# OUTDOOR LIGHTING FOR SAFETY AND SECURITY

## WHAT DO WE MEAN BY SAFETY AND SECURITY?

Safety lighting allows people to move about safely in a given environment. For example, a light located on stairs will help prevent people tripping. Security lighting, on the other hand, is concerned with crime prevention. It has three main functions:

- **Deterring crime:** if a light is on, it creates the impression that someone is at home and alert to an outside presence.
- **Detecting crime:** in a well-lit area, an intruder would find it difficult to approach unseen.
- **Preventing concealment:** lighting takes away shadows where someone could hide.

When selecting an outdoor lighting system, keep in mind that brighter may not always mean safer. A 1996 study by the US National Institute of Justice found little research to support "brighter-is-safer" and even suggested that in some circumstances poorly designed excessive lighting might actually increase personal vulnerability. Glare can impair vision and poorly located lighting can create shadows where criminals can hide.

## CHOOSING A LIGHTING SYSTEM

While good lighting can improve safety and security, poor lighting may increase personal vulnerability and result in light pollution and higher energy costs.

The first step before installing outdoor lighting is to assess your needs. You must then decide on locations for the proposed lighting and the types of fixtures and control systems.

### NEEDS ASSESSMENT

Ask yourself is the lighting really needed. Assess your safety and security needs by looking for potential 'problem' areas. If so, determine what areas have to be lit, how much illumination do you need, and when do your require the lighting.

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## OVERVIEW

Good lighting allows you to see and be seen. Good lighting allows you to walk safely on the path or steps to your home, lets you see who's at the door before opening it, and acts as a deterrent to criminals and prowlers. Find out how to select the appropriate outdoor lighting system for the greatest safety and energy savings.

### PLACEMENT OF LIGHTS

Consider lighting a path from the entry at the street all the way to the door. If there is shrubbery near the entryway, use lighting to eliminate shadows. A long or steep flight of stairs should have lights at the top and bottom for safety.

Direct the light to where is needed. Use lights that shield the lamp and direct the light down to help you see better rather than out and away. It will reduce the light that is cast in the sky and save energy.

**Bad**—
Waste light goes up and sideways

**Good**—
Directs all light down

Avoid glare. A luminaire that emits a concentrated beam of light offers better visibility than one that shines light in all directions. In certain cases, glare can compromise safety.

Post lanterns are particularly useful at entrances to driveways and walks. Avoid clear glass designs and exposed high-wattage lamps, as their blinding effect can be almost as hazardous as no light at all. Minimum height should be 2.4 metres (8 feet) above the ground to provide the most light.

Floodlights on your driveway should be installed at least 3.6 metres (12 feet) above the ground. This will keep the light out of drivers' e yes, protecting their night vision.

Walk lights are low-mounted fixtures that spread their light downward. They're best used for steps, paths and driveways, and should be placed 2.4 to 3 metres (8 to 10 feet) apart.

Look for the new solar lighting kits for garden paths as an energy-efficient alternative.

### CONTROL SYSTEMS

Besides being convenient, automatic control systems save electricity by ensuring that lights are on only when needed. The most common types are timers, photoelectric cells and motion detectors.

**Timers** operate lights at preset times. The settings must be adjusted to allow for longer or shorter seasonal hours of darkness.

**Photoelectric cells** sense the lack of natural light and turn lights on at dusk and off at dawn. A photocell can't be controlled on its own, but is programmable when used in combination with a timer.

**Motion detectors** are especially convenient for safety lighting and act as a strong deterrent to intruders, as they immediately alert homeowners to an outside presence.

## TYPES OF OUTDOOR LIGHT SOURCES

**Incandescent light bulbs**, the most common outdoor light source, are inexpensive to buy, available in a wide range of wattages and work well with most control devices. They are, however, an inefficient light source with an average of 90 per cent of the input energy going to create heat. They also have a relatively short life span, meaning that high-use lighting will need frequent replacement which can be inconvenient in hard-to-reach locations.

**Compact fluorescent lights (CFLs)** use up to 75 per cent less electricity and last up to ten times longer than regular incandescent bulbs. This means you'll save money on your BC Hydro bill and avoid the inconvenience and cost of frequent replacements. CFLs are quick starting, and are sold in a variety of shapes, sizes and light levels. Therefore, make sure you choose the right bulb for your fixture. Outside, CFLs can be used in enclosed fixtures, such as porch lights. Although extreme heat and cold will diminish the amount of light a fluorescent light will produce, many are now designed to start in temperatures well below zero—check the packaging for details. CFLs are best suited for high use areas where lights are on for a long time.

**Fluorescent lamps.** While traditional T12 lamps using magnetic ballasts have trouble starting at sub-zero temperatures, newer T8 lamps using electronic ballasts will start in temperatures up to -18°C.

**High Intensity Discharge (HID)** lamps include the groups of lamps commonly known as mercury, metal halide, and high-pressure sodium. Metal halide or high-pressure sodium lamps are excellent choices for outdoor lighting, and can be used as flood or area lighting. They provide high light levels with less wattage than mercury vapour and much less wattage than incandescent lamps. HID lights aren't affected by low temperatures. They can be wall or ground-mounted, but can only be used in an HID light fixture. They also require a ballast to control power to the lamp.

## TYPES OF OUTDOOR LIGHT SOURCES

The daily cost of any lamp can be calculated using this formula:

$$\frac{\text{lamp wattage x hrs used/day x 7¢kWh} = \text{cost/day}}{1000}$$

For example, a 90-watt incandescent light operated 10 hours a day at 7¢/kWh = 6¢ a day or $1.89 a month. A 23-watt compact fluorescent light operated at 10 hours a day would provide equal illumination to the above example, but the total cost would be lower, at 2¢ a day or 48¢ a month.

## INSTALLATION

This is a general guide only. Please ensure that installations meet your requirements, manufacturers' instructions and all applicable codes, standards and regulations. BC Hydro is not responsible for installations.

## FOR MORE INFORMATION

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