



# GIS:

THE ESSENTIAL TOOL

FOR SMART COMMUNITIES

INDUSTRY PERSPECTIVE





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## THE ESSENTIAL TOOL

## FOR SMART COMMUNITIES

FOR STATE AND LOCAL GOVERNMENTS, DATA HAS BECOME THE CURRENCY OF INNOVATION. TODAY, PUBLIC SECTOR MANAGERS UNDERSTAND THAT TO CREATE LIVABLE, SUSTAINABLE, RESILIENT AND HEALTHY COMMUNITIES, THEY MUST UNDERSTAND HOW TO CAPITALIZE ON THEIR DATA. THEY KNOW THAT IN TURN, DATA IS THE KEY TO BECOMING MORE RESPONSIVE TO CITIZENS AND IMPROVING THE COMMUNITY'S STANDARDS OF LIVING.

ESRI, THE GLOBAL LEADER IN GEOGRAPHIC INFORMATION SYSTEMS (GIS) TECHNOLOGY, HAS EMBRACED THE TERM SMARTER COMMUNITY, WHICH UNDERSCORES GOVERNMENTS' QUEST TO LEVERAGE DATA IN TRANSFORMATIVE WAYS.

A smart community approach creates a more transparent, collaborative, and accessible government for its constituents. GIS is the foundation for a smart community because it allows governments to share data openly, gives the data a geographic context that everyone can understand and helps communities make more informed decisions. In turn, this approach creates more sustainable, livable and vibrant communities.

Time and again, we have seen how GIS empowers leaders to visualize, question, analyze, and interpret organizational data to better understand relationships and trends in their community. "People have now begun to connect that GIS is a smart community tool," said Chris Thomas, Director of Government Markets at Esri. Specifically this Industry Perspective will discuss:

- Three case studies of smart communities from Minneapolis, Minnesota; Rancho Cucamonga, California; and the Department of Health and Environmental Control (DHEC) in South Carolina.
- Esri's Executive White Board Exercises, which engage public sector managers and builds apps based on their needs.
- How the Esri ArcGIS Platform helps build smart communities.

Throughout this report, our case studies will highlight how agencies have used the Esri ArcGIS Platform to build a smart community. With Esri's [ArcGIS for State and Local](#) Government apps and maps offerings, state and local governments can receive a series of free and ready to go app templates. Esri's templates were built in partnership with city and state employees, and are designed to support a wide range of government services, from health, safety and transportation. As you will see from our case studies, they can quickly be deployed and easily be customized to fit community needs.

We opened this report by saying that data is the currency of innovation. But collecting and storing data is simply not enough in today's world. With troves of data being collected, managers must turn their spreadsheets and tabular files into visually compelling applications to drive decision-making. That's where GIS can come into play. GIS functions just like an organizations bank; it's hosting, storing and managing its most critical assets. But it's also helping government maximize the utility of their most precious asset by making data actionable, enabling them to deliver a better experience for their citizens.

To start off showing the potential of GIS, we look first to the city of Minneapolis, Minnesota.



## CASE STUDY #1: MINNEAPOLIS, MN

Minneapolis, Minnesota, defines what it means to be a smart community. Leveraging ArcGIS software, the city has created hundreds of GIS applications that connect employees, promote civic engagement and drive more efficient operations.

The flagship GIS program for Minneapolis is the [MapIT Minneapolis](#) (MapIT) web portal, where hundreds of employees create, share and use maps everyday. The MapIT GIS portal can be used to access maps, information, analytical tools and build and share maps in the city. The site is the one stop shop for employees to leverage the power of GIS.

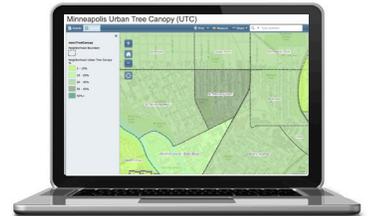
For decades, the city had been using desktop GIS and employees had obtained valuable datasets across all city departments. But in 2012, the city committed to transform the way they used GIS to improve government services.

“We had great databases, tools and users, but we were having difficulty implementing our enterprise vision, at that time we were too focused on centralization and standards,” said Steve Misterek, GIS Coordinator, city of Minneapolis at the Esri User Conference. “And to be enterprise wide that meant that everything needed to fit in our one box.”

To gain buy-in for the MapIT GIS platform, Misterek reached out to middle management and executive leadership to show them the value GIS provides. Misterek explained that the new MapIT program focused on three key mission areas: the enabling of infrastructure; education and build expertise; and the promotion of the many capabilities of the ArcGIS platform, which were used to support the portal.

