



## Seeing The Way To A Well-Lit Exterior

Consider the potential for glare, and how to avoid its effects when planning a lighting project.

By Scott Tapia

A well-lit facility exterior may seem easy enough to achieve but doing so isn't as cut and dried as one might think. Rapidly evolving equipment and concerns about the impact of our lighting choices on human health threaten the simplicity of an attractive and functional space. By relying on clear safety and security metrics, making the case for change becomes easier—change that could also lower energy spend and improve the impact of exterior lighting quality on facilities.

### Security First

In 2016, the American Medical Association (AMA) published concerns about excessive blue light at night, prompting debate over how to best implement energy efficient LED technologies. *[Editor's Note: For insight on this topic at the time from two researchers at the Lighting Research Center (LRC) at Rensselaer Polytechnic Institute, access a June 2016 document online at:*

*facilityexecutive.com/2016/07/lrc-response-led-lighting-safety/.]*

It's also been noted that a desire for security may be leading to excessive illumination. Illuminating Engineering Society (IES) standards for safely lighting parking structures and automated teller machines (ATMs) provide a clear response to concerns about excess light with metrics for sufficiency and due diligence. But there is one type of excess light that clearly overexposes a facility to risk and requires more attention to get right—and that's glare.

### It's Glaring Us In The Face

Even if the specs on the luminaires are right, and the light is planned out evenly and meeting the appropriate levels, the directionality and shielding of each luminaire must be considered to avoid unnecessary glare. Glare is more than an annoyance when it reduces visibility; then it becomes a risk. Glare can be called out as a factor in

slips and falls, thefts, and auto accidents, and it attacks our perception in different ways: Disability Glare; Nuisance Glare; and Discomfort Glare.

Disability glare interferes directly with our ability to see, impeding perception of contrast and reducing visibility. Studies suggest people may habitually underestimate how much their vision is reduced when facing disability glare, decreasing an exterior luminaire's ability to mitigate slip and fall hazards if it is contributing to glare. Disability glare also disproportionately affects older individuals: at age 60, the retina receives one third as much light as that of a 20 year old, while age related changes to the cornea increase negative effects of glare. This means individuals already at a high risk for slip and fall injury are also susceptible to imbalances between luminaire sufficiency and glare.

Nuisance glare might better be termed distraction glare because it pulls focus from where it's intended.

Discomfort glare, however, is as obvious as a flashlight to the face. When glare from an efficient but poorly implemented exterior luminaire causes discomfort or disability, that efficiency may be at too high of a price.

Reduced visibility from glare can cause the same (or worse) risk to an individual as reduced visibility from insufficient light in the same space. While standards for lighting levels can be answered with luminaire specs and measurements of the output, appropriately dealing with glare calls for attention to design and implementation, as well as understanding how people use and approach the space.

Using ATMs as an example, ordinances usually address minimum lighting levels required and uniformity. There will be a clear measurement for luminance for distances surrounding the ATM. Sections covering glare may not reference such a quantitative need, but rest solely on a qualitative assessment of the lighting, such as "care should be taken to keep glare from interfering with the ability to clearly see the area immediately around the ATM or within any vestibule or area."

So, if lighting in the ATM area inhibits vision of the approach for any customer, it

doesn't matter if the surrounding area meets the right measurements for even, sufficient light. Similarly, lighting in the area should not cause glare that inhibits vision of the approach for any customer standing at the ATM. Both are situations in which light may be sufficient, even efficient, but still not safe.

Complaints that security lighting is too bright also dovetail with energy and cost concerns. By paying attention to effective light output—not just what the luminaire is capable of, but how it is used in the space—output can meet safety and security standards without wasted energy. For instance, if a building exterior has security cameras, check manufacturer requirements for sufficient light levels for security goals, such as distinguishing facial features within an acceptable distance. Placement of exterior lights and cameras must consider excess light and glare. Uneven light levels interfere with a camera's ability to capture detail, and a lens flare can significantly degrade the efficacy of a recording.

Cameras, like security guidelines, give clear metrics to meet, but that's not the whole story. Sufficiency is part of a safe and secure lighting plan, but so is placement to avoid glare. Measuring the effect may be more difficult and require more attention, but the effect of errors is no less real. Dim or distressed lighting leads to the perception of an unsafe environment. Glare that causes discomfort or impaired visibility can have the same effect.

From an efficacy perspective, glaring lights waste energy, no matter how efficient the light source is. The U.S. Department of Energy refers to this as Fitted Target Efficacy (FTE). A measurement like FTE helps quantify if light isn't being used effectively, so the focus isn't only on the light source, but how it's being used. In this sense, glare is a whole lot of light that is missing the target.

### Light That Fails... To Mitigate Risk

Lights that waste energy and increase risk through glare require reassessment, but a light that stops working increases

risk immediately. Seen through the lens of security, ensuring the lights don't run to failure is ideal, and seen through the lens of cost management, pre-empting the cost of repair and replacement is also ideal, since response time is a factor in risk mitigation. A proactive maintenance schedule for exterior lights can also uncover damage from tampering attempts, accidents, or extreme weather. A controls system can also alert personnel to luminaires that have been subverted.

Consider these factors when assessing if changes to exterior lighting are needed. Addressing glare, which depends so much on the distinct qualities of a facility, often requires a partner with expertise in evolving lighting standards and equipment. ■



*Tapia is the southern California regional sales manager for ABM, a provider of facility solutions throughout the U.S. and internationally. He has been with ABM's electrical & lighting business unit ([www.abm.com/electrical/](http://www.abm.com/electrical/)) since 2014 and represents the greater Los Angeles area.*

