing broadband availability is one of the major ways the city can provide residents with more opportunity and economic mobility.

In 2016, the city introduced the Dubuque Broadband Acceleration Initiative, an effort to focus on public-private collaborations that reduce the cost and time required for broadband expansion. Ultimately, the city aimed to reach the goal of broadband access for all residents and businesses. The initiative has paid off in terms of providers—growing from 2 legacy carriers to over 14 providers. The partnerships resulted in over $2.6 million of value to the city and a leverageable investment of over $19 million in infrastructure. This arrangement, part of the city's

larger Broadband Expansion Initiative, set in place a system for an efficient way of sharing infrastructure and services that allows for a reduction in broadband deployment and provisioning costs. While good progress was being made, it was also clear that more targeted efforts would be required to address the equity of that access. The city needed to know if the benefits of its broadband efforts were reaching those most in need.

"For us to accomplish this initiative, we recognized early on we would need a comprehensive effort based on data and analytics with multiple funding sources," said Chris Kohlmann, information services manager, City of Dubuque.

Kohlmann turned to the city's GIS department, led by GIS coordinator Nikki Rosemeyer, to determine how staff could use location intelligence to better understand their community, identify gaps in service, prioritize where to invest, and perhaps even strengthen the city's grant applications for additional funding sources.

The Arrival of GIS, Supporting Data-Driven Policy

To start, Kohlmann and Rosemeyer knew they needed to gather data that would give them a better understanding of current service levels across their community. They could leverage the Federal Communications Commission (FCC) broadband availability data, and supplement that with feedback and insight directly from residents. Using ArcGIS Survey123, they set up the Dubuque Broadband Services Survey (bit.ly/3EBWPa0) to collect baseline data on current use, speed, and bandwidth and the need for services from households across the city.

The survey asked respondents in each household to describe the ways in which internet service impacts their lives. Residents identified their internet and cellphone providers and shared the results of a speed test to capture download and upload speed, measured in megabits per second. Dubuque leaders also used the survey as an opportunity to better understand who was impacted by limited or nonexistent broadband availability. Each household also identified the number of people residing in the housing unit as well as their race, ethnicity, and monthly income.

All results were anonymous and kept confidential to maintain residents' privacy.

Survey results clearly showed areas of the city where people are disproportionately disadvantaged. For example, 30 percent of survey recipients said they requested faster internet speed and were told it wasn't available. Using this information, the city could determine priority areas and develop a long-term plan to apply for grant funding.

Identification of a Project Area

The lack of accessibility, affordability, and availability of broadband communications services in the most disadvantaged census tracts augmented the disparate impact of the pandemic on those lower-income populations of Dubuque. Starting with the more granular survey data, Kohlmann and Rosemeyer began to overlay additional local datasets. "We thought we might know where we needed to dedicate resources. But not until we started to visualize local datasets, survey results, FCC data, and demographics did the picture become clear," said Rosemeyer.

With the analysis completed, Kohlmann and Rosemeyer were able to identify a project area—one with a high concentration of anchor institutions like parks, schools, churches, and youth centers—and apply for grant funding. The area also included

↓ Project Area Identified after Analysis

census block groups that were already city targets for community development block grants.

Having identified a statistically relevant neighborhood, the city approached providers willing to invest resources into their community.

The GIS analysis enabled the city to present a project that would result in service provider profit via increased customers and coverage, and would address community concerns about speed, access, cost, and equity.

Presentation of a Holistic Plan to City Council

Because the national broadband crisis is widespread and well-known, Dubuque leaders were able to apply for support from many federal agencies and resources. One funding opportunity, the Broadband Infrastructure Program grant from the National Telecommunications and Information Administration (NTIA), supports state-and-provider partnerships in broadband infrastructure deployment to areas in need.

Knowing they had a strategic plan that would help them compete for this grant, Kohlmann and Rosemeyer took their data and analysis to the city council for approval. "When we went to city council [members], I knew we had what we needed to show them the immense opportunity we had if we were to secure funding for our project area. The data, analysis, and maps clearly showed the council we had done our homework," said Kohlmann. "We walked out of there with not only approval on our plan, but with their full trust and belief in the power of GIS."

GIS: The Great Equalizer

Now that federal funding is readily available, competition among jurisdictions will likely be steep. Using GIS, the Dubuque team members were able to differentiate their city, demonstrate a deeper understanding of their community's needs, and create a strategic plan. City staff showed providers that Dubuque is an easy city to work with and that there is benefit to investing in the community. The city's GIS analysis showcased a plan that would address equity and at-risk populations—a major condition of the NTIA grant.