Today, MapIT supports dozens of GIS web applications to improve government efficiency, economic development and promote civic engagement, all foundations of a smart community. The site contains great maps and apps, but three exemplary examples include:

- The [Find My Solar Suitability](#) Map: The Minneapolis “Find My Solar Suitability” map shows an estimate of the solar resources available on buildings and helps businesses make a decision if they are a prime location for solar panels.
- The [City of Minneapolis Urban Tree Canopy \(UTC\)](#) Map: In urban communities, trees play an essential role for reducing storm water runoff and improving air quality, among many other benefits. This map is an analysis of trees within the city, both at the neighborhood and parcel level. Users can zoom in and out to see canopy coverage within the city.
- [Snow Emergency Parking Rules](#): This easy to use mapping application helps citizens know which side of the street they can park on during snow emergencies, so that plows can efficiently clear the streets.



These are just three of many apps the city is using through the MapIT portal. “I love our work because our GIS team gets to play a role in so many interesting pieces of how we operate in the city,” said Misterek.



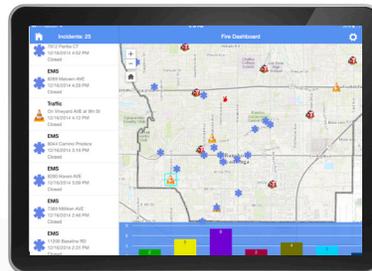
## CASE STUDY #2: RANCHO CUCAMONGA, CA

The city of Rancho Cucamonga, a suburb of San Bernardino County, California, is constantly working to meet the needs of their citizens. To do this, the city with a population of 165,000 became a smart, responsive community through an aggressive campaign to deploy GIS applications. That's why this year the city was recognized with Esri's prestigious Presidents Award at the Esri User Conference.

"GIS is mission critical to the city of Rancho Cucamonga, not just a few people, or a couple of departments, but everyone," said Rancho Cucamonga City Manager John Gillison, while accepting the award at the User Conference. The city leverages an internal cloud-based portal that allows all Rancho Cucamonga employees to access content, anytime and anywhere. "It's our one stop shop for GIS," explained Gillison.

The city also uses ArcGIS Collector to connect field crews and public works teams to update safety hazards in real-time. Data can be imputed with smartphones and tablets, and automatically synced back to a dashboard. Rancho Cucamonga employees utilize these technologies to identify and repair damaged sidewalks. After locating a damaged sidewalk during daily inspections, workers check their mobile GIS app to see if the sidewalk has already been flagged for repair. If not, the worker can add the incident to the map while documenting its condition and even uploading a picture of the damage. After creating an incident, the city's repair team receives a direct notification with the precise GPS location.

Rancho Cucamonga also has a real-time fire operations dashboard, which allows their fire chief to see when emergency calls are happening, and important information about incidents and data on response vehicles. Through the use of ArcGIS API for JavaScript, the city's GIS team was able to create the Team RC app, which provides live operations dashboard for city personnel. City officials can access layers of live data on sidewalk conditions, calls for fire service, reports of speeding, downed trees, and code violations from any type of device. Additionally, the team built charting



widgets and intelligent filters that provide critical data analysis, answering questions such as, "Which fire crew has been dispatched most this week?" and "Which homeless camps need to be addressed?"

Rancho Cucamonga is a fantastic example of a local government leveraging GIS to build a smart community, and of how GIS touches so many different parts of a community. Through innovative mobile technology and ArcGIS apps, Rancho Cucamonga employees are able to perform more efficiently while saving time and money. City employees estimated that productivity increased by up to 500 percent last spring as the city utilized GIS mobile systems to implement an extensive weed abatement program.

City Manager John Gillison further praised their new responsive capabilities, "Every day, we find a new way to use GIS to make Rancho Cucamonga a better place," Gillison said. "That's what we're most proud of."

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JOHN GILLISON, RANCHO CUCAMONGA CITY MANAGER



## CASE STUDY #3:

# SOUTH CAROLINA

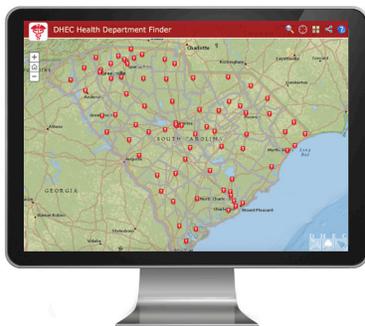


The [Department of Health and Environmental Control](#) (DHEC) is one of the largest agencies in the state of South Carolina. With over 3,500 employees spread out across the entire state, the department must handle a wide range of topics. The department is responsible for analyzing everything from watershed issues, mines, dock permits, recycling centers, to public health data such as birth and death rates. Today, the department uses GIS to help them analyze and understand their data. Using various Esri templates, DHEC is a prime example of what it means to be a smart community.

“When browsing through our website I found a lot of things were still in tabular format, when they really could be displayed as maps. So I really thought we should take the lead and show some program areas how GIS could be used to display their data,” said Philip Weinbach, GIS Program Manager at DHEC.

