



SMART CITIES: A BUSINESS LEADER'S GUIDE

By Teena Maddox

INTRODUCTION

Smart cities are more than a trend—they're the wave of the future, as the world becomes more urban, with 60% of the population expected to live in cities by 2050.

Across the globe, smart city technology spending reached \$80 billion in 2016, and is expected to grow to \$135 billion by 2021, according to the International Data Corporation (IDC).

Cities are digitally transforming to improve environmental, financial, and social aspects of urban life. The IDC defines smart city development as the use of smart initiatives combined to leverage technology investments across an entire city, with common platforms increasing efficiency, data being shared across systems, and IT investments tied to smart missions.

“Smart cities have recently evolved from a collection of discrete flagship projects to a sizeable market opportunity that will drive significant technology investments in 2018 and beyond,” said Serena Da Rold, program manager in IDC’s customer insights and analysis group. “IDC believes that the strategic priorities we identified will drive digital transformation across cities of all sizes, but our research demonstrates that there can be significant differences in the focus of investments across regions. The [new spending guide](#) is a powerful tool to help vendors identify where the best opportunities lie for each specific use case now and over the next several years.”

A truly smart city improves the quality of life for citizens and visitors, and while a smart city can be many things, just as with humans, some are smarter than others. Read on to find out more about smart cities and what they mean for the future.

EXECUTIVE SUMMARY

- **What is a smart city?** A smart city uses IoT sensors and technology to connect components across a city to derive data and improve the lives of citizens and visitors.
- **What does a smart city do?** Oftentimes, a mobile app is provided to give immediate access to data, communication channels, and more so that people can do everything from avoiding traffic jams to finding a parking spot to reporting a pothole or an overflowing dumpster.
- **Why do smart cities matter?** The world is becoming more urbanized, and by 2050, more than 60% of the world’s population is expected to live in cities. Making these cities better places to live is essential to quality of life by enabling them to be more sustainable and efficient with streamlined services.
- **Who do smart cities affect?** They affect everyone on the planet.
- **When are smart cities happening?** They’re happening now.

- **Where are the smartest cities in the world?** Early adopters of smart city technology were European cities, but US cities have quickly picked up steam and are incorporating technology into municipal infrastructure.
- **Who is making smart cities happen?** Public and private companies, as well as federal, state, and city governments, are getting involved to make it easier for municipalities to adopt new technology. Private and public partnerships are becoming a smart way for cities to add technology.
- **How can my city become a smart city?** Cities often embark on becoming connected through streetlights, which offer a quick revenue return for municipalities with the use of LED reduced energy lighting. Utilities and renewable energy are other good starting points, as well as public safety, which can drive the use of technology by offering connected emergency response services.

WHAT IS A SMART CITY?

There is a range of definitions of a smart city, but the consensus is that smart cities utilize IoT sensors, actuators, and technology to connect components across the city. This connects every layer of a city, from the air to the street to underground. It's when you can derive data from everything that is connected and use it to improve the lives of citizens and improve communication between citizens and the government that a city becomes a smart city, said Esmeralda Swartz, head of strategy and marketing of the software business unit for Ericsson.

Gartner analyst Bettina Tratz-Ryan said, "Our definition of smart cities is around how you become efficient at optimizing certain technologies or operations or infrastructures. How you can start to share outcome or best practices with each other and generate not just best practices but generate citizen outcome or context. The contextual services where you don't only look at a citizen but you look at a person with individual needs or business groups with very specific needs. That constitutes a smart city."

Additional resources

- [The world's smartest cities: What IoT and smart governments will mean for you](#) (TechRepublic cover story)
- [Cities first to benefit from Internet of Things, if we can write better software](#) (TechRepublic)
- [Is 5G the missing link for autonomous vehicles, smart cities, and a brave new world?](#) (ZDNet)
- [IT leader's guide to the rise of smart cities, volume 2](#) (Tech Pro Research)
- [5 lessons from IoT leaders creating sustainable, smart cities](#) (TechRepublic)

WHAT DOES A SMART CITY DO?

Smart cities improve the quality of the lives of citizens. They often employ a mobile app to give fast access to traffic information, road conditions, and more.

