



Striking effects can transform landscapes into beautiful nightscapes.

# In the Best Light

by Susan Gibson

Well planned lighting can do much to enhance the overall effects of a particular landscape project. Lighting can be a functional as well as an aesthetic addition to the overall feel and look of a landscape scheme.

**G**ood lighting can make or break a landscape.

Too often, lighting takes a back seat in the design and construction of landscape projects large and small. Major public projects, commercial landscapes, resorts, golf courses and residential gardens—both urban and rural—all need good lighting systems to bring out their ultimate beauty and use.

Lighting serves many purposes, the most obvious being safety and security.

It helps the traveler negotiate roads, find buildings, park the car, walk to a destination and approach the entry. Lighting can also show or mask specific vistas to the traveler, change a person's mood, extend the hours of enjoyment of a landscape, dramatize the changing seasons and provide safety.

The effect of lighting on landscapes and on people's emotions can be a powerful tool. To be most effective, it should be an integral part of a landscape—not a last minute addition.

Good lighting accomplishes its purpose and becomes part of the total landscape. Poor lighting gives illumination without consideration to psychology or aesthetics.

Good lighting design is a balancing act of various elements: functions, budget, aesthetics, maintenance requirements, and local regulations. The trick is to have good balance of all these elements through careful planning, good sense and the proper equipment.

## Lighting effects

Outdoor lighting can have an enormous impact on the psychological and physical worlds. It can make people feel invigorated, relaxed, vulnerable, peaceful, secure or closed in. Bright glaring lights can be annoying, startling and even dangerous. Ironically, some low-key lighting systems can give a feeling of greater safety, security and warmth than brighter ones.

The physical world, too, can be affected by various lighting systems. Lighting certainly can attract insects, but that can be balanced by the increased use of a newly-lighted landscape area. Certain color lights make foliage look more beautiful (and sometimes even grow more quickly.) Light can emphasize textures of foliage, water and structures that do not contrast at all during the day. Pools or ponds that are inky pools in the dark become glowing pools of light or a re-

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flective backdrop for a dramatic oak tree.

Lamp colors play a major role in setting the landscape mood. For instance, energy and cost-efficient, high pressure sodium bulbs often denote "crime area" in many people's minds. Mercury vapor lamps can make some skin tones seem eerie and unreal, but flatter the greens of foliage. Similarly, pinkish-tinged lights give skin a healthy glow, while making foliage look sick. Yellow "bug" bulbs make people and plants look unnatural. Bright, colored lights can give drama, but used too often, give a fairyland effect that may not be desirable.

### Design element

Lighting can reinforce the architecture and become the definer of space.

"Lighting can be a separate design element," says Ken Bassett, Sasaki Associates. "The best lighting design tends to reinforce the overall structure of things. Even if it is well designed, lighting can detract if it is not

integrated with the overall structure. Lighting gives balance, graphic design, furnishings to a landscape."

A project done by Edward Pinckney Associates in Charleston, SC, involved the master plan for the historic College of Charleston area downtown. According to Jim Tiller,

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the company chose several landscape elements that contributed to the historical theme and provided a continuity of design. Among them were special light fixtures that looked distinctly historical and blended with the period benches and other ele-

ments in the design.

Lastly, lighting can be a magician with landscape space. It makes illusions for the eyes. It can extend or shorten distance. It can define or cloud dimensions. It can become the soft glow of moonlight, the drama of a theater spotlight, the magic of glitter. James van Sweden, a Washington, D.C. landscape architect explains,

"Lighting extends the whole landscape. It brings the outside in. You can light a landscape so that it looks endless. It does wonderful things for a garden."

### Plant growth

One of the advantages of a nightscape is that it can accentuate the more beautiful growths in a landscape while accommodating seasonal and yearly changes. In a new landscape, for instance, fixtures can be placed to dramatize specific trees, shrubs or flower beds as they mature. A rotating system of lights can highlight spring blooms, summer perennials, bright autumn leaves or the silhouette of a special tree's branches in winter.

