



Making Smart Cities Brilliant

How Amerlux Provides Beacon of Light for Tomorrow



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It's a typical morning in Normal City, USA. The streets are snarled with rush hour traffic and everyone is trying to get to work.

For years, a group has been presenting the city planner's office with a proposal to reengineer some intersections to reduce the endemic traffic jams. The city says they don't have enough data to justify the investment and the proposal never gets anywhere.

It's daylight, so the streetlights are not needed—which is fortunate as many of them have burned out—but there are still a few on. They must not have gotten the memo to turn off during the day, so they continue slurping down electricity all day.

There was a shooting during the night—committed under the darkness of several broken streetlights. The police didn't find out about the incident until the morning, hours later. The crime was a needless tragedy, considering the victim could have survived with prompt medical treatment.

Meanwhile, in neighboring Smart City, USA, there's a very different picture. It's rush hour and there's traffic of course, but during the past several years, the city has managed traffic by building a parallel main street through the city and adding more public transit options. Traffic is much better than it used to be.

The city manager credits the lamppost-mounted, traffic-monitoring sensor network across the city with providing the necessary insights to optimize traffic flow.

A maintenance crew is fixing a "day burner" streetlight, thanks to the automatic notification the light sent to the city utility. The lights in Smart City are smart enough to know when they are still on during the day, or if they have burned out altogether.

Violent crime is on a downward trajectory in Smart City, thanks to better lighting curbing crime. Residents feel safer walking down the streets at night.

It's a bright day in Smart City and the future is looking bright too.

The Promise of the Smart City

“Smart city” is a loose term for a city or community that uses sensor data to deliver a responsive infrastructure. In a smart city, sensors can monitor everything from energy usage to traffic flow to occupancy. Using wireless connectivity, cities can control and adjust their infrastructure in real-time based on changing needs of the community.

Data collection methods can include sensors for energy and water usage, occupancy and crowd size measurement, facial recognition, environmental conditions, traffic flow and public transportation use.

The promise of smart cities is better managed infrastructure and services for communities through technologies such as Internet of Things (IoT), artificial intelligence and big data. The challenge is that the infrastructure in many cities is decades old, which holds the cities back.

Some of the world’s wealthiest investors see the potential of smart cities and are partnering around the globe to create smart communities:

- **Google/Toronto, Canada**

Sidewalk Labs, a subsidiary of Google’s parent company, Alphabet, has reached an agreement with Toronto to revitalize a 12-acre under-used industrial neighborhood on the waterfront. Sidewalk Labs plans to break ground by 2020 and ultimately, Google plans to move its Canadian headquarters to the redeveloped area. Sidewalk Labs has committed \$50 million to kick off the project.

Billed as the “world’s first neighborhood built from the internet up,” this project will feature

a “digital layer” that would monitor everything from inefficient electricity use to foot traffic to popular park benches. The data from all these systems would feed back to the city for analysis and allow for constant optimization.

- **Bill Gates/Belmont, Arizona**

Bill Gates, through an investment company he controls, has put \$80 million in a proposed smart city near Phoenix. A greenfield parcel of 24,800 acres, the city is planned to rival Paris in size once completed.

The proposal calls for Belmont to be built around emerging technologies, such as high-speed internet embedded into the built environment, systems for self-driving cars (e.g. traffic lights that communicate with each other to minimize congestion) and smart manufacturing tech. As many as 80,000 homes may be built in Belmont.

- **Saudi Arabia/NEOM**

Saudi Arabia has committed \$500 million to a newly planned smart megacity—NEOM—which would span 10,230 square miles and connect to Egypt and Jordan. More than 33 times the size of New York City, the business- and industrial-focused city will be completely powered by renewable energy and built around smart technologies.

The Smart City Blueprint

The hallmark of a smart city is its connectivity. Networks of sensors connecting to each other and to central decision-making hubs (e.g. town hall) provide the information needed to optimize the city experience for its communities.





Amerlux offers a variety of decorative post top luminaires that can incorporate an optional 7-pin twist-lock receptacle. This industry standard receptacle can be used to quickly and easily integrate a wireless control system into any project.

A wireless control system offers a variety of benefits over traditional on/off photocells including the remote management of individual luminaires.

Amerlux Wireless by Synapse is a lighting control system that not only provide the basics functions such as ON, OFF and Dimming but also provides advanced control and scheduling functionality and can serve as the foundation of emerging IoT applications.

Around the world, cities are implementing a variety of technologies to improve their communities, save money and invest in their futures. Common examples include:

Lighting controls

Chicago recently launched it's Smart Lighting Program with plans to replace 270,000 street lights by 2021 with smart LEDs. The new lights will be connected, alerting the city when lights go out or need service—addressing one of the top reasons residents call the non-emergency city services line.