“The example I like to use is common services. If you think about one of the biggest drivers of traffic congestion, it is people, whether residents or visitors, driving around looking for an open parking spot. Now through a mobile app, through sensors that are deployed on parking spots, you know exactly where [to go] and you don’t have to search around and try to find an open parking spot. It’s those simple things we take for granted for improving interaction with common city services,” Swartz said.

“Another thing that drives the point home is smart waste management. Think about sensor technology applied to a smart waste receptacle. It knows when the trash is basically hitting the middle of the container. It compresses it down and when it gets to the top and is full, it notifies the city sanitation department that it’s time to collect the trash,” she said.

Additional resources

- [How Louisville became the first smart city on the IFTTT platform](#) (ZDNet)
- [Internet of Things World Forum: Pushing adoption of IoT business models](#) (TechRepublic)
- [Cisco CEO Chuck Robbins on smart cities architecture: Step by step](#) (ZDNet)
- [Smart cities expected to invest \\$80B in technologies in 2018](#) (TechRepublic)

WHY DO SMART CITIES MATTER?

The smart city industry is projected to be a \$400 billion market by 2020, with 600 cities around the globe expected to generate 60% of the world’s GDP by 2025, according to McKinsey research, [as previously published in TechRepublic](#).

Urbanization is an issue that all cities have to deal with around the globe.

“When you have more population coming in, there’s a mass migration from the country to the city. The impact is similar to the urbanization that occurred during the industrial revolution,” Swartz said. “The best way to optimize that experience is digitally.

“The questions that urban engineers are dealing with include, How do you take the opportunity with people armed with smart phones to deal with urbanization? How do you combine technology and ubiquitous mobility and an increasing voracious appetite on the part of city dwellers to have efficiency, and how do they get services now, and how do they really interact in a more fluid way with common city services?”

Jarrett Wendt, vice president of strategic initiatives and business development for Panasonic Enterprise Solutions Company, said, “You do it because you improve and impact people’s lives. Period, end of story. This is about transforming people’s lives into making them more efficient.”

“Quality of life is not spending three hours in a car every day. If you’re becoming smarter and more connected and utilizing those city services that are available then you’re alleviating some of those pain points,” Wendt said.

Mrinalini Ingram, who spent 16 years at Cisco Systems working with smart and connected communities before becoming the new head of the Smart City initiative at Verizon in March, said, “One of the most important reasons to have a smart city is that we can actually communicate with our environment in a way that we never have in the past.”

“With the smart city capability we are just touching on that higher wave of transition of people being able to communicate and interact with the environment around them. That could be physical assets that are around them, services that are available around them, and the ability to not only get information but provide a two-way dialogue between an individual and their environment and the services that enable activities around that space,” Ingram said.

Additional resources

- [Smart city IoT revenue to explode from \\$25B to \\$62B in 2026](#) (TechRepublic)
- [10 ways to capitalize on the Internet of Things](#) (TechRepublic)
- [Big data and IoT matter to 56% of organizations](#) (Tech Pro Research)
- [Video: How smart cities are using automation to increase energy efficiency](#) (TechRepublic)
- [A reimagined city life is the vision propelling the newest URBAN-X startups](#) (TechRepublic)

WHO DO SMART CITIES AFFECT?

Smart cities affect everyone, whether directly or indirectly. People who live in smart cities or who are visiting smart cities have the immediate benefit of being connected to the governing body for information and services. The quality of their lives can be improved with better traffic management, waste removal, snow removal, and more. Those who don’t live or visit a smart city are affected simply because of the lack of connected services and communication available to them.

A smart city also benefits the environment. Water and energy usage are sustainability issues, and a common thread across all smart city projects is how a city reduces CO2 emissions.

Additional resources

- [BYOD, IoT and wearables thriving in the enterprise](#) (Tech Pro Research)
- [16 tech jobs that will be needed for the future of smart cities](#) (TechRepublic)
- [How NYCx unites business, community, and government to solve big problems](#) (TechRepublic)
- [How universities are helping fill the smart cities talent gap](#) (TechRepublic)
- [How New York City plans to become a 5G leader](#) (TechRepublic)

WHEN ARE SMART CITIES HAPPENING?

