

Smart City Readiness: Understand the Issues to Accelerate the Journey

What You Will Learn

In a recent survey of municipal executives in North America on the readiness of cities to undertake smart city initiatives, these facts emerged:

- The officials surveyed indicated that although some early adopters have smart city initiatives underway, most are still in the planning stages.
- By far, the biggest inhibitor for cities is funding, as officials are challenged to find the appropriate financial resources for both short- and long-term projects.
- The respondents also indicated there were internal organizational challenges, such as the lack of cross-departmental coordination and alignment. In addition, many cities need a committed champion to lead the effort across departments.

Based on the findings, there are clear steps that cities can take, such as getting assistance in leading projects, improving planning, and achieving a better understanding of the cost and benefits of a smart city. As they undertake the steps recommended here, they can move beyond the current barriers and start to capitalize on the benefits of a smart city.

Introduction

Cities around the globe are undertaking “smart” initiatives that result in better services for citizens, a more attractive city for visitors and businesses, a better place to work, and greater cost savings.

To achieve these results, it’s important for cities to think big, but start small. In other words, think big initially with a holistic, citywide evaluation of the opportunity and the engagement of all the stakeholders—citizens, businesses, and city employees—right from the start. Equally important is the development of a smart-city roadmap with clear estimates of costs and benefits, along with a simple return-on-investment (ROI) analysis for individual projects.

Then, with a vision for the future of the city, small projects with quick payback can be initiated. The savings from these projects, along with the positive publicity of citizen engagement, will provide momentum for future projects.

What Kind of Progress Have Cities Made?

To find out where cities in North America are on this path, Cisco recently collaborated with members of the Smart Cities Council, a worldwide coalition of companies that are dedicated to inventing an urban future. Cisco asked mayors, city councilors, IT executives, and city managers to share where they are today, and the challenges and opportunities they are experiencing on their smart city journey.

Here are a few of the key findings:

- The most significant driver for smart city development is improving city infrastructures such as energy, water, and transportation systems.
- Some smart city projects have been initiated, mostly in smaller pilots, but overall, smart city development is still largely in various degrees of planning. And although planning is good, it is evident that cities need help in avoiding the downfall of endless city bureaucracy and getting pilot programs started.
- Cities are challenged by lack of clarity around the benefits a smart city initiative would bring. They need better resources—tools, guidance, and expertise—to help them understand what a smart city initiative could do for their municipality.
- The top barrier to smart city development is funding, as cities are struggling to find innovative funding alternatives. And they seem keenly unaware of newer, less risk-oriented options that are now available.

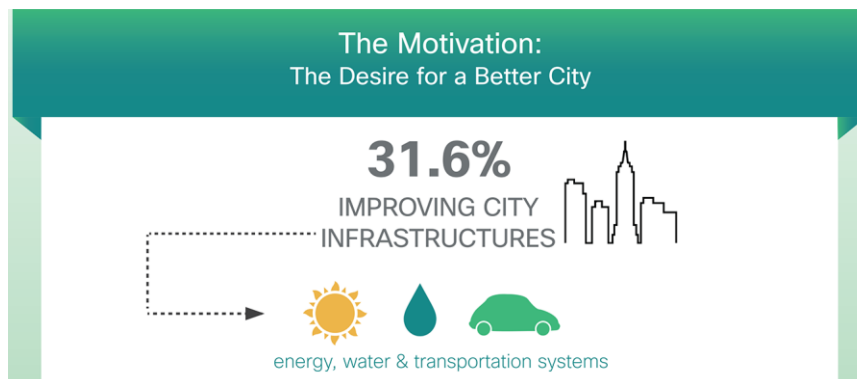
The Motivation: The Desire for a Better City

Municipalities worldwide are looking to improve their infrastructures and create a city that is more attractive to businesses, citizens, visitors, and its workers. The respondents of this survey are no different.