"On our grant application, we were able to present background on why we picked the specific neighborhood for our project area; that we had a provider ready to partner with us; and that, above all, we would address a major equity concern in our community. The mapping and analysis allowed us to apply with confidence and compete with larger jurisdictions, with bigger budgets. GIS gives us an advantage to stand apart," said Kohlmann.

While funding will help Dubuque leaders further their goals, they also have a clear plan based on a strategic public-private partnership to move their broadband access forward.

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.

ARPA Funding for Planning, Housing, and Economic Development

By Keith Cooke, Industry Manager of Planning and Community Development – Esri

For many cities and counties, the passing of the American Rescue Plan Act (ARPA) created as much confusion as excitement. Every municipality and county was allocated federal funds in an effort to better support recovery efforts in the midst of the COVID-19 pandemic. There have been many misconceptions about the funding from ARPA, such as cities having to eventually repay the funds (they don't); funds having to be spent by the end of the year like they were with the Coronavirus Aid, Relief, and Economic Security (CARES) Act (they don't); and cities having to supply some matching funds as they would with most grants (they don't).

Planning and economic development professionals have been essential in helping cities and counties wade through some of the by-products of this pandemic to support local businesses (e.g., changes to curbside pickup management, pedestrian access, and outdoor seating) and help alleviate some of the housing crises many are experiencing (e.g., changes to accessory dwelling unit policy). These necessary activities have put other, larger-scale projects—such as zoning reform, updated affordable housing policy, and green infrastructure planning—on hold. This influx of money to

governments has communities rethinking their plans. After all, it was only last year when hundreds of cities and counties were bracing for significant budget cuts because of the lack of tax revenue in their communities. As they start to prioritize the projects they'd like to undertake, many have questions about how they can access the funds.

Let's look at some of the main funding vehicles that planners and economic developers have at their disposal:

- **Direct Allocation—**Every municipality, county, and state has received a portion of ARPA's $65.1 billion directly. As expected, this allocation was based on the population of the recipient. The National League of Cities provided a page (bit.ly/3GsxK1D) for people to search for each municipality's and state's allocation. The National Association of Counties provided a similar resource as well with county allocations. Planners would access this money the same way they would any normal budget item.
- **Federal Funding from the US Department of Housing and Urban Development (HUD)—**Title III of ARPA lists several initiatives overseen by HUD that provide tens of billions of

dollars in additional funding. Again, these are not loans but funds that are meant for distribution to cities, counties, and states to promote fairer access to housing. Some of these initiatives include emergency rental assistance ($21.55 billion), housing counseling ($100 million), assistance for housing solutions for homeless people ($5 billion), emergency housing vouchers ($5 billion), rural homeowner assistance ($39 million), and fair housing assistance ($20 million). People can apply for these allocations directly through the HUD site or at grants.gov.
- **Federal Funding from the Economic Development Administration (EDA)—**ARPA provided approximately $3 billion in supplemental funding to the EDA's existing budget to help communities build local economies that will hopefully be more resilient to future acute shocks like the one we're in. There are numerous opportunities for project funding here, such as economic adjustment assistance ($500 million) that will put people back to work through projects (both construction and nonconstruction) designed to meet local needs that have risen from the pandemic. The Travel, Tourism and

Outdoor Recreation program provides money ($750 million) to quickly invest in marketing, infrastructure, and workforce needs to promote travel locally and throughout the state. The complete list of EDA funding initiatives is available on the EDA American Rescue Plan Programs page (eda.gov/arpa).

- **Federal Funding from the Small Business Administration (SBA)**—The SBA received over $50 billion in additional funding through ARPA. The initiatives highlighted in Title V of the law include $15 billion in funding for Economic Injury Disaster Loans (EIDL) targeted at underserved small businesses, which have been disproportionately devastated by the pandemic. There is just under $29 billion in direct relief for restaurants, $1.25 billion for shuttered venue operators, and $175 million for technical assistance for community navigators and administrators. More details on these relief efforts and how to apply for them can be found on SBA's resource page (bit.ly/3IxQVcf).

It's worth mentioning that there are additional funds available through other agencies, such as the Department of Commerce and the Department of Health and Human Services, that will overlap with planning and economic development initiatives.

