



Smart Cities Need Telecommunications Service Providers:

*Smarter solutions provide opportunities to manage
resources, create better quality of life*

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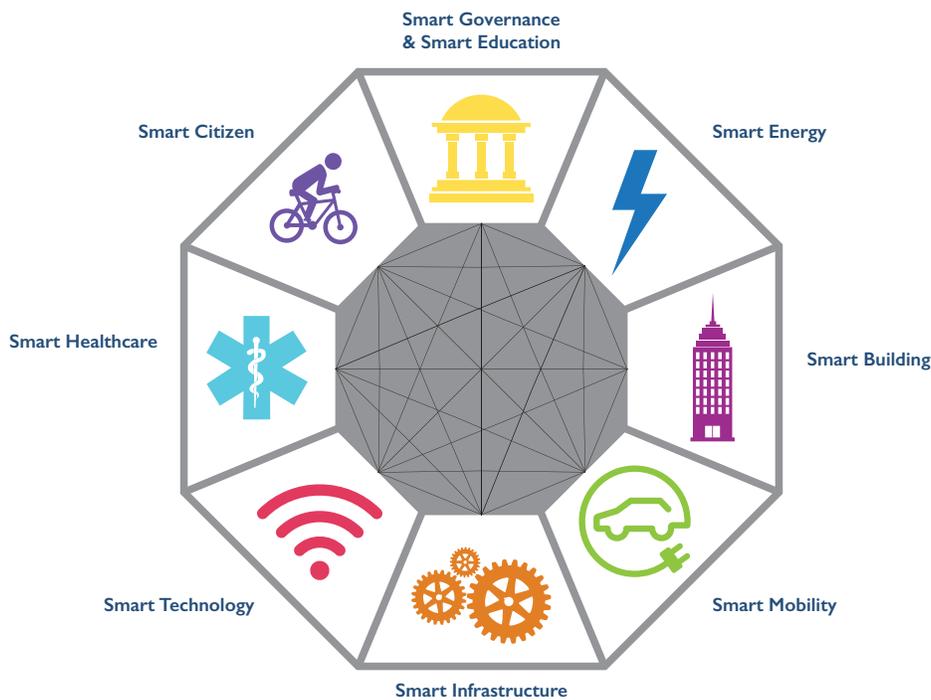
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INTRODUCTION TO THE SMART CITY

Frost & Sullivan has been tracking and quantifying smart city opportunities for nearly a decade. Cities in the United States and around the world have begun to look to smarter solutions to help better manage existing resources and assets, effectively deal with growing populations, help mitigate expenses related to aging infrastructure, and, in general, provide a better quality of life and standard of living for city residents, businesses, employees, and visitors.

For the purposes of this paper, Frost & Sullivan analyzed numerous global smart city initiatives and uncovered the key attributes that were indicative of what constitutes a “Smart City.” We identified eight core parameters that provide a comprehensive view of the smart city. We define smart cities as those that are built on “Smart” and “Intelligent” solutions and technology that will lead to adoption of at least five out of the eight following smart parameters.

Chart 1: Frost & Sullivan Smart Diamond Defining Smart City Framework



Source: Frost & Sullivan analysis

Urban migration and the physical expansion of cities and metropolitan areas are adding immense pressure on energy resources, environment, infrastructure, sanitation, health, public funds and other basic utilities. Cities across the world are facing challenges such as congestion and pollution, while steep real estate prices and a lack of access to affordable housing are leading to a sense of instability. In developing and growing cities, governments are struggling to match the city infrastructure to accommodate the rapidly growing population. Cities with a declining rate of growth, and consequently declining tax revenues, are forced to deal with obsolete infrastructure and obsolete systems. In addition, cities have complicated political structures that enable each department to deploy point solutions that are not compatible with systems deployed by other departments. Since the budgets and reporting structure are complicated and managed by departments, there is an inherent lack of cohesion in decision making and technology deployment.

