

# City of Santa Fe LED Conversion Project



Community-Guided Lighting Design Working Group  
Tuesday April 13, 2021

# Lighting Design Working Group Context

- Assembled with guidance for balance and equity
- Understand lighting design parameters
- Articulate community goals and needs
- Marry goals and needs with requirements
- Participate in Demonstrations
- Review Lighting Design

## City of Santa Fe Outdoor Lighting Code - (Ord. No. 2011-37 § 10)

**“Reduce light pollution, reduce or prevent glare, reduce or prevent light trespass, conserve energy, promote a sense of safety and security, and ensure aesthetically appropriate outdoor lighting in keeping with the character of Santa Fe.”**

The objective of this meeting is to prioritize the requirements set forth by the City Ordinance.

# Lighting Design Terminology

Lumens: measure of lighting output, measure of brightness

Color temperature: measured in Kelvins, warm or cool tone of the light

Wattage: unit of measurement for energy consumption

Efficacy: lumens (amount of light) per watt (amount of energy) ~ similar to miles per gallon

Cut off: design which allows or prevents light to go above the horizontal plane of the fixture (“full cut off” is considered dark-sky friendly)

Shielding: small piece of equipment installed on a street light to further prevent light trespass

# Project Motivation

- High failure rate and long repair times
- Confusing customer service
- Double energy use
- High cost for electricity and maintenance
- Failure to meet safety regulations and dark-sky regulations
- Excessive fugitive light affecting quality of life and dark sky

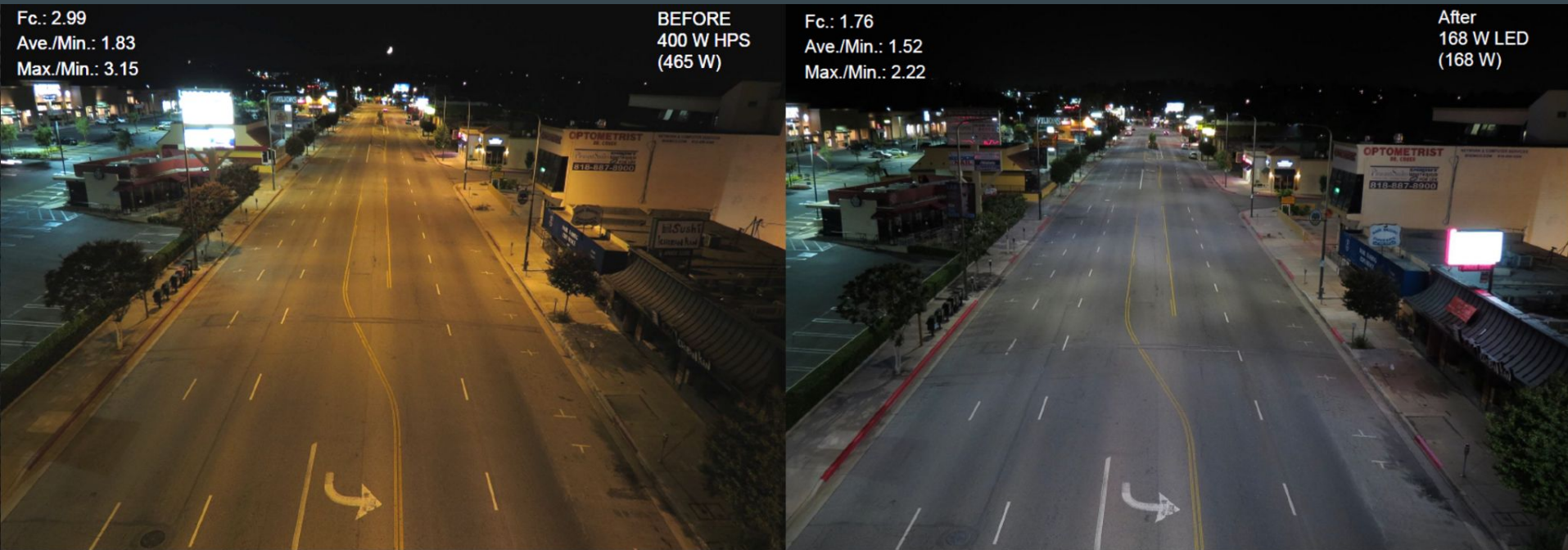


# Centralized Maintenance Management

- Online problem reporting and customer service hotline
- Routine repairs within 5 days – faster if more than 1 light
- Automatic detection of failures
- Reporting and accountability for repairs, reliability and energy use through dedicated company
- Accurate inventory, consistent fixture types
- Safety improved with more reliable lighting



# Environmental Considerations



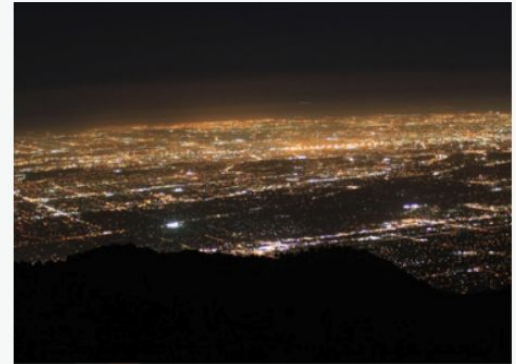
- Energy saved since LEDs use less energy for same lumens 400w HPS vs 168W LED
- Dimming capability further reduces energy consumption
- Progress on City goal of carbon neutrality by 2040
- LEED Cities points toward Platinum