In fact, nearly a third (31.6 percent) of the city officials identified that one of the top drivers in smart city development was improving their city infrastructures. This by far outweighed any other reason for developing a smart city, most likely because many city infrastructures, such as energy, water, and transportation systems, are aging and declining rapidly. As such, it's hard for these systems to keep up with growing populations and the increased expectations of citizens who are living in a highly technologically advanced society.

Improving a city's infrastructure may also be important because city officials understand that projects like these create new short-term jobs, enhance the prospects for new long-term jobs, and make cities more livable and workable. And, of course, improvements in city infrastructures are a tangible result of investments that show stakeholders, like a city's citizens, that a city is concerned about the welfare of its residents.

Enhancing a city's global attractiveness and competitiveness to business and economic development are also important to city officials, as are strengthening financial stability, growing the tax base, and improving job conditions.



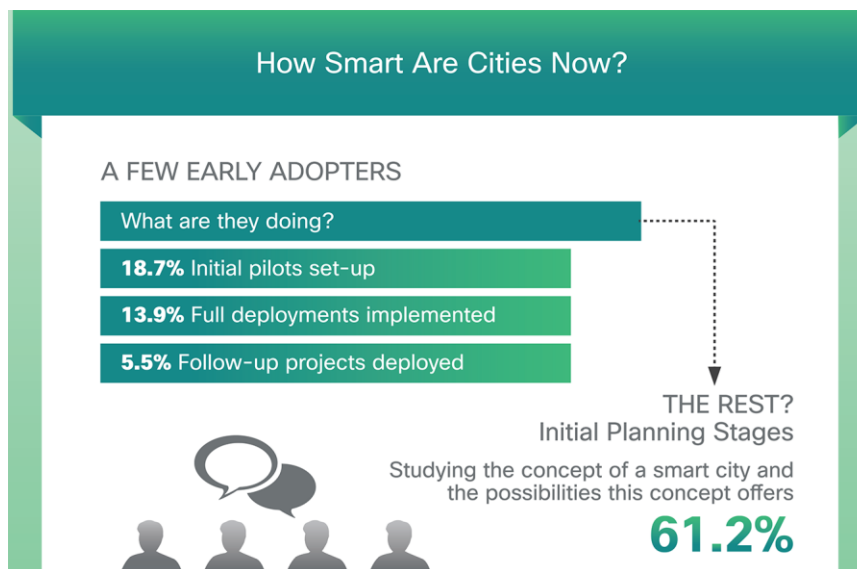
How Smart Are These Cities Now?

The survey showed that many cities are early adopters of smart city solutions, with initial pilots (18.7 percent), full deployments (13.9 percent), and follow-up projects (5.5 percent) in progress or completed.

However, the vast majority are just beginning the process. In fact, of the city officials surveyed, most are in the initial planning stages, with 61.2 percent indicating they are studying the concept of a smart city and the possibilities this concept offers. Other planning activities that these cities are undertaking include:

- 51.2% of the cities have started reviewing their priorities and departmental needs
- 49% have developed long-term visions and roadmaps
- 37.6% of the respondents have created a long-term plan and have communicated the vision for this plan both internally and externally
- 34.1% have created action plans, with priorities and next steps outlined

These initiatives indicate that these cities are on the right path, because having a vision is one of the first requirements on this journey, and building a plan to get there is a critical second step.



What Other Steps and Projects Have Cities Begun?

In addition to the planning efforts mentioned, almost half of the respondents are undertaking improved IT and communication systems projects (49.9 percent) and energy efficiency and sustainability initiatives (47 percent). They have also started on projects for citizen engagement and empowerment (46.4 percent); open data and government transparency (42.1 percent); and transportation, parking, and traffic management (40.3 percent). And more than a third are taking action regarding public safety and security (38 percent).

Many cities (31.9 percent) have engaged the citizens to find out their needs, and more than a quarter of the cities (27.8 percent) are in the process of determining funding requirements and sources. Others (21.6 percent) have created a smart city team or task force, while many (20.5 percent) are issuing Requests for Proposals (RFPs) to procure the appropriate technology and services.