Therefore, it has become imperative that this issue of urbanization is addressed in a manner that caters to our evolving society, lifestyles, and technologies. “City as a Customer” is an implication of urbanization wherein cities are viewed as potential customers and hubs of investment, wealth creation, and economic growth. Every city will be highly unique in its infrastructure demands offering cross-sector micro implications and opportunities for a variety of stakeholders.

In this environment, the “Smart City” concept has emerged. But what exactly is a Smart City? There are multitude of varying perceptions of what a Smart City is, what it should be, and what it could be. Moreover, there are many cities that claim to be “Smart,” while most of their initiatives center only on green concepts or individual point solutions. Other cities have launched city-wide initiatives with high-optic broadband networks and, again, claim a “smart city” classification. Although they may be “smarter,” Frost & Sullivan would not formally classify these cases as “smart cities” unless they have built out at least five of our eight smart parameters.

CASE STUDY: SAN FRANCISCO LEADS THE SMART CITY RACE



Over the past few years, San Francisco has made giant strides in seven of the eight categories that define the Smart City framework. The dot-com boom of the 1990s and tech boom in the past 10 years have contributed to make San Francisco one of the most popular cities in the US for technology companies. This popularity has led to increased gentrification of San Francisco with skyrocketing property prices and increased inbound migration into the city. City planners have long struggled with developing infrastructure to support this rapid growth. Over the past few years, San Francisco city government has taken rapid steps to develop infrastructure and embrace the Smart City frameworks with some success. Here are some of the features of the San Francisco Smart City.

Chart 2: Features of the San Francisco Smart City



Source: Frost & Sullivan analysis

BENEFITS OF ADOPTION OF SMART CITY FRAMEWORK

Over the past few years, “Smart” has evolved into the new “Green.” In the US, many cities are burdened with outdated infrastructure and obsolete systems that are in urgent need of overhaul. From an infrastructure standpoint, US cities lag behind newer cities in China and the Asia Pacific region. The reality is that the US has not spent significantly to upgrade infrastructure since the 1950s. While devastating floods and events such as Hurricane Katrina are expected in developing nations, such scenarios should not occur in developed nations.

For these and a multitude of other reasons, US cities are looking to spend on upgrading and overhauling existing infrastructure in favor of developing Smart Cities. When evaluating cities that have mature Smart City deployments, the benefits of adoption are numerous and significant, including:

- **Increasing the quality of life for residents of the city:** This can be achieved through improved infrastructure, increased safety & security, investments in public transportation, reduced pollution, etc. An increase in quality of life has a direct impact on net migration for a city. Businesses and individuals typically move to cities for the quality of life, leading to increased revenue base for a city.
- **Increasing the tax base of a city:** With an increased quality of life, technology investments will aid cities by increasing net migration, resulting in an increased tax base (business and individual). In addition to increased collection of income taxes, smart cities typically see a pronounced increase in sales tax revenue and property taxes (both from increased home ownership and increase in property values).
- **Reducing environmental impact:** One of the biggest benefits of smart city deployments is in reducing the environmental impact by a city. Reductions in energy costs (from using more environmentally friendly lighting solutions) to reducing pollution (with a robust public transportation system), the benefits of reducing the environmental footprint of a city results in more people calling a city “home” for longer periods of time.
- **Fiscal Responsibility:** By investing in smart city technologies, cities can generate higher operation incomes from toll collection, city-wide connectivity, taxes, tourism, etc. This helps cities manage their budgets more effectively and generate revenues to further invest in improving the quality of life for residents.
- **Operational Efficiency:** In addition to increasing revenues in a city, a smart city deployment has the potential to reduce waste and save cities money. By adhering to smart city frameworks, cities can develop comprehensive solutions that cut across the needs of multiple departments and eliminate wasted investments in point solutions. This helps cities in reallocating budgets toward increasing the quality of life and making the city government operate more efficiently.