"In northern climates," explains Bob Brickman of Theodore Brickman Co., "there's a longer time without leaves. Lights can highlight the shadows of branching trees against the snow. It's a beautiful effect."

Light not only emphasizes plant growth, it also directly affects it. Plants and trees near light sources grow shoots and leaves more quickly; as a result they need more care.

An extensive lighting system can fool some annuals and perennials into blooming earlier or later than usual. Lights that extend the day in cooler months can confuse trees or shrubs that need dormant periods. They can keep growing late into the fall, or start blooming and flowering too early in spring. Either way, this can damage the plant and cause irregular behavior.

### Light works for you

Each landscape has unique qualities that can be emphasized by light. The first step to designing the right lighting system is to determine the prime functions light will perform in your landscapes. Many projects use light for all four functions:

#### 1 Safety and Orientation

Lighting gives safe guidance through a landscape. It defines path and drive-ways, steps and inclines, obstacles, planes, walls and pools of water. Safe lighting welcomes people into the night, makes them feel secure in the dark and shows them how to avoid any potential hazards.

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## Lamp Efficiency

Type	Wattages	Lumens Per Watt†	% Lumen Maintenance	Ave. Rated Life (Hours)
Incandescent	60-1500	15-24	90-95	750-2500
Fluorescent	40-215	63-100	66-88	12-20,000+
Mercury Vapor	50-1000	30-60	75-89	16-24,000+
High-Pressure Sodium	50-1000	79-130	90-91	10-24,000+
Low-Pressure Sodium	18-180*	62-150	100	10-18,000
Metal Halide	175-1500	69-115	77-80	10-20,000

† Initial lumens per watt including ballast losses.

\* Does not account for wattage increase over lamp life.



Lights can not only enhance a landscape, they provide safety and orientation features as well.



Well lighting is less conspicuous while at the same time providing utility and compactness.

### 2 Security

Protective lighting makes people feel safe—not threatened. Security lighting systems illuminate walkways, open areas such as parking lots, buildings, entries, and other areas. Glaring, harsh lights often do more to make people feel insecure than secure. Protective lighting should give evenly distributed light and leave no shadows. “People actually get a greater sense of security where softer lighting illuminates plants and the edges of space,” advises Bassett.

### 3 Environment Integration

This effect is achieved through effective area lighting. It can also enhance security and safety/orientation and gives a unity to a landscape area by defining space and giving a background to it. It is best achieved through a combination of techniques that help it set the tone of a landscape and still allow room to highlight dramatic elements.

### 4 Dramatics

The ordinary by day can be the star at night through the use of lighting for dramatic effect. Subtle lighting techniques catch the eye and focus it on a beautiful feature such as a reflective pool, branching structures, contrasting textures. Use dramatic techniques to highlight sparkling water, striking sculpture, special plants.

### A balancing act

Before you get specific on lighting system design, consider first the special requirements that each landscape



During the day, this flower-form fixture blends subtly with adjacent landscaping. It is particularly suited for lighting steps, entrances, pathways or special interest areas.

has. Cost, obviously, has primary influence on the choice of a system. Good lighting is not cheap, but the costs can be absorbed by the amount of use it opens up in an otherwise unused nightscape. If the landscape will get plenty of use, don't skimp on lighting design and materials. The budget may determine how much of a landscape is illuminated, what kind of bulbs and fixtures can be used, and how the overall design will work.

According to Ken Bassett, the main considerations in lighting system de-

sign are “cost of equipment, energy consumption, maintenance, possible vandalism costs, local regulations, the relationship of hardware to the overall design and its aesthetic appeal.”

The design is made up of those elements that the designer “feels more strongly about, within the parameters of budget and maintenance costs,” he adds.

And remember, too, the cost avoidance aspects of good lighting. It can

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**Water, foliage and surfaces have different reflective levels—shiny leaves reflect more; sparse foliage reflects less.**

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help prevent vandalism, break-ins, and other crimes; vehicle-vehicle and vehicle-pedestrian accidents, as well as the slipping-tripping accidents which can sometimes result in a lawsuit.