The Biggest Barrier: Funding and Financial Acumen

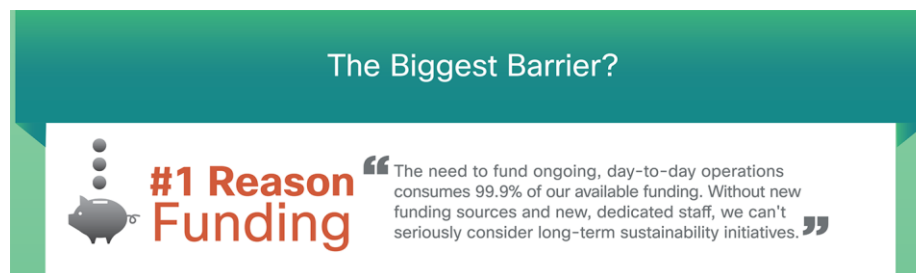
So why are smart cities not evolving more quickly?

One of the most critical hindrances is funding, as this was the top answer for an internal challenge (35.4 percent) as well as an external challenge (26.2 percent). And access to innovative funding alternatives (28.5 percent) was on the top of the list when these officials were asked what would accelerate smart city implementations.

A primary concern for cities is the ease of securing funding to cover the total costs for smart city projects (36 percent). Cities are also concerned about securing funding options that match the duration of the project (short- or long-term). And others are challenged by uncovering flexible funding that matches the needs of the project. One respondent summarized these challenges with this statement:

“The need to fund ongoing, day-to-day operations consumes 99.9 percent of our available funding. Without new funding sources and new, dedicated staff, we can't seriously consider long-term sustainability initiatives.”

What do cities use now for funding? Nearly two thirds (59.8 percent) of the respondents are using or are planning to use government-based finance options, such as general obligation bonds, revenue bonds, industrial revenue bonds, green bonds, or user fees. Almost half (42.4 percent) consider public-private options such as partnerships, pay for performance, and securitization and structured finance opportunities as important options.



The infographic features a green header with the text "The Biggest Barrier?". Below the header, on the left, is a piggy bank icon with three coins above it. To the right of the icon, the text "#1 Reason Funding" is displayed in a large, bold, orange font. Further to the right, a quote is presented in a smaller black font, enclosed in double quotation marks: "The need to fund ongoing, day-to-day operations consumes 99.9% of our available funding. Without new funding sources and new, dedicated staff, we can't seriously consider long-term sustainability initiatives."

Lack of Insights into Costs and Benefits a Hindrance Too

In addition to finding appropriate funding, city officials also expressed a concern about the lack of ability to correctly estimate the costs and ROI of these projects (24.8 percent). This fact became evident when these city officials were asked about financial planning. Surprisingly, few have any type of business plan (31.8 percent), budget allocation (20.1 percent), or ability to forecast ROI and metrics for projects like these (23.7 percent).

And yet although nearly two-thirds of the respondents seem to fall short in these proficiencies, many cities seem to grasp the financial ramifications of what being a smart city means. For instance, 43.6 percent of the cities surveyed understand how to estimate new revenue streams as part of funding a project like a smart city. They also have a good understanding of the cost savings and operating efficiencies (54.5 percent) and environment benefits (51.9 percent) that such an endeavor might bring.

Other Important Influencers in the Smart City Journey

Citizen Engagement

The Smart City survey also indicates that some city officials are concerned that they haven't engaged the community enough or that the community is not at the same level of readiness as their cities are (22.1 percent). This phase is an important part of smart city evolution, yet surprisingly some cities (10.7 percent) don't recognize this and elect not to engage with citizens. This is a situation that can backfire in massive initiatives such as smart city projects.

Organizational Support

Other internal challenges highlighted organizational concerns. An important one is the lack of a committed champion or visionary leader; about a quarter of the respondents (21.5 percent) experienced this situation. Additionally, departmental silos, lack of coordination, and a lack of alignment on priorities provided barriers to other cities.

