



Industry perspective

# Creating Smart Installations With the Power of GIS





Today, citizens are calling on governments to be more transparent, efficient, collaborative and productive. This has led to more and more government officials using technology and data to address community needs and make sound, data-driven policy decisions – factors that contribute to an effort known as the “smart community” movement. The movement advocates the use of data and analytics in government to better the lives of citizens.

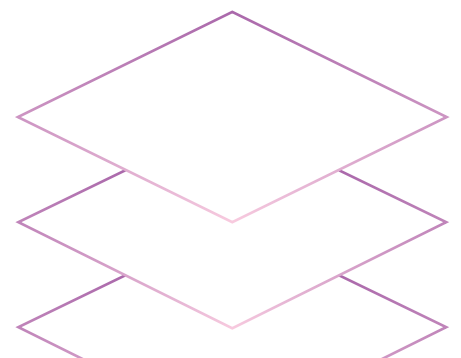
In the past decade, the smart community movement has taken off in response to these rising citizen demands and expectations around technology, advocating that municipalities and counties rethink the way local governments deliver services and address the issues of our times.

The rise of the smart community movement has inspired many other areas of the public sector to make use of technology to serve its citizens, enable interdepartmental collaboration through open data sources, give mobile access to information and focus on the efficient collection of real-time data.

But one area of the public sector that could stand to benefit the most from the tenets of smart communities are government installations. Government installations – large-scale and complex government facilities – need

to focus on becoming smart and taking advantage of technology to make better decisions and be more efficient. One way they can do this: Use existing GIS platforms and technology to move their installation along the path to becoming “smart.”

To discuss what being a smart installation truly means and how a government facility can become one, GovLoop and Esri have partnered for this industry perspective. In the following pages, we’ll discuss the technology behind smart installations; explain why they matter to the public sector and the citizens it serves; explore how GIS supports smart installations and give tips on how large-scale facilities can start their own journey to become a smart installation.





# Why Smart Installations Are Needed Today

Smart communities are able to leverage technology to improve the quality of life for citizens. GIS plays a critical role in this, as it empowers leaders to visualize, question, analyze and interpret organizational data to better understand relationships and trends in their community. A smart community approach creates a more transparent, collaborative and accessible government for its citizens. In many ways, 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.

So why do installations need to look to smart communities for inspiration? It's all about effectiveness and efficiency. Installations – large government-run complexes that typically house multiple facilities used by multiple organizations – are run and operated by the U.S. government across the country, and the world. The effective management of these installations can have a huge impact on the effectiveness of the government – everything from maintaining effective energy utilization, to construction costs, to transparency and efficiency for both the citizens affected by what the installation does and the public sector employees who work at the installation.

But the most important reason an installation needs to be run well is that it allows the tenant organization – whether it's NASA or the military – to effectively execute its mission. Think of a military installation like Fort Bragg; it needs an incredibly well-run and efficient installation to handle the complex training requirements of the units that are on base.

But the reality is that the smart installation movement has lagged behind that of the smart community movement, in part because it faces a variety of unique challenges. One of the main challenges: the need to be able to comply with government regulations and directives, which typically impact all the different departments on an installation – everything from public works to environmental groups.

Another significant challenge on an installation is the ability to maintain an accurate picture of all assets around the clock with a high fidelity of information. Additionally, many installations deal with challenges relating to energy efficiency and resiliency and cost savings.

Finally, since many installations have a mission-critical function that affects national security, they need the ability to be self-sufficient, and perform independently even if the main power grid goes down.

Even given these unique challenges, though, any installation can move toward becoming a smart installation. Here's how.

