



## CITY COUNCIL WORK SESSION MEMO

DEPARTMENT	PRESENTED BY	DATE
Public Works	David Lady - Public Works Director	March 14, 2022

### **ITEM**

Solar Street Lighting Evaluation Update and Dark Sky Presentation

### **BACKGROUND**

The City Council met with Clanton and Associates (Clanton) on March 1, 2021 to review a presentation that discussed a variety of topics related to managing public and private lighting within the City. Since that time, staff has worked with Clanton to review and develop standards for solar lighting options. Staff has also received feedback from Council Members indicating interest in dark sky initiatives. Clanton will provide an overview to Council of the solar evaluation as well as information to consider when developing dark sky initiatives.

#### Solar Evaluation

The analysis for the solar evaluation included the following scope items:

- Review Solar Fixture Options
- Pros/Cons of the Fixtures
- Lighting Parameters
- Technology Components
- Life Cycle Cost Analysis
- Implementation of Product
- Operational Considerations

#### Dark Sky

Dark Sky initiatives have become more common in recent years. These initiatives can include a variety of components that may include lighting standards for different uses, code language, and involvement with other organizations such as the International Dark Sky Association. Clanton will provide an overview of this topic including the following items:

- Existing Conditions for the Region
- Lighting Zones for Different Uses
- Land Use Code and/or Ordinance Development
- Compliance and Implementation

Additional Council guidance and comments with respect to the Solar Evaluation and Dark Sky initiatives will assist staff in determining the next steps.



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# SALIDA Solar Evaluation

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Senior Lighting Designer  
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## Scope



- **Assess solar lighting practicality**
- **Evaluate currently available products**
- **Estimate probable cost of equipment**

# Greenshine



Greenshine solar streetlights are powered by pole-mounted solar panels with a side-mounted battery enclosure.

## Product Specifications

Battery Type	Lead Acid, GEL Deep Cycle
Battery Operating Temperature	-20°C to 50°C
Battery Warranty Period	5 years
Battery Expected Life	6 years
System Autonomy	5 days
Pole design wind speeds	145 mph
Luminaire Agnostic	No



## City of Salida—Solar Lighting

# ClearWorld



ClearWorld retroflex solar systems wrap the pole with solar panels with an internal battery.

## Product Specifications

Battery Type	Lithium Ion
Battery Operating Temperature	-30°C to 60°C
Battery Warranty Period	10 years full system
Battery Expected Life	12 years
System Autonomy	8 days
Pole design wind speeds	180 mph
Luminaire Agnostic	Yes



## City of Salida–Solar Lighting

# Comparison

## Greenshine



### PROs:

- Top mounted solar panel (can avoid some shading)
- Cheaper battery replacement
- Lower initial cost

### CONs:

- Larger wind exposure (high EPA)
- Reduced battery lifetime
- Limited Luminaire options



## ClearWorld



### PROs:

- 360° Solar array
- Long battery lifetime
- Can use any fixture, including post top designs
- Reduced build up of dirt, snow and debris
- Simple install

