

Palomar Observatory Night Sky Brightness Program Part 2

Approach

Dan McKenna Palomar Observatory





Demonstration Area Tours!

Pick a Date and Join Us
November 10, 14, 29 or December 7

The Regional Streetlight Program is helping jurisdictions in Western Riverside County purchase 63,000 Southern California Edison-owned streetlights, and retrofit them with energy-efficient technologies, saving local governments millions in operating and utility costs!

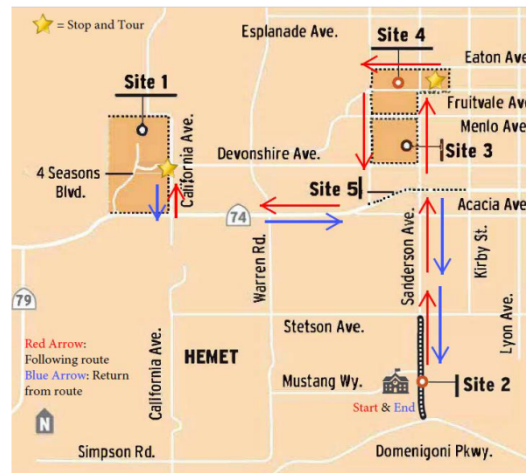
Visit Our Website

Download Streetlight Program FAQs

Take a Tour!

RSVP for one of the tours (they're all the same) to see the streetlights installed in our Demonstration Areas. Tours are about 2 hours and showcase lighting characteristics of LEDs and how they can offer lower energy costs, enhanced public safety, and minimized light pollution.

During each tour attendees will be guided through the Demonstration Areas and have the chance to assess various LED lighting scenarios on public roadways and in residential and commercial areas. Bus transportation is provided during the tour, but some walking is involved.



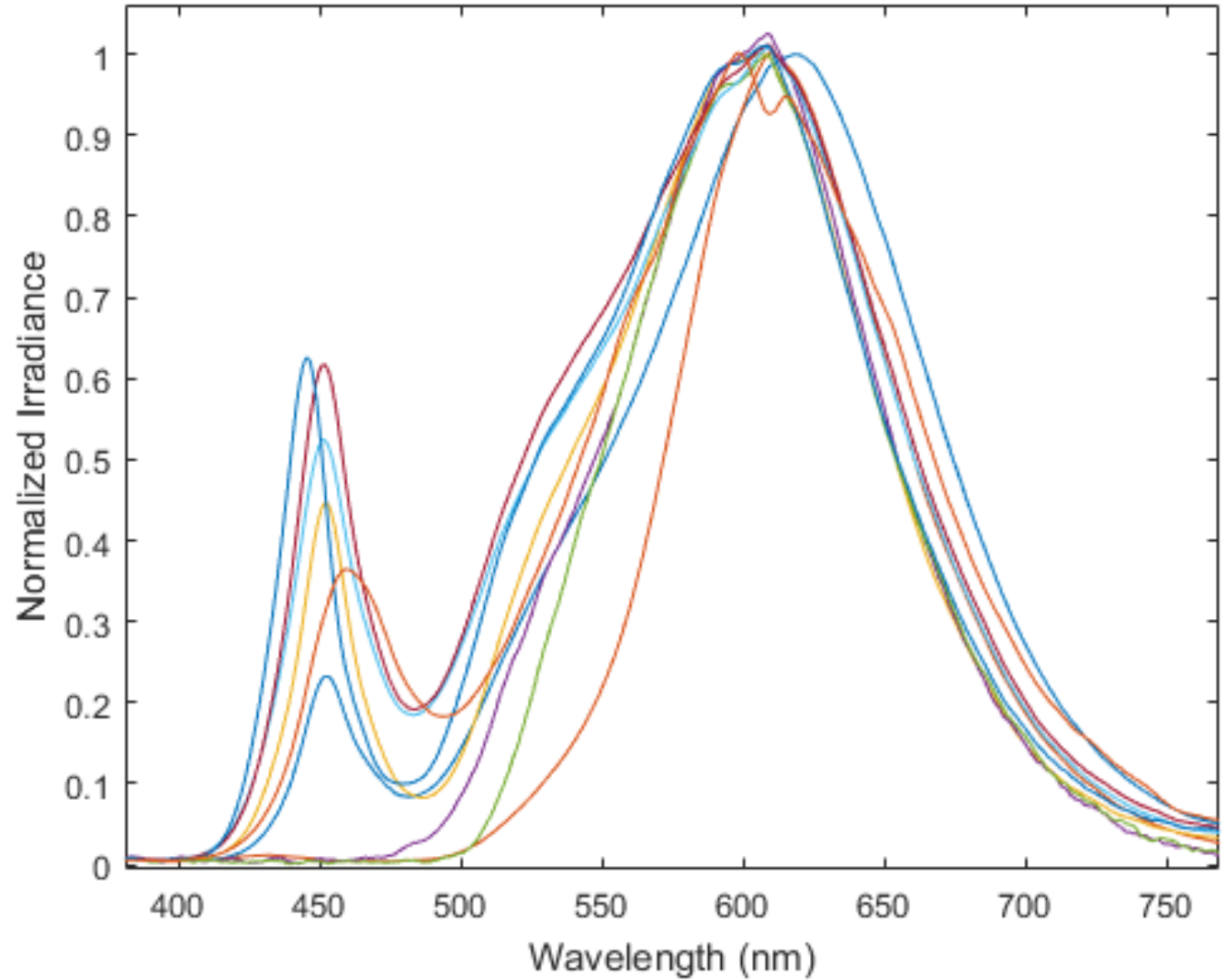
Location	West Valley High School, 3401 Mustang Way, Hemet, CA, 92545
	*Parking lot on Mustang Way and S. Sanderson Ave.

