



# A BETTER APPROACH TO SMART CITIES

*The intersection of smart lighting and smart grids is key to new services and more value.*

Vehicle congestion costs the U.S. economy \$124 billion per year, plus another \$50 to \$80 billion in associated health care costs.<sup>1</sup> To help solve congestion, pollution and other problems that have vexed communities for decades, cities are looking to ubiquitous sensor networks, centralized big data and wall-to-wall automation to become “smarter.” Smart cities securely integrate information and communication technology and the Internet of things (IoT) to manage their assets more effectively and holistically.

Although many government leaders want to turn their communities into smart cities, they often don’t know the best way to achieve this goal. This paper defines a smart city, describes its components, and explains how the intersection of smart lighting and a smart grid can be the launching point for a smart city initiative.

## WHAT IS A SMART CITY?

The Smart Cities Council offers a loose definition of a smart city as one “that has digital technology embedded across all city functions.” There are many components of a true smart city. These usually include the following:

- **Energy** — This comprises smart grids and meters, along with smart energy harvesting and storage.

- **Buildings** — Smart buildings typically incorporate building automation, advanced HVAC and smart interior lighting.
- **Transportation** — Smart traffic, public transportation and parking lot management are key components of smart transportation.
- **IT Infrastructure** — Sensors, networks, connectivity and platforms are key components of a smart infrastructure.
- **Security** — Security in a smart city includes smart surveillance, predictive crime, and privacy and data security.
- **Governance** — Smart city governance usually incorporates eGovernment, environment management and smart disaster management.

Many of these components rely on a robust and secure communication network, so building a strong network foundation is critical to the success of a smart city implementation.

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## HOW CITIES CAN BECOME SMARTER

Technological changes have enabled municipalities to move closer to achieving true smart city status in recent years. These include the growth of cloud computing; the widespread use of mobile devices and apps; and the rise of IoT, which permits inexpensive sensors to track various information — from traffic patterns to air pollution.

Smart outdoor lighting technology — which takes advantage of sensors to maximize energy efficiency — along with smart grid networks built to support the delivery of essential public services like gas, electricity and water are key components of any smart city.

In particular, smart street lights are the gateway to a true smart city. These are the most logical locations for sensors, enabling better access to power and the proximity to key roadways where many of the sensor measurements would ideally be taken. Also, their elevation allows for optimal radio frequency (RF) coverage. A fair amount of smart lighting activity already is underway. According to a report by Navigant Research, the installed base of global smart street lights is expected to grow from roughly 6.3 million in 2017 to nearly 73 million by 2026.<sup>2</sup>

But getting the most value from smart light poles and lighting deployments requires government leaders to think broadly and collaboratively. Unfortunately, many cities fail to partner with local utilities to leverage existing smart grid networks as part of a smart lighting/smart city solution. Often, the result is an overlay of competing and non-integrated networks that waste valuable municipal resources. With their existing smart grid networks, utilities could play a much bigger role in the creation of smart cities, but they will need to adopt new revenue models to make this a profitable endeavor for them.

The city of Philadelphia provides a good example of how a city and utility can work together to leverage an existing smart grid network in this way. In 2016, PECO, Philadelphia's electric and natural gas utility, worked with Sensus, a North Carolina-based smart infrastructure company, to install energy-saving smart street lights to light the path along Independence Mall for the Democratic National Convention.

The new lighting is managed by the Sensus VantagePoint™ Lighting Control Solution, which provides an environmentally friendly and cost-effective way to keep public areas safe and promote economic development. It uses a lighting control module, lighting software and the Sensus FlexNet® communication network for greater control and automation of lights.

### ENDNOTES

1. <https://www.forbes.com/sites/federicoguerrini/2014/10/14/traffic-congestion-costs-americans-124-billion-a-year-report-says/#6e5f0f46c107>
2. <https://www.navigantresearch.com/research/smart-street-lighting-for-smart-cities>



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## THE DIGITAL DIVIDE

A holistic smart city buildout will leverage smart lighting and smart grid networks to bring essential services to all city residents in a smart way. But in some cities, a “digital divide” exists in which not all citizens and residents are able to reap smart city benefits equally.

This digital divide is the result of technology vendors focusing their resources only on the largest cities, or only in certain sections of large cities. A true smart city is built to support all residents — regardless of their socioeconomic status — with smart delivery of essential public services.

One way to achieve this is to use a single communication network for the smart grid and smart lighting. This will boost public safety and economic development, improve urban mobility and leverage infrastructure assets, resulting in a better community for all.

The solution leveraged PECO's existing smart grid assets to provide intelligent lighting for the city that remains in place today. The street lights can be brightened, flashed or dimmed to support public safety for all city residents and visitors.

Besides providing intelligent lighting control, the VantagePoint solution measures a wide range of physical and environmental factors, which helps utilities and public service providers conserve energy, improve asset management, reduce costs and increase public safety. The solution's intelligent lighting modules work for both LED and legacy area lights, which results in greater control and lower lighting maintenance costs without having to change an entire network to LED technology.

### A JOURNEY, NOT A DESTINATION

The move toward smart cities is more of a journey than a destination. The individual components that comprise a smart city must become interconnected building blocks within the framework of a shared vision among municipal leaders.

Smart lighting, a smart grid and a smart infrastructure are among the most critical components of a smart city. You should plan carefully for the strategic role that each of these components will play as you plot your course toward becoming a true smart city.

*This piece was developed and written by the Governing Institute Content Studio, with information and input from Sensus.*