Most state and local government organizations are still in the early phases of listing priorities for funding projects. But it should be clear that if your city or county has been planning a worthwhile project that would provide sustainable benefit and value to the community, there is no shortage of funding options to make that project a reality. Some of these projects are likely to include the following:

- **Comprehensive Plan Updates**—There's no shortage of cities that had to put long-range planning on hold while dealing with office closures and other immediate problems brought on by the pandemic.
- **Zoning/Housing Reform**—The current housing crisis, which is visible

nationally, has highlighted the need to replace dated, exclusionary zoning codes with more equitable and sustainable ones. As the trend of counterurbanization continues, this is going to be of particular importance to suburban and rural communities that need to accommodate former urban residents who are able to take advantage of remote-work options.

- **Curbside Pickup Management**—Countless cities made temporary accommodations for businesses to expand operations to (and beyond) the curb. Many of these cities, in the interest of continuing to promote walkability and decrease vehicle dependence, are looking at making more permanent changes that meet the needs of local businesses and the community.

It's no secret that location is at the center of planning and economic policy, and GIS is the tool that planners use to embrace a data-driven approach to policy development, project design, and public engagement. Esri provides a complete geospatial system that empowers planning and economic development departments to make necessary and justifiable decisions for both short- and long-term needs. Components of this system include the following:

- **ArcGIS Urban** is software for a web-based 3D experience engineered to improve planning, design, and decision-making through quick visualization of projects, definable development metrics (population change, jobs, environmental impact, etc.), and easy and secure collaboration with colleagues and developers.
- **ArcGIS Hub** is an initiative-driven community engagement software as a service that easily allows internal and external stakeholders to provide feedback, track progress, and improve outcomes.
- **ArcGIS Business Analyst** provides access to over 2,000 demographic, lifestyle, business, and socioeconomic variables as well as analytical tools to help planners and economic

developers achieve a genuine understanding of neighborhood characteristics and needs.
- **ArcGIS Insights** generates geospatial and business intelligence from established business systems used in planning, such as permitting, to see patterns in the data and identify trends.
- **ArcGIS Solutions** is a suite of dozens of focused, open-source applications that deal with specific planning workflows, ranging from public notification to blight management.

There is no doubt that this is both an exciting and challenging time for planners and economic developers in this country. With both the numerous funding vehicles and the web-based tools easily available to them, the projects these professionals need to implement to meet the short- and long-term needs of their communities are well within their reach.

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

Maps Help Ensure Equitable Distribution of Infrastructure Funds in Montana

By Chris Thomas, Director of Government Marketing – Esri

Key Takeaways

- Montana officials used mapping tools and dashboards to track and share infrastructure spending.
- With the help of maps, DNRC staff ensure equitable distribution of funds across the state.
- Grant applicants and the public accessed the maps and dashboards to navigate the submission process.

The Montana Department of Natural Resources and Conservation (DNRC) recently experienced a rare money problem: a surplus instead of a deficit. To figure out where to spend the money, state officials analyzed maps and built online dashboards to share results with the public.

Thanks to the $350 billion American Rescue Plan Act of 2021 (ARPA), passed by Congress in March to provide economic stimulus for state, local, territorial, and tribal governments, Montana officials found themselves with about $900 million to use strategically.

The Montana legislature decided the bulk of the money should be spent to upgrade the state's water and sewer systems, and the staff at the DNRC were tasked with determining which communities to invest in. But they had to move quickly to meet the deadline imposed by the legislature.

DNRC invited city and county governments, state agencies, water and sewer associations, and conservation districts to submit proposals for projects to fund. "They only had about a month to apply for this money, and we got over $900 million in grant requests," said Autumn Coleman, DNRC's resource development bureau chief. "For people to even apply for the money, they had to figure out how much they could get and how much in matching funds they needed to bring to the table to even be considered."

To allocate and disperse the funds, DNRC created two separate grant programs. One was to be divided among Montana's 56 counties, based on the same formula used to distribute money collected from the state's gasoline tax. This gas tax formula calculates a county's size, population, and miles of public roadways. The formula was fair but complex and difficult to parse for those unfamiliar with it. Adding further confusion, potential grantees were required to present matching funds.

That's where an online dashboard and map proved crucial to the effort. Coleman and her team significantly reduced the complexity of the process by building a public-facing map and dashboard using a geographic information system.

The visualization tools added a graphic element to what would otherwise be facts and figures. Residents and grant applicants could more easily make a connection between the gas tax formula and its impact on funding decisions—and also monitor what decisions were being made as they began to appear on the map.

