

# Efficiency Works

February 6, 2018

## Night Sky Initiative



## Nature in the City Objective CP2:

*Work cross-departmentally and with external partners  
toward a darker night sky.*

## Night Sky Initiative Goals:

- Maintain safety and security
- Develop and implement best practices in outdoor lighting
- Reduce light pollution
- Support human and ecological health

## **TRIPLE BOTTOM LINE**

### Outdoor Lighting Considerations

#### **SOCIAL**

Safe and effectively lit roadways and other areas, minimized light pollution and glare, and a visible night sky.

#### **ECONOMIC**

Energy cost, replacement cost, installation cost, maintenance cost.



#### **ENVIRONMENTAL**

Human and wildlife health, energy efficiency.

## Education

- Lighting Series
- Saddlebrook retrofit
- Local business & resident outreach/rebate opportunities
- Articles for Neighborhood Newsletter, Soapbox, CityNews
- Social media campaign
- Citizen science

## Technical/Code Work

### Code changes:

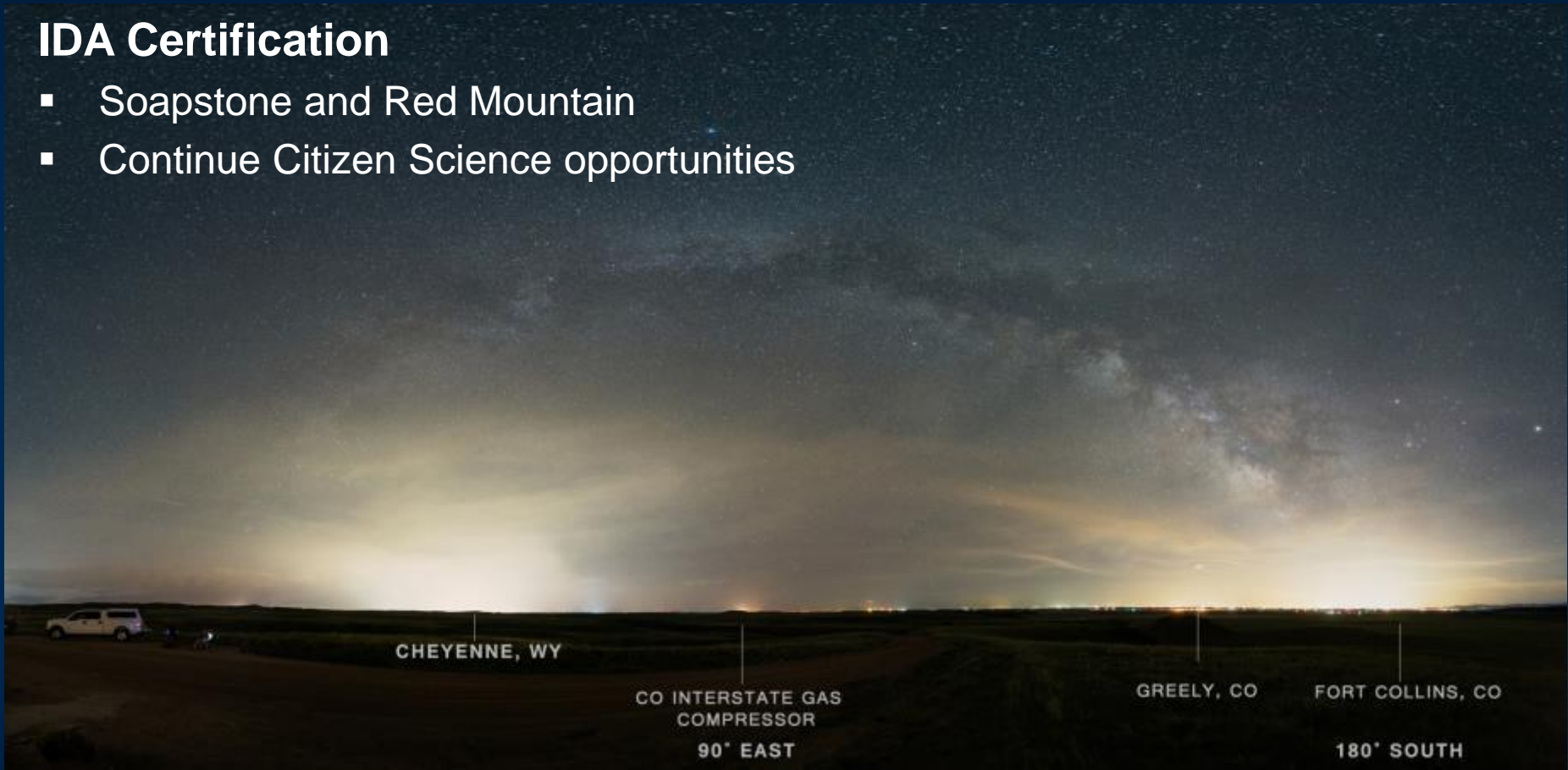
- 2017-Night sky friendly lighting on all residential and commercial buildings
- 2018- site lighting

