



Hewlett Packard
Enterprise

Business white paper

Be a smart city

Look at smart street lighting



Street lights are expensive to manage and use a lot of energy. It's time to look at smart alternatives.

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With the rising costs of energy, combined with increased environmental and regulatory pressures toward energy efficiency, many local councils and governments are looking to improve their street lighting operations and infrastructure. Street lighting, an important community service and key to citizens' safety and security, consumes as much as 40 percent of an operator's energy consumption, and they're costly to manage.

Legacy High Pressure Sodium (HPS) lights, and their supporting infrastructure, aren't very efficient and typically operate for up to 12 hours a day, at full intensity. Even using ambient light sensors to switch on and off individual street lights, the energy costs of providing this service are high. In addition, lack of monitoring or recording energy consumption within individual lights means operators often pay based on using a few metered lights, multiplied by the number of lights within their infrastructure, regardless of actual use.

Outages in street lighting have an impact on public safety and public services liability. With HPS, street lights often having a short life span—around five years; and, it's not uncommon for operators to replace approximately 20 percent of these lights each year. This leads to unpredictable services and maintenance cost.

Move to smart street lighting

To address these issues, many operators are moving to intelligent outdoor lighting systems, often referred to as smart street lighting. A smart street lighting infrastructure includes Internet Protocol (IP) connectivity via gateways to and from the street lights, which enables remote management of individual lights. By monitoring environmental conditions, such as ambient light, traffic volumes, and more, the system can optimize energy consumption at the individual light level, for example dimming a light in the early morning hours if there's no traffic on the road. Monitoring also enables preventative and reactive maintenance, leading to fewer outages and reduced operational costs such as maintenance. Cities such as Los Angeles¹ and Oslo² saw an energy savings of more than 60 percent when becoming smart.

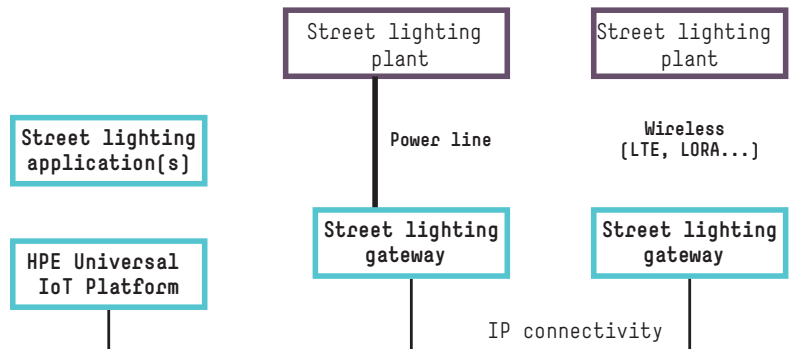


Figure 1. Smart street lighting example

¹ c4o.org/blog_posts/london-and-los-angeles-share-knowledge-on-outdoor-lighting-retrofit

² kemptechnologies.com/white-papers/designing-application-centric-network-19-trillion-internet-things-economy/

Incorporate smart units

Smart street lighting requires new, smart/connected luminaries and power units (ballasts) to be fitted; however, the actual lights can vary between HPS and LED-based lights.

Using traditional HPS lights in a managed environment reduces the investment required to implement the new infrastructure, as much of the existing light can be reused. Using newer, more efficient power units, managing the lights, and optimizing their use, means significant savings to the operator. Also, newer luminaries and lights can deliver more effective lighting than the conventional infrastructure. And LED can be dimmed in real time, while HPS lights require about one minute to dim. Given the benefits and relatively low cost of deployment by reusing the existing infrastructure means the return on investment for such an upgrade generally takes two to three years.

New, energy efficient, LED-based street lights enable lower energy use. They have a life span of up to 20 years, which reduces operations costs, making these lights more popular with operators. However, their deployment requires high levels of investment to deploy new power units, luminaries, poles, and lights. For example, many of the current LED lights have a lower range than HPS, so the light posts must be closer together. As a result, the long-term savings may be the same or greater; in the short term, the payback period can be as long as four to seven years depending on the deployment. As the LED lighting market matures, this time period will reduce. From the Hewlett Packard Enterprise (HPE) Universal IoT Platform and existing smart lighting application, we can manage both HPS and LED. This means that you can implement a combination of HPS and LED lights—where you can incorporate fast dimming, as you see fit.

Know additional nonlighting-related benefits

Providing IP connectivity to street lights opens up a large number of opportunities for operators to use that connectivity for additional smart services. Examples include:

- Using street lights as access points for a Wi-Fi or small cell mesh to provide citizens and employees with Internet access
- Enabling sensors to manage traffic or parking, such as traffic light controls or smart parking services
- Providing access points or concentrators for home automation services or smart metering connectivity

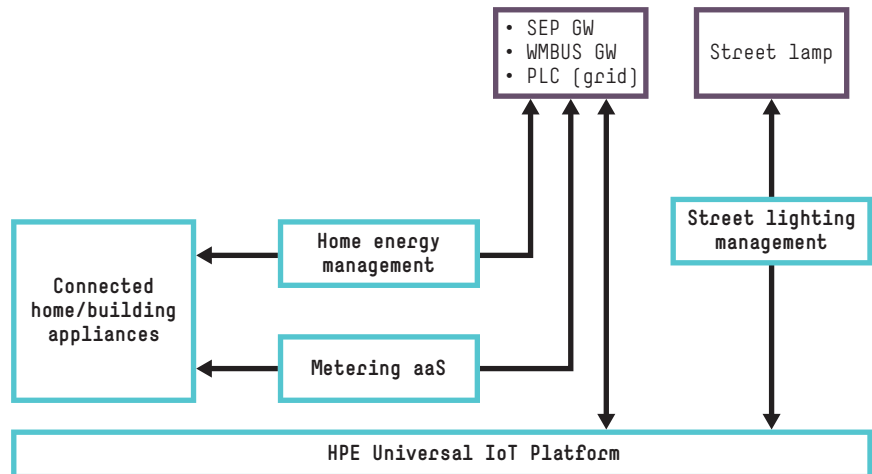


Figure 2. Managing street lights; offering connectivity to smart city services

Take a look

Regardless of the light you use, intelligent outdoor lighting systems—smart street lighting—can save you energy and money, and enable additional benefits to your employees and citizens. It's time to take a look.

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