



• DESIGN • REVIEW • GUIDE •

Outdoor Lighting

Burlington is well known as a community with a high quality of life, small and cohesive neighborhoods, a vibrant downtown and waterfront – all within a spectacular setting on the shores of Lake Champlain. This deserving reputation is due in part to the City's small size, entrepreneurial spirit, civic-minded citizens and activist government. One of the many factors that makes Burlington such a great place to live, work and visit is the community's attention to detail, and respect for its setting, heritage and quality urban design.

Burlington's Design Review process strives to protect the city's unique qualities and strong sense of place by carrying out citywide development and design objectives. The purpose of this *Design Review Guide* is to help applicants in preparing projects to be reviewed by the Design Review Board and the Burlington Planning Commission. Through materials such as this, the Department of Planning & Zoning seeks to make information available well before the final design of a project saving the applicant, and the city, time and money.

Lighting can be an important tool, when used carefully, in enhancing Burlington's architectural heritage. However, of all the many design issues, outdoor lighting is arguably one of the more difficult to understand and visualize.

The first things you need to consider are:

- **What is the purpose of the light?**
- **What kind of light is already around me?**
- **Do I really need to add more outdoor light - will it improve visibility or make my property more secure?**
- **How much light do I really need, and what are the long-term energy costs?**

LIGHTING CONCEPTS AND ISSUES

There are several concepts and issues that you need to understand before adding light to your property. It is the combination of **all** of these factors that creates a quality lighting application that will benefit you **and** the community.

Illumination Level

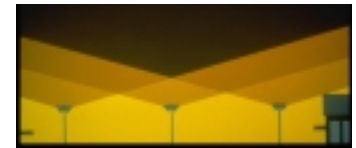
The level of illumination refers to the **amount** of light needed for a specific task. Most of us are led to believe that more light is better. However, this is not necessarily true. The light level on a typical sunny day at the beach is 30,000 footcandles and 1,500 on a cloudy day. However, you only need 0.1 footcandles to read the serial number on a dollar bill. Unless you're planning to do needlepoint, think "**less is more.**"



Over-Lit Canopy by Gary Hall

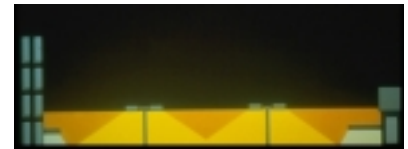
Glare

When light shines directly into your eye, visibility is reduced due to glare. Glare causes contrasts to be washed out and objects become much harder to see. Causes of glare include using too much light and improperly aimed fixtures.



Non-Cutoff Fixtures

The solution is to use only as much light as you need, direct the light to where it is needed, and shield the lamp from view. Cutoff fixtures are often the best choice. Cutoff fixtures are shielded so that the light is focused exactly where it is needed (one can also use reflectors inside the lamp to aim the light). Finally, the height of the fixture helps define the area that is lit. Surprisingly, it's better to have more lights at a lower height, than fewer high up. If they're too high, they will light the area directly around the light, not the area on the ground that needs it. By focusing the light directly onto what you want illuminated, you're not wasting energy or money and contributing to an over-lit environment.



Cutoff Fixtures

Uniformity & Security

While the human eye can adjust to a wide range of light conditions, it can only adapt to one at a time - typically the brightest. This causes everything else to appear very dark in comparison. If your neighbor has a really bright light, your yard by comparison probably feels very dark. This kind of over-lighting is increasingly common, and creates areas that are very bright and very dark. Competing light levels detract from our sense of safety and security, and the overall character of a neighborhood.

Personal safety and site security are some of the most common reasons people add light. However, it is the **quality** of the light, **not quantity**, that improves our sense of security the most.

Energy Efficiency

Not all lights are created equal. There are wide ranges in efficiency based on both the amount of light produced per watt, and the life-span of the lamp. Factors which affect energy efficiency include the how much light is used (see *Illumination* above), the amount of misdirected light (see *Glare* above) and the color of light desired (see *Color* below). The bottom line is that no-one wants to spend more than we really need.

Color

The color of the light used affects how objects appear compared to normal sunlight. The color you choose is often based on two factors - the task and energy usage. Incandescent lamps (your basic light bulb) offers the closest to natural light, yet are a very inefficient user of energy. High pressure sodium (HPS) lamps, while very efficient and long lasting, emit an orange-yellow light that distorts color as well as our ability to identify features at a distance. Metal halide lamps emit a cool white light which makes for more accurate object identification and adds to our sense of security. This white light creates a skyglow similar to moonlight rather than the orange glow of HPS, and are only slightly less efficient at commonly used wattages. Metal halide is the preferred lamp for lighting applications in Burlington for both it's color rendering and energy efficiency.



City Hall Park by Gary Hall

DESIGN OBJECTIVES

- ✓ **The lighting level should be appropriate to the task. Remember, less is more!**
- ✓ **Lighting levels should be reasonably uniform to avoid very bright and very dark areas.**
- ✓ **The lamp should make objects appear as close to a natural color as possible and provide high energy efficiency.**
- ✓ **The fixture should minimize glare and spill-over onto adjacent property or into the sky. This can be done through the use of cutoff fixtures and/or reflectors in the lamp.**
- ✓ **The mounting height of the fixture should be as low as possible.**

✓ **Sensor-controlled lights** (typically heat or motion) **should be considered for security lighting and for energy savings.**

If you are proposing lighting on your site, you may need a permit and should include a lighting plan with your application. This should include the proposed fixture style, wattage, location, mounting height, and any existing light fixtures that will be replaced, relocated or remain.

SOME COMMONLY USED TERMS:

Foot candle: A measure of light falling on a surface. One foot candle is equal to the amount of light generated by one candle shining on a square foot surface one foot away (Lux is the metric equivalent of footcandles, and both can be measured by a light meter). The Illuminating Engineering Society of North America (IESNA) provides lighting standards for typical applications.

Lumen: A measure of light energy emitted by a light source.

Luminaire: The complete lighting fixture including the lamp (i.e. bulb), lens (used to direct and distribute light) and the wiring. The luminaire is typically mounted on a pole or other fixed object.

Uniformity Ratio: The ratio of average to minimum illumination. IESNA also provides standards for uniformity ratio.

ADDITIONAL INFORMATION

city zoning permits & general information

- **Burlington Dept. of Planning & Zoning**
135 Church St., Burlington, VT 05401
802.865.7188

electric service and lighting

- **Burlington Electric Department**
585 Pine Street, Burlington, VT 05401
802.658.0300

lighting applications and standards

- **Illuminating Engineering Society of North America**
120 Wall Street, 17th Floor, New York, NY 10005-4001
212.248.5000 or www.IESNA.org

“Outdoor Lighting Manual for VT Municipalities”

- **Chittenden County Regional Planning Commission**
66 Pearl Street, Box 108, Essex Jct., VT 05453
802.872.1600

Selected photos by Gary Hall Photography, Shelburne VT.

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