They're happening now.

“It’s the now generation. People say, ‘I want access now. I want to understand how I can make my life more efficient.’ That’s what’s driving not just smart cities but the reason why Internet of Things and connectivity are impacting all of these different industries. It’s efficiencies. More contextual interactions. A better experience overall is the goal,” Swartz said.

[The Internet of Things was already at a tipping point](#) in 2015, with future growth happening at an explosive rate. Smart cities are part of the world of IoT, with everything from streetlights to parking spots digitally connected.

“I think the evolution of this has been amazingly fast as far as a creation of an industry, but people are still looking for that tangibility. Sometimes things are happening that are smart city activities but they’re happening in pockets,” Ingram said.

“We’re seeing a lot more pilots happening, you’re seeing individual solutions happening on a broader scale. Lighting solutions are taking off faster than most. Security solutions and traffic solutions are very big. It really kind of comes down to a tagline I use quite a bit. That it’s ‘think big, start small and scale.’ That is the approach that a lot of cities are taking and a lot of companies are taking where you have to have that overarching architectural approach and what that future vision will look like ultimately. But they have to start small. Let’s do one neighborhood, let’s do one venue, let’s do one downtown strip and test out that solution and make sure it makes sense,” Ingram said.

Additional resources

- [6 ways smart cities will become smarter in 2017](#) (TechRepublic)
- [Alphabet’s Sidewalk Labs hopes smart cities will go with its Flow analytics platform](#) (TechRepublic)

- [The next decade in tech: Three defining forces to watch](#) (TechRepublic)
- [Expanding the playing field of the Internet of Things](#) (TechRepublic)
- [Photos: How Google Fiber is using 'shallow trenching' to outbuild its gigabit rivals](#) (TechRepublic)

WHERE ARE THE SMARTEST CITIES IN THE WORLD?

Cities across the globe are becoming smarter. Early adopters were the European cities of Barcelona and Amsterdam, with Copenhagen, Dubai, Singapore, Hamburg, and Nice quickly following suit. In the US, San Francisco, [Chicago](#), [New York](#), Miami, [Kansas City](#), [Columbus](#), Denver, Boston, [Cincinnati](#), and [Atlanta](#) are among the cities adding smart city technologies and pilot programs, [as reported in an in-depth TechRepublic article](#).

Any city of any size can become a smart city, because all it requires is the commitment of city officials and citizens to work together to find solutions to everyday issues.

Additional resources

- [The top 20 smart city governments worldwide](#) (TechRepublic)
- [Louisville and the future of the smart city](#) (ZDNet special feature)
- [Five cities win the Smart Cities Council Readiness Challenge Grant](#) (TechRepublic)
- [Columbus, Ohio: What's next for the DoT Smart City Challenge winner](#) (TechRepublic)
- [Inside Kansas City's goal to become 'the smartest city on planet earth'](#) (TechRepublic)
- [Illinois seeks to become the nation's first smart state](#) (TechRepublic)
- [IBM X-Force finds multiple IoT security risks in smart buildings](#) (TechRepublic)
- [Cisco: The Internet of Everything is at tipping point](#) (TechRepublic)

WHO IS MAKING SMART CITIES HAPPEN?

Companies such as Intel, Cisco Systems, IBM, Verizon, Silver Spring Networks, Build.io, GE Lighting, Ericsson, and Siemens are among those providing smart city solutions. Associations like [TM Forum](#), which is a leadership collaboration of seven cities created in 2016 to push [the creation of smart cities around the globe](#), are also spurring development.

In 2015, the Obama administration announced a new smart cities initiative to invest \$160 million in federal grants to create software and IoT applications to help local communities improve city services. And the [White House announced in late 2016](#) that it would make an investment of \$80 million for smart cities, expanding upon an initiative that began in September 2015. This includes \$15 million to improve energy efficiency through data gathering, \$15 million for research in improving transportation, and \$10 million for natural disaster response programs.