### CONs:

- Higher initial cost
- More expensive battery replacement cost

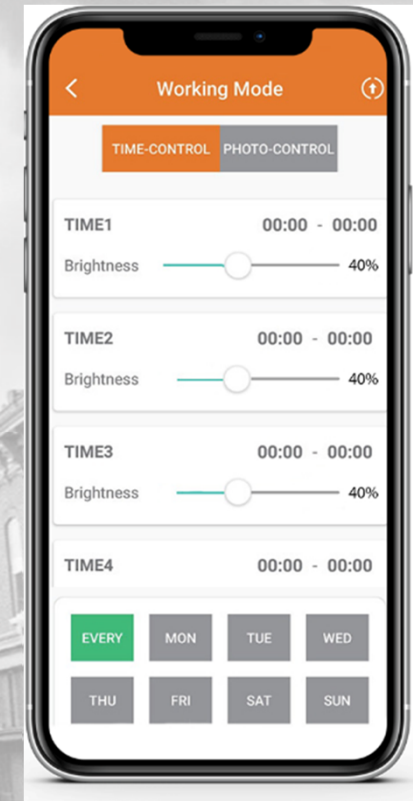


City of Salida—Solar Lighting

# Controls

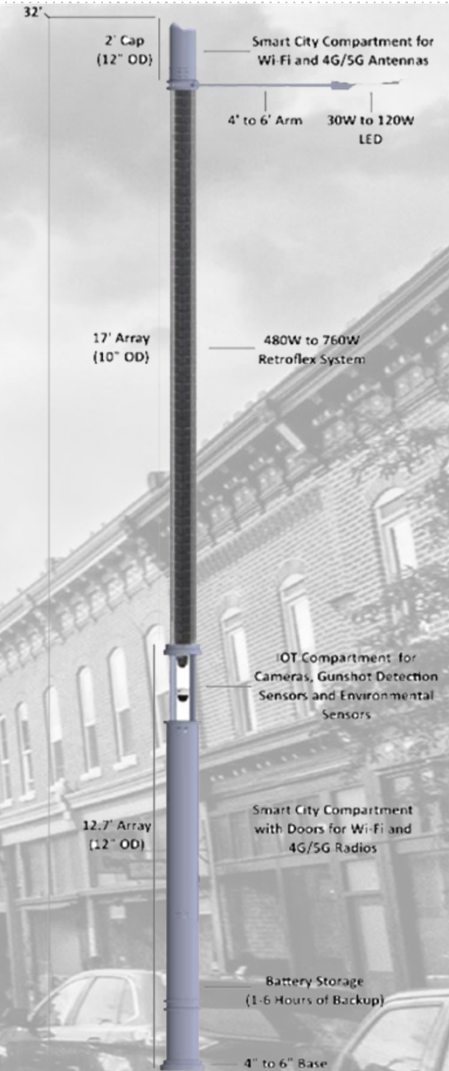
## Bluetooth based monitoring and control:

- Scheduling
- Dimming
- Set multiple profiles per day
- Monitor battery
- Access historical light and battery data.