### Monitoring Work:

- Establish baseline and benchmarks
- One monitor currently (Hilton)

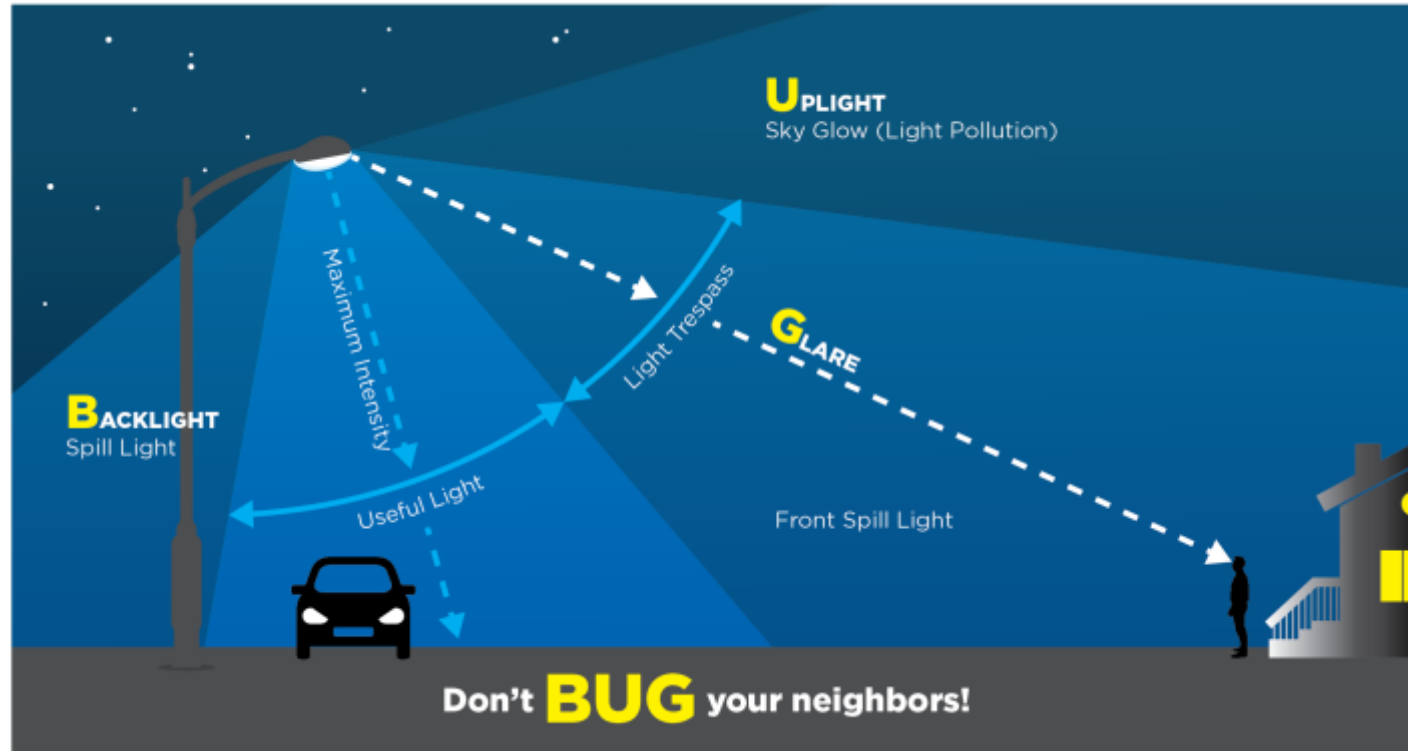
## IDA Certification

- Soapstone and Red Mountain
- Continue Citizen Science opportunities



# What is Light Pollution?

- Sky glow
- Light trespass
- Glare
  - Nuisance
  - Discomfort
  - Disability
- Clutter



# What is Light Pollution?

- Sky glow
- Light trespass
- Glare
- Clutter







## Outdoor Lighting Best Practices:

- Light only where you need it
- Light only when you need it
- Shield lights and direct them downward
- Use the minimum amount of light needed
- Select the most energy efficient lighting
- Select lamps with warmer colors

## Good for nighttime usage



**2700K**  
Extra Warm White

**3000K**  
Warm White

## Good for daytime usage

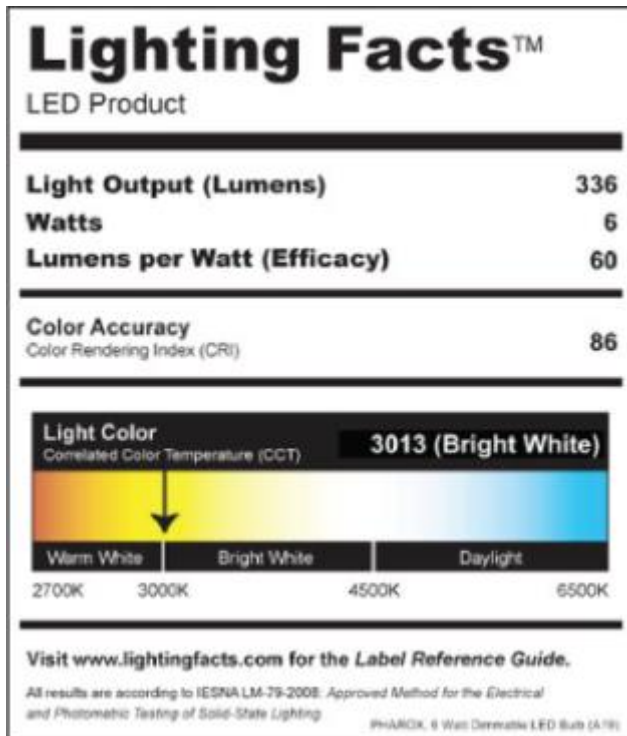


**3500K**  
White

**4000K**  
Cool White

**6000K**  
Daylight





## Night Sky Initiative – Focus Areas

- Land Use and Building Code Updates
- Pursue International Dark Sky Certification for Soapstone Natural Area
- Monitoring for sky quality in key locations throughout the City
- Education, training and outreach
- Pilot projects and case studies
- Consider other actions and future ordinances to support night sky objectives

# How the City Regulates Lighting

	Residential Code	Energy Code	Land Use Code
Single-Family Detached	X		X
Single-Family Attached	X		X
Duplex	X		X
Multi-Family		X	X
Commercial		X	X

X – Likely to be added in 2018

## Light Placement:

- Buildings, parking lots, walkways, plazas, landscape areas
- Spillover lighting (foot-candles)
- Impacts to adjacent properties
- Impacts to natural features

## Light Fixtures:

- Efficiency
- Shielding
- Glare
- Brightness

## Operations

- Timing
- Dimming



## Light Fixture Specifications:

- Color temperature (Kelvin)
- Lumens
- Wattage
- Pole height
- Specific technology (e.g., LEDs)



# Potential Land Use Code Updates

- Creation of lighting zones and/or limits specific to different land use types
- Maximum pole height/mounting height
- Limits on color temperature
- Limits on lumens emitted
- Limits on backlight, uplight and glare (BUG ratings)
- Hours of operation, automatic controls
- Require full cutoff and down directional fixtures for single family residential development
- Exemptions for holiday decorations, string lights, sculptures, etc.

