
esri
Starting Smart Guide
Frameworks for Building Smart Communities

An Introduction to Smart Frameworks

Simply put, smart communities are about connecting people to technology to achieve better daily outcomes. Modern communities face constant challenges. Whether it's congested roadways, homelessness, lack of jobs, underperforming schools, crime, or otherwise, the opportunity for improvement is everywhere. To address these challenges and provide the best services sustainably, governments leverage the efforts of the entire community to devise smarter solutions.

Smart communities find the results they seek more often through civic engagement, data-driven decision-making, and collaboration. Geographic information system (GIS) technology supports these efforts by uniting data sources, analyzing information at scale, and providing intelligence with context to help anticipate outcomes.

But how does a community become smart? The process is no simple task. Budget constraints, difficulties navigating intricate technology, and training large staffs can all stall aspiring smart communities. Given what can be a complex process, communities need a road map to guide them through the journey to becoming smart.

Ultimately, organizations that understand the importance of connecting data will see opportunities where other communities will not. Use this guide to envision your digital transformation and make the proper accommodations along the way.

Connecting the Data Points

Nearly all data relates to space, time, or both. Smart governments use these attributes to blend endless datasets so that they can analyze relationships and integrate business systems. As a tool or science, GIS is used to examine information rapidly, objectively, and comprehensively. Independent of scale or structure, smart communities use geographic context to reveal insight, improve decision-making, and deliver positive outcomes.

Smart Statistics

32 Use of Data Analytics—Only 32 percent of cities and counties in the United States currently use data analytics. (Source: Center for Digital Government, The Platform of Tomorrow, Public CIO, 2015)

41 Spending on Internet of Things (IoT)—Cities are expected to spend $41 trillion on IoT technologies in the next 20 years. (Source: Data-Smart City Solutions—August 31, 2015)

75 Lack of Process and Change Management—By 2017, 75 percent of cities worldwide will fail to take full advantage of smart city data and digital assets due to a lack of process, project management, and change management skills (Source: Ruthbea Yesner Clarke, IDC—December 2, 2016)

Smart Starting Points

The primary condition for a successful smart community is to have in place the right people with the right mind-set. Without a culture that nurtures scientific analysis and new ideas, smart adoption is not possible.

Whether beginning or expanding your smart journey, be prepared to accept that there will be unknowns in the process. Success comes more easily when initiatives have clear business objectives.

A maturing smart community demonstrates it can:

☐ Prioritize Initiatives

Connecting people with data doesn't accomplish much unless they're being connected to a cause. A community must focus on which problems and opportunities will be addressed first. What initiatives can be accomplished with the resources it already has? What will achieve the greatest good for those critically in need? Establishing clear priorities allows governments to shape expectations and set the standards by which success will be measured.

☐ Assemble a Team

A smart community is only as effective as the individuals supporting it. Assemble a solid foundation by locating and empowering an executive champion who understands the community's initiatives and has strong change-management skills. Even with executive support, smart implementation will stall without a motivated team to see tasks through to completion. Surround the designated leader with a technical staff that takes ownership of objectives from start to finish.

☐ Gather the Data

Data drives initiatives. To be informed, local intelligence must be collected and referenced against other datasets. Identify which data sources initiatives need and locate where they can be found. Should inputs be inadequate, expand them with data-capture best practices. Ultimately, a community's goal should be to convert all inputs into live data feeds that are either centralized or decentralized for government departments.

☐ Address Gaps

When governments know their strengths, they're better suited to address their weaknesses. An understanding of community data pinpoints where technology, processes, and technical skill sets fall short. Whether it's the need for more hardware, network capability, skilled personnel, or data inputs, highlight what organizational gaps are limiting progress. In many instances, policy and procedure gaps will be the most difficult for governments to overcome.

☐ Provide Insight

Authoritative data alone doesn't inform a smart community. Building maps and apps gives context to challenges and influences innovative solutions. People use information tools, from lightweight apps to web pages and robust business systems, to drive initiatives, track progress, and stimulate collaboration. Communities that build and reuse app templates produce more avenues to share data, making it quicker and easier to access intelligence.

