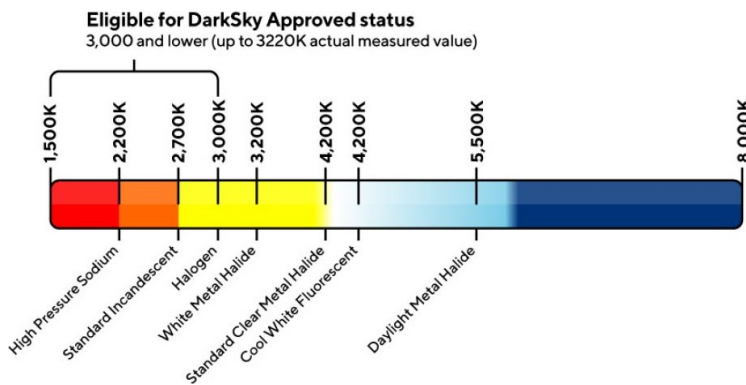


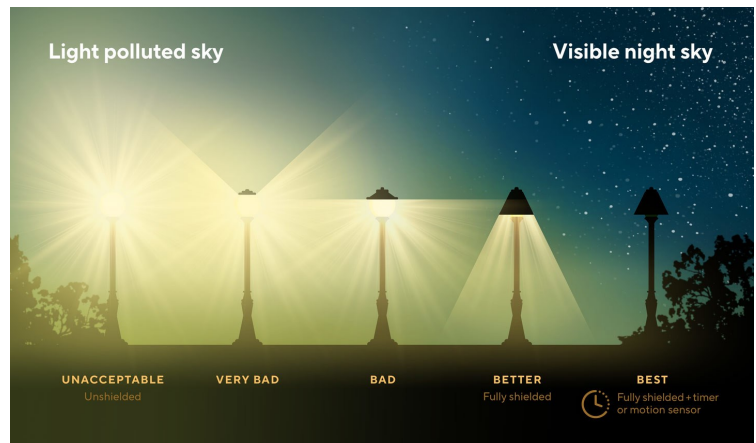
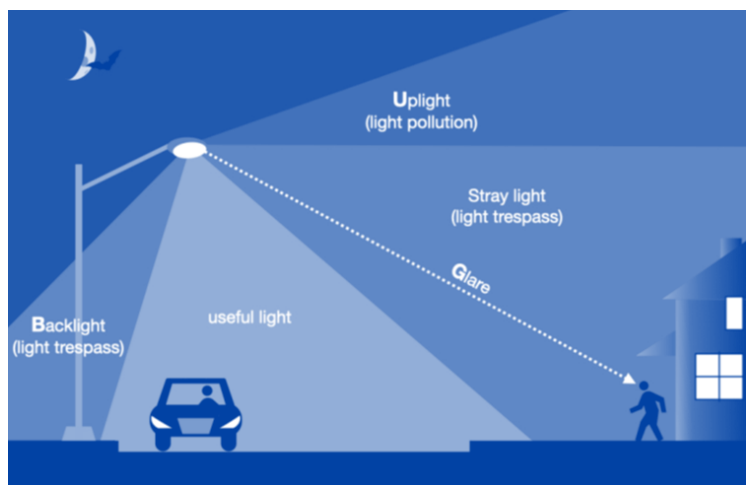
# Best Practices and Principles for Responsible Lighting

## External Lighting

- **Values.** Adopt and implement best practices in accordance with community and environmental sustainability values.
- **Compliance.** Adhere to current recommendations, standards, and regulations to promote pedestrian and vehicular safety, energy efficient lighting, energy conservation, outdoor nighttime lighting control, and light pollution reduction.
- **Necessity.** Assess whether lighting is necessary or if it could instead be replaced by reflective materials or other solutions. Dark sky does not mean dark ground. Increased lighting can reduce safety.
- **Correlated Color Temperature.** Adopt lighting between 2,200 K and 2,700 K, both to minimize biologically harmful blue light and to reduce environmentally polluting skyglow. Adopt 3,000 K lighting only selectively in cases where older, pre-existing fixtures are simply incompatible with redder lighting.



- **Brightness.** Adopt lighting illumination levels not exceeding the values recommended by the Illuminating Engineering Society for the specific application by more than 25%.
- **Uplight and Shielding.** Adopt lighting with a preferred BUG\* rating of U0, to minimize uplight. This means that outdoor fixtures are fully-shielded. They are designed so that all light emitted, directly or indirectly, is projected below a horizontal plane passing through the lowest light-emitting part of the fixture.
- **Glare.** Adopt lighting with a preferred BUG\* rating of G0 or G1, and no greater than G2, to improve visibility.
- **Backlight.** Adopt lighting with a preferred BUG\* rating of B0 or B1, and no greater than B2, to minimize trespass.



- **Controls.** Adopt timers, dimmers, motion sensors, and smart control systems to maximize energy savings by using light only when needed and only at the level required for or appropriate for the specific application.
- **Add-on Shielding.** Deploy supplemental dorm-side and dark-skies shields for road lights and spotlights, where necessary to eliminate light trespass in select areas.
- **Engagement.** Recommend demonstrating multiple fixture options (including options meeting these best practices) to the community and polling the community to assess preferences to ensure community satisfaction.

## Five Lighting Principles for Responsible Outdoor Lighting



Principle	Description	Icon
1 Useful	<b>Use light only if it is needed</b> All light should have a clear purpose. Consider how the use of light will impact the area, including wildlife and their habitats.	Clipboard icon
2 Targeted	<b>Direct light so it falls only where it is needed</b> Use shielding and careful aiming to target the direction of the light beam so that it points downward and does not spill beyond where it is needed.	Light fixture icon
3 Low Level	<b>Light should be no brighter than necessary</b> Use the lowest light level required. Be mindful of surface conditions, as some surfaces may reflect more light into the night sky than intended.	Light meter icon
4 Controlled	<b>Use light only when it is needed</b> Use controls such as timers or motion detectors to ensure that light is available when it is needed, dimmed when possible, and turned off when not needed.	Timer icon
5 Warm-colored	<b>Use warmer color lights where possible</b> Limit the amount of shorter wavelength (blue-violet) light to the least amount needed.	Color temperature icon

## Internal Lighting

- **Trespass.** Adopt interior lighting controls and window shades to minimize unintended environmentally polluting light trespass.

\* The Illuminating Engineering Society defines the BUG system with a range of values from 0 to 5 for best to worst in defining backlight (B), uplight (U), and glare (G). More information is available at <https://www.ies.org/wp-content/uploads/2017/03/TM-15-11BUGRatingsAddendum.pdf>.

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