## Comparable Communities

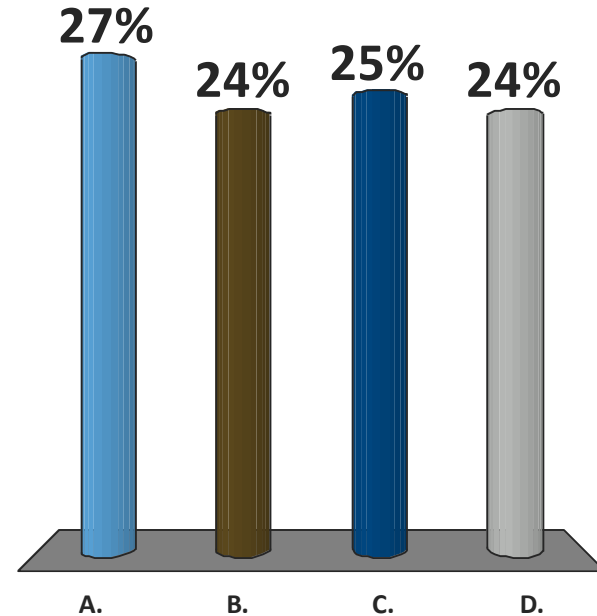
- Flagstaff, AZ (first Dark Sky Certified city)
- Tucson, AZ
- Boulder, CO
- Eugene, OR
- Plymouth, MN
- Homer Glen, IL

# *Pop Quiz!*

# During what stage(s) in the process is outdoor lighting reviewed?

*Select all that apply:*

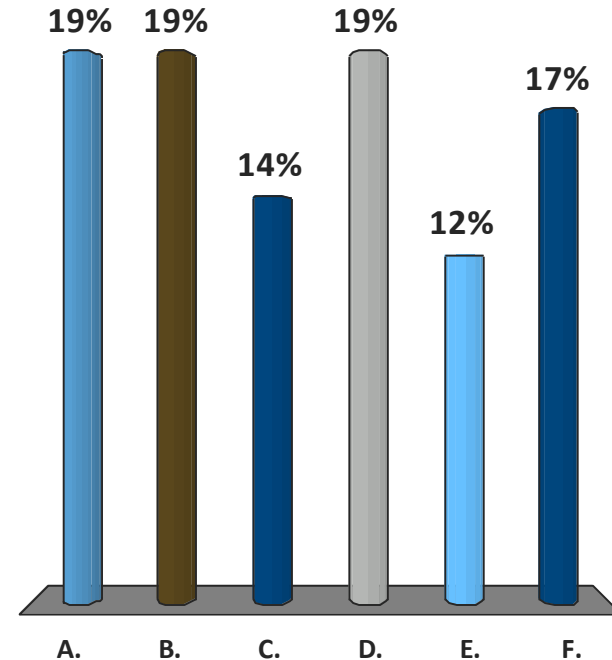
- A. Development review (pre-hearing)
- B. Final plan compliance
- C. Building permit review
- D. Post-construction