To start leveraging GIS, Weinbach’s team began to leverage Esri Templates, which provide easy to use GIS solutions that can be quickly customized to meet operational needs. “We have used Esri templates in a fair number of cases. The first one we worked on is our [RecycleHere](#) app. A program area came to me and was interested in having some type of web presence, showing where various recycling centers were located around the state,” said Weinbach. They have also built additional applications:

- [Health Department Finder](#): This web app allows citizens to find the closest health centers to them for services such as family planning, WIC, immunizations and vital records.
- [Environmental Public Notices](#): This web app allows users to obtain public notices about the environment in their community.



“Using application templates allows you to quickly get the main functionality of the application built. The focus can then shift to customization that allows for the same template to be used multiple times and for different purposes. They all look different in the end,” said Weinbach.

Since Weinbach has started at DHEC, he has been championing to get more applications pushed out for public consumption, as well as internal applications. His efforts have not come without challenges.

“Data accuracy and completeness is always the biggest challenge,” said Weinbach. “It’s been easy to get a program area excited about seeing their application and data live on the web, but when you look at the data in a tabular format, you don’t always realize if the spatial data is accurate or not. Once you see the points and the associated attribute information on a map it becomes easier to discern where errors lie. Because of this, we have been emphasizing with the program areas that data is the key to everything, and accurate and authoritative data are crucial for application development.”

In addition to data, another obstacle faced by South Carolina was choosing the right style, symbols and colors of maps. But once these decisions were made, South Carolina found that the actual deployment and building of apps was simple. “I am not a trained programmer,” said Weinbach. “However, I was able to get in and build some good applications quickly as a novice through the use of the Esri templates.”

DHEC also found that the applications look great in mobile. Esri already coded the templates to be mobile ready, which saves teams a great deal of time since they don’t have to worry about creating a mobile experience for users.

“People should really use these tools. I can’t think of a single agency that wouldn’t benefit from the Finder Template, if for no other reason than to show where all their offices are around the state,” said Weinbach.



## FEEDBACK FROM THOSE WHO KNOW

“WE’RE ACTUALLY SEEING THIS PROCESS WHERE GOVERNMENT EXECUTIVES ARE ONCE AGAIN AT THE FOREFRONT OF HELPING TECHNOLOGY COME INTO CITIES. AS CITIZENS AND EMPLOYEES WERE LOOKING FOR MORE TECHNOLOGY, WE’RE SEEING GOVERNMENT EXECUTIVES GET REENGAGED.”

CHRISTOPHER THOMAS, DIRECTOR OF GOVERNMENT MARKETS AT ESRI.

Esri has recently invited government executives to participate in an “Executive White Board Exercise,” the session is designed to discuss what kinds of GIS apps and templates would improve their organizations efficiency and help create smart communities.

“We brought in jurisdictions representing cities of 1,400 people, ranging all the way up to counties of 4 million people. We got them all in a room, and instead of asking what would you use GIS for, we asked them to tell us what problems they’re trying to solve,” said Thomas.

In addition to White Boarding Exercises, Esri recommends four steps to create a successful strategy that supports a smart community:

- **START WITH A WORLD-CLASS GIS PLATFORM:** The ArcGIS® platform gives governments the power to approach problems in a way that serves decision makers, citizens, field-workers, GIS professionals, and professionals that use GIS.
- **BUILD A LOCATION STRATEGY:** A location strategy enables governments to prioritize the GIS applications they need.
- **DELIVER REAL SOLUTIONS THAT SERVE GOVERNMENT PRIORITIES:** Governments know the biggest challenges include improving infrastructure, boosting efficiency and productivity, aiding local economic conditions, and delivering green solutions. Esri’s ArcGIS for Local Government and ArcGIS for State Government applications are complimentary for Esri users to download and share.
- **DEVELOP STRONG RELATIONSHIPS WITH ESRI PARTNER NETWORK:** The Esri Partner Network is a community of organizations that help you get the most out of your GIS investment. The Esri Partner Network can help you deliver sophisticated solutions for issues such as permitting, crime analysis, asset management, and climate analysis. These solutions are built on top of the ArcGIS platform and can extend customized solutions that scale with a state, municipal, or regional government over time.



## HOW ESRI CAN HELP

Esri's ArcGIS platform is empowering smart communities. ArcGIS creates an integrated web GIS platform, and GIS applications are not restricted to just the web. ArcGIS also provides on-premise solutions to help improve mapping, analytics, data management and collaboration solutions. "We've definitely created a platform that works at scale. So it works on mobile, it works on cloud. It's just a delivery mechanism of how people will use things," said Thomas.

With ArcGIS, you can deliver services from servers or directly online, easily accessed through a portal. You can also create a hybrid system, where solutions are delivered on-premise or via a browser, or a hybrid, all tailored to meet your needs as an organization. "When you're trying to solve or understand a problem, we take the data that's already been created, and give you the tools to understand the depth of the issue you're trying to tackle," said Thomas.