# Night Sky

- New fixtures being evaluated will exceed state and local dark sky code
- Goal to be Dark Sky Designated Community - current fixtures disqualify the city
- Full cutoff fixtures guarantee zero uplight
- Preserve character of Santa Fe



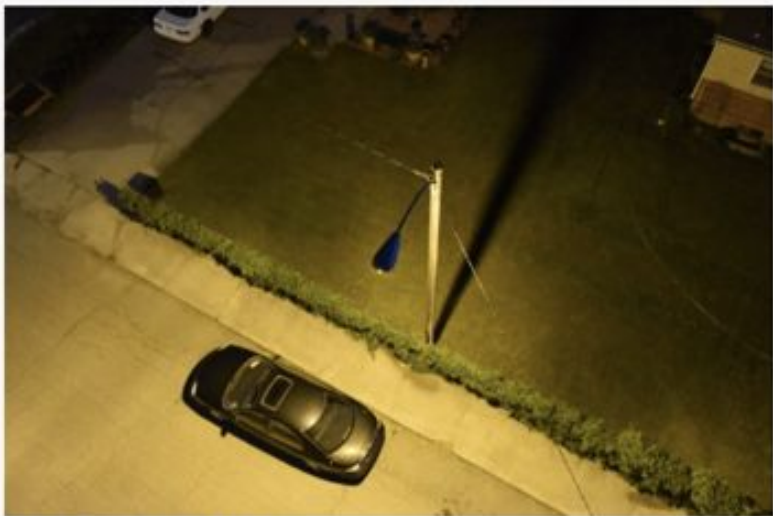
View from Mt. Wilson before LED Retrofit Project  
(Los Angeles Basin, 2008)



View from Mt. Wilson after LED Retrofit Project  
(Los Angeles Basin, 2012)

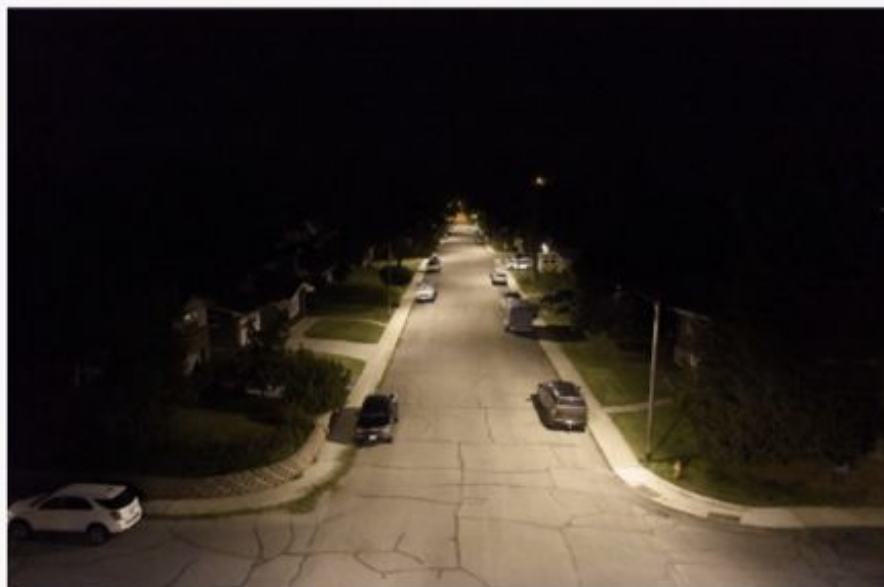


# Lights shine on street, not into homes



**Stoddard St. HPS #1**

HPS fixture with more back light than ideal.



**Fairview Ave. LED #2**

- Restrict backlight to sidewalk only
- Additional shielding options available for any resident at no additional cost

# Upgrade Project Requirements

- Minimum of 50% energy reduction
- Meet or exceed New Mexico Dark Sky Protection Act
- Meet minimum Roadway Lighting Levels established by ANSI IES RP-8-18
  - Achieves lighting standard with existing lighting poles
- Meet PRC performance requirements for replacement equipment
- First energy-savings payment due on loan in December 2021

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# Community-Guided Lighting Design Process

- Website with education, feedback form
- Engage Neighbors
- Share information, demonstrations and gather feedback
- Analyze options and tradeoffs
- Ensure regulatory compliance
- Governing Body approval of final design

# Discuss priorities and arrive at Top 3-5 criteria

“Reduce light pollution, reduce or prevent glare, reduce or prevent light trespass, conserve energy, promote a sense of safety and security, and ensure aesthetically appropriate outdoor lighting in keeping with the character of Santa Fe.”

Examples:

- Balance energy consumption, color temperature, brightness, and shielding to reduce overall light pollution
- Lowest lumen output possible that meets specification and feels safe
- Capture energy savings needed to pay for project
- Maximum shielding that meet specification

Meets specification = Energy Usage + Regulatory Compliance + Cost + City Code Compliance