Creativity can help you get the effects you want within these parameters. Judicial use of energy-efficient lighting, cost-saving fixtures, use of natural elements, and experimentation can make the difference in achieving the perfect nightscape. “We try to use existing structures or trees for our fixtures; this saves the cost of installing large poles or posts,” says Lee Behnke, Wm. Behnke & Associates.

Jim Tiller explains, “We design a lot of our own light fixtures to achieve the effects we want—for aesthetic and functional reasons.”

### Costs

Maintenance costs can be a key element in lighting decisions. Exotic effects such as moonlighting, twinkle lights and multiple path lights all add beauty, but are often time-consuming and costly to maintain. Subtle lights are often inefficient, requiring frequent bulb changes. Some fixtures need more cleaning than others to assure proper light and bulb efficiency. Certain bulbs lose efficiency after a period of time and must be replaced long before they burn out for maximum energy savings.

Vandals are often attracted to the more creative uses of light. Bulbs, fixtures and even electrical controls are

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vulnerable to vandalism. Consider this in the context of your landscape's location, security and maintenance budget.

Local regulations can have a powerful voice in the choice of lighting systems. Many areas have strict policies about types of bulbs and fixtures, installation and wiring procedures, placement of materials, light invasion to neighboring properties and safe brightness levels. These rules apply specifically to streets and drives, signs, parking lots, pedestrian areas, pools and other areas. Planned communities and resorts, reports Jim Tiller, "often have more types of controls and restraints on lighting systems."

### Lighting up

Study nightscapes in your area to become familiar with the many types of lamps and their effects on the landscapes and the people in them. Every type of lamp has certain advantages and drawbacks. Some of the main lamp types and their characteristics include:

**1 Incandescent**—These and quartz incandescent lamps are frequently used in spot and floodlights. They give a warm, "white" light that can look very natural on people and plants. They are not very long-lived or energy-efficient.

**2 Fluorescent**—These tubes can also give a whitish type of light. They have limited outdoor uses, but perform well for lighting signs and walls. They are much more long-lived and energy-efficient than incandescent lamps.

**3 Mercury Vapor**—Use clear "blue" mercury vapor lamps to bring out the green foliage of landscapes. These lamps are not highly energy efficient, but they do give long life. Sometimes they also give the wrong aesthetic effect.

**4 High Sodium**—Widely used for large area lighting, these golden white tone lamps give great efficiency, brightness and long life, but may not be suitable in the "natural" looking landscape.

**5 Low Pressure Sodium**—These are the most efficient of all lamps, but all colors they illuminate appear as shades of gray. They are useful only for security purposes or for safety/orientation.

**6 Metal Halide**—Also very efficient



Rugged, all-cast fixtures provide excellent glare control and withstand considerable abuse.

and long-lived, these lamps can cast a greenish hue and bright light over large areas which may be too much for the "quiet" landscape. "Color-improved" versions are now available.

### Nightscapes

Great nightscapes depend on a healthy balance of aesthetics, function and budget. According to Jim Tiller, "Great lighting is an exacting kind of science. The effort for good lighting is a time-consuming process, especially where pedestrian areas are involved."

Water, foliage and surfaces have different reflective levels—shiny leaves reflect more; sparse foliage reflects less. Light locations and brightness levels must incorporate these elements in the design.

Depending on the landscape, different amounts of brightness will be required.

Brightness is measured in footcandles (FC), and varies from dim (natural moonlight equals .1 FC) to bright (office lighting equals 70-150 FC). Generally, dim lighting measures up to .5 FC. Medium-bright includes lighting between .5 FC and 8 FC. Bright includes everything over 8 FC. For aesthetic and practical purposes, landscape lighting need not be excessively bright to do the job.

Most designers use a system of plans and charts that let them place prospective lights determined on the amount of footcandles. By plotting isobars, you get a picture of light sweep and overlap in areas—this helps maintain even levels of brightness and avoid large areas of shadow.

Manufacturers often provide materials that help you figure the amount of light and proper placement for landscape areas. Don't forget to include the effects of light trespass from inside buildings from neighboring properties, and from nearby streets and drives. This may increase brightness levels in the landscape.