## What Is a Smart Installation?



- Accurate and up-to-date inventory of assets
- Integrated systems for cross-department coordination
- Real-time situational awareness at all levels of command
- Consistent centralized view of all installation operations

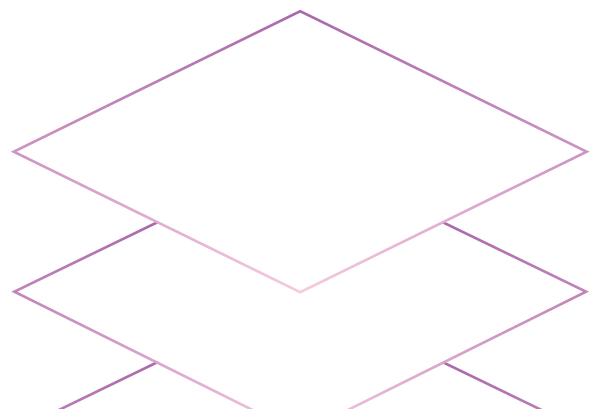


# Leveraging the Smart Community Framework for Installations

Every smart community blueprint emphasizes a hub approach that enables collaboration and information-sharing between departments and people. To become a smart community, organizations need workflows and processes that encourage data sharing for timely, data-driven decisions.

The goal of a smart community – and therefore a smart installation – is to deliver improved services and make the installation a place that functions efficiently while contributing to the overall readiness of the organization.

An installation doesn't just become smart; it needs to have a strategy for becoming smart. And it can look to the smart community approach.

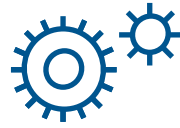


Here are five important steps:



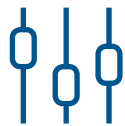
### 1. Use a world-class GIS platform to track assets with accuracy.

Location plays a key role in the management and operation of installations. To apply spatial thinking to installation needs and use location as a tool to inform decisions, installation leaders should invest in a world-class GIS platform. This solution needs to serve GIS professionals, knowledge workers who simply use GIS, field workers and decision-makers. It also needs to support workflows such as collecting data, analyzing and performing what-if scenarios against information, improving operational awareness and improving field operations.



### 2. Build a location strategy to analyze and plan management strategies.

Next, determine where the highest-need areas are in your installation and where a robust GIS platform can have the most valuable impact. When you're just starting your smart installation journey, it's important to prioritize your efforts. As you progress, you can revisit this step and expand which assets and strategies you apply GIS technology to. "Launching Your Location Platform," [a white paper from Esri](#), offers a number of tips to help get your locations strategy off the ground.



### 3. Deliver real solutions to control operations.

Once you have a platform in place, and a strategy to use it, it's time to really deploy solutions. One such solution is the ArcGIS application, which has more than 150 ready-to-use applications to get you started; read the following section about further advice for using Esri products to create your smart installation.



### 4. Develop strategic partnerships to drive efficiency. Maps are a common language for sharing.

One of the biggest benefits of using GIS platforms is the ability to connect users within and across organizations. Even with that collaboration, however, some installation leaders may need more assistance to make the most of GIS. In those cases, consider moving beyond your organization.



### 5. Seek communities of practice that are experienced with GIS and its benefits.

Esri offers a number of channels, including meet-ups and online portals, that allow users to share best practices. Take advantage of the Esri community and reach out to the partner organizations you have access to through the ArcGIS platform.

By creating a location strategy and using a GIS platform, installations can transform their operations to be smart.





# Using GIS to Create a Smart Installation

“The value of GIS is that it gives us information in context about our world and provides a framework for understanding installations and brings factors together that allow us to visualize and analyze the data,”

—**Ben Conklin**,  
Industry Manager  
Defense, Intel and  
National Security  
at Esri.

Smart installations leverage technologies that collect a large volume of data, making it difficult to search through the data and pick out what is meaningful.

Visualizing data on maps helps connect the different workflows across an installation, giving them a common language for information-sharing. These more integrated workflows foster a more productive, efficient, transparent and collaborative workforce, which can ultimately better serve the installations community.



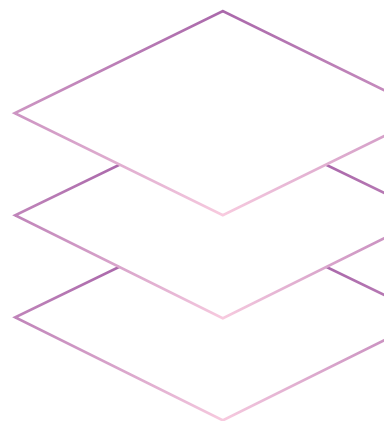
## Esri's ArcGIS platform can support those processes in the following ways:

- It allows you to integrate mapping and spatial analysis into organizational system dashboards for the most effective visualization of data.
- The platform can empower smart installations. It 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.
- 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 installation.
- When you're trying to solve or understand a problem, ArcGIS can 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.
- 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.