"It's just a really hard thing to explain to folks, so having this mapping tool made it easier for people to understand," Coleman said. "I think that's why spatial data works in this regard. We're trying to communicate with the public. We could share a giant 20-page table, but it just doesn't play as well as being able to look and see what you and your neighbors are getting."

One Big State, Many Small Identities

The second ARPA grant program was purely competitive. Proposals were judged solely on merit. Geographic distribution was not officially a consideration, but that didn't mean it was going to be ignored.

Like all states, Montana has important political and demographic considerations, which are influenced by its size (third largest in the continental US, twice the area of all New England states combined) and population (sixth lowest, 7 percent of New England's). Natural conflicts include urban centers versus rural areas; sparsely populated eastern Montana versus the more populous west; and longtime residents of modest means versus more affluent new arrivals. This all plays out against the

backdrop of Montana's rapid population growth, enough for the 2020 Census results to earn the state a new congressional seat. The fastest-growing area is Gallatin County, one of only two counties with a median family income greater than the US average. The upscale magazine *Travel + Leisure* recently called Bozeman, Gallatin's county seat, "one of America's coolest towns" and "a place of serendipities."

Despite its growth and coolness factor, Montana was recently ranked as the nation's seventh-worst state for infrastructure. According to Coleman, water and sewer funding is often viewed as an important dimension of fairness by the state's differing populations and places and their representatives.

"We're a very dispersed state, with a few major population centers and lots of rural areas," she said. "Legislators want to see ARPA funds spread evenly across Montana. They want to make sure that the smaller communities in their districts get a fair chance in all of this."

Healthy Competition
DNRC's map and dashboard of competitive grant applicants have served a dual purpose. As much as the map and dashboard promote transparency by showing the public the geographic distribution of the grants, they also allow Coleman and her team to test various funding scenarios, which supports internal accountability.

"It was definitely a decision-making tool," Coleman said. "We could look at it and say, 'If we fund the top 28 projects, what does the map look like?' As we funded more projects, we could see the dots spread across the state."

"We could show that funds weren't just going to population centers," said Corey Richidt, a GIS analyst and developer at DNRC. "We could even see the areas that are disproportionly affected by COVID-19."

For Brian Collins, GIS manager at DNRC, the dashboard and map serve as a manifestation of the agency's larger purpose—serving residents.

"Putting together this kind of information resource was a good reminder that we're in a public service profession," he said. "We're providing customer service at a very high level to people that need it right now. And it's very gratifying to put it out there this way."

Creating Clear Communication with the Public
The American Rescue Plan Act of 2021 is a wide-ranging economic relief program. Montana's online ARPA tools provide a model any state can follow to help residents understand the funding mechanisms and promote internal accountability within state agencies.

Key to Montana's approach is a unique combination of technologies that are all supported by a GIS.

The maps built by DNRC help the public in Montana see where the state is distributing its federal economic stimulus funds. ArcGIS Dashboards provides critical context, but DNRC also needs to communicate information clearly and effectively. For that reason, the dashboards and maps are included within an informational website, built by Lauri Abeyta, a DNRC web developer, using ArcGIS Hub.

"It was fast and easy," Abeyta said. "With just our current website, I don't think we would've gotten the traffic or been able to disseminate information in a way that made sense to the public, with the easy interlaying of different dashboards."

"When we pulled Lauri into this, she had a really fast turnaround time," said Richidt. "She was able to stand up the hub site and make it look polished and clean, so then we could easily bring in the dashboard aspect."

The wealth of information provided by the hub site functioned as an informational clearinghouse, reducing the number of process-related queries from potential grant applicants that had to be fielded by DNRC staff. "Front-loading information resources for potential applicants reduced some of the impact," said Collins. "We knew if we gave applicants a fighting chance at understanding the process, that alone would be a huge success."

Visit Esri's web page at go.esri.com /SLNstimulusfunding to learn how GIS aligns your health, economy, infrastructure, and equity efforts with federal funding objectives.

↓ The dashboard lets users see fiscal recovery fund spending on water and sewer infrastructure by county or municipality.

Using Federal Infrastructure Dollars to Invest in Digital Drone Infrastructure

Infrastructure Redefined—Roads, Bridges and . . . Drones?

By Lisa Peterson, Vice President of Business Development – Airspace Link, Inc.

State and local funding efforts to build reliable, sustainable infrastructure have historically been key drivers of thriving economies. The recently passed infrastructure bill will allocate up to $1 trillion in federal funding for infrastructure.

