# How Data-Driven Insights Improve Quality of Life

## Cities are investing in proven technologies to increase efficiency, improve safety, and enhance the overall quality of life for residents and visitors.

According to Juniper Research, smart cities can "give back" more than 125 hours to each resident every year.[2]

## TIME SAVED

**60 Hours** — Dynamic traffic light phasing and smart parking

**35 Hours** — Predicting where emergency personnel should be deployed

**21 Hours** — Using digital services to interact with city agencies

**9 Hours** — Reduced healthcare wait times

As cities continue to grow—with 60% of the globe expected to live in urban settlements by 2030[1]—civic leaders are looking for new ways to serve the needs of expanding populations. That's why cities are investing in proven, scalable, ready-to-deploy technologies to improve quality of life and increase economic efficiencies.
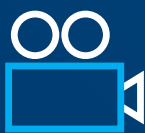
The Intel® IoT Market Ready Solutions (Intel® IMRS) were created to address these needs. Made possible by the Intel® Internet of Things (IoT) partner ecosystem, these end-to-end solutions provide solid benefits today and lay the foundation for a more intelligent tomorrow.

The solutions include:

- **Smart Vision**, which uses data-driven insights and video to provide near real-time situational awareness, enhance public safety, and improve delivery of vital services.
- **Smart Lighting**, which helps cities increase energy efficiency, reduce costs, and monitor environmental conditions.
- **Smart Hubs**, which strengthen connections between local government, businesses, residents, and visitors.
- **Smart Transit**, which enables improved transportation options that reduce congestion and cuts maintenance budgets.

This business brief provides an overview of these technologies. It will help city officials and employees responsible for public safety, transportation, economic development, or information technology become more knowledgeable about using IoT technology to benefit citizens.

## SMART VISION

Leverage data-driven insights to enable real-time situational awareness, transform public safety, and drive better business outcomes

## SMART LIGHTING

Create lighting solutions that dramatically improve energy efficiency, control costs, and enhance resident quality of life

## SMART HUBS

Utilize smart city hubs to strengthen the connections between cities and their businesses, residents, and visitors

## SMART TRANSIT

Optimize mass transportation to improve service while reducing costs and environmental footprint

## How IoT Technology Makes Cities Smarter

Every day, cities generate tremendous amounts of data on traffic, public safety, economic activity, environmental conditions, and other metrics. By collecting this information, cities are enabled to make data-driven decisions—leading to increased revenue, streamlined city operations, enhanced delivery of critical services, and improved mobility and safety.

These proven IoT technologies are essential to both gathering data and transforming it into actionable insights that produce real results. With the right IoT technologies in place, city managers can demonstrate why they are implementing new policies and initiatives and provide justification for spending decisions. Smarter cities can also foster smarter, connected citizens, organizations, businesses, and schools, helping them to become active participants in the city's vision.

To capture these benefits, cities should look for holistic solutions that bring together sensors, wireless connectivity, and end-to-end analytics. The technology enables cities to combine data from multiple sources, rather than confine them to separate silos. City managers gain a continuous, near real-time, holistic view of systems and behaviors, creating a wellspring of data-driven insights.

Cities also need proven, scalable solutions that can be easily deployed immediately. Such solutions enable a metropolis to receive the benefits of the IoT today while also providing a path for future innovation that can attract new businesses and vibrant, productive citizens.

## Unleash the IoT with Deployment-Ready Solutions

Achieving these goals requires a team effort. "Cities are engines of economic activity, and we as an industry need to make them more resilient and responsive," says Sameer Sharma, global general manager of smart cities IoT solutions at Intel. "Partnerships between city planners, government officials, private companies, OEMs, software developers, and startups are creating smart city ecosystems that will empower citizens while reducing our carbon footprint."

This philosophy can be seen in the Intel MRS ecosystem. These collaborations bring together Intel's leadership in scalable technology with its partner's expertise in smart city applications. The solutions offer exceptional performance and empower cities with end-to-end actionable intelligence.

These IoT solutions are already deployed in cities across the globe, helping them become smarter, safer, and more livable.

## Real-World Results

Cities worldwide have improved their quality of life, increased revenue, and reduced costs by deploying Intel IMRS to meet the specific needs of local government, organizations, law enforcement, businesses, residents, and visitors. Here are just a few examples of how the IoT technology is transforming urban environments.

## Smart Vision

Intelligent vision technology brings a multitude of benefits to metropolitan areas, from managing traffic to enhancing public safety. These capabilities are particularly important in busy areas like airports, where the sheer volume of activity can overwhelm security personnel.

That's why Intel partnered with Dahua Technology Co., Ltd. to offer the More Intelligent More Secure for Airport solution. This solution leverages Intel's industry-leading artificial intelligence (AI) to create a comprehensive camera-to-command-center platform that can recognize and classify vehicles, passengers, and luggage entering the airport for complete threat detection.

Airports all over the world have deployed the solution, demonstrating its ability to scale up to the toughest demands:

- Nadi International Airport in Fiji completed video surveillance for more than 60 duty-free shops

- Peruvian LAN Airline premises were secured with a hybrid solution using a combination of access points and wire transmission to transmit the camera data to sub-centers

- Santiago Pudahuel Airport in Chile used a front-end camera and storage control center for video surveillance



## SMART VISION

### Dahua More Intelligent More Secure for Airport

**Maximize Airport Visibility**

- Increase scope of video surveillance and monitoring
- Gain clearer view of the airport and surrounding environment
- Minimize risk of illegal intrusions and security loopholes

**Optimize Security Management**

- Enable security guards and police to respond quickly to incidents
- Reduce maintenance costs and complexity of security systems
- Simplify daily management of devices and operations

**Mitigate Security Threats**

- Efficiently identify potential threats and unauthorized activities
- Proactively increase security measures
- Accelerate escalation of threats to security and police

# SMART LIGHTING

**Emergency Response**
Location Alert

**Vibration**
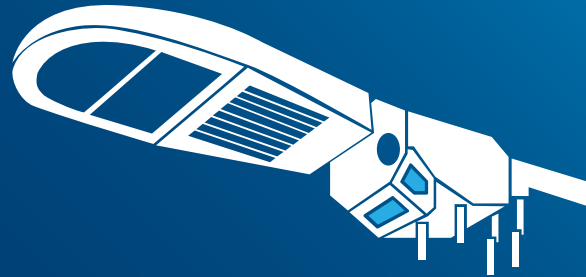Seismic Detection

**Audio**
Gunshot Detection

**Environment**
Weather Monitoring

**Video**
Parking Assistance and
Crowd and Traffic Monitoring

CityIQ* from Current, Powered by GE

## Smart Lighting

Streetlights may seem like a simple technology, but they can serve as the basis for sophisticated IoT applications. Consider the possibilities enabled by CityIQ*, a smart lighting solution running on Intel® technology, built by Current, powered by GE, and offered through AT&T.

The solution centers on smart nodes, which integrate LED lighting, wide-angle cameras and other sensors, preconfigured networking, and local intelligence based on Intel technology. The smart nodes can be installed on any streetlight, instantly creating a citywide IoT network.

CityIQ cuts energy costs by dimming lights until pedestrians or vehicles are detected. And they can do much more. For example, they can collect near real-time traffic data to optimize the routing of emergency services, enhancing the health and safety of the citizens.

The City of San Diego deployed 3,200 CityIQ intelligent nodes and achieved:

• 60% reduction of in energy use for its streetlights[3]

• $2.8 million savings in annual energy costs[4]

San Diego's selection of CityIQ is part of the city's initiative in building the world's largest municipal IoT network.[4]

## Smart Transit

Congestion can result in drivers spending more than 70 hours per year in gridlock.[2] To reduce traffic, smart cities around the world are improving their mass transit systems and inducing people to drive their cars less often. That's why Intel and Cisco are working together to provide an end-to-end solution that makes mass transit more attractive.

The San Diego Metropolitan Transit System implemented the Cisco Connected Mass Transit solution and produced the following benefits:

• Reduced operational costs through predictive maintenance

• Created more efficient routes that save fuel

• Enhanced passenger safety by using coordinated video surveillance

• Provided passengers with fast WiFi and real-time schedule updates

The city of Linz, Austria implemented the same solution on its 60 trams and 180 buses, reducing energy consumption by 10% and carbon dioxide output by 85 tons.[6] Linz also used the solution's real-time data to:

• Monitor the health of buses, trams, and IoT equipment as well as the stability of the electricity powering the vehicles and IoT solution

• Conduct predictive maintenance on all systems

• Optimize bus and tram schedules

## Smart Hubs

Citybeacon is a smart hub that runs on Intel IoT technology, which blends state-of-the-art connectivity, public safety, and communications technology into a single open platform. Deployed in busy civic venues—such as town squares or train stations—smart hubs are designed to:

• Boost the local economy by connecting cities, residents, visitors, and businesses

• Facilitate communication

• Enable telecoms to expand network coverage and offload traffic

# SMART HUB

## Smartcity Operations Management System



The Citybeacon's 32-inch touchscreen allows it to act as a convenient information and payments center for parking and other services and as an advertising medium. The Citybeacon smart hubs are also equipped with public safety features.

Eindhoven, Netherlands, which was named Intelligent Community of the Year 2011 by the Intelligent Community Forum,[5] deployed 30 Citybeacon smart hubs that broadcast WiFi and 4G mobile network signals, enabling:

- More than 16,500 people each day to interact with Citybeacon smart hubs
- Approximately 165,000 searches per month to be performed

- The city to broadcast public service announcements as well as information to promote local businesses and events

## Making Cities Smarter

Cities throughout the world are using the IoT technologies to create new opportunities and manage new demands brought on by population growth and technological change. Solutions such as Intel IMRS® can enable city managers to make data-driven decisions to deliver the quality of life that both the public and business leaders expect. Moreover, these IoT solutions can increase revenue, optimize city budgets, and provide cities with the opportunity to generate future innovation.

**For more information, visit the Solutions Directory.**

[1] http://www.un.org/en/development/desa/population/publications/pdf/urbanization/the_worlds_cities_in_2016_data_booklet.pdf

[2] https://newsroom.intel.com/wp-content/uploads/sites/11/2018/03/smart-cities-whats-in-it-for-citizens.pdf

[3] https://smartcitiesconnect.org/san-diego-speaks-about-largest-city-based-iot-platform-in-world/

[4] http://www.futureofbusinessandtech.com/sponsored/how-your-citys-digital-intelligent-cities-infrastructure-will-shape-the-future-of-community-engagement

[5] https://hub.beesmart.city/city-portraits/smart-city-portrait-eindhoven

[6] https://www.insight.tech/cities/how-iot-is-transforming-mass-transit