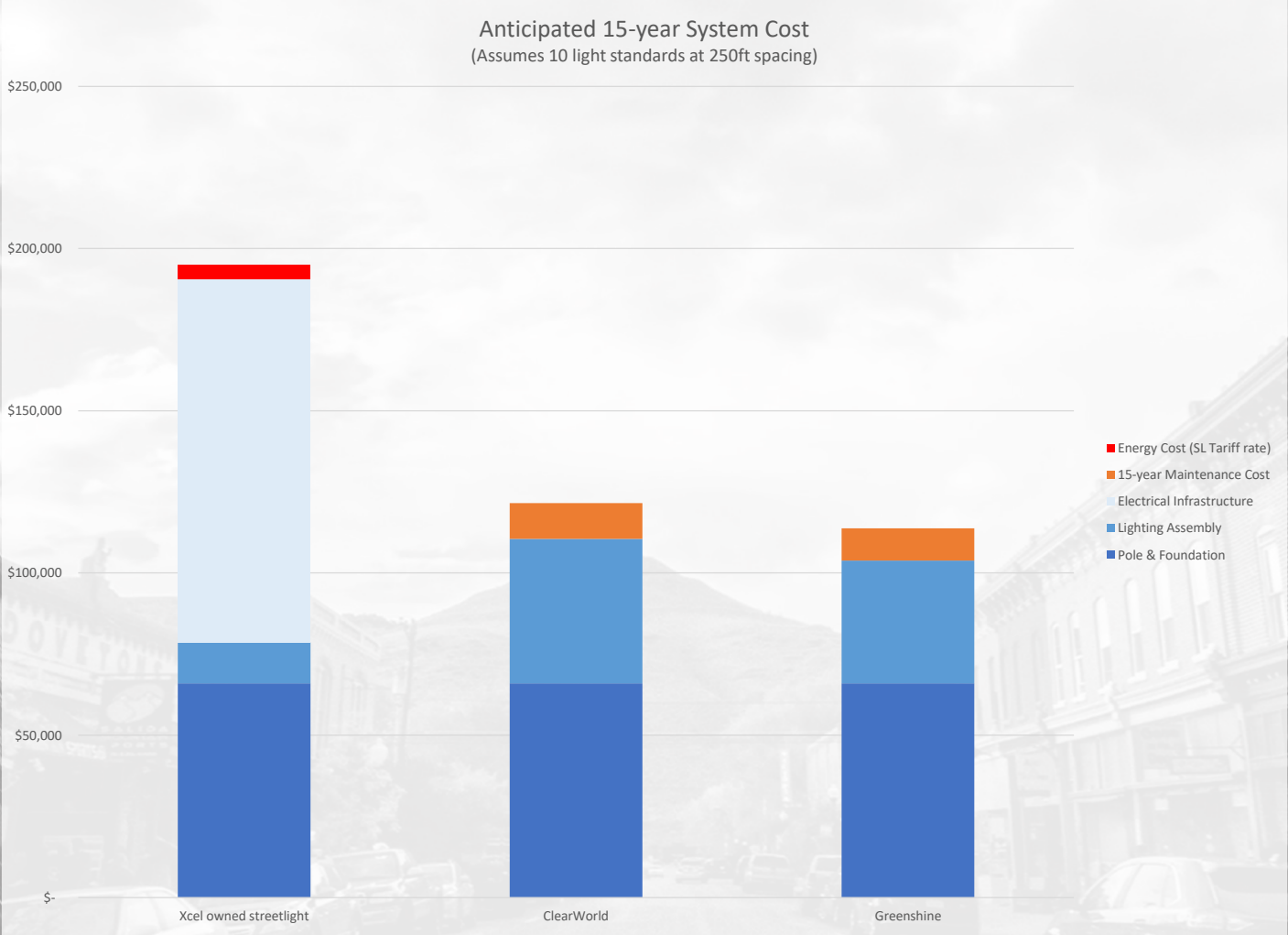
City of Salida–Solar Lighting

## Future expansion



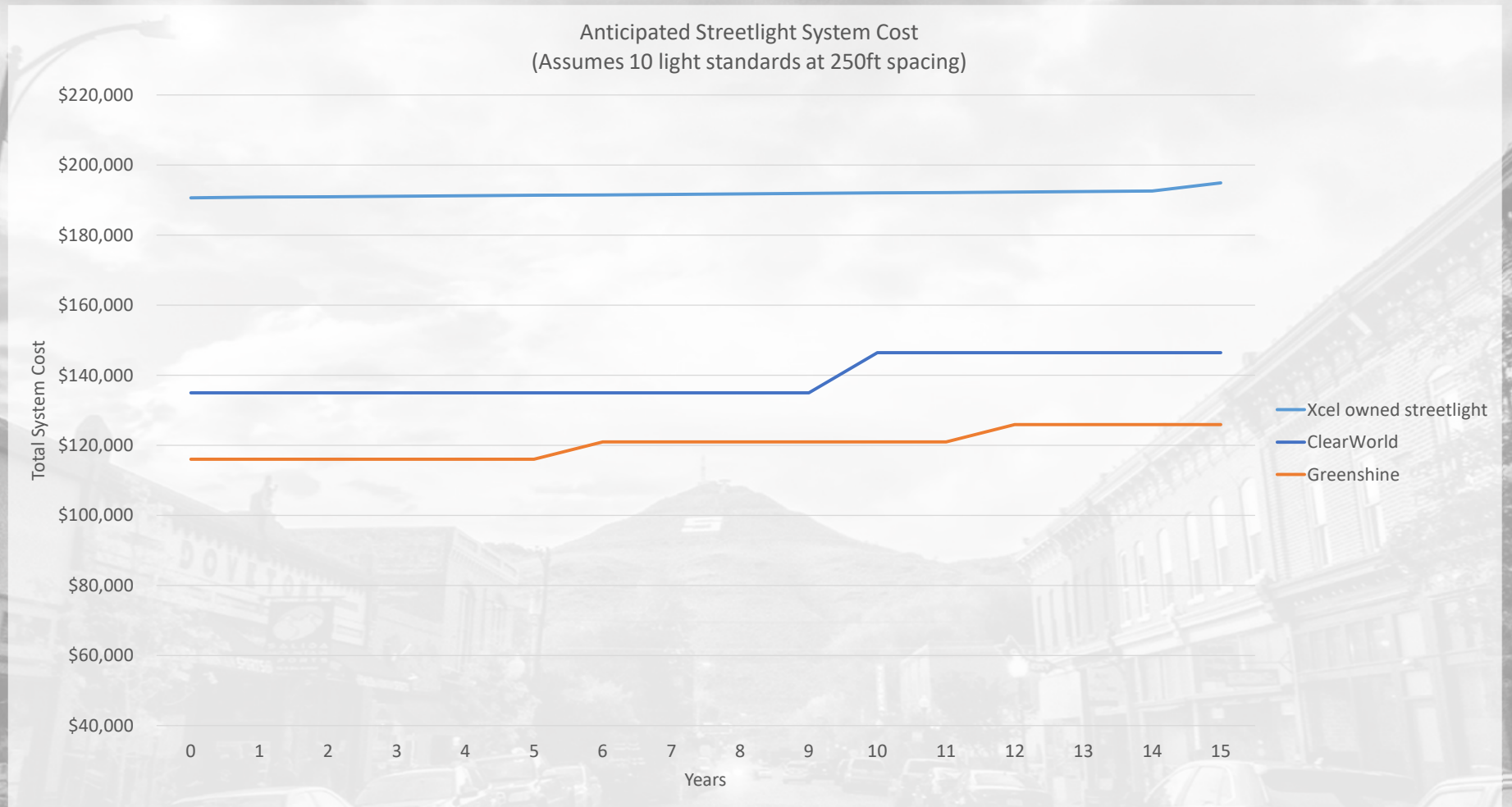
City of Salida—Solar Lighting