OPERATING MODELS FOR CITIES

There are many different operating models that cities can use to deploy Smart City solutions. Of these, the following four models are most popular globally.

Chart 3: Operating Models Employed for Cities for Smart City Solutions

| | |
|--|---|
| 1 Build, Own, Operate (BOO) | 2 Build, Operate, Transfer (BOT) |
| <p>The smart city planner independently builds the city infrastructure and delivers smart city services. The operation and maintenance of the services is fully under the planner’s control.</p> | <p>The smart city planner appoints a trusted partner to build the city infrastructure and provide smart city services for a particular area within a time period. After completion, the operation is handed over to the smart city planner.</p> |
| <p>The smart city planner appoints a trusted partner to develop the city infrastructure and services. The partner operates and manages the smart city services. The city planner has no role further. Most of the public-private partnerships are built on this model.</p> | <p>The city planner allows any qualified company or business organization to build city infrastructure and provide city services. The city planner, however, will impose some regulatory obligations.</p> |
| 3 Build, Own, Manage (BOM) | 4 Open Business Model (OBM) |

Source: Frost & Sullivan analysis

All of these business models assume the city manager will serve in the central leadership role in the planning and deployment of smart city solutions. In reality though, many cities have different departments deploying “point” solutions. The data from these point solutions is typically not shared, and there is no cross-department collaboration or cooperation. In most cases, point solutions deployed by one department are not compatible with point solutions deployed by another department. This leads to wastage in terms of investment and resources. To alleviate this issue, the smart city planner must encourage cross-departmental collaboration to build and deploy smart city solutions that are open, flexible, scalable and integrated.

WHAT SETS TELECOMMUNICATIONS VENDORS APART AS VALUABLE PARTNERS?

There are hundreds of companies that are valued ecosystem partners in the smart city ecosystem. From systems integrators to independent software vendors to application-specific product manufacturers, the list is endless of potential partners that deploy smart city solutions. However, telecommunication providers have unique core competencies that set them apart from other large solution providers. Some of these unique capabilities include:

- **Managing multi-network connectivity:** Telecommunications service providers operate large network operations centers that manage many different forms of connectivity—from fixed-line to cellular to Wi-Fi to private networks. This particular skill set is critical for the operation and management of several communication networks managed by a city with their smart city deployments. Connectivity is the cornerstone of successful smart city deployments, which makes the telecommunications service provider an ideal partner.
- **Nationally Scalable Blueprints:** Telecommunications service providers have a national (and global) network under their purview. The network is a critical piece of a smart city deployment, especially in a disaster scenario. Network uptime is critical to emergency response and recovery of a city during unforeseen events.

Network management allows city managers to coordinate emergency response with local law enforcement and federal agencies. A reliable network operator as a preferred smart city partner will help a city manage its network even during disasters.

- **Relationships with different levels of city and municipal government:** Telecommunications service providers have deep and wide relationships with different levels in city and municipal government (from mayors and city council members down to IT analysts within different departments). This enables telcos to bring together different stakeholders in a smart city deployment—facilitating project and solution integration across political silos and extracting incremental value for citizens. In addition, telcos have worked closely with stakeholders in executing complex deployments and bring this experience to smart city deployments.

AT&T VALUE PROPOSITION

With over 26 million devices managed on its cellular network, AT&T is the market leader in the Internet of Things (IoT) market. Over the past year, these devices have transmitted over 117 million petabytes (PB) of data. In the smart cities market, AT&T's value proposition can be summarized as follows:

- **Multi-network Connectivity Management:** While AT&T is a leader in cellular connectivity, the company also has advanced capabilities in managing multi-network solutions. The company manages millions of connections with its Wi-Fi and fixed-line solutions in addition to the over 26 million cellular IoT devices (as of 2015 yearend). All these connections are managed using its Control Center solution. In addition to cellular, fixed-line and Wi-Fi solutions, AT&T has experience with building and managing an Enhanced Push-to-Talk (EPTT) network to manage radio communications for first responders and commercial organizations. These capabilities have helped position AT&T as a leader in developing Smart City solutions.
- **Secure Connectivity:** In addition to providing connectivity, AT&T has advanced capabilities in protecting not just its network, but the devices that connect to its network. In IoT, devices are more likely to get hacked than networks. By extending its security protocols to protect devices, AT&T goes the extra mile in ensuring the security of a smart city deployment.
- **Partner Ecosystem:** In addition to its network capabilities, AT&T has a large partner ecosystem that can deploy smart city solutions across many different applications and vertical markets. From water management to mobility to street lighting, AT&T has been in the forefront of technology for the past several years in IoT and smart city deployments. With best-of-breed solutions as a part of this ecosystem, AT&T can tap into the expertise of its partners to help cities improve the lives of its residents.
- **Vertical Solution Focus:** In addition to connectivity solutions, AT&T has a long history of deploying solutions focused on certain vertical markets and applications with its ever-expanding partner ecosystem. AT&T solution bundles include utility/energy, transportation, infrastructure, public safety and citizen engagement use cases.
- **Leverage Best Practices:** AT&T has been at the forefront of the smart city and IoT revolution. The company has deployed many different solutions in different cities in the US and globally. AT&T brings this expertise to help cities develop a smart city framework and deploy end-to-end solutions that are flexible, scalable and secure. Currently, AT&T is involved with smart cities pilots focused on deploying multi-use case solutions in Dallas; Chicago; Atlanta; Miami; LA; Montgomery County, Md., and many others.

- **Culture of Innovation:** AT&T has built a culture of innovation that started with Bell Labs. Over the past few years, the company has set up foundries in Palo Alto, Calif., and Plano, Texas, to bring together developers to create new IoT solutions. In addition, AT&T opened its Drive Studio in Atlanta, Ga., focused on Connected Car solutions and a new mHealth Foundry in Houston, Texas, to focus on healthcare solutions. With over 2,000 developers as part of its ever-expanding developer program, AT&T is leading the IoT and Smart City markets with innovative solutions to solve market challenges.
- **Assets on the Ground:** A smart city deployment has a massive impact on a city for years, if not decades. To be a valued partner, cities must work with a company that is likely to survive in the long term without being an acquisition target or, worse yet, go out of business. In addition, the partner must have assets on the ground for maintenance and regular servicing of the different sensors and solutions that are part of a smart city deployment. AT&T has these capabilities and can support a city not just for deployment, but for post-deployment services and management capabilities.

FROST & SULLIVAN FINAL WORD

Ultimately, a smart city is an enabling platform built by the government, for the people, to understand and manage the interactions between people and the infrastructure in a city and to guide informed policy making through the intelligent usage of technology. The concept of smart cities is set to drive urban development for the next decade and will require storage, multi-energy networks, smart devices, and new business models. Cities will have to approach the development of such initiatives with a more open and collaborative approach—one that partners with solution providers that have the capabilities to manage network operations, increase safety and security, have local assets on the ground, a best-of-breed partner ecosystem, and can leverage best practices from other cities to improve upon smart city deployments.

To deploy a successful smart city solution, Frost & Sullivan believes cities must embrace five critical factors for success, as outlined below.

Chart 4: Success Factors for a Smart City Deployment



Source: Frost & Sullivan analysis

In conclusion, smart city development will involve multiple stakeholders with their own visions and objectives. Hence, there is a need for greater coherence, collaboration, and accountability while executing a smart city strategy.

NEXT STEPS 

Schedule a meeting with our global team to experience our thought leadership and to integrate your ideas, opportunities and challenges into the discussion.



Interested in learning more about the topics covered in this white paper? Call us at 877.GoFrost and reference the paper you're interested in. We'll have an analyst get in touch with you.



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