

Lighting the Night Environment

Excerpted and adapted from an article by Victor Reno originally published in *NH Forum* the newsletter of AIA New Hampshire October 2007

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SUMMARY

People have struggled since prehistoric times to light the nighttime environment, often unsuccessfully, which you will notice if you look around at most parking lots, the typical city and suburban landscape, and our streets and highways. A few key elements of nighttime lighting design, when followed, can create unique, comfortable, safe environments.

THE LIGHTING DESIGN PROGRAM

First, form a vision. This can come from the architect, landscape architect, the lighting designer—or, better yet, from the designers working together. Ultimately, a space will look better if it follows a plan or vision. A risky and often unsatisfactory approach is lighting after the landscape is created by running around with lights, shining them on things, and seeing what looks interesting or at least acceptable.

Safety and security are critical programmatic elements of night lighting. If an area does not feel safe and provide a personal sense of security, the lighting is either failing or lacking.

Can a person see and be seen, thus preventing personal harm? Are steps and other operational hazards lit adequately? Are the objects of a space identifiable enough that someone can find his or her way to the car? Concepts of light levels, uniformity, glare, color rendering, and light trespass come into play here and are issues that most municipalities and planning boards scrutinize.

Beyond basics: understanding. We use light not only for utilitarian functions but also to enhance and enjoy the artistry and beauty of built and natural environments. Just as beautiful interior spaces can suffer from poor lighting, the perception of exterior environments at night depends on good lighting.

Excitement. Instead of focusing solely on utility, a professional lighting designer can synthesize the program elements of site lighting with a multitude of lighting products to produce great site lighting. Excitement—the ability of site lighting to set a space apart from “just lit”—comes from the years of

experience a lighting designer brings to the table. The designer’s ability to excite comes from knowledge of scientific and technical aspects of light, lighting design for many types of clients, and working with all varieties of buildings and spaces. Excitement, above all other program elements, is what makes site lighting at night memorable.

TECHNICAL LIGHTING DESIGN

With those key program elements established, the following are some of the scientific and technical ingredients that spice up the lighting design process:

- **Glare.** Avoid glare, which can be disabling, discomforting, or simply a nuisance.
- **Light trespass.** Lighting is not good when it leaves your site and lights up a neighbor’s space, such as their bedroom!
- **Visibility.** Highlight the desired key elements but don’t forget about safety and security by lighting other important areas that account for travel, safety, and security.
- **Color.** How things appear during the day may not be (and probably won’t be) how they appear at night. Factor in an understanding of color, color rendering (CRI), perceived color (CCT), and luminance/brightness.
- **Light sources.** Incandescent lights have good color rendering but are inefficient and high maintenance. Fluorescent light is more efficient and works outdoors, but you must have a lamp or ballast that will start in cold weather, which limits your choices of lamps. Metal halide (MH) and high-pressure sodium (HPS) are efficient and long lasting, but both have warm-up times. In addition, while MH lamps have fairly good color rendering (especially certain lamps), HPS generally has terrible color rendering, although it can give an interesting effect with the warm, yellowish-orange light. My advice is to take some lamps outside and illuminate the landscape to understand how different features such as plants, rocks, grass, and buildings look under each of these light sources. Mock-ups are

great and well worth it! The latest big thing is LED, or “solid state,” lighting. Careful, this source has its uses, but while it does have long life (probably closer to 50,000 hours than the 100,000 hours often touted), it is not particularly efficient, putting out few more lumens per watt than good incandescent lamps. I’ve seen 3-watt LEDs compared to 35-watt MR16 lamps—yes, they save a lot of money—because you are using about one-tenth the energy and one-tenth the light.

- **Architectural compatibility.** This includes what fixtures are available and how to use them: pole and post lights, in-ground and ground-mounted fixtures, bollards, and other specialty fixtures.
- **Light source combinations.** How the combination of lamps and fixtures will affect your environment. Lighting fixtures should look good in both daylight and nightlight.
- **Contrast.** Contrast is everything. On a dark night with no artificial light and no moon, you can see a bright match about a mile away. From a lighted auto dealer lot, the match disappears at about 50 to 100 feet. Now light the match and the moonlit landscape disappears as the eye adapts to the match’s light.
- **Human response.** Aesthetics, mood, and atmosphere affect the emotional response to lighting. The eye works differently in low levels of light than it does in high levels, and beyond that, people tend to experience different emotions at different times of day or night. Light affects these emotions—ideally in a positive way.

Many tools are available for modeling and simulation of lighting and illuminated spaces. Often it is wise to simulate your design on the computer or mock it up in the actual space.

Remember, different people perceive light differently. They also have different preferences. Some like it dark, and some like it bright and light. Much about light and lighting design is more about perception and less about being mathematically quantifiable. With a knowledgeable and experienced approach to lighting design, you can achieve it all—safety, understanding, and excitement.

About the Contributor

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RESOURCES

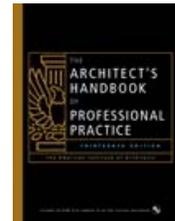
More Best Practices

The following AIA Best Practices provide additional information related to this topic:

- 16.02.10 Deciphering the Varying Shades of Green
- 16.02.06 Differences in Environmentally Preferable Products
- 16.02.09 Energy Modeling and Daylighting Analysis

For More Information on This Topic

See also “Lighting Design” by Howard M. Brandston, LC, FIES, FIALD, in *The Architect’s Handbook of Professional Practice*, 13th edition, Chapter 18, page 639.



See also the 14th edition of the *Handbook*, which can be ordered from the AIA Bookstore by calling 800-242-3837 (option 4) or by email at bookstore@aia.org.



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Key Terms

- Building Performance
- Lighting
- Artificial Illumination
- Safety