Smart Community Characteristics

Every smart community may be different, but they all share common operational traits. Each relies on real-time intelligence for evidence-based decision-making, more effective collaboration, and public engagement. Using data to act in the community's best interest, proactive administrations embody the following characteristics:

Forward-Thinking Leadership and Strategy

Modern leaders rely on facts, not gut feelings.

To achieve smarter operations and deliver services that citizens need, civic strategies must be measured and people centric. Data is what fuels the smart community, and its adoption begins from the top of the organizational food chain. Leaders progress ideas forward, build ecosystems that encourage innovation, and remove obstacles that might impede initiatives. The best leaders will motivate their entire organization, inspiring a smart community to become optimized.

Data-Driven Decision-Making

Information provides perspectives to improve outcomes.

The pressure to invest wisely and respond to situations effectively has never been greater. To avoid waste and public scrutiny, governments need data-driven decisions that are justified by facts from multiple perspectives. By sourcing authoritative data, emphasizing analysis, and using evidence to determine actions, governments achieve their initiatives with greater success and support.

Real-Time Awareness

Live data informs immediate response.

Better decisions begin with current, accurate, and relevant information. With the overwhelming amounts of live information being observed and acted on, real-time data feeds are no longer a luxury. From mobile devices to networked inputs across the IoT, governments draw actionable intelligence promptly from streaming data. To make a meaningful difference, organizations must remain continually aware of community events in order to respond to critical incidents in a timely manner.

Collaboration across Departments

Pooled intelligence enables successful operations.

Smart communities unite the efforts of government and community groups through free-flowing information across departments and organizations. Once limited by data silos, integrated networks make intelligence accessible beyond traditional boundaries. When users share and pull communal data through their applications of choice, efforts are better aligned, resources are allocated more wisely, and time is saved.

Civic Engagement

Engaging open data is essential to transparency.

Beyond just publicly sharing information, governments must actively explore new ways to interact with citizens and provide them with contextual data. Including community groups in the process, which may be viewed as untapped government departments, promotes transparency and opens additional resources. Further, governments that embrace communication with the public make it easy for people to provide and find feedback. Through channels such as social media, citizens can contribute commentary that directly influences government decisions. When data-driven rationales and logical thought processes are made clear to the public, governments better justify their priorities, budgets, and actions.

Stages and Dimensions

Governments must consider their operations in detail to determine what shortcomings are holding back their smart strategy. Smart communities begin by identifying a government's overall maturity. Whether a smart strategy is well developed or still in its infancy, each stage of maturity will depend on how its people, processes, data, and technology come together to make advancements possible.

Stages

Are members of your organization still attempting to sell the smart community concept internally, or are public service needs already being intelligently addressed and budgeted for? Assess what stage of maturity your government is operating in to determine what steps remain to become optimized.

Experimental
Siloed Successes

Your smart community project is just beginning to take form. Officials have identified key communal challenges to address. Advocates have begun demonstrating business value through proof of concept to key stakeholders. Pilot projects are testing how smart approaches affect outcomes while also providing useful examples of how business objectives succeed or fail. Initiatives are often isolated to smart incubation groups whose efforts may be ad hoc, improvised, or unrepeatable. Regardless of silos, applied analysis proves smart strategies are driven by data, not guesswork or theories.

Functional
Intentionally Smart

A maturing smart community deliberately seeks opportunities to become smarter. With lessons applied from the experimental stage, organizations are looking to expand on successful, repeatable implementations. Governments build momentum by expanding stakeholder buy-in, involving additional internal departments in smart strategies, and beginning to outline a clear approach to connecting the entire organization. Proactive smart communities encourage collaboration between departments on smart projects, strengthening the ties between governance, initiatives, and data.

Transformational
Enhancing Integration

When smart processes become second nature, a transformation in organizational culture occurs. This transformation internalizes within a government first, before it expands outward to community groups as well. Maturing smart communities form standards for data quality, capture, sharing, and integration with core business systems. Their legacy systems have been sufficiently planned for or replaced with modern platforms, so they can address new events rapidly and at scale. Structured strategies demonstrate what to expect from projects and actively make use of data so that governments can improve their levels of service.