# On-Grid v. Solar Cost



City of Salida–Solar Lighting

# On-Grid v. Solar Cost



City of Salida–Solar Lighting



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# SALIDA Dark Skies

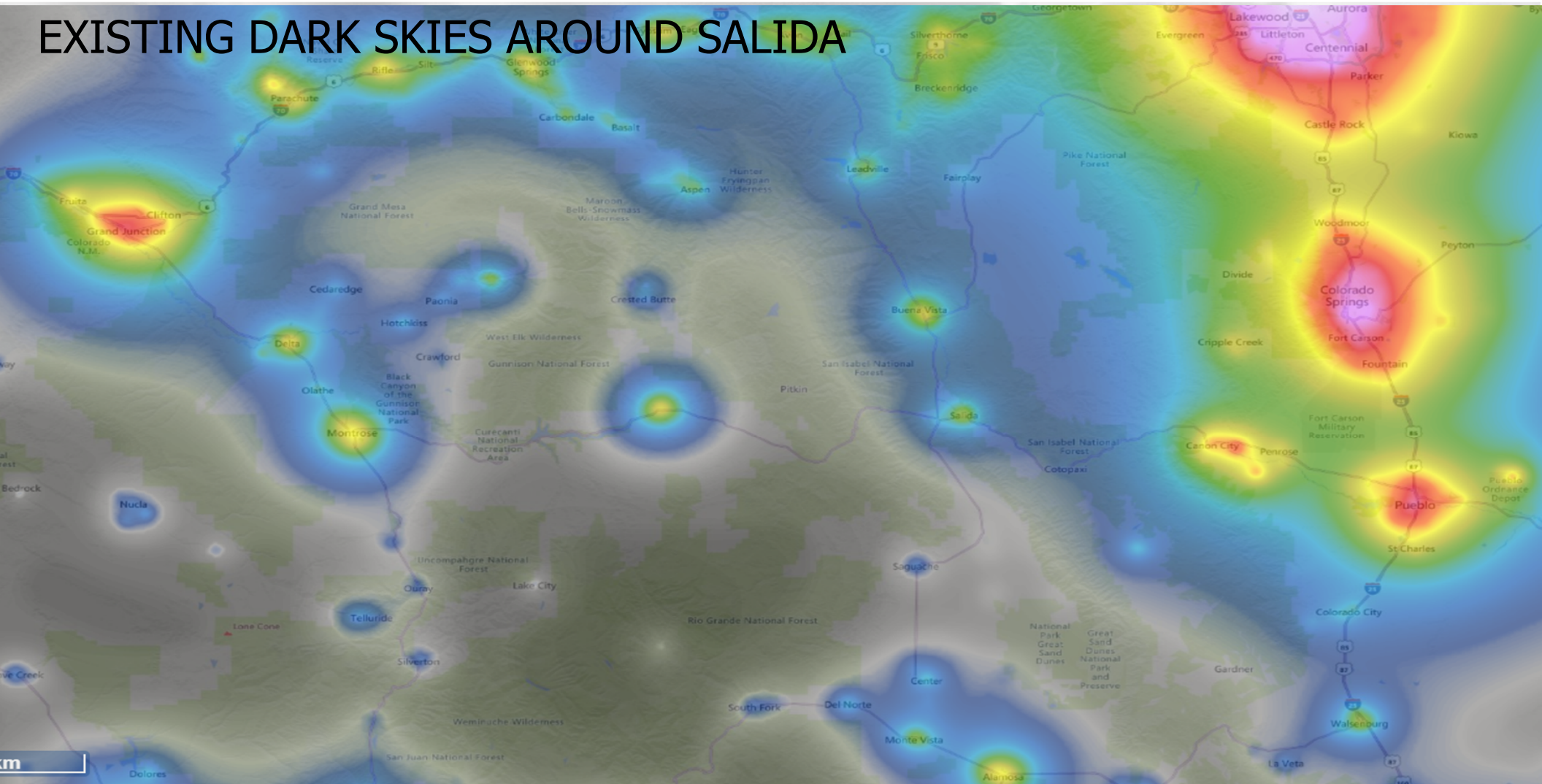
Dane Sanders  
President  
[dane@clantonassociates.com](mailto:dane@clantonassociates.com)