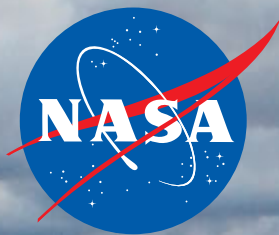
But to truly achieve success with GIS, installations must prioritize need based on the issues important to their employees and the citizens they serve.

Today, GIS extends across all elements of an installation. Whether it is facilities management, power outages, electrical grid issues or others, GIS is an essential tool for a more efficient and effective government and to build a smart installation.

Many government installations already use Esri's ArcGIS technology to connect separate systems and empower their people with modern applications to deliver better services. From data collection and creation to analysis and community engagement, ArcGIS supplies organizations with an end-to-end solution to make their installations smarter.











# A Smart Installation and GIS Case Study: NASA's Langley Research Center

Becoming a smart installation means creating effective space management, which relies on information about people, places and processes. GIS technology helps facility managers organize and spatially visualize where and in what type of space people work. And at NASA's Langley Research Center (LaRC), GIS has been instrumental in helping the installation become a smart installation.

LaRC is an 800-acre facility with approximately 400 buildings and test structures totaling 3.7 million gross square feet. Its 6,700 rooms house 4,000 employees. The center is primarily identified with wind tunnel research but supports many other disciplines, including structures and materials, flight electronics and atmospheric science.

Because of LaRC's diverse activities, the infrastructure is massive and complex with a variety of facilities. And in the past few years, based on the success of its GIS implementation for facility master planning, the GIS team of the LaRC in Hampton, Va., has carried the system forward to handle the large task of its facility's space management – effectively becoming a smart installation.

Brad Ball, lead for GIS at NASA Langley Research Center, said: "My team has the responsibility for managing spatial data at LaRC – the boundaries, the roads, the environmental consideration areas, the buildings, the sidewalks. So we have all of this integrated in a complete data-management and decision-support environment. We have an excess of 700 feature datasets and tables that are in either the edit or production role. That translates to over 250 tools that we make available through the Esri portal environment to our facilities folks."

This use of datasets allows LaRC to use resources more intelligently and more efficiently. "Instead of sending people out to find problems, through these web tools and through gap analysis, we're able to identify where potential problems may exist in our spatial data, and then address it from there," Ball said.

This massive amount of data and its accessibility allows Ball and his team to run LaRC as a smart installation – and becoming a smart installation was not as difficult as one may think.

"Many organizations have come to us saying they can't possibly do what we have," Ball said. "But they absolutely can. They just have to think beyond what their legacy process is. We have accomplished the majority of what we have done using very low-cost interns to do the necessary data collection, for example."

In addition to the savings the agency will realize from more efficient property use, Ball believes the system is paying dividends in terms of effectiveness. He says the system's ability to integrate data from various sources allows the agency to make better decisions, resulting in opportunities for further operational improvements and reduced costs.



# Conclusion

Many installations already have GIS platforms, and are using the technology for creating more efficient techniques for existing workflows. But moving to a smart installation means departments and leaders from all parts of an installation – commanders, public works officials, military police – all want to use GIS.

When installations can take the approach and frameworks from smart communities, they will become smart installations – achieving efficiency, transparency and cost savings and better executing their mission to serve the public.







When Esri was founded in 1969, we realized even then that geographic information system (GIS) technology could make a difference in society. Working with others who shared this passion, we were encouraged by the vast possibilities of GIS.

Today our confidence in GIS is built on the belief that geography matters - it connects our many cultures and societies and influences our way of life. GIS leverage geographic insight to ensure better communication and collaboration.

Explore our website to discover how our customers have obtained the geographic advantage by using Esri software to address social, economic, business, and environmental concerns at local, regional, national, and global scales. We hope you will be inspired to join the Esri community in using GIS to create a better world.

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