Predictive
Proactive Intelligence

When governments predict the needs of their citizens, they can provide solutions and prevent service disruptions. As community problems and opportunities are anticipated, sufficient personnel and resources are budgeted in advance. Internally, the smart concept has been fully adopted. Organizations can be proactive and are no longer caught off guard by sudden developments. Externally, citizens increasingly access contextualized data, encouraging collaboration with and contribution to community intelligence.

Optimized
Sustainable Progress

An optimal smart community is agile with problem solving, innovative in how it addresses issues, and effective in acting quickly. Government operations and decision-making are geared to be well-oiled machines that improve community services sustainably. Everything is connected in a fully mature smart community, tying systems, processes, people, and data to one another in complete integration without duplication of information or effort. Such a framework allows leadership to keep citizens and staff aligned on issues and convey intelligence effortlessly. Optimized smart communities have a superior ability to raise standards of living and be resilient when disastrous events occur, giving themselves a competitive advantage over their peers.

Dimensions

The progressive stages of smart community development require increasingly streamlined processes, connecting people to authoritative data and modern technology. To mature and achieve various initiatives, governments must be conscious of how each of these aspects supports one another. Independent of where an organization stands, these areas are critical to long-term adoption by effective smart communities.

People

Becoming a smart community is a cultural shift for governments that connects people to information. While most people will embrace this concept, plenty will be reluctant to accept change because of uncertainty toward new responsibilities. As such, securing staff who are willing and capable of implementing smart strategies is of the utmost importance. It takes inspired personnel to maintain an organization's direction and advance its digital transformation with innovative problem solving.

Data

Authoritative data is the lifeblood of any smart community. Without its insight, decision-making isn't based on intelligence but is merely subjective intuition. Governments must continually question the integrity and transmission of their information. How is data procured, stored, and protected? Under what circumstance is it shared, accessed, and used within your community? Communities that connect to live data, as opposed to static datasets that show isolated snapshots in time, build better intelligence than their counterparts. While establishing an open data strategy is a fine place to begin, data and its uses will need to be under constant examination as a community pursues smart optimization.

Process

Developing a smart community is a process; so implicitly, the policies, governance, partnerships, and workflows that guide an organization's operations and decision-making are fundamental to its structure. Is there a system in place for flexible decision-making? Are initiatives addressed in a way that is repeatable? Can operations be streamlined without having to start from square one? It's necessary that they be flexible enough to allow quick adjustments while also remaining rigid enough to maintain quality and integration. Long-term maturity and success depend on governance that constantly evaluates its processes to ensure optimized performance.

Technology

Smart communities are measured by the technology they use. Whether it's sensors, servers, or GIS, modern technology is an indispensable tool. To stay informed, drive better decision-making, and impact positive change in the community, governments must integrate many different business systems. Legacy software constrains organizations, so flexible solutions must be devised or communities must transition to up-to-date offerings. Mature governments need interoperable technology in order to better connect, observe, and analyze data anywhere, anytime, and through any device. Is your technology in place to evolve with a comprehensive smart strategy?

What a Community Is Building

Communities progressively build integrated networks to connect people and data. These networks use GIS to contextually analyze tracked movement and change across IoT, social media, and other live data sources. Esri calls these networks hubs.

A hub serves as an ideal foundation for a smart community because its framework provides people with insight for making better-informed decisions. Governments modernize technology with GIS so that they can visualize and manage big data.