Technology

The Smart Cities community surveyed spends most of its time talking about technology, so that may be why the respondents indicated that technology is not a primary inhibitor of further progress. But this area has some challenges nonetheless.

Getting technology and products to work together was the most cited challenge, followed by interoperability between different technology areas. Mobile communications may be problematic in the future, because more than half of the respondents have only 25 percent or fewer of their applications prepared for mobile usage.

The top technology purchasing initiatives that were cited as the most important by these cities' officials indicate that they are thinking about the infrastructure they will need to move forward as a smart city. Here are the top five most mentioned:

- Communication networks
- Intelligent infrastructure
- Compute, data storage, and data centers
- Data analytics
- Cyber security

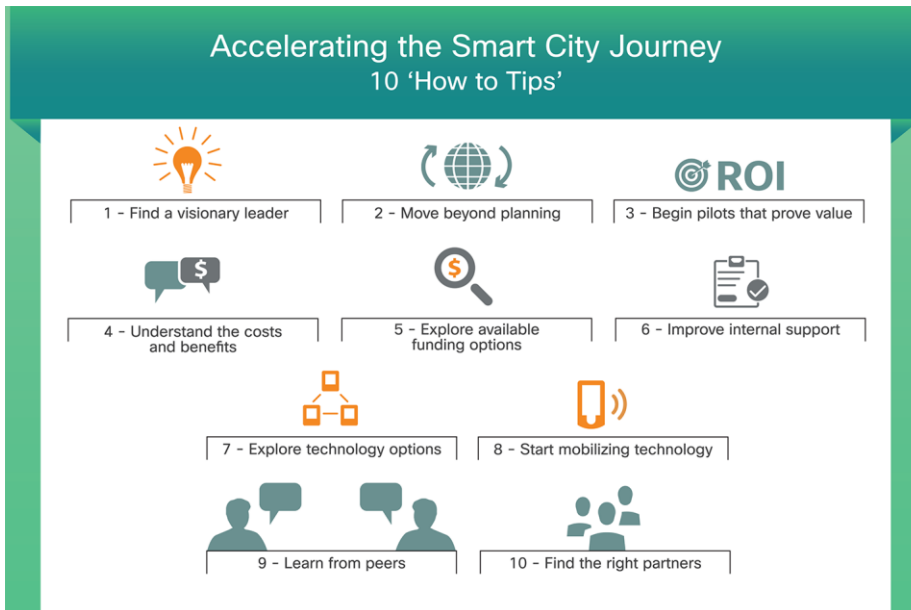
Data Security and Privacy

Data is always a problem in any technology endeavor, making policies around data security critical. And it seems that the cities surveyed understand this problem, and therefore, security and data privacy are not considered barriers.

More than three quarters (75.5 percent) of the officials surveyed have data privacy policies in place, and more than two thirds (69.9 percent) have cybersecurity policies. These statistics are very reassuring; however, how these policies are implemented across the cities is still a concern.

Although a little under half (40 percent) of the respondents have citywide data policies, only about a quarter of them (27 percent) have department-based policies. And a third of the respondents (33 percent) still do not have any type of policy in place at all. Privacy and security are a requested element, and they can explode if ignored.

Accelerating the Path to a Smart City



So given where cities are and the obstacles city officials perceive, what can be done to accelerate the journey? Here are some critical steps:

- **Find a visionary leader:** The right champion can be the catalyst to overcome all the other hurdles in the complex evolution of a smart city. This step is, in fact, a critical step and should be one of the first to be addressed.
- **Move beyond planning:** The planning initiatives the cities surveyed have undertaken are significant first steps. However, they need to move plans out of planning departments and into action. The process includes cutting through city bureaucracy and gaining greater visibility and input from citizens, businesses, and smart city vendors.
- **Begin pilots that prove the value of larger efforts:** The planning efforts help in truly understanding how to think big initially with a holistic, citywide evaluation and engaging the stakeholders to get buy-in. But careful pilots with clear estimates of costs, benefits, and a simple ROI analysis for each project will build the path to success for wider-scale efforts.
- **Understand the costs and benefits:** The survey results indicate that cities understand the benefits of a smart city on a global level, but they do not understand how to translate these benefits into specific metrics that apply to their cities. Nor do they have the models or tools to do so. In addition, it is clear that cities need to get a firmer estimate of the costs involved in smart city projects. Their lack of comprehension is understandable, because the array of different technologies that go into a smart city is vast, with complexities that are beyond the technological knowledge of any city, large or small.
- **Explore available funding options:** Although government bonds and other similar options may be a common choice historically, many cities appear not to be aware of better financing options available for smart city endeavors. Many innovative and relatively new financing mechanisms are available today, yet cities don't seem familiar them. With different options for procuring technology, for instance, cities can shift to a business model that defines these projects as operating expenditures versus capital expenses.

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- **Improve internal support:** To alleviate the internal barriers and lack of cross-vertical governance, it's important to create a cross-departmental team to help pool funding sources and align priorities in tackling strategic projects. For instance, during a smart city evolution, cities will have many opportunities to create an ecosystem to solve individual departmental problems collectively, and these opportunities can help create significant efficiencies on many levels.
 - **Explore technology options:** Cloud- and software as a service (SaaS)-based smart city solutions that can create economic efficiencies for cities are available today. Here too, these types of solutions also create staffing efficiencies, because external experts can become extensions of internal IT departments for little additional investment. Wherever possible, incorporate Smart Regulations and Open Architectures to help mitigate interoperability concerns.
 - **Start mobilizing technology:** The lack of applications designed for mobile communications—which are core to smart city solutions—will certainly be problematic for cities. Mobile usage is skyrocketing, and businesses, tourists, and visitors who are tech-savvy will soon expect a city's mobile communications to meet their needs.
 - **Learn from peers:** Cities around the world are already undertaking massive smart city initiatives, and they are willing to share their stories. Many members of the Smart Cities Council, for instance, are already sharing their insights.
 - **Find the right partners:** The right tools, resources, and expertise can help cities with each of the steps mentioned here. With the right partnership, officials can gain the support they need to evolve quickly and realize the smart city benefits that are available for them.

For More Information

It is evident from the survey responses that city officials need guidance, tools, and expertise to help them plan, execute, and deploy smart city initiatives. Here are some resources to help you get started:

The [Smart Cities Council](#) provides a wealth of information, including:

- The [Smart Cities Readiness Guide](#) has emerged as a most popular smart city framework.
- The [Smart Cities Financing Guide](#) as well as a [gallery of smart city mobile apps](#) can be helpful.
- In addition, many of the members of the council have helped construct financial models for smart city projects large and small.
- Also, the council is sometimes able to "mentor" cities in the early stages, calling on its member companies and advisors for their expert advice. And it also offers Readiness Workshops in several locations around the world.

Visit the [Smart Cities Council's website](#) to learn more.

In addition, Cisco has been a trusted partner in many [smart city initiatives](#), including:

- In [Dallas, Texas](#), smart city solutions are supporting economic growth, better communication, and better services.
- [Barcelona, Spain](#), is now a connected city and a better place for citizens, businesses, city workers, and visitors.
- The Cisco® Smart + Connected Solutions portfolio includes remote access to government services as well as City Infrastructure Management solutions for connected [parking](#), [Wi-Fi](#), [traffic](#), [lighting](#), [safety](#), and [security](#).
- Cisco solutions for [Connected Transportation](#) help improve safety, efficiency, and mobility for city and regional transport.
- Cisco solutions for [Sports and Entertainment](#) help boost revenue with a better fan experience.
- For more information about how to deliver next-generation citizen services, review this [white paper from IDC](#).

Survey details: Forty thousand subscribers of the Cisco Smart Cities Council newsletter received the Smart City survey in an email message; 668 responded, for a 1.67-percent response rate.



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