In addition, the [National Science Foundation allocated \\$60 million](#) in new funding for its Smart Cities Initiative. This funding covers a research task force seeking solutions for cities, expanding internet architecture within cities, transportation efficiency, health research, and networked computer systems.

The future of smart cities will involve advanced and low-latency applications that leverage big data analytics and real-time video and information sharing, enabled by symmetrical fiber or [5G wireless networks](#). Computing and storage at the edge, and fiber that goes deep into neighborhoods, are critical to get cities to that point, said Daniele Loffreda, head of market development and consulting for Ciena. Ciena is helping cities with coherent optical, edge packet platforms, automation, and multi-domain service orchestration.

“I’m looking forward to seeing a whole group of innovative new startups that you can already see being built up. The new wave of creativity that they are bringing to the table is enormously exciting,” Ingram said.

“We want to encourage that small entrepreneur or that student in the university to build an application or to build a service that fits the need of what they see every single day. That’s a whole other industry that is just now beginning. That combined with the personal interactions are probably the two biggest positives around why we really are excited about smart cities,” Ingram said.

Additional resources

- [IT leader’s guide to the rise of smart cities, volume 3](#) (Tech Pro Research)
- [Smart parking, smart lighting, fleet management at heart of Nokia’s IoT platform update](#) (TechRepublic)
- [Video: CES 2017: How AT&T is accelerating smart cities with new advances](#) (TechRepublic)
- [Video: How CityDigital is bringing together cities, startups, and academics for smart city wins](#) (TechRepublic)
- [Here’s what it takes to become a smart city](#) (CNET)
- [New forum seeks to unite 100 cities in standards to drive smart city innovation](#) (TechRepublic)

- [Surge in real-time big data and IoT analytics is changing corporate thinking](#) (TechRepublic)
- [Why the Internet of Things needs open source](#) (TechRepublic)
- [How Google Cloud Platform supports IoT development](#) (TechRepublic)

HOW CAN MY CITY BECOME A SMART CITY?

Many cities first embark on becoming connected through streetlights because they offer a quick revenue return for municipalities with the use of LED reduced energy lighting.

“We had a project in L.A. that was a partnership with Philips that was basically smart lighting. These light posts that could be used for both energy reduction and LEDs, and when you save costs on these common city services using technology, imagine the impact of applying that budget to schools or other services that are increasingly under budget constraints,” Swartz said.

Utilities and renewable energy are an optional starting point, by offering alternative energy solutions. And public safety is another way to drive the use of technology by offering connected emergency response services.

TM Forum is hoping to unite more than 100 cities in the development of smart cities, including those without the resources to add smart innovation. The forum will work to develop recommendations on how those cities can work within urban incubators and learn things such as how to structure a partnership within the private sector to create opportunities for innovation.

Atlanta is one of the cities embarking on a smart city initiative. Atlanta CIO and commissioner Samir Saini said that he hopes the lessons learned in Atlanta will benefit other cities, especially those without the necessary resources readily available.

“At the end of the day we can make all the greatest plans in the world, but if resources aren’t available to implement them, it doesn’t really matter,” Saini said.

Additional resources

- [3 smart cities that raised the bar: A panel discussion](#) (TechRepublic)
- [66% of US cities are investing in smart city technology](#) (TechRepublic)
- [Video: Why proper planning is an essential part of a smart city](#) (TechRepublic)
- [4 common entry points to a smart city](#) (TechRepublic)
- [Smart cities: 6 essential technologies](#) (TechRepublic)

- [TechRepublic to partner with CNET and City of Louisville to connect smart cities to professionals and their living spaces](#) (TechRepublic)
- [The 5 IoT products a smart city needs in 2017](#) (TechRepublic)
- [Why your next IoT smart project promises to be very, very dumb](#) (TechRepublic)
- [National League of Cities: 3 recommendations for smart city development](#) (TechRepublic)
- [Video: The two biggest obstacles to smart cities are silos and platforms, says Atlanta CIO](#) (TechRepublic)
- [The smart city security nightmare: How cities can stay awake](#) (TechRepublic)
- [Free audio story: The world's smartest cities: What IoT and smart governments will mean for you](#) (TechRepublic)

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