Avoid glare at all costs. Glare not only ruins subtle effects; it also is dangerous when it shines in people's eyes. To avoid glare, hide the light sources out of direct view and use fixtures that are shrouded or hooded to direct light on specific areas. For safety's sake, keep fixtures out of visitor's paths. Proper placement also gives a more natural look.

A unified lighting design depends on using one major type of lamp, two at the most. You can achieve a wide variety of effects with one or two lamp types; more than that can present a riotous and conflicting lightscape of too many colors and effects.

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## Recommended Brightness Levels

Lighted Area	Footcandles
<b>Building Exteriors</b>	
Entrances:	
Active (pedestrian and/or conveyance)	5
Inactive (normally locked, less used)	1
Vital locations or structures	5
Building surrounds	1
<b>Buildings &amp; Monuments, floodlighted</b>	
Bright surroundings	
Light surfaces	15
Medium light surfaces	29
Medium dark surfaces	30
Dark surfaces	50
Dark surroundings	
Light surfaces	5
Medium light surfaces	10
Medium dark surfaces	15
Dark surfaces	20
<b>Gardens</b>	
General lighting	0.5
Path, steps, away from structure	1
Backgrounds—fences, walls, trees, shrubbery	2
Flower beds, rock gardens	5
Trees, shrubbery, when highlighted	5
Focal points, large	10
Focal points, small	20
<b>Parking Areas</b>	
Self-park areas	1
Attendant-parking area	2

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Electric lighting systems offer many options. Dimmers give the client more or less light when needed. Time clocks and photocells make the lighting system automatic. Built-in security systems add alarms and direct police communication for emergencies. System controllers let you customize the display to exact specifications.

### Putting it together

Whether a lighting system is part of an

original landscape plan or added at a later time, the design process requires some careful thought about priorities. Some points to consider:

- What are the strong points of the landscape that will be emphasized?
- What are the main walkways, views, specimens that must be illuminated?
- What hazardous areas are there? How will visitors orient themselves?
- What space will you create—the floor, walls, and ceiling with lights?
- What specific uses call for special treatment?

- What areas should be hidden or contrasted with brighter spaces?
- What mood do you want to set?
- What architectural, regulatory and aesthetic rules apply?

### Maintenance

Lighting systems should be designed with maintenance in mind. More expensive fixtures and lamps often pay for themselves with reduced maintenance costs. For instance, mercury vapor, high-pressure sodium, and metal halide lamps last much longer than incandescent lamps. This factor can make them more suitable for uses in hard-to-reach areas such as tall poles, building roofs or trees. Similarly, heavy-duty fixtures and electrical equipment give longer life than cheaper, more delicate units.

Well lights, spotlights and other fixtures used for uplighting need frequent cleaning to keep dirt and leaves from blocking off light. Sprinkler systems often leave hard water deposits on fixtures that can eventually damage housings. Underwater lights must be cleaned to prevent mineral deposit buildup on lens and housings. Normal atmospheric corrosion can damage housings in urban and ocean environments.

Hard-to-reach and multiple fixtures require much time and effort to keep the system running right and these costs should be included in the maintenance budget.

Landscape maintenance needs also change with lighting systems.

More frequent and careful pruning may be needed on ground covers, low plants and shrubs near direct light sources. You may have to relocate some light sources to avoid glare, if major pruning changes the lighted background. As trees and large shrubs grow, the cables attached to them may need realignment. Plant growth rates may change with large lighting systems. Be prepared to make adjustments.

One Washington, D.C. landscape architect installs a "temporary" system of lighting that lets clients adjust elements to their needs. James van Sweden explains, "We place double outlets in the landscape about 12 feet apart. The client can add fixtures and move them around to try different effects. This gives them as much lighting as they want." **WT&T**

*Editor's Note: The National Lighting Bureau publishes a variety of self-help guides. All are written in lay terms and are heavily illustrated. A directory of Bureau publications is available free of charge by contacting the NLB, 2101 L Street NW, Suite 300, Washington, D.C. 20037.*

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