

Building the IoT-enabled city

You can create prosperous, safe, resilient cities by creating a living replica that brings together all your data into a digital twin



Contents

Cities are changing.

Their digital infrastructure needs to change too.

Today, there are 4.2 billion people living in urban areas. By 2050, there will be 6.7 billion people.¹ To meet this growth—happening as we speak—cities are undergoing rapid change to deliver housing and infrastructure. At the same time, they also need to address more intangible goals: economic growth, safety and security, and their overall resiliency.

Many cities are being proactive, investing in a resilient future by committing to many of the United Nation's sustainable development goals, which range from ensuring safe access to water, sanitation, and energy to combating climate change and its impacts. And with a rapid upsurge in technologies, such as sensors, they're developing innovative solutions across all city systems, like planning, smart transportation, and utility usage. In fact, the smart cities initiatives market size will grow to nearly **\$821B by 2025**.²

But complexity still remains. Cities are collecting electronic data in unprecedented volumes. However, they continue to struggle using that data to support decision-making, in part because they lack the digital technology to improve their business processes. The move to digital presents a real opportunity for cities to change how they work by using their data more effectively—but it also represents a risk. Without a way to use their data effectively to address real problems, cities may find themselves drowning in data while thirsting for insight.

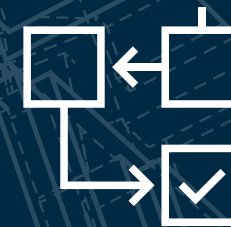
// As urban populations continue to grow, the world is expected to add more than two trillion square feet of new building space [and other infrastructure] by 2060. **That's the equivalent of adding another New York City every month for the next 40 years."**

Bill Gates

Bentley OpenCities Planner gives you a living, breathing digital twin of your city.

OpenCities is a digital platform for city planning, citizen engagement, urban development, and infrastructure projects that help cities build resilient models that enhance planning productivity and decision making. It pulls together data from a wide variety of sources and presents them in a simple to use and accessible online model.

OpenCities in combination with Azure IoT enables digital representations of physical assets, processes, or systems. Because digital twins are continuously updated with data from multiple sources, it is far more than just a static 3D model. Instead, it's a way to mesh reality with the digital world.



Improve planning and project visualization

- Easily access your data and applications from anywhere
- Gain insights by involvement and dialog
- Sketch, combine data, and evaluate options
- Create one city-scale environment for multiple projects
- Create 3D scenes and share them with your team



Communicate and engage

- Conduct global or local project overviews with all stakeholders, including the public
- Share detailed scenes of projects
- Publish to web, mobile, or showroom with one click
- Create surveys and gather comments and feedback from all stakeholders—including citizens



Get a single environment in Azure

- Combine geospatial, 3D buildings, building footprints, maps, terrain models and more.
- Access plans and projects anywhere and any time.
- Overlay Azure IoT data in context

The value of OpenCities Planner extends past planning phases.

Because it is architected using digital twins, you'll get an ongoing solution that pulls in sensor data to help you manage all aspects of how your city is running on a daily—even hourly—basis and make improvements. Over time, this data will feed into new planning and development, creating a truly resilient city.



Buildings

Public, commercial, industrial, residential, sensor networks

Utilities

Water, stormwater, sewer, electricity, gas, lighting, communications (cable + cell)

Transportation

Roads, tunnels, bridges, metro, light rail, heavy rail, high-speed rail, ports, airports

Environmental

Parks, streams, rivers, lakes, beaches, estuaries, harbors

Safety

Air quality, water levels, vehicle counters, noise levels



Use case:

