Energy Effiicient Parking Area Lighting

A well-lighted parking lot is more appealing to potential customers, as it has been proven to deter crime, giving customers a more reassuring peace of mind and a worry-free experience.

When it comes to lighting upgrades, parking lot and garage lighting is an area where operators and businesses can save substantial amounts of money and energy – ultimately increasing revenues.

There are many factors justifying lighting retrofits. They include: huge energy savings, maintenance savings, generous utility and tax incentives and lowered cost of ownership. Add to the list another one that, until now, has gone unnoticed: increase in parkers and parking retention!

Recently, two facilities reported that after relighting their parking structures, they saw anywhere from a 7.5% to a 15% increase in parkers and parker retention.

More fundamentally, proper parking facility lighting allows motorists to navigate the carpark safely, protecting vehicles from damaged paintwork and bodywork.

Perhaps more importantly, proper lighting can improve safety and reduce claims. Parking lot and garage lighting is not only for the motorist or the vehicle; it is primarily for the pedestrian.

Quality lighting is essential to seeing irregular surfaces or curb lines, slippery or wet areas, concrete wheel stops, pole bases and bollards, vehicle conflict, and feeling safety from facial recognition. Lighting in parking structures should allow a person to read building numbers and identify potential threats from 100 feet away.

A major study of claims in commercial parking facilities found slip or trip-and-fall pedestrian accidents accounted for about 75 percent of the number of total claims and slightly over 50 percent of the costs paid.

According to the Insurance Institute for Highway Safety, about 14 percent of all vehicle collisions that result in damage happen in parking lots. The primary contributing factor to higher insurance rates for parking companies is their loss history.

Roughly 80% of the criminal acts at shopping centers, strip malls and business offices occur in the parking lot. Therefore, some lawyers find no shortage of premises liability cases based on the fact that the owner or management did not provide adequate security measures to deter criminal activity or risks of slip & fall.

Since most lawsuits revolve around lack of sufficient lighting, layout and response, anyone in business should be careful to ensure that they are taking "reasonable care" in their efforts to provide for the protection of employees, invitees and guests against foreseeable criminal threats.

Increased & improved lighting is key in providing security. Color rendition (CRI) of the lighting is also an important concern when coordinating with installation of color CCTV cameras. LED and induction light sources have no flicker effect like other light sources which enables to CCTV to render images better, LED & Induction also have a high CRI.

According to a study conducted by Liability Consultants Inc. of "more than 1,000 premises lawsuits between 1992 and 2001 revealed that in almost one-third of all cases reviewed, the basis of the lawsuit was a murder, rape, robbery or assault that occurred in a parking lot or garage." The study also found that jury awards or pre-trial settlements to the plaintiffs in the lawsuits averaged between approximately $1 million for assaults and $2.75 million for homicides.

Homicide ranks as one of the leading types of occupational injury in the United States, accounting for over 1100 worker deaths in the most recent year. In the period 1980 - 1989, the rate of employee homicide was reported as 8.0 per 100,000 with 75 percent of these homicides resulting from gunshots. After taxicabs, convenience stores have the highest prevalence of workplace homicide (NOSH. 1993) and also have very high rates of robbery.

One of the earliest studies that set the foundation for subsequent studies of convenience stores was conducted by Crow and Bull (1975) in conjunction with the National Institute of Law Enforcement and Criminal Justice (NILECJ) and the Southland Corporation, then the largest owner of western 7-11 convenience stores.

Crow and Bull surveyed 349 convicted armed robbers and asked them to identify store characteristics that could influence their decision to rob a store. The robbers' responses were then used to develop a ranking of stores according to their attractiveness to robbery. Based on this scale, Crow and Bull developed several robbery prevention measures.

The prevention measures consisted of: strategic placing of signs announcing a low amount of cash on hand in the store: moving cash drop boxes to make them more conspicuous: improving lighting in the parking lot: keeping the store clean: enhancing employee alertness: and greeting each person who came in.

Parking garages are the third most frequent place for crime in the U.S., studies show averaging about 1,400 violent crimes per day. Security professionals agree that parking garage design influences the level of crime significantly. The easiest way to deter

criminal activity in preexisting structures is by installing bright, white lights, coupled with occupancy sensor controls.

Step-dimming parking garage luminaires automatically reduce to 40% power on vacancy and increase to 100% power upon occupancy. The luminaire uses a fixture-integrated occupancy sensor.

Bi-level products may be combined with “smart” photocontrols to maximize energy savings, which is estimated to be 30% to 50% per fixture. These solutions are available on both LED and Induction lighting systems.

Bi-level induction garage fixtures are considered ideal for applications that are vacant during parts of the night, yet security lighting is necessary. Bi-level fixtures dim to 40% power when an area is vacant and step back up to 100% upon occupancy.

The “smart” bi-level technology integrated into the fixtures steps down the energy use in the parking structure to 40% when areas are vacant for a set length of time, allowing the facility to achieve more than 60% energy savings when compared with existing fixtures.

Furthermore, safety in the garage is also expected to improve. When motion is detected and the higher light mode is activated, the change in visual environment alerts occupants.

Using bi-level lighting technologies for parking lots and parking structures is one of the most effective strategies for deep energy saving, as well as for the potential to enhance safety and security.

New bi-level induction or LED fixtures can cut the energy expenses by more than half and produce a much brighter looking light that provides a better sense of security for its customers.

The most common violent crimes committed in urban parking lots are stranger-on-stranger purse snatch and strong-arm robbery, and occasionally carjackings and abductions. More than 1 in 10 property crimes occurred in parking lots or garages.

Parking garages, lobbies, and elevators are at high risk for personal crime incidents due to their constrained and isolated nature, low activity level and poor lighting.

According to the U.S. Department of Justice, parking facilities are more likely settings for crime—both violent and property—than all other real estate except residential.

Between 2004 and 2008, 7.3% of all violent crimes occurred in parking lots or garages. In 2009, 6% of purse snatchings and pick-pocketings took place in parking lots or garages.

If you think about it, we are all strangers in a large parking lot.

Violent criminals can blend in with the rest of us and get in close proximity fairly easily. Criminal predators can walk right by us and we will allow it because of the public setting. The truth is that parking garages are an excellent place for predators to hide and to take advantage of you and both are frequent favored "hunting grounds" for robbers and thieves.

Recommended Light Levels for Parking Garages

(See RP-20-98 & LM-64-01 for details)

Area		Minimum Horizontal Illuminance[2] lux (fc)	Maximum Max-to-Min Ratio	Minimum Vertical Illuminance[3] lux (fc)
Basic[1]		10 (1.0)	10:1	5 (0.5)
Ramps[4]	Day[5]	20 (2.0)	10:1	10 (1.0)
	Night	10 (1.0)	10:1	5 (0.5)
Entrance Areas	Day[5]	500 (50)		250 (25)
	Night	10 (1.0)	10:1	5 (0.5)
Stairways		20 (2.0)		10 (1.0)

1 = Typical conditions
2 = Measured on the parking surface without any shadowing effects.
3 = Measured 1.5m above parking surface at point of lowest horizontal illuminance (not including points on the boundaries facing outward.)
4 = Applies to clearway ramps (no adjacent parking) but not to sloping floor designs.
5 = Daylight may be considered in the design calculation.

Sources:

U.S. Department of Justice

National Institute of Law Enforcement and Criminal Justice

The National Crime Victimization Survey

Chris McGoey, Certified Safety Professional

National Institute of Justice

California Lighting Technology Center (CLTC) at the University of California, Davis

Insurance Institute for Highway Safety

Liability Consultants Inc

Southland Corporation

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