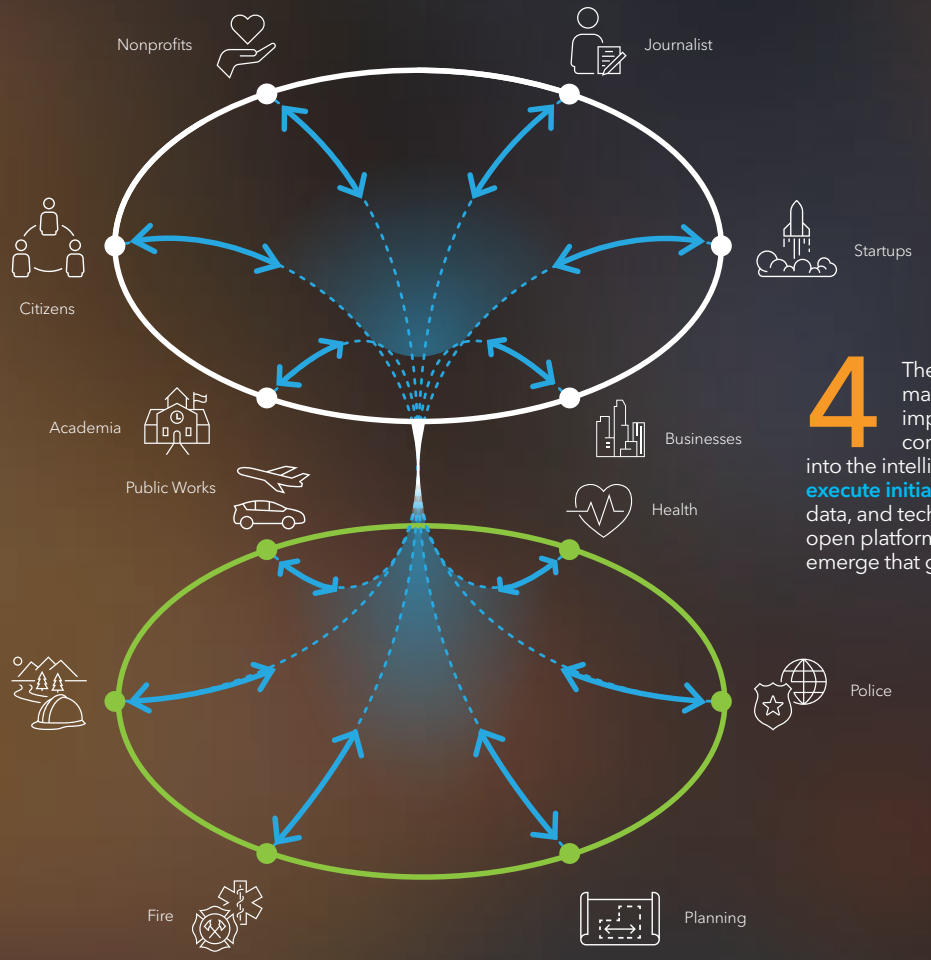
In doing so, they unite their entire organizational trees via information-sharing networks that tie all branches and agencies to one another.

Building a hub enables a community to become part of the measured approach to addressing problems. By sharing data between government and citizens, people are given the intelligence to become part of the solution. Regardless of a community's maturity, any government can build a hub that reaps benefits for everyone involved.

2 When organizations are ready for greater community involvement, they expand and build a hub. With a **hub**, governments seamlessly integrate community groups into the data-driven decision-making process for key initiatives. Doing so augments a smart community's workforce, adding untapped resources, such as universities and nongovernmental organizations (NGOs), through a public engagement platform that streams live data. Whether contributing social media feedback or gaining greater understanding from public services information, citizens benefit when governments build more ways for them to connect.

3 By uniting community members and enterprise GIS, a powerful **integrated network** is developed. These connected ecosystems produce interoperability between other technology systems that allow people to provide and consume authoritative data. Within a hub, citizens become valued components of an organization through sustained engagement, participation, and data contribution. In addition, this networking directly supports real-time awareness and data-driven decision-making with insightful maps, intuitive apps, and improved communication.

1 What brings organizations together is **enterprise GIS**, a means to connect data between internal government departments. Organizations find that connected individuals collaborate more productively while also saving time accessing information—their operational efficiency, delivery of public services, and overall return on investment tend to agree.