WRCOG is seeking input

- 4 public transit based night tours (Bus)
- Governments, Public, and Agencies invited
- Tour includes a survey to rate each stop, 9 street scenes total
- LEDs under 3,000K and some blue suppressed
- Palomar worked with WRCOG and Lighting engineers

LED Spectra

All poles measured Hemet 09/18/2016



Oceanside California

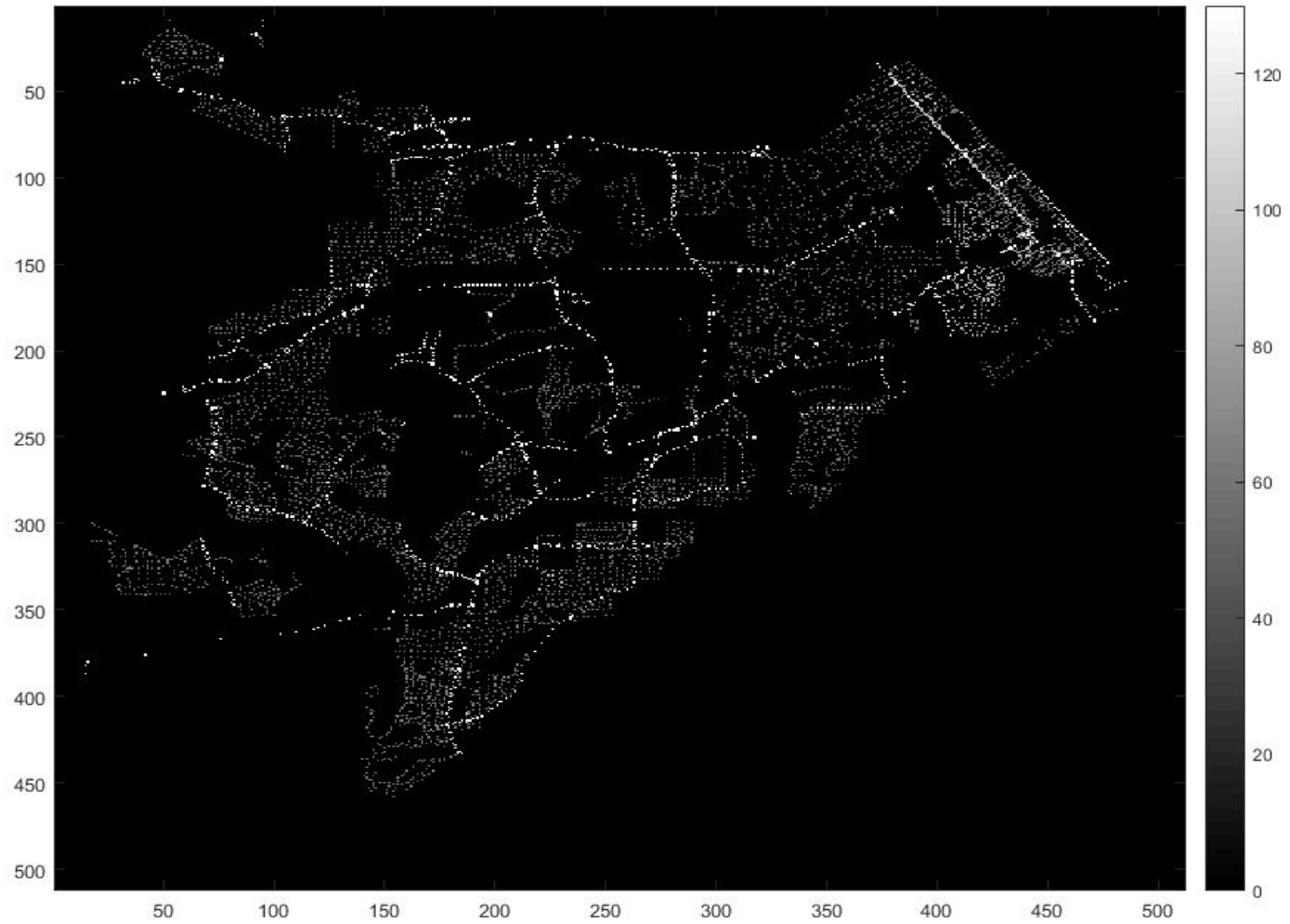
- Mixture of residential, light industry, military, and recreation.
- Discovered that dimming streetlights saves money
- Will allow reasonable experiments to be performed with streetlights