ArcGIS brings tabular data, enterprise data, spreadsheets or SAP databases, and turns that information into visually compelling maps. You can also integrate social feeds, sensor data and leverage big data as a means to drive new value from your information.

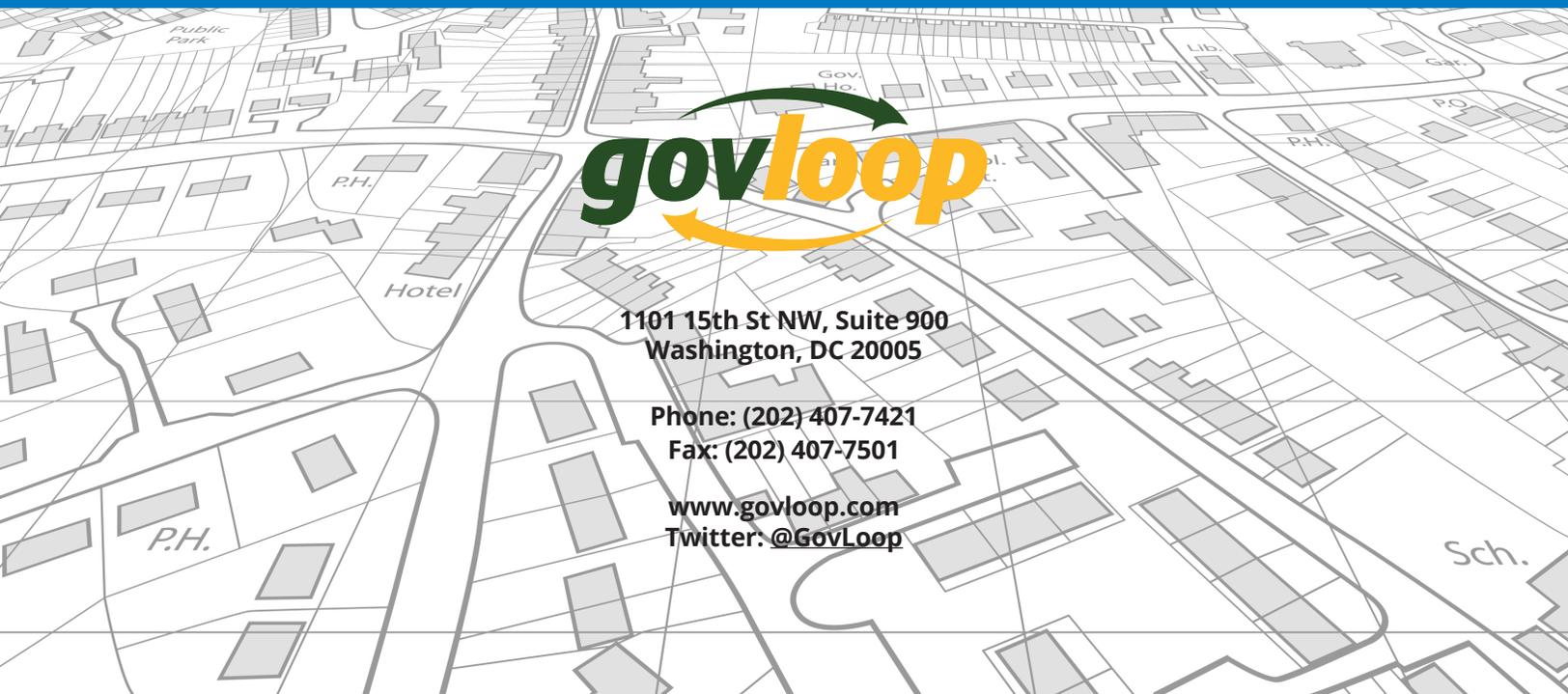
But to truly achieve success with GIS, organizations must prioritize need based on the issues important to their citizens. "We've dedicated significant time documenting the return on investment of applying GIS and spatial reasoning to various problems, whether it be streamlining your permitting system, urban plan, and designing infrastructure, we've always been part of that fabric," said Thomas.

Today, GIS extends across all elements of a city. Whether it is tracking permits, fires, hotspots for crime or tracking disease, GIS is an essential tool for a more efficient and effective government, and to build a smart community.



“ ONE THING THAT ALL GOVERNMENTS DO IS MAINTAIN AND CREATE A LOT OF DATA. WHETHER THAT'S INVENTORYING TREES, RESEARCH ON POPULATIONS, PROTECTING ENDANGERED SPECIES, OUR SOFTWARE IS THEN USED TO CREATE AUTHORITATIVE DATASETS. ”

CHRISTOPHER THOMAS, DIRECTOR OF GOVERNMENT MARKETS AT ESRI.



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