

OUTDOOR LIGHTING REQUIREMENTS

There are three lighting classes and two lighting zones. These determine where and when you can use outdoor lighting, how much lighting you are allowed to emit on your property, and what kind of lighting you can use.

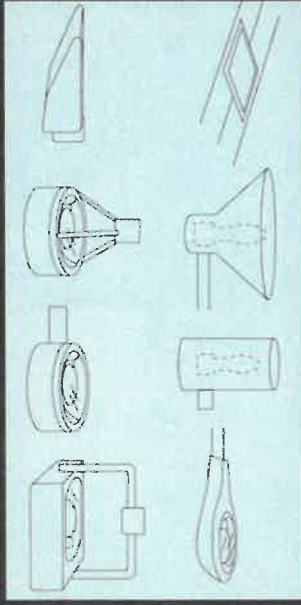
Class 1 lighting is used for applications where color rendition is required to preserve the effectiveness of an activity such as display areas, entries, and sports fields.

Class 2 lighting is used for applications where general illumination for safety or security is the primary concern such as walkways, driveways, roads, and parking lots.

Class 3 lighting is used for outdoor decorative purposes such as building or landscaping accent lights.

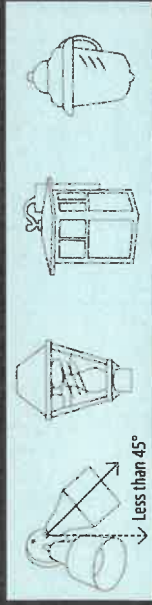
◆ **Color:** Narrow-spectrum amber LEDs (NSALEDs) are the preferred lighting sources. Code compliant NSALEDs have a peak intensity wavelength between 589 and 595 nanometers. Other bulbs should have a correlated color temperature of 2,700K or less.

◆ **Full Shielding:** Fully shielded lighting fixtures are the best at reducing light pollution and trespass.



Examples of fully shielded light fixtures

◆ **Partial Shielding:** Partially shielded light fixtures emit some light sideways and upwards. This includes flood lights that are pointed at the ground at a 45 angle or less.



Examples of partially shielded light fixtures

WHERE TO LEARN MORE

Both Flagstaff and Coconino County have laws that maintain and enhance dark skies. These laws are aimed at reducing light pollution and minimizing energy losses.

See Flagstaff Zoning Code: Division 10-50.70 and Coconino County Zoning Code Chapter 4, Section 4.3 for more information.

For assistance with code compliance, contact Flagstaff Community Development or Coconino Community Planning Department, or their dark sky compliance specialists.

CITY OF FLAGSTAFF Community Development

211 W. Aspen Avenue
Flagstaff, AZ 86001
PH: (928) 213- 2104
flagstaff.az.gov/10/community-development

Dark Sky Compliance Specialist

Janice Hakala
EMAIL: janice.hakala@flagstaffaz.gov
PH: 928.213.2148

COCONINO COUNTY

Coconino Planning Department

2500 N. Fort Valley Road, Building 1
Flagstaff, AZ 86001
PH: 928.679.8850
coconino.az.gov/136/community-development

Dark Sky Compliance Specialist

Mark Stento
Email: mstento@coconino.az.gov
PH: 928.679.8856



Prepared by



Matrix

This brochure was prepared under contract with Coconino County as a component of the Coconino County Military Installation Sustainability program. Financial support for this brochure was provided by the Department of Defense Office of Local Defense Community Cooperation (OLDFCC). The content reflects the views of Coconino County and does not necessarily reflect the views of the OLDFCC.

DARK SKIES

COMMERCIAL AND INDUSTRIAL PROPERTIES

Help Defend the Darkness

Protect the region's glorious night skies

Save energy with approved fixtures

Improve the quality of the nighttime environment at your home or business

You can make a difference!

◆ **FLAGSTAFF** was recognized as the world's first International Dark Sky City in 2001. Flagstaff and Coconino County are at the forefront of the effort to reduce light pollution through education and best practices. This brochure provides a concise overview of outdoor lighting regulations and information on how to bring nonconforming lighting into conformance.

WHO NEEDS DARK SKIES?



LOCALS AND TOURISTS: Stargazing is an important part of Arizona culture, especially in the Flagstaff and Coconino County areas, and astrotourism is an important part of Flagstaff's economy. Lowell Observatory attracts over 100,000 visitors annually.



ASTRONOMERS: The Lowell Observatory attracts researchers from across the globe and provides new insights into the universe every year.



THE MILITARY: The area hosts two naval facilities that support astronomical research and critical military operations, bringing \$8.7 million a year and economic benefits to the region. Camp Navajo also relies on natural darkness for important night training operations.

The naval observatories provide benefits including:

- Monitoring GPS satellites to ensure accurate GPS data, not only for driving directions, but for keeping our service men and women out of harm's way during military operations
- Keeping us safe by monitoring who and what is orbiting around Earth
- Providing navigational routes to space vehicles and astronauts in NASA

WHAT PREVENTS DARK SKIES?

LIGHT POLLUTION: There are four primary causes of light pollution.

Excessive and Misdirected Light – Excessive light, or light shining in the wrong directions – directly into the sky or into your eyes – wastes energy and creates glare and sky glow.

Light Trespass – Light trespass exists when light illuminates areas where it is unneeded or unintended, like when your neighbor's light shines into your house.

Glare – When excessively bright or unshielded lights shine directly into your eyes, glare decreases your ability to see.

Visual Clutter – When large numbers of poorly shielded and overbright lights create a cluttered appearance, it is difficult to find what you need to see



COMMERCIAL LIGHTING TIPS



LIGHT COLOR
The light color affects dark sky impacts. Amber light has far less impact than white or blue light and is just effective for general use.



SHIELDED FIXTURES
Fully shielded light fixtures should be used for outdoor and commercial lighting to limit glare and light trespass and to minimize sky glow, ecological impacts, and potential human health impacts.



SECURITY
Data show crime does not actually decrease as light increases. Effective lighting design utilizing fully shielded fixtures can enhance security while using less energy and lowering impact.



SAFETY
Bright, unshielded white lights may negatively affect safety and adversely affect drivers in particular by creating dark shadows and blinding glare.

THE VALUE OF DARK SKIES

- Outdoor lighting consumes **15% of total U.S. energy production** yearly, with approximately **60% wasted** through unneeded, over lit, or poorly aimed lighting.
- \$7 billion dollars of energy** is wasted on unnecessary lighting annually.
- For every **\$100 spent** on operating a dusk-to-dawn light fixture, **\$45 is wasted** on light that never reaches the ground.
- Arizona's military installations** have an annual economic impact of **\$11.5 billion**. Protecting dark skies ensures Coconino County's military operations are not impacted and continue to contribute to the local economy.