# DARK SKIES – AN ENDANGERED RESOURCE

A wide-angle photograph of a clear night sky. The Milky Way galaxy is the central focus, appearing as a dense, glowing band of stars and cosmic dust that curves from the lower right towards the upper left. The dust lanes are visible in shades of orange, red, and purple. The sky is filled with countless individual stars. In the foreground, the dark, jagged silhouettes of mountains or hills are visible against the bright light of the galaxy.

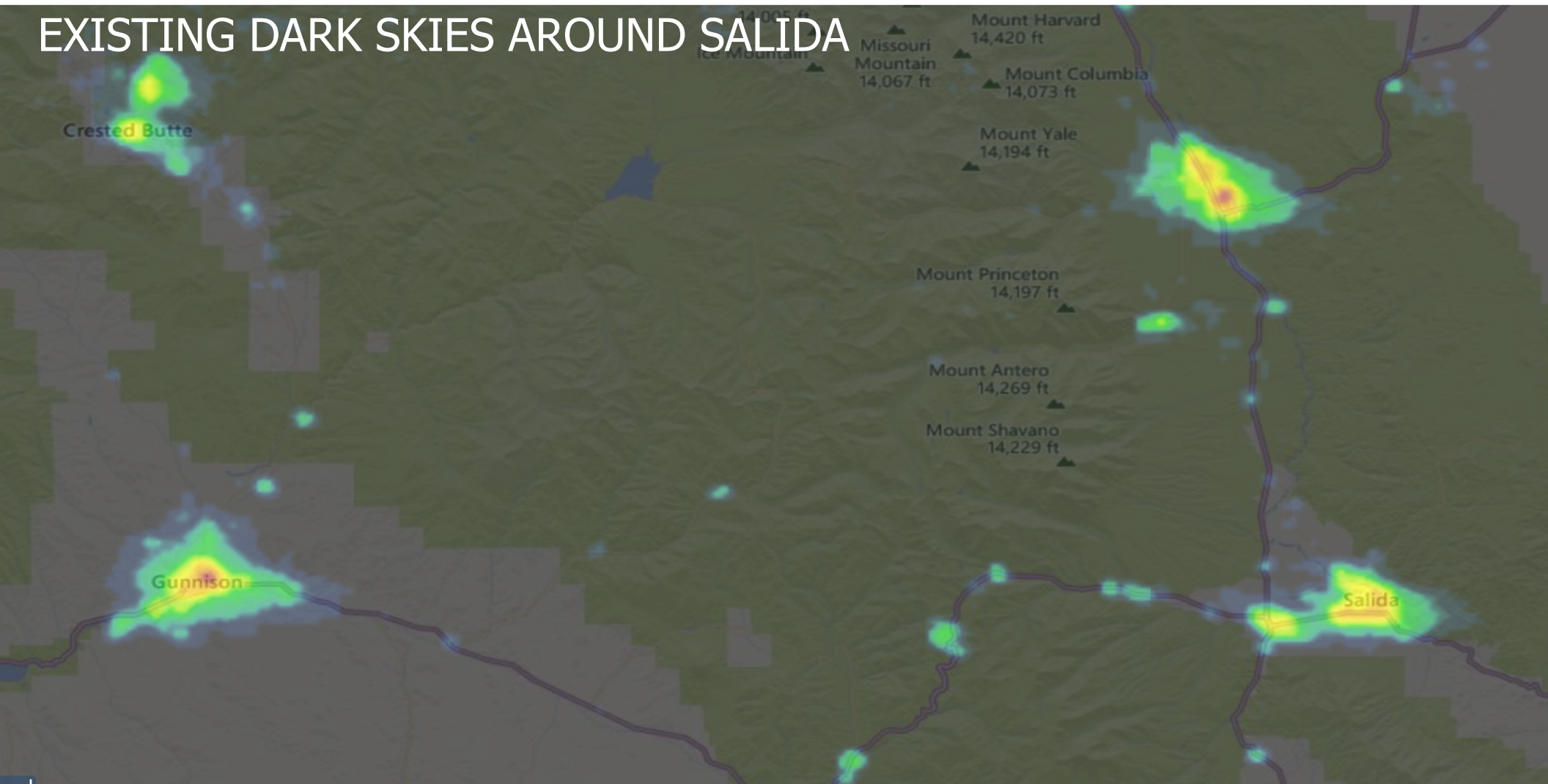
SALIDA - DARK SKIES INITIATIVES

# EXISTING DARK SKIES AROUND SALIDA



SALIDA - DARK SKIES INITIATIVES

# EXISTING DARK SKIES AROUND SALIDA



SALIDA - DARK SKIES INITIATIVES

# EVALUATE EXISTING LIGHTING



F ST. BRIDGE

**Historic Pedestrian**



F ST. DOWNTOWN

**Historic Downtown**



US-50 / E. RAINBOW BLVD

**Transitional**



1000 F ST.

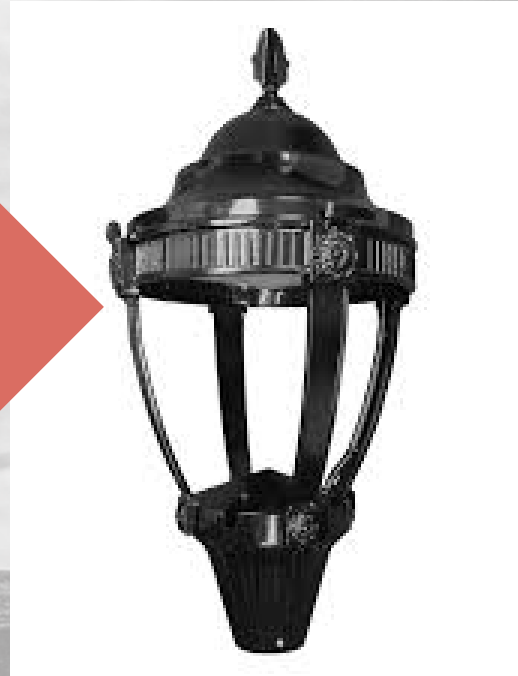
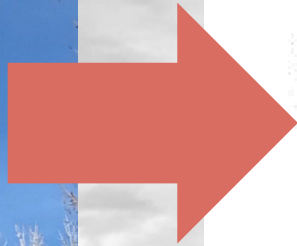
**Industrial**