Across the pond in the U.K. city of Manchester, motion sensors dim the lights in unused areas, while upping the light output in busy areas for energy savings. Copenhagen, Denmark took the idea further by combining energy efficiency with bicycle safety. The city added sensors to the streetlights to detect cyclists and turn up the lights when cyclists pass down the streets.

Data collection for future investment

Using sensors to count people, bicycles and motor vehicles and their flow through certain areas are common kinds of data collection. Cities as diverse as Vancouver, Canada and the Georgetown area of Washington, D.C. use networks of sensors to count pedestrians and vehicles. The data from these sensors guide future infrastructure investments and provide useful “before-and-after” measurements to gauge the effectiveness of projects.

Cameras

Cameras are another common smart city application. Some cities install cameras for security purposes—as has been done throughout the U.K., but some places use the cameras for optimization purposes. For example, Moscow, Russia has more than 150,000 cameras installed throughout the city to monitor traffic, as well as city services like trash removal and street cleaning.



Public Wi-Fi

With the proliferation of mobile devices, connectivity needs have exploded. San Jose, California took the step of installing Wi-Fi access points throughout the city, leveraging lampposts as the mounting platform.

Air quality monitoring

Chicago rolled out a network of sensors on lampposts to track airborne pollutants. Called the "Array of Things," the data from these sensors can predict air quality incidents in the city and help protect residents.

Lampposts Become the Foundation for New Realities

Exterior lighting is a key part of any smart city implementation, whether with existing infrastructure or in greenfield communities. Smart cities are built on thousands to millions of sensors across the community and those sensors need wireless communication connectivity, as well as power supplies.

Streetlighting is the perfect foundation for smart cities because the streetlights can provide the power and the pole, which provides a physical platform for the sensor to mount onto. Streetlights double as the backbone of a city, hosting the sensors and data collectors that make smart cities possible.

Amerlux, an award-winning LED manufacturer, is designing bold exterior lighting solutions that enable cities, communities, and individual sites to realize the promise of smart cities.

The key is the 7-pin NEMA socket. A standard electrical receptacle is available as an option on Amerlux lighting products, such as the Avista LED light engine, the Coach Style Lantern fixture, as well as a variety of other control-ready luminaires.



With the 7-pin socket, cities are future-proofing their streetlighting and laying a solid foundation for current or subsequent smart city upgrades.

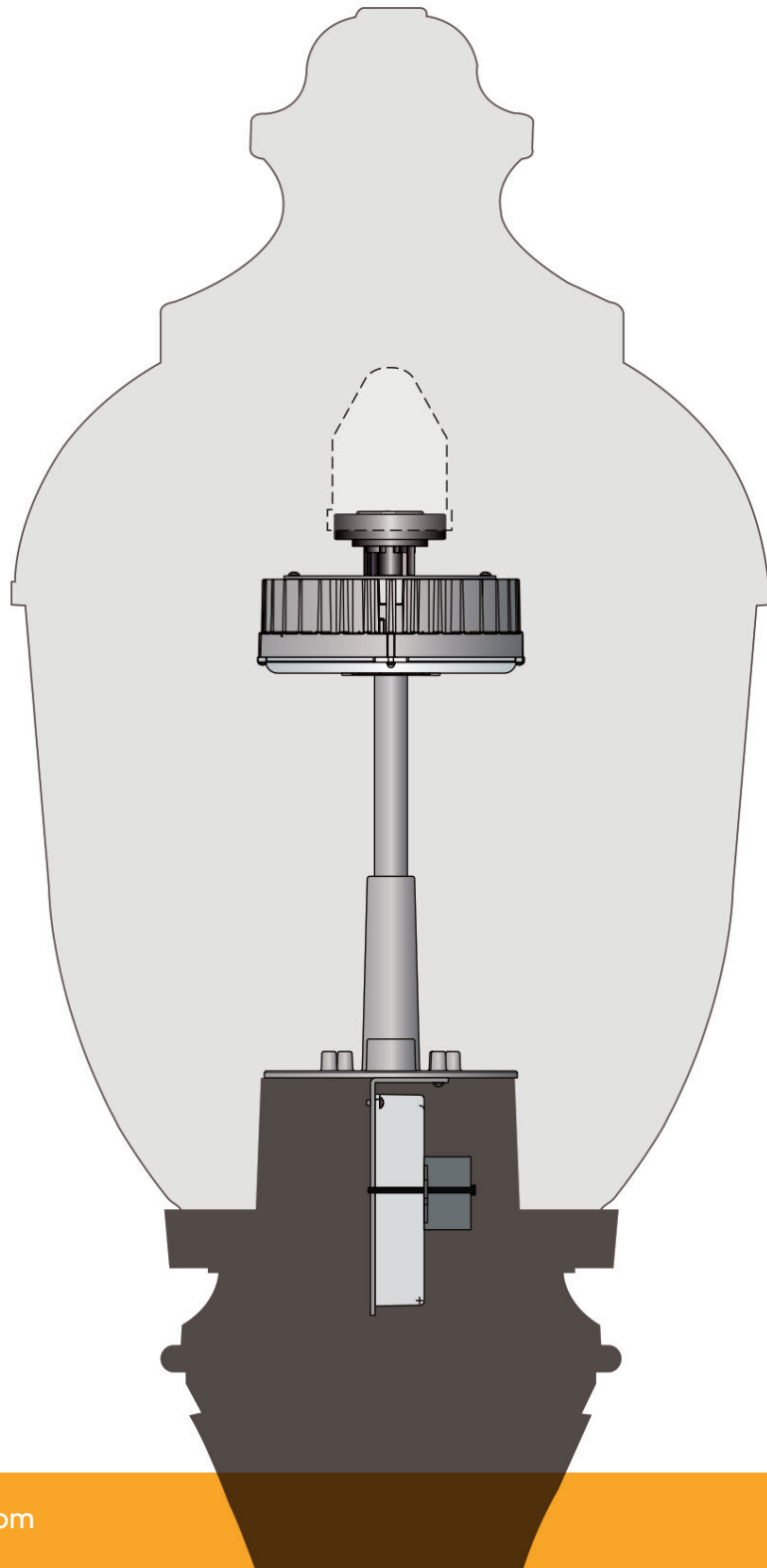
The 7-pin socket is backwards compatible with older 3-pin plug sensors for maximum utility, but the real magic is in what the 7-pin socket enables: the extra pins in the receptacle allow for wireless communication, occupancy sensors, power monitoring and video.

With a small forward-thinking investment added onto a lighting upgrade, cities can lay the ground work for their future by purchasing lights with the 7-pin option. Buying the 7-pin option up front can save hundreds or thousands of dollars per pole in additional retrofitting costs later.

LEDs last for 50,000-100,000 hours (10-20 years), so it makes sense to maximize future options with the 7-pin receptacle, even if a city isn't ready for the full smart city investment yet. This way, the city can use today's wireless controls and the controls of tomorrow still being developed.

Current uses for the 7-pin socket include lighting specific controls, such as wireless controls, dimming, monitoring for faults, and GPS so each pole is automatically mapped out. Besides just controlling lighting, there are a myriad of uses for the light pole and the 7-pin socket in smart cities around the world.

In today's smart city, the humble lamp post is also the eyes and ears. Sensors collect data and communicate wirelessly with a central hub, enabling better decision making by municipal leaders. If the lamppost has a way to connect with the entire grid—which is where the 7-pin socket comes in—it becomes the foundation the smart city plugs into.



Twist-Lock Lighting Controller

The AMX-TL7-G1-LV is an intelligent wireless lighting controller that provides light monitoring and control with utility-grade power monitoring. The controller provides intelligent on/off switching, dimming, control, and constant status monitoring of lighting fixtures.

Smart Innovating for the Cities of Tomorrow

Amerlux launched its first lighting products in the 1980s—a well-received track lighting solution for supermarkets—and ever since, the company has operated based on innovating around customer needs.

“We listen to our customers rather than developing products first,” said Bill Plageman, vice president of marketing at Amerlux. “Our inspiration comes from listening and we take a thoughtful approach to lighting. Innovation is about taking disruptive technology that’s emerging and understanding exactly how it will be used.”

“As we help engineer the next generation of smart cities, we’re listening to our customers, as well as scientists, designers, urban planners and other experts in the industry. We consider their input very carefully before we launch new products and solutions,” continued Plageman.



Avista Street & Pedestrian Lighting

Avista mimics a traditional New England-style globe or “acorn,” using LEDs to tastefully match or retrofit lighting styles prevalent in the northeastern U.S. on campuses at universities, corporations, private communities and municipalities. Avista is available in new fixtures provided by Amerlux and as retrofits of old light sources for many decorative fixtures in the marketplace.

Lighting the Next Steps with Avista

The shift into the street light retrofit market with the Avista LED light engine is Amerlux’s latest customer-focused innovation and its next step forward.

“We designed Avista in a disc shape with the LEDs positioned on the underside of the heatsink to maximize efficiency, resulting in a DLC-listed light engine that optimally addresses everything from energy-savings to Dark Sky compliance,” Plageman said.

Avista, which takes exterior LED lighting to the next level, has been a top pick by a broad range of major cities and towns nationwide.

“During this time of disruptive technology in the lighting industry, we don’t just run with the pack at Amerlux,” Plageman said.

“We listen hard and think very carefully before launching a product. We’re capable of developing any product. Our philosophy—‘It’s not the big that eat the small but the fast that eat the slow’—results in delivering solutions when our customers really need them.”

To learn more, please visit **Amerlux.com**.



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