# Which types of outdoor lighting are regulated by Fort Collins codes?

*Select all that apply:*

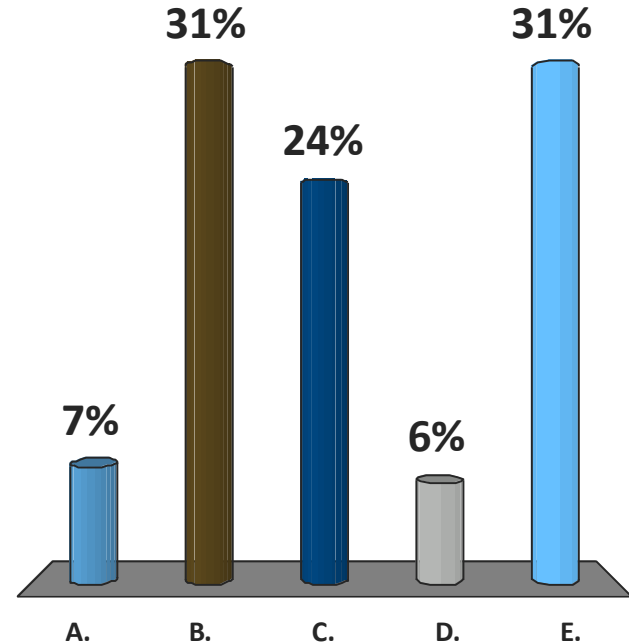
- A. Building lighting
- B. Parking lot lighting
- C. Street lighting
- D. Pedestrian walkway/plaza lighting
- E. Decorative/landscape lighting
- F. Canopies/outdoor sales areas



## Which of the following are currently required?

*Select all that apply:*

- A. Color temperature <3000K
- B. Full cutoff, fully shielded fixtures
- C. Automatic dimming after business hours
- D. Motion sensors on the back side of buildings
- E. No light spill into natural areas



- Minimum & maximum foot-candle levels depending on location
- Light fixtures must be:
  - Concealed
  - Fully shielded
  - Full cut-off
- Up-light, spill-light, glare, contrast & brightness should be minimized
- Natural areas/features should be protected from light spillage

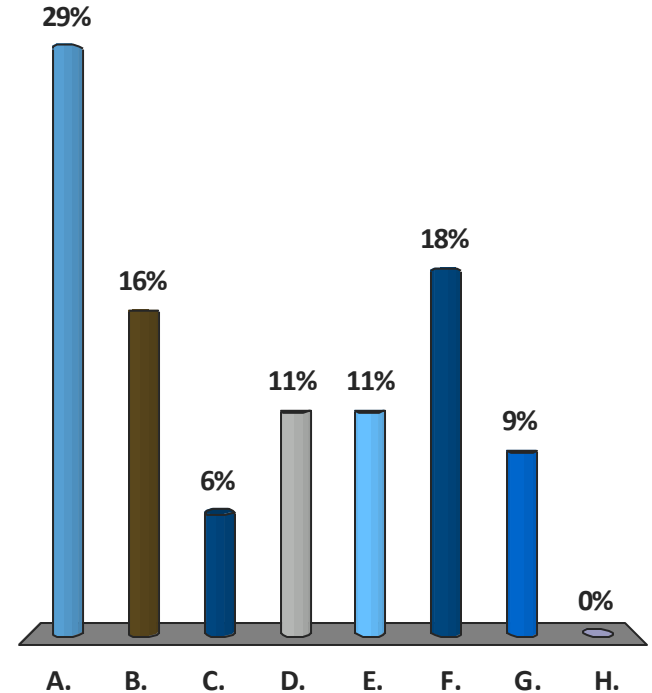




# Which of the following is most important to you?

*Choose your top 3:*

- A. Energy efficiency
- B. Public safety
- C. Security (for properties)
- D. Saving money (upfront or over time)
- E. Public health
- F. Wildlife health
- G. Aesthetics / design
- H. Other