CRESTONE

**SALIDA - DARK SKIES INITIATIVES**

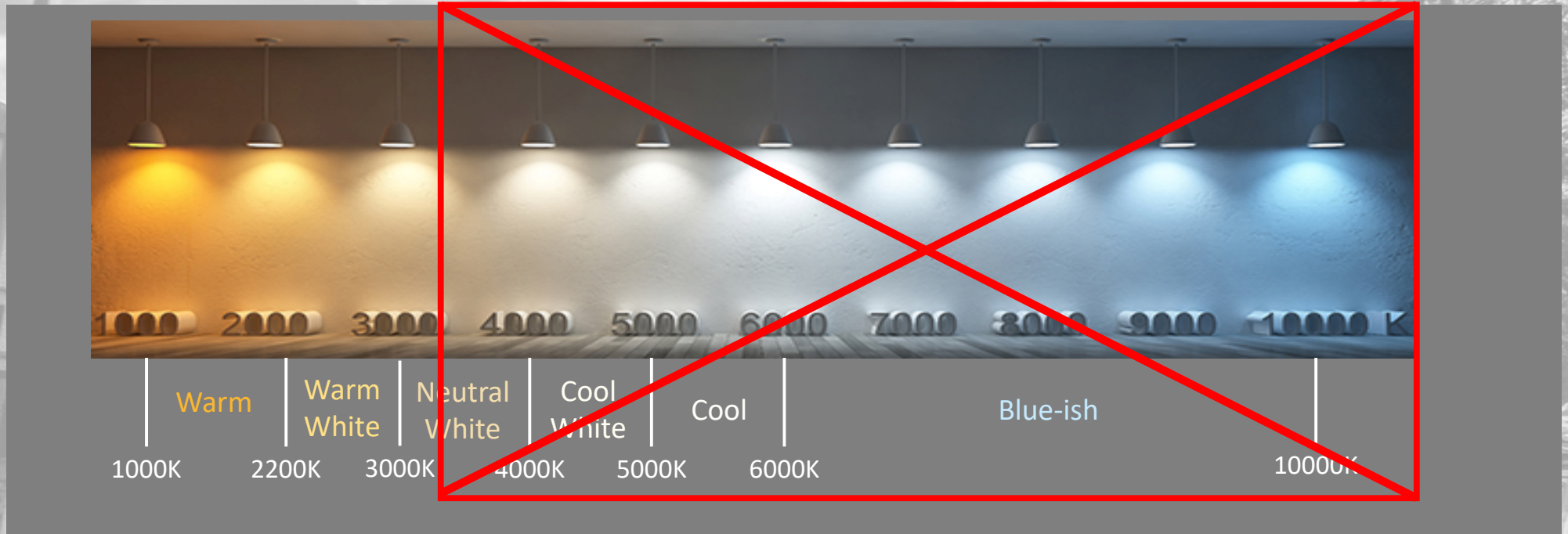
## FULLY SHIELDED LIGHTING



Historic Pedestrian

SALIDA - DARK SKIES INITIATIVES

COLOR & SPECTRUM: WARM LIGHT  $\leq 3000\text{K}$



SALIDA - DARK SKIES INITIATIVES

## LIGHTING WARRANTS: LIGHT **ONLY WHERE NEEDED**

Road Classification	Adjacent Land Use	High Pedestrian Conflict Area	Medium Pedestrian Conflict Area	Low Pedestrian Conflict Area
Arterial	Commercial	Continuous	Continuous	Non-Continuous
	Industrial	Continuous	Continuous	Non-Continuous
	Residential	Continuous	Non-Continuous	Non-Continuous
	Open Space	Continuous	Non-Continuous	Non-Continuous
Collector	Commercial	Continuous	Continuous	Non-Continuous
	Industrial	Continuous	Continuous	Non-Continuous
	Residential	Continuous	Non-Continuous	Non-Continuous
	Open Space	Non-Continuous	Non-Continuous	Not Warranted
Local	Commercial	Continuous	Non-Continuous	Non-Continuous
	Industrial	Continuous	Non-Continuous	Non-Continuous
	Residential	Non-Continuous	Non-Continuous	Non-Continuous
	Open Space	Non-Continuous	Non-Continuous	Not Warranted

