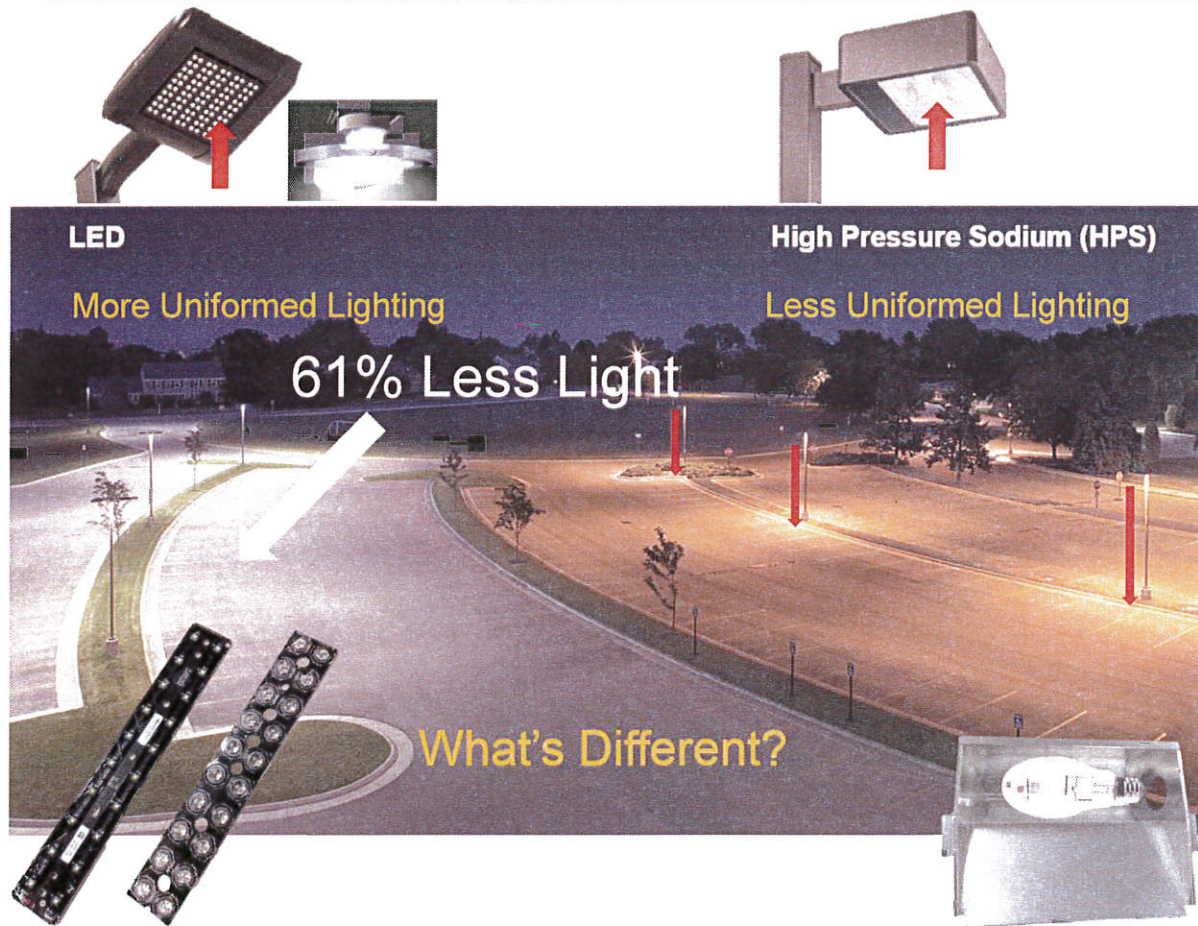


Optical Control

12



City of Los Angeles



Stokes Loss and Its Economic Impact on Source Color

16

Today



Example: 70W HPS (~ 86 System Watts)
4000K LED Replacement ~ 26W / 3000K LED Replacement ~28W

Some products provide nearly the same high efficacy (Lumens Per Watt) in warmer source colors (4000K or 3000