Global Market Trends in Smart Outdoor Lighting Systems

By Ron Bernstein, CEO/Executive Director, LonMark International

As electricity prices continue to rise, more municipalities around the world are switching over to intelligent streetlight networks to reduce operational costs while improving efficiency and safety.

It is widely recognized that conventional outdoor lighting systems on roads, streets, parks, campuses and parking lots account for up to 40 percent of a city's energy use and may represent its largest expenditure when maintenance costs are factored in. During the last few years, many projects proved that, using a smart and networked lighting solution reduce energy spending, decrease maintenance costs, enhance safety in the public spaces and minimize the environmental impact.

Benefits of Smart Streetlighting

While there are numerous benefits to deploying smart outdoor lighting, LonMark International suggests the three most important benefits for municipalities to consider:

1) ***Up to 40–50 percent energy savings.*** Using existing power wiring or wireless mechanisms, networked outdoor lighting systems have the capability to provide full remote on/off control of individual lamps and segments and to adjust light intensity at the right level, at the right place, at the right time, based on time of day, traffic patterns, weather, or season. Maintenance costs may also be reduced up to 50 percent, and the increased energy efficiency contributes to the reduction of CO_2 emissions.

2) ***Automatic, real-time diagnostics***. Cities relying on conventional lighting systems typically send personnel in trucks on nightly patrols to monitor, identify and repair failures, at significant expense in man-hours and resources. Data transmitted through a networked system will report irregular lamp behavior, individual lamp failure, and lamp temperature when it occurs, so patrol resources can be reallocated to improve safety elsewhere.

3) ***Creating a communications infrastructure.*** Smart outdoor streetlight systems can serve as the foundation of an entire smart city communications network. Costs are reduced by providing a common interoperable platform for a range of connected devices that integrate with citywide security, police, and other services, such as traffic sensing, emergency lamp flashing, and many more applications, which enhance driver, pedestrian, and resident safety.

Ron Bernstein, CEO and executive director of LonMark International, emphasizes that, "These multiple avenues for significant cost savings result in a rapid return on investment, mitigating the upfront cost of deployment. By encouraging cities to

implement additional services on top of the common backbone of the lighting system, the cost is distributed and provides greater economic value."

Competition: Proprietary vs. Open Systems

Many cities have determined that proprietary systems are no longer the most efficient or cost-effective, after wasting too much time and money on branded solutions that become obsolete within just a few years. LonMark International supports the open systems model by helping interested vendors develop interoperable products that can work together. While they may be competitors, these vendors find value in developing interoperable products as competitive advantage to the market.

On one hand we have identified over 70 competitive suppliers of light point controllers in many countries. On the other hand, only the most robust solutions survive, such as those provided by established industrial suppliers. Smart Outdoor Lighting system field equipment must be highly reliable, sustainable, and able to survive in harsh environments for at least 15 years of operation.

Furthermore, specifying a standards-based architecture based on open-system interoperability standards such as ISO/IEC 14908 allows each municipality to mix and match components or system elements from multiple suppliers, driving down implementation and maintenance costs. Making competitive devices, infrastructure, and back-end software options available also helps to drive innovation and flexibility.

By providing an open communications platform at the pole, the door is opened to add additional sensors such as light level, motion detection, weather stations, and other environmental sensors and actuators, including digital displays, parking meters, EV charging stations and many more, creating a common infrastructure that is the backbone of a smart city.

Current and Potential Market

Still an emerging market, Smart Outdoor Lighting started gaining more attention in 2008, as prices for networking technology and related components began to decline. Today, with the need for municipalities to reduce energy usage, respond to budget pressures, and to become "greener" due to the increased awareness of global warming (particularly since the COP21 United Nations Conference on Climate Change in Paris), more and more cities across the globe are choosing to deploy intelligent, connected streetlighting solutions.

According to Bernstein, "The biggest adopters at present are China and the United States, although countries such as Poland and Germany (as well as Europe in general) are catching up quickly. Large cities such as Los Angeles and San Diego, California, Miami, Florida; Canton, Ohio; Montreal, Canada; and São Paulo, Brazil, have already deployed, or are close to deploying, Smart Outdoor Lighting, which adds up to millions of connected streetlights, while there were fewer than several hundred thousand only a few years ago."

Smart Outdoor Lighting is a win-win solution for all. Cities invest to reduce their budget through decreasing energy expenditures and maintenance costs. The economy of supply and demand is expected to continue driving prices down, even as suppliers work to add more features to their products. This provides both a fair return on investment to the cities and profitable margins for vendors.

How to Meet Evolving Customer Needs

When it comes to selling the concept of intelligent streetlighting systems to municipalities and other customers it is important to evaluate their pain points and solution value.

Many customers, in this case, cities, experience certain pains—such as expensive energy, costly maintenance, lights falling down, street safety issues, outages, etc. How can you help them alleviate this pain? An open and robust Smart Outdoor Lighting solution is a highly effective prescription to resolve these short-term issues and provide long-term, ongoing improvement.

A growing number of cities worldwide are currently investing to fix such pains in their streetlighting networks. The question is why are other cities still hesitating to change? In all likelihood, it is because the technology still seems too complex for city managers to understand how the benefits prevail over the initial expense of deployment.

However, customers are getting smarter, looking for more options, and targeting new capabilities. There is much more focus on energy, safety, resident services, and value than before. Thus, any discussion needs to emphasize the exceptional value, greater flexibility, and better reliability of implementation, in addition to overall energy and cost savings.

The Future of Smart Lighting

Smart Outdoor Lighting is the first and most profitable connected application that enables other smart city applications to be deployed. These systems are at the cutting edge of technology, with several options for communication depending upon the project. More and more, smart streetlight systems are becoming the foundation of broader smart city networks. Lighting systems already provide a two-way control and monitoring capability with features like dimming, on/off, and advanced service where the city can have limited or full access to the network from one central location.

Cities will soon have the capacity to connect environmental sensors, parking place detectors, EV charging stations, and even information and advertising panels to the streetlight network. In addition, researchers are developing new technology for dynamic response: lighting based on the presence of an individual, the speed of cars, real-time weather, and other factors, as well as any combination of them. What’s more, with a digital system already in place, new innovations can be seamlessly and cost-effectively added to existing capabilities.

Powerline communication (PLC) and low-power radio frequency (RF) are the most commonly used media today for sharing information. LonMark is working aggressively to bring a new RF standard to this market, which will enable more flexibility. In addition, new innovations in the software and control capability will enable additional added value for cities.

“Intelligent outdoor lighting and smart city systems are the future,” stresses Bernstein. “The global market potential for vendors supplying this industry is tremendous. We have barely scratched the surface, and based on the exponential pace of growth so far, the potential for rapid expansion looks very bright indeed,” he added.

LonMark International is a member-based, non-profit organization that supports open, multi-vendor integration of interoperable systems for products based on the ISO/IEC 14908 series of standards in the lighting, building, and other industries.

www.lonmark.org/connection/solutions/lighting/outdoor/street/

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