**SALIDA - DARK SKIES INITIATIVES**

# ADAPTIVE LIGHTING CONTROLS: LIGHT **ONLY WHEN NEEDED**



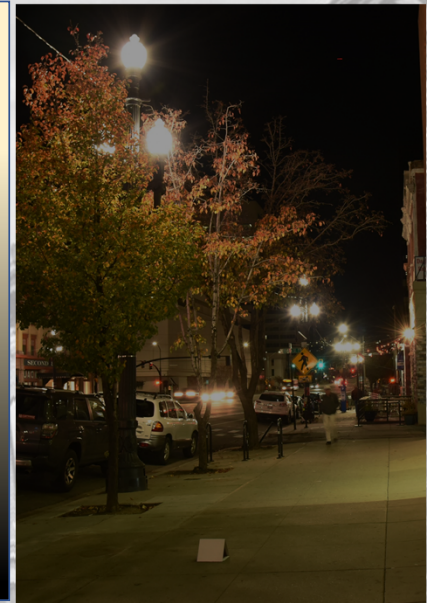
**Dusk to 10pm**  
Light to Criteria



**10pm to 12am**  
Reduce Pedestrian  
Criteria



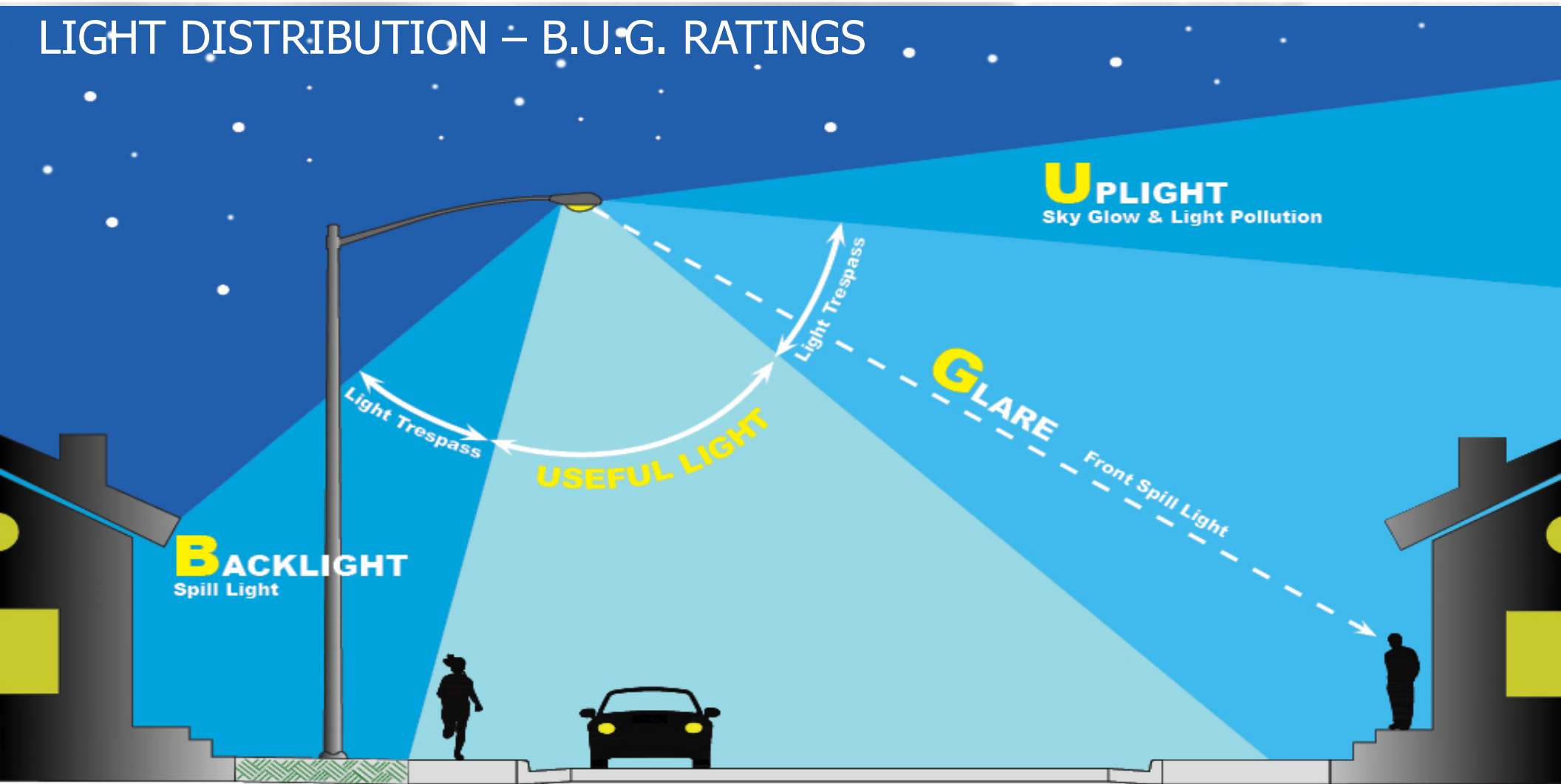
**12am to 2am**  
Light to Criteria



**2am to Dawn**  
Reduce to Low Ped  
Criteria

**SALIDA - DARK SKIES INITIATIVES**

## LIGHT DISTRIBUTION – B.U.G. RATINGS



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## ILLUMINATED SIGNAGE



Luminance  $\leq 100$  cd/m<sup>2</sup>  
Operation: Extinguish After Closing  
Size  $\leq 200$  sqft

SALIDA - DARK SKIES INITIATIVES

# SPORTS LIGHTING



SALIDA - DARK SKIES INITIATIVES

# CERTIFIED INTERNATIONAL DARK SKY COMMUNITY

- 
- 1 Dark Sky Lighting Policy**  
Public: Lighting & Street Lighting Guideline  
Private: Lighting Ordinance
  - 2 Community Commitment**  
Public Lighting: 5-Year Plan  
Private: Municipal Support & Education
  - 3 Broad Support**  
Utility, HOAs, Retailers, Community Orgs
  - 4 Dark Sky Education**  
Awareness Events, Documents, School Curriculum
  - 5 Demonstrated Success**  
# of Projects, Demonstrate Effective Policy
  - 6 Measurement Program**  
Sky Brightness Measurement
  - 7 Dark Sky Community Sign**  
Once Established, Install Signage

SALIDA - DARK SKIES INITIATIVES

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QUESTIONS?

CLANTON & ASSOCIATES



THANK YOU!

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