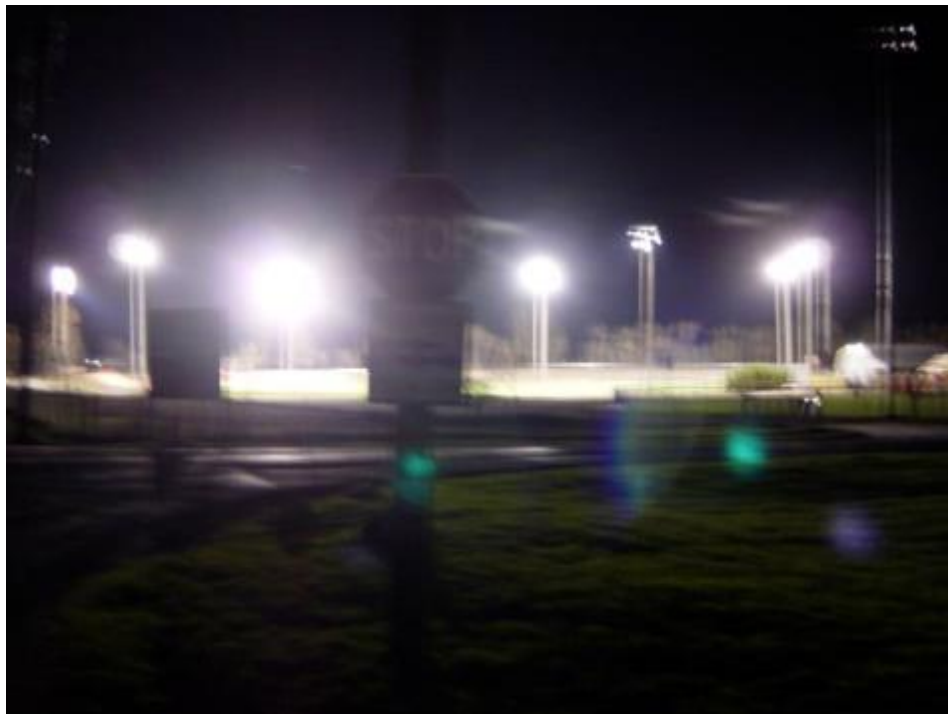


[www.fcgov.com/nightsky](http://www.fcgov.com/nightsky)









Bright light glare makes traffic signage hard to read.

## **\*Commercial & Multi-Family Projects**

### Land Use Code Section 3.2.4 – Site Lighting

- Lighting evaluated in the development review process
- Applies to lighting for:
  - Buildings
  - Parking lots
  - Walkways
  - Plazas
  - Landscape
- Ensure that functional/security needs are met without adversely impacting adjacent properties & neighborhood
- Considers light source, level of illumination, hours of illumination & need for illumination

## **\*Commercial & Multi-Family Projects**

- Applies to:
  - Building façades
  - Parking lots & garages
  - Canopies (sales and non-sales)
  - Outdoor sales areas
- Requires:
  - Automatic controls to dim lighting by at least 50% two hours after normal business closing
  - Outdoor lighting must be turned off 30 minutes after sunrise



## \*Commercial & Multi-Family

### Dark Night Skies:

- Light should be shielded so the lamp itself is not visible beyond the property line
- All exterior lighting fixtures (new buildings) shall have the “Fixture Seal of Approval” from the International Dark-Sky Association (IDA)
- Lighting placement shall conform to IDA Model Lighting Ordinance for Lighting Zone 1 (low ambient lighting):
  - Lighting may be used for safety and convenience but it is not necessarily uniform or continuous
  - After curfew, most lighting should be extinguished or reduced as activity levels decline

## \*Single-Family Detached, Attached & Duplex Housing

### Dark Night Skies:

- Light should be shielded so the lamp itself is not visible beyond the property line
- All exterior lighting fixtures (new buildings) shall have the “Fixture Seal of Approval” from the International Dark-Sky Association (IDA)
- Lighting placement shall conform to IDA Model Lighting Ordinance for Lighting Zone 1 (low ambient lighting):
  - Lighting may be used for safety and convenience but it is not necessarily uniform or continuous
  - After curfew, most lighting should be extinguished or reduced as activity levels decline

## **\*Single-Family Detached, Attached & Duplex Housing**

### **Energy Efficiency:**

- A minimum of 75% of light fixtures should be high efficiency lamps

**OR**

- A minimum of 50% of lighting fixtures shall contain only LED lamps

