

# Lighting: The Missing Piece in the Campus Security Jigsaw

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**W**hat picture does the word "campus" conjure up for you? To most people, a campus is a large open space dotted with prestigious buildings, surrounded by lawns, shrubs and woods. But amid this idyllic setting in the groves of academe lies another picture — that of students moving about the campus at all hours of the day and night, usually on foot and sometimes alone. It is at this point that the sad reality of modern life intrudes. Crime, and particularly crime against the person, is a growing threat in campus life.

Every university has an agency for combating crime on campus, and one of the foremost concerns of this agency is campus lighting. This concern arises from the widespread belief that good lighting acts as a deterrent to crime. In a review of the published literature on the interaction of lighting and crime, however, Boyce and Gutkowski (1991) concluded that the case for a simple link between improved lighting and reduced crime was unproven. Many factors influence the incidence of crime; lighting is just one of them. But it is always worth considering what lighting, and lighting alone, can do to deter crime.

## Light and security

When we improve lighting, we allow ourselves to see better. This is not a matter of probability, it is a matter of fact. For example, increasing the overall brightness allows us to resolve fine detail, detect small differences in luminance and generally see more easily. Using a better color-rendering lamp allows us to recognize colors more accurately. But why should these things matter to campus security? The answer is that good lighting will allow people to take action at a greater distance. By providing lighting which allows better vision, the law-abiding can detect others a distance and can see the detail of facial expression and body language from far

away, often far enough away to take evasive or defensive action. As for the criminally inclined, better lighting raises concerns about whether they have been seen, their intentions recognized and their actions observed and reported. Thus it can be argued that good lighting shifts the odds in favor of the law-abiding. Sometimes, this is enough to deter a criminal. Sometimes it is not, but there is no doubt about the overall effect of good lighting.

## Aspects of good lighting

What constitutes good lighting? At least four aspects contribute to good lighting: illuminance, illuminance uniformity, glare and light source color. Illuminance is important because, in combination with the surfaces on which it impinges, it determines the overall brightness of the scene and thus the adaptation luminance of the visual system. From their review of the literature, Boyce and Gutkowski recommend a vertical illuminance in the range of one to three footcandles as being sufficient to ensure long-range detection and confident face recognition at night.

Providing enough illuminance does not alone guarantee good campus lighting. Another important characteristic of good lighting is illuminance uniformity. For lighting to be effective in combating crime, enough light should be provided over a large enough area to allow action at a distance. If there are pools of darkness between or immediately adjacent to the lit areas, the benefits of the lighting will be negated.

Glare is another aspect of lighting which needs to be considered. Disability glare from low-mounted fixtures can diminish visual capabilities. Again, if there is glare, then the benefits of the lighting and the possibility of action at a distance will be reduced. In fact, the conflict between the need for sufficient vertical illuminance to allow confident detection and recognition and the need to avoid glare to the observer represents an opportunity for fixture manufacturers. A fixture which could resolve this conflict would represent a breakthrough in security lighting.

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**Considering light sources when considering security**

One of the most common questions asked about campus lighting concerns finding the best light source. There are advocates for high pressure sodium and for metal halide, but information relevant to the effectiveness of different light sources for security lighting is scarce. However, some experimental results show that there is no difference between low and high pressure sodium lamps as far as the ability to detect and recognize approaching people (Boyce and Rea, 1990). If there is no difference between these two light sources, where the differences in color rendering properties are great, then the chance that there is a reliable difference between high pressure sodium and metal halide lamps for detection and recognition is slight. Obviously, the ability to describe colors will be different under these two light sources, but what is not known is the extent and precision with which witnesses and victims of crime use color in description.

**Consider a holistic approach and common sense**

Information on good security lighting for a campus is rare, and applications are largely based on belief. Perhaps the key point is that good campus lighting involves much more than lamps, fixtures and poles. To be effective, campus lighting has to be part of a comprehensive security system which encompasses landscaping, surveillance and emergency response procedures. There is little point in providing good lighting if the vegetation on the campus is dense enough to allow a criminal to hide in ambush. There is little point in providing good lighting if the criminal knows there is no possibility of being disturbed. There is little point in providing good lighting if there is no means for someone in trouble to call for assistance. And there is little point in providing good lighting if a call for assistance does not produce a quick response.

**The systems approach**

A systems approach to campus lighting calls for a systems approach to implementation. Specifically, what is needed is a campus master plan which integrates lighting with landscaping, surveillance, communication and response. Without such a master plan, various parts of the system will tend to be implemented piecemeal as money permits. Such actions tend to be disappointing in their outcome and may create overconfidence and complacency. Having a master plan does not imply that all improvements have to be made at once. Rather, what the master plan does is ensure that all relevant factors are considered as each stage of the plan is implemented. It also provides a framework for deciding related issues — namely, the appearance of the fixtures by day and night and their impact on the overall appearance of the campus.

Given that a master plan is the route to go, the next step is to gather support from senior administrators and faculty. Once these people are committed to the master plan, it can be implemented. Without their support, it is doomed. As for how to gather their support, in these tough financial times for higher education, it is probably sufficient to mention the loss of income from students who reject the university because they — or their parents — consider the campus unsafe at night.

Campus lighting is an essential piece in the jigsaw of campus security. By developing a master plan for campus security and implementing it through a campaign aimed at winning administration and faculty support, it is possible to create a campus which is well-lit, secure and pleasant at night. Such a campus has protection in the fight against crime.

**Acknowledgment**

*This article is the result of discussions with Mark Rea, director of the Lighting Research Center, and Howard Brandston, lighting designer, about the problems of campus lighting. ♦*

**References**

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