To some, the word "infrastructure" only includes traditional items like roads, bridges, and utility networks. But as new dimensions of mobility are introduced, the word's definition has begun to expand and gain new meaning. Just as cars need roads to drive on and trains need tracks, drones will require a digital infrastructure to operate safely, compliantly, and at scale. Today's current air traffic control infrastructure is not designed for this type of low-altitude mode of air mobility yet. However, the Federal Aviation Administration (FAA) is actively working with a spectrum of partners on new solutions as drone use cases steadily scale.

Today, drones are used in various industries, ranging from public safety to retail package and time-sensitive prescription delivery. As of this writing, the announcement of a bipartisan bill would authorize $100 million in grants for state and local governments to use drone technology to visually inspect infrastructure, and another $100 million to train employees to use drones properly. This provides a significant opportunity for governments to secure direct funding to deploy digital infrastructure to support these use cases safely.

Looking at the American Rescue Plan (ARP) Act spending as an example, many cities had reported not spending any of the $130 billion federal recovery funds allocated in March 2021, according to a *Brookings Metro* survey conducted in September 2021. Some cities cite a longer process in getting constituent input, while others prepare for changing economic situations in the coming months. But one key takeaway was clear: there is still massive opportunity, the study said, for "city leaders to adopt thoughtful, evidence-based, equity-oriented approaches to using these substantial one-time funds." Cities that initiated comprehensive strategies to leverage funding to address high-level goals set a precedent for other jurisdictions to follow.

Likewise, state and local governments are using federal funding to modernize their IT infrastructure and rethink the way they deliver services. For example, as the definition of infrastructure expands, jurisdictions are combining the forces of GIS and drones to prepare for future needs, create economic opportunity, and improve mobility patterns.

With GIS as a foundation, governments are leveraging Airspace Link's AirHub Platform to develop a digital drone infrastructure with community considerations in mind. The AirHub Platform integrates not only the FAA rules and regulations of the airspace but also additional third-party datasets to enable safe and compliant flights across communities. The level of detail in the AirHub Platform increases drone pilots' awareness of potential hazards and risks, which assists in the planning and execution of safe operations.

The existing and forthcoming federal funds provide a unique opportunity for governments to invest in this type of infrastructure. These funds will help governments increase safety today while laying the groundwork for advanced drone operations and the corresponding rise in economic opportunity that is projected to follow.

To learn more about safely integrating drones into your community and using federal infrastructure funding to prepare for drone operations in your community, reach out to us at **sales@airspacelink.com** or visit **airspacelink.com/government**.
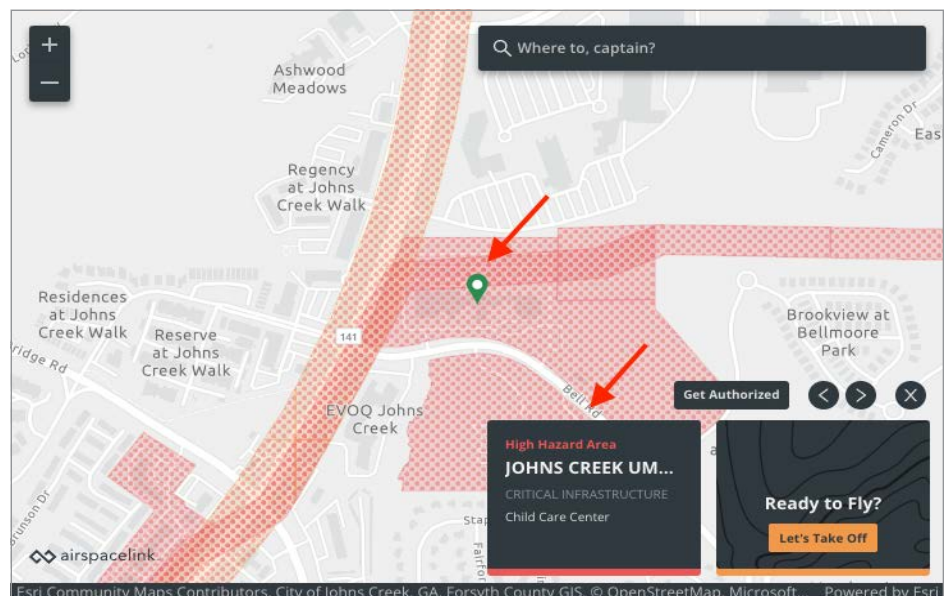
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