Executive Brief

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intel IoT Solutions Alliance

Building a Smart City? Start with Smart Streetlights

When the City of San Diego wanted to upgrade its streetlights, it saw an opportunity to launch a larger smart city initiative. Working with Current, powered by GE, the city installed CityIQ intelligent nodes—embedded with multiple sensors powered by Intel® technology—on 3,200 of its light poles.

In addition to the intelligent nodes, the city will install 14,000 new GE LED fixtures with adaptive lighting control across the city, which is expected to save San Diego an estimated $2.8 million per year in energy costs.

$2.8M

Expected annual energy savings for the city of San Diego

But saving resources is just one benefit. By using streetlights as the basis of an open, secure, and scalable digital infrastructure, San Diego gained the ability to implement a wide range of smart city initiatives that can improve livability and safety, and generate revenue, reduce costs, and accelerate growth.

Why Streetlights?

Streetlights offer three things that make them an ideal installation site for smart city equipment. They are ubiquitous, they provide a source of power, and provide a bird's-eye view of the city while keeping equipment out of sight and out of danger. Intelligent devices on streetlights can instantly see, hear, and feel—using optical, acoustic, and environmental sensors to act on traffic conditions, gunshot detections, public activities, and more.

These types of solutions provide cities and metropolitan areas with the means to accumulate a wide range of information that produces numerous benefits. This data can be examined to find meaning in a variety of environmental conditions such as traffic and pedestrian patterns, air pressure, temperature, vibration, and noise.

The addition of intelligent nodes to light poles is particularly powerful. By taking advantage of computer vision, city managers and employees can make decisions that:

- **Improve public safety and security**. By using computer vision-ready cameras, cities can capture and transmit images to law enforcement and fire departments to advance short-term response, long-term planning, and evidence-based investigations.
- **Identify congestion and optimize traffic**. Cities can analyze vehicle traffic data to reduce congestion. The solution will also analyze pedestrian and bicycles traffic on sidewalks, crosswalks, and bike lanes. This enables cities to make data-driven and comprehensive transportation policy decisions.
- **Direct drivers to available parking and enhance enforcement**. The solution can help drivers find open parking spots, and it automates issuing parking fines.
- **Increase situational awareness**. Video-on-demand provides first responders with real-time, on-scene emergency information. The solution also can be used to feed an archive, letting investigators rapidly locate and review images to identify patterns or people involved in an incident.

A Look at CityIQ

CityIQ, developed by Current, powered by GE, is an example of a solution designed to help municipalities collect and make use of data. CityIQ takes advantage of existing streetlights as part of an integrated, modular solution that enables cities to improve livability, optimize city finances, and accelerate growth.

Current's CityIQ intelligent nodes, which run on Intel technology, allow seamless integration into any streetlight pole. Multiple sensors embedded into the CityIQ node collect and transmit data over a secure cloud connection using Ethernet, Wi-Fi, or cellular service. Intel technology provides the advanced processing and edge analytics needed for these compute-intensive functions.

The platform empowers any city department to use data to solve its specific needs. Since individual departments can share this digital infrastructure, there's no need to install and manage their own point-solution hardware or store their own data. This means CityIQ solution deployments save money while eliminating departmental data silos **(Figure 1)**.

In addition, CityIQ's future-proof design makes it simple to adopt new use cases via over-the-air software upgrades. CityIQ fosters the development of apps that use city data to boost local economic expansion and increase convenience.

Powering App Development

Cities can benefit by encouraging third-party developers to build applications that enhance livability and improve the local economy. CityIQ—which makes real-time data available with open API and security-focused, scalable Intel technology—makes it simple for developers to build unique, customized applications that produce targeted solutions.

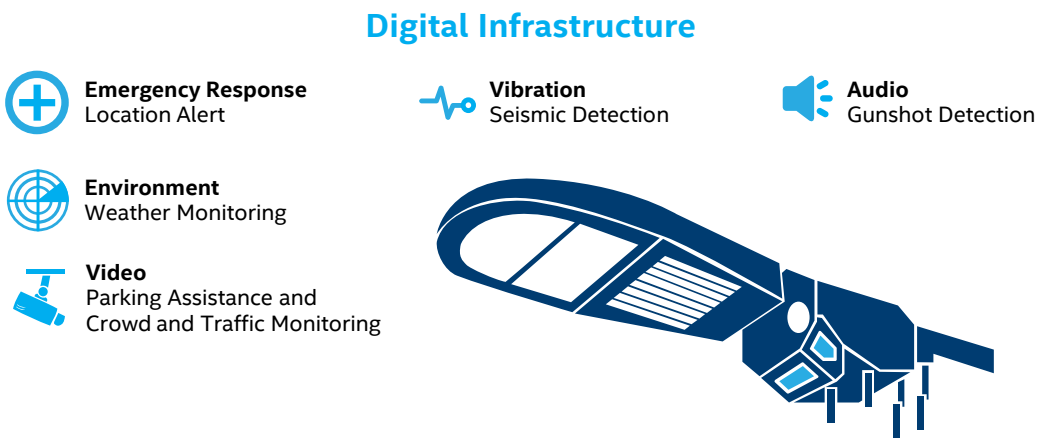

Figure 1. Solutions such as CityIQ* enable cities to monitor a variety of metrics with one device. (Source: Intel®)

For example, San Diego sponsored a hackathon and invited developers to create new apps. One of the apps, DreamBiz, enables entrepreneurs to leverage a wide array of city data. Based on CityIQ historical traffic, parking, and pedestrian data, the app helps them match their type of business venture with available real estate **(Figure 2)**.

In partnership with GE Digital, San Diego provided real-time data from recently deployed CityIQ nodes to the 2018 CSU Challenge. The winning app, Treety, uses traffic, pedestrian routes, and other data to aid urban planners and citizens in choosing optimal locations and types of trees to plant. It helps make neighborhoods more people-friendly, reduce carbon emissions, and revitalize neighborhoods.

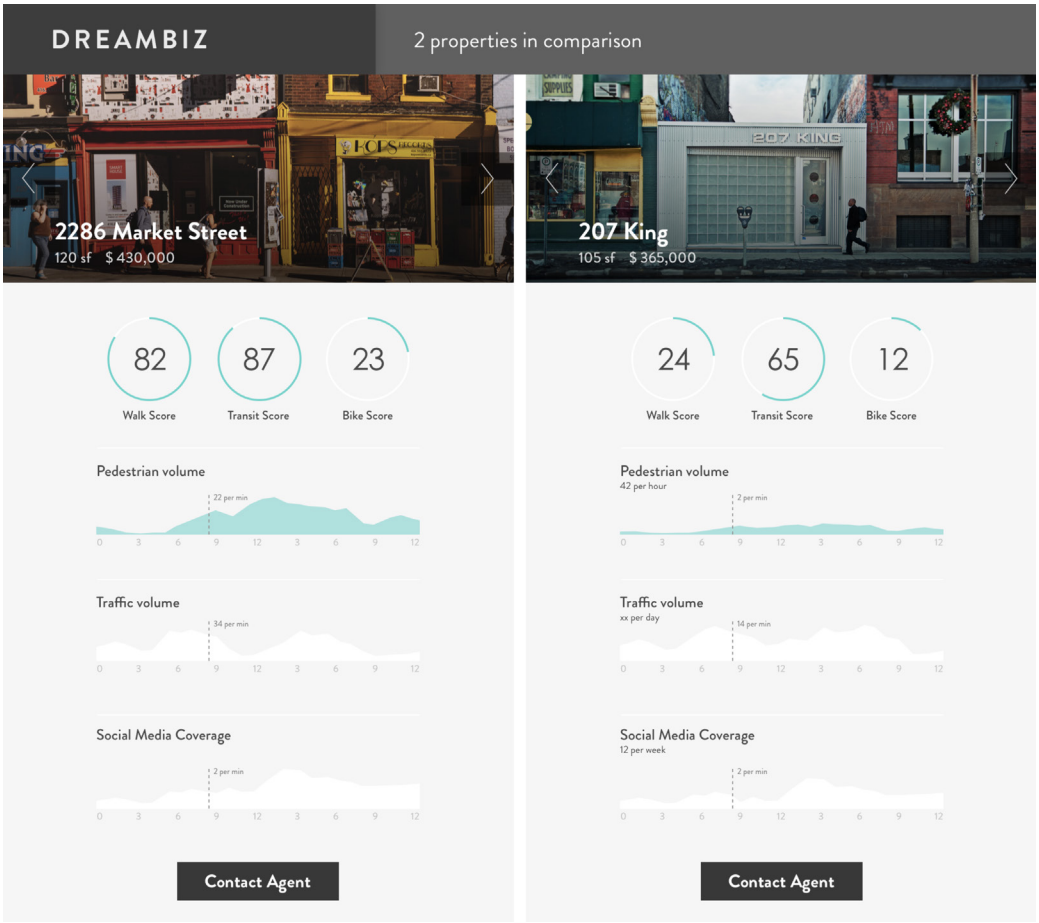

Figure 2. App developers can use city-owned data collected through CityIQ to build new, innovative applications. (Source: Current, powered by GE)

Secure and Scalable Solutions

Municipal IT departments require secure, high-performance solutions that address current and future needs. CityIQ is built with scalable Intel technology that protects data, software, and hardware. Intel processors support high-resolution multimedia and high frames-per-second video streaming.

In addition, any application can connect to GE Predix. Optimized for Intel® Xeon® processors, the Predix data center platform enables cities to gain an end-to-end, standards-based solution that scales with their needs **(Figure 3)**.

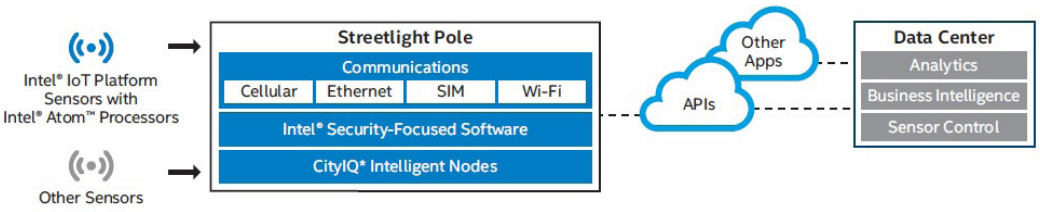

Figure 3. Solutions including CityIQ* provide security and scalability, enabling cities to adapt the solution to new requirements. (Source: Intel®)

Designed to Help Smart Cities Thrive

Municipalities around the world use solutions such as CityIQ to collect and analyze data, helping them improve quality of life, generate revenue, reduce costs, and accelerate growth. These solutions take advantage of existing streetlight infrastructure, and their scalable, modular approach empowers cities to grow the solution to match their needs.

San Diego Mayor Kevin Faulconer spoke about CityIQ benefits: "Fostering innovation and improving infrastructure are important to enhancing the lives of all San Diegans." He added, "This new technology will give the city and developers the opportunity to make our neighborhoods safer and smarter."

By deploying a solution designed to solve current and future needs, city managers and employees make data-informed decisions that improve livability, optimize resources, enticing new businesses and enthusiastic citizens to make smart cities their home.

Learn more about CityIQ and other Current IoT solutions.