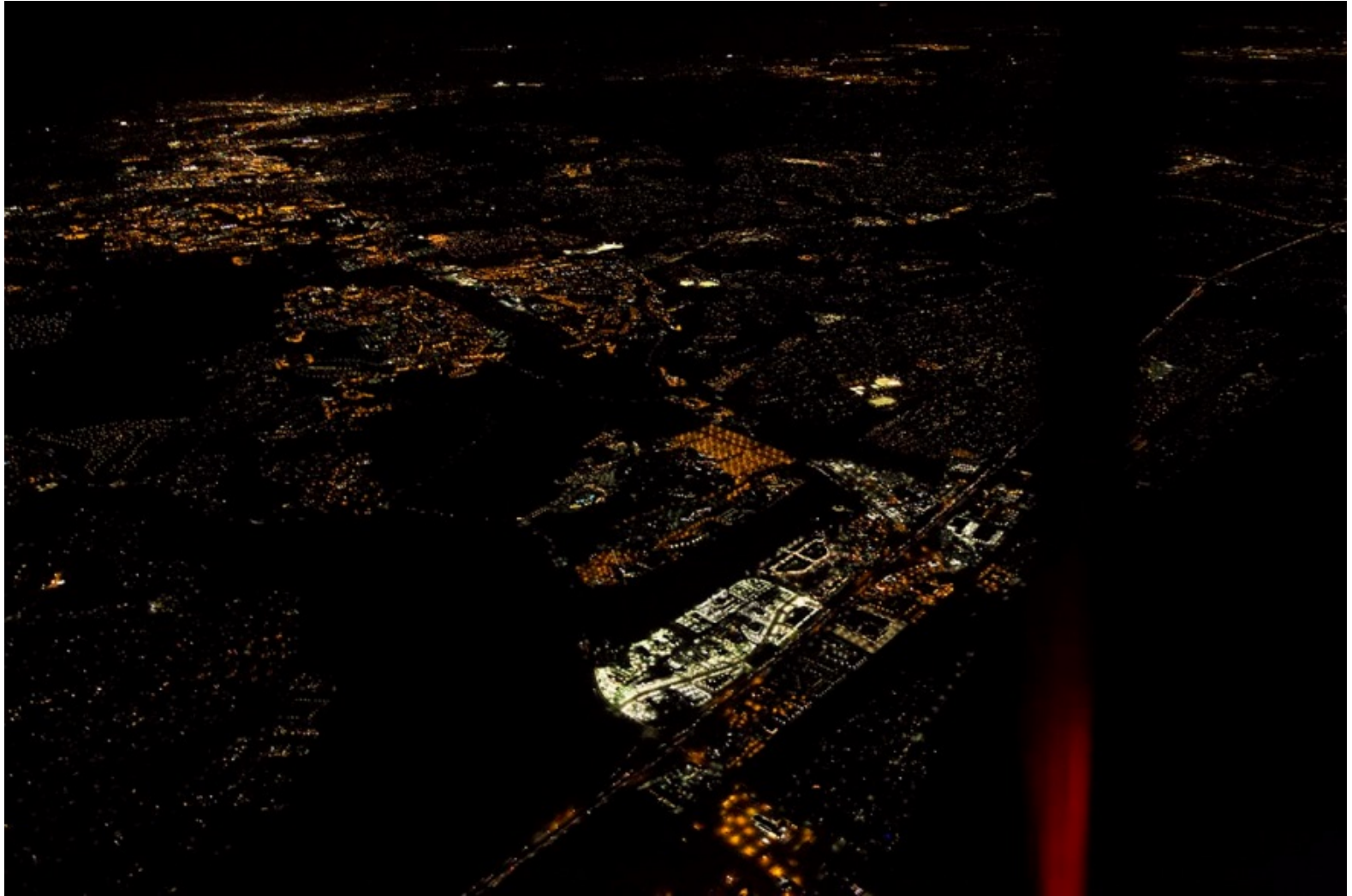
Photomapping in RAW mode



Oceanside Streetlight map



Commercial Vs Residence



Role of Palomar Observatory

- Palomar Observatory is an Icon of U.S. science and industry
- New detector technology produces surveys 100's of times more productive than with photographic plates
- Partnerships continue to develop cutting edge programs
- Observatory Outreach and Docent Organization effective in communicating the importance of astronomy and Palomar to the public

The notion of your team

We suggest that Palomar Observatory competes on an international level in Astronomy and not only represents the U.S. but all involved with our efforts. Cooperation in the effort to reduce sky brightness makes for a larger partnership and fosters interest and support from Cities and the Public. Palomar then becomes "The Team" that plays for the supporters.

Lessons learned

- Perception of brightness is non-linear yet thinking is. Sky brightness is better received in linear units such as brightness relative to a pristine sky.
- City managers and government officials are more receptive to measurements than theory and not all are impressed by the fit to theoretical models.

- The public does not always want change and some prefer sodium vapor as it is what they know.
- Most interviewed have experienced cars at night that have the ultra blue headlights and feel that **blue is bad** at night
- Streetlights are but only a part of the nightscape, commercial and recreation lighting have a significant sky glow component
- The term Light pollution seems to be polarizing and artificial night sky glow is a little better

Closing Thoughts

- Younger generations may not care about what they never experienced. (dark sky)
- We urge the adoption of aggressive cutoff angles, low color temperature, blue suppressed, dimmable lighting
- Centrally controlled, dimmable lighting allows cities to enhance safety by using light brightness to signal safety concerns such as detours, traffic jams, amber alerts and evacuation routes
- Dimming lights saves money and maintenance. I call it the “Money Knob”

Law enforcement and commercial security

It is the change of light level that gets peoples attention. Dimming lights creates the ability to brighten a scene when needed and that will cause people in the area to change their awareness. This may be effective in combination with motion sensing so that an area like a car lot may accept operating at an average lower night brightness level.

Mood lighting

Property values may be influenced by the appearance of an area at night. Lower color temperatures, controlled beam patterns can be combined to enhance the night appearance and desirability of real estate and, enhance the attractiveness of storefront lighting.