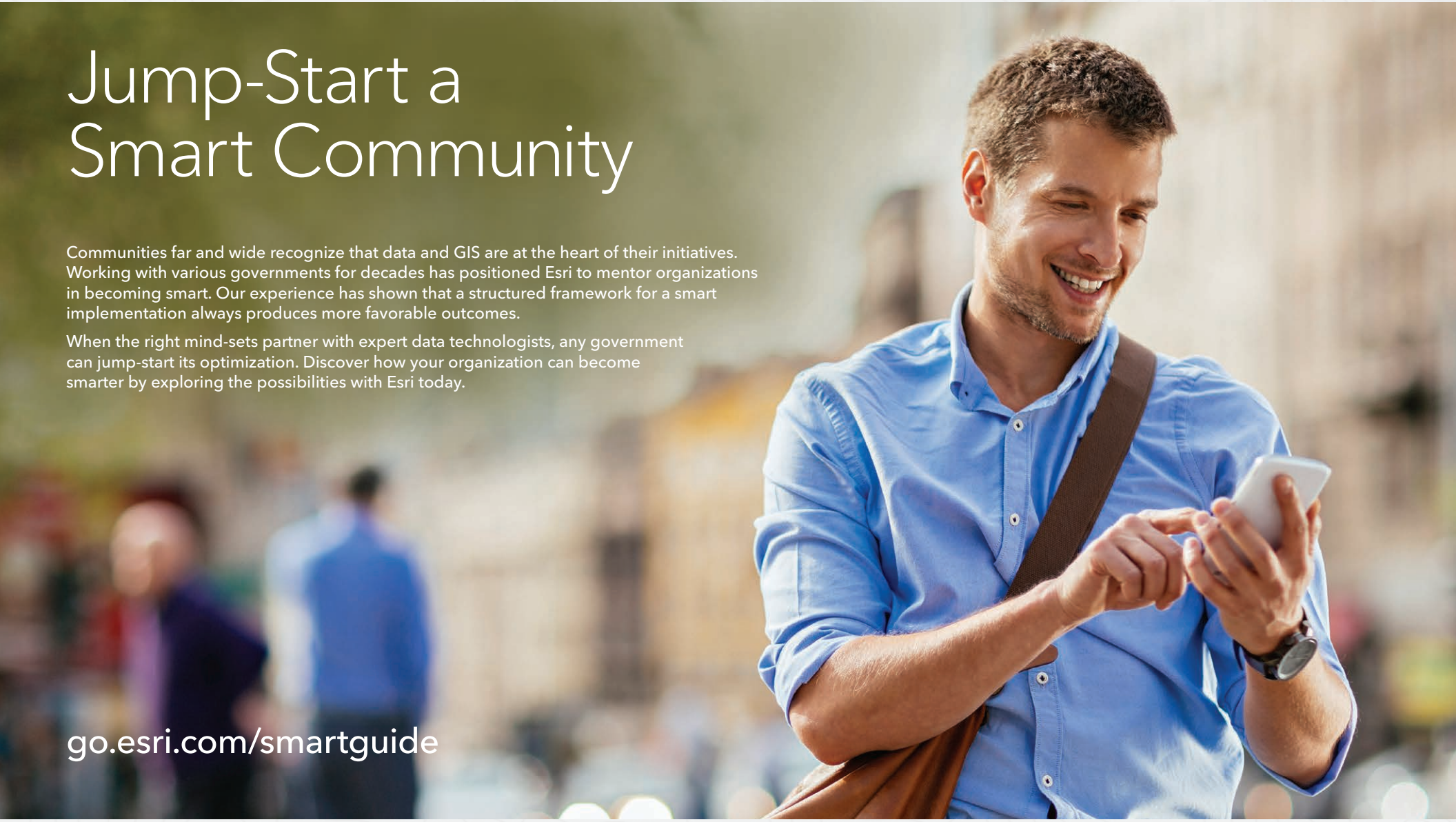
4 The sum of the parts is a well-oiled machine for implementing civic improvements. This smart community engine converts data into the intelligence governments use to **execute initiatives**. When people, processes, data, and technology are tethered within an open platform, forward-thinking strategies emerge that guide intelligent action.

Jump-Start a Smart Community

Communities far and wide recognize that data and GIS are at the heart of their initiatives. Working with various governments for decades has positioned Esri to mentor organizations in becoming smart. Our experience has shown that a structured framework for a smart implementation always produces more favorable outcomes.

When the right mind-sets partner with expert data technologists, any government can jump-start its optimization. Discover how your organization can become smarter by exploring the possibilities with Esri today.

go.esri.com/smartguide



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