

LIGHTING IT UP

Garage owners find that new lighting is both economical and welcoming, offering big return on investment.

By Antonio Giacobbe

LIGHTING HAS A DRAMATIC EFFECT on how a parking facility is perceived. The right design creates an atmosphere that welcomes, creates an enhanced sense of security, and invites guests to return. In short, it ensures continued revenue. At the same time, smart lighting strategies can significantly lower energy consumption and maintenance costs.

Quality lighting delivers multiple benefits to a parking facility:

- Improves visibility, which increases the safety of pedestrians and vehicles as they enter, park, and exit the facility.
- Brings in more cars, whose drivers enter thanks to illuminated wayfinding and signage.
- Strengthens the image and facility's standing as a destination when the exterior is lighted as a branded point of entry.
- Gives peace of mind to patrons.
- Deters vandalism and crime with active occupancy sensing and responsive lighting.
- Delivers cost savings through reduced energy use and lighting maintenance.

All that is true, but the bottom line is often the deciding factor for facility improvements. A lighting upgrade can save a facility a significant portion of current operating

costs, but the cost to install a new lighting system can sometimes induce sticker shock. Savvy facility managers consider the total cost of ownership, which is not only how much a lighting system costs initially but also how much it saves over its lifetime when compared to the existing system.

The ongoing cost of maintaining the average lighting system is derived from four factors:

- **Material costs:** the cost of replacement lamps or power supplies.
- **Labor costs:** the cost to replace lamps and/or clean the luminaires.
- **Energy costs:** the cost of energy consumed to operate the luminaires.
- **Recycling costs:** the cost of removal and disposal of spent lamps in an environmentally-responsible manner.

The initial cost of a lighting system is small compared to the cost of the energy needed to operate it,



▲ Before



▼ After

and it is not unusual for new LED lighting systems to see a positive return on investment in less than three years. “Lighting represents an incredible opportunity for innovation and environmental improvement in the parking industry. Long-life LED lighting solutions can help property owners reduce the environmental impact of their facilities,” says Paul Wessel, executive director of the Green Parking Council, an affiliate of IPI.

Often the energy-savings conversation—which is important—is what drives lighting upgrades in parking facilities, but there are additional benefits that can bring more cars off the streets and inside to park. Current recommended practice highlights the importance of uniformity, color rendering, and other lighting quality metrics. Vertical illumination helps reveal faces and raises the sense of comfort in a facility. Controls further reduce energy consumption, while also tailoring the light levels to the use of the facility. All of these factors constitute quality lighting for parking facilities.

The perfect parking garage luminaire needs to distribute light far to the sides without creating a bright pool directly beneath the fixture. LED luminaires that take advantage of multi-chip optics do this, achieving outstanding uniformity. The resulting light eliminates dark spots, so guests can perceive the entire deck of a garage. One word of warning is that glare can be a risk with some LED luminaires. High angles of light used for broad coverage can create uncomfortable glare for drivers and pedestrians. Careful optical control can address these issues. The best option is to evaluate LED luminaire samples before installing them throughout a facility.

The color rendering index (CRI) of light is a measurement of how well that light source displays color. Color quality is important in wayfinding because it helps visitors identify their vehicles in a multi-colored row of cars. Older technologies were common because of their energy-efficiency ratings, but the sacrifice of color rendering made it hard to distinguish between cars. Good color quality also contributes to creating a safer facility by contrasting the color of a slick oil spill against the surrounding floor finish, reducing the risk of slips and falls.

New Standards

Something important for parking facility managers to be aware of is that lighting recommendations for parking facilities are undergoing a change. While a facility was previously categorized as “typical” or “high security,” new lighting guidelines established by the Illuminating Engineering Society (IES) (published in the 10th edition of its *The Lighting Handbook*) consider the density of traffic and pedestrian activity in a parking zone when determining illumination targets.

Lighting zones are defined by areas of high, moderate, and low activity. High-density applications include

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shopping districts and transportation hubs; moderate-activity levels are typical for college campuses and small shopping areas; and low-activity levels include residential neighborhoods. These shifts in recommended practice reflect an understanding that a parking facility is a core component of an integrated neighborhood or commerce area.

Recommendations for lighting controls have also expanded. While a time clock may previously have been sufficient lighting control, occupancy sensors are now encouraged to dim luminaires in areas with no activity. Daylight sensors dim the lights along a garage perimeter, saving energy when daylight is present. These additional lighting control techniques drive the energy savings to greater levels and enable a faster payback from a new lighting system.

Boston Garage Sees the Light

One parking garage that’s embraced change and the future of lighting can be found in a city that’s known for revolution. Boston has a rich history, and while it’s deeply proud of its past, the city also strives to be forward-thinking. Environmental initiatives such as Greenovate Boston are at the top of its list.

Greenovate Boston is a community-driven movement to get all Bostonians involved in reducing the city’s greenhouse gas emissions by 25 percent by 2020 and 80 percent by 2050. In September 2013, the American Council for an Energy-Efficient Economy (ACEEE) released the 2013 City Energy Efficiency Scorecard, a report that ranks 34 of the most populous U.S. cities on policies to advance energy efficiency. Boston was rated No. 1 in doing the most to save energy. While it’s a little ironic that a city made infamous by littering its harbor with tea to help spark a revolution is making headlines with green campaigns, it is definitely something city residents are passionate about.




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One of the city's innovative, energy-saving efforts is an upgrade to LED lighting in its facilities. A wide variety of tenants, including biomedical manufacturers, breweries, curtain makers, and computer manufacturers, use the Boston Marine Industrial Park (BMIP) parking facility that's owned and operated by the Economic Development and Industrial Corporation (EDIC), part of the Boston Redevelopment Authority. It was important for the EDIC to provide garage tenants with a well-lit environment that made them feel safe at night. The EDIC previously chose 150-watt high-pressure sodium (HPS) luminaires throughout the garage, which caused issues last year. The older HPS fixtures used a significant amount of energy and resulted in high electricity bills, emitted a less-than-appealing yellow light, and suffered from burnouts that forced a high replacement rate, which increased maintenance costs.

After an extensive review of several LED solutions on the market, the EDIC chose the OSRAM PermaLED Low Profile LED Canopy Luminaire because of its high efficacy. SYLVANIA Lighting Services audited the project and oversaw the installation. Each of the existing 450 150-watt HPS fixtures was replaced with a new 55-watt LED luminaire, not only helping the city save money and energy but also providing bright white light that

improved lighting uniformity. Unlike the yellow light from the HPS lamps, the vastly-improved color rendering index of the LED luminaires can facilitate quick vehicle identification and increase pedestrian visibility, enhancing the perception of safety in garage facilities. The LED system has a life rating of 100,000 hours, which translates into dramatically fewer replacement costs, especially compared with the previous lighting.

As a result of upgrading the lighting at the BMIP parking facility, the EDIC anticipates an annual saving of 473,040 kWh, translating into \$70,956 in energy savings and avoidance of 530,070 pounds of carbon dioxide emissions from electricity plants. In addition, because of the long life of the luminaires, the agency also expects to save approximately \$15,300 in maintenance costs per year.

The goal for lighting the modern parking facility should be more than an energy story. While energy savings is irrefutably the most important chapter, the story is not complete without the inclusion of more uniform and true-to-color light. The resulting facility is one that welcomes drivers off the street to stay awhile. Why stop at energy savings, when a lighting upgrade can increase revenue, reduce maintenance costs, and minimize safety and security concerns at the same time? 



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