Smart street lighting

Situation

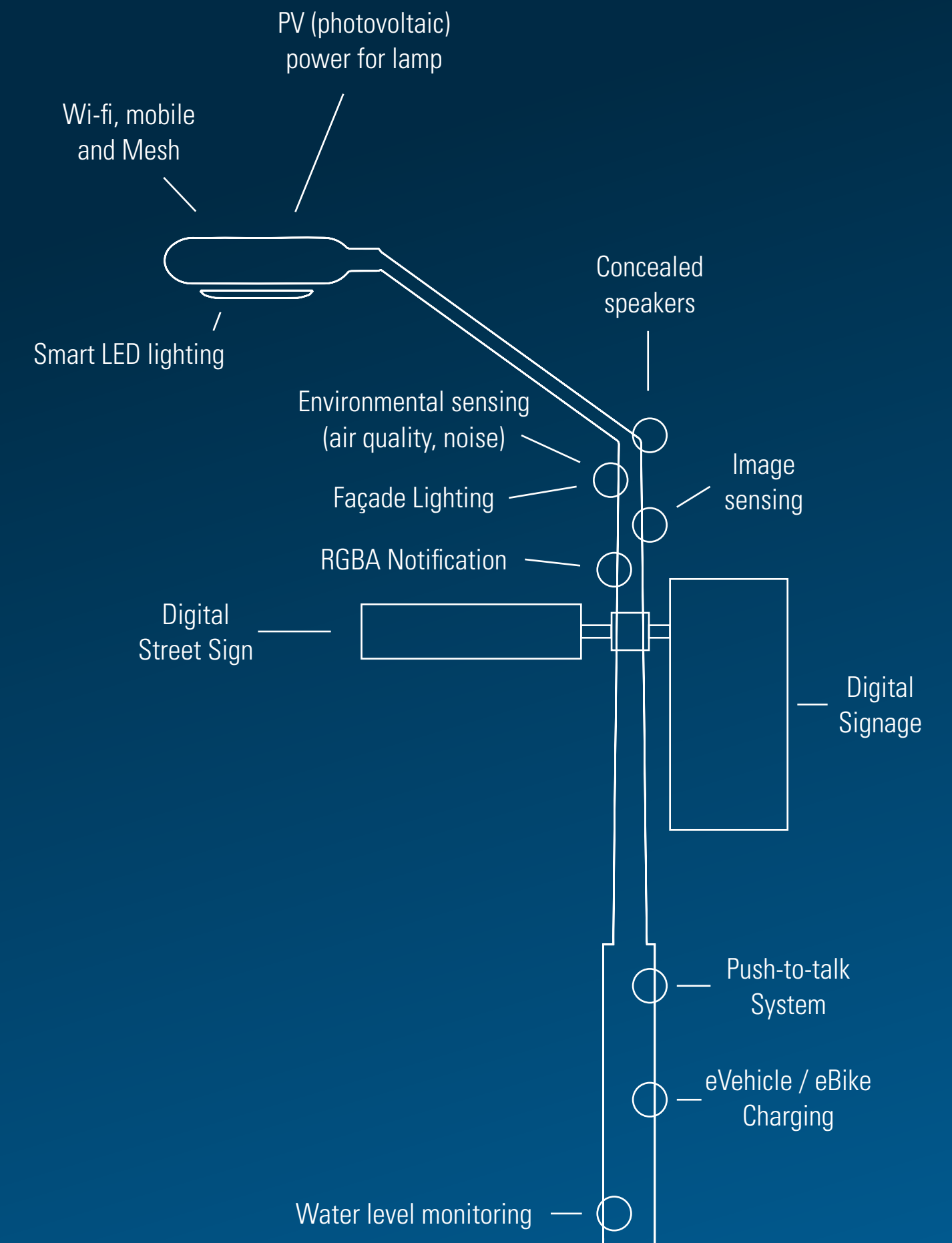
Public lighting plays a pivotal role in cities. Not only is it functional, but it exerts a strong emotional impact through effects on ambience, mood, and safety. In many cities, lighting infrastructure is outdated and can take up as much as 40 percent of the energy budget.

Solution

Shifting to connected digital public lighting using OpenCities offers many opportunities for better management of lighting infrastructure, whether it's to facilitate a transition to LED lighting, which can save up to 50 percent in energy costs, or moving toward solar powered lighting.

Benefits

With real-time sensors, managing lighting remotely and proactively can yield up to 80 percent in savings, while providing citizens with more reliable and flexible lighting solutions. Smart street lighting infrastructure can also serve as a basis for creating a dense network of sensors and actuators to enable additional smart city services including real time data on everything from traffic and pollution to data on how to improve the entire business ecosystem.





Use case:

Dynamic space reallocation

Situation

With physical distancing top of mind, the biggest challenge regarding space within offices and public areas, such as malls or stores, has shifted from using space efficiently, to ensuring safe distancing between people.

Solution

An OpenCities environment can help you enhance operational efficiency and support specific functions—such as physical distancing—with digital twin modeling and simulation. With the ability to visualize and analyze space configurations, you'll be able to dynamically optimize variable occupancy and use.

Benefits

With robust data to run “what if” scenarios, you'll get the ability to shut off and repurpose spaces dynamically so you can be more agile in responding to social distancing requirements. In addition, the solution can provide value through potential energy savings and continuous building tuning. It can also be applied or extended to other scenarios—such as a downtown street.



Use case:

Visualization & simulation of resource performance

Situation


Building performance efficiency is important not only to control costs, but also to meet sustainable development goals related to carbon reduction.

Solution

Using an OpenCities environment, you can augment your current Building Automation and Management Systems (BAS, BMS). Then, you can automatically and continuously monitor your real estate assets and measure against resource usage targets such as energy, water, and wastewater.

Benefits

With an OpenCities solution, you can drive progressively greater operational and environmental efficiencies. Additional value comes from improving your sustainability transparency.



Use case:

Flood resilience & readiness

Situation

Extreme hydrometeorological events with rapid urbanization and inadequate drainage substructures can trigger flooding and cause major damage to infrastructure, impact human safety, and weaken the economy.

Solution

OpenCities enables you to visualize accurate and reliable risk and analysis results to agencies involved in flood preparedness, response, recovery, and mitigation. These insights can help cities anticipate where flood concerns are greatest, helping to provide early warnings and communicate with the public.

Benefits

You can promote both prevention and response strategies to help increase public safety and potentially decrease damage to infrastructure. Utilities can also use information from the scenarios to define mitigation strategies, including cost/benefit analysis of changes to utility systems to mitigate future system issues.

Better together: Microsoft and Bentley

Together, Microsoft and Bentley deliver a fully-integrated solution for city planning in a cloud-based environment.

Bentley®

Bentley provides a digital platform capable of modeling urban plans and performance at city scale.

The ability to visualize everything:

Get complete views above ground, below ground, inside buildings, any size terrain, with smart sensors and attributes.

A way to connect everything:

Connect any data source, any visualization tool, any maps.

Easy to use:

Get a modern, easy-to-use interface with drag and drop configuration and simplified content publishing.

Simple to get started:

Start with the data you have, build on to it as you go.

Microsoft

Azure provides the IT infrastructure and tools that power intelligent solutions.

A complete solution with no installation:

Totally web-based, there are no apps or servers to install.

Easy connections to an online platform:

Azure provides the ability to connect almost any software, solution, or other platform.

The security you expect from Microsoft:

Keep peace of mind with more security certifications than any other provider.



Build your city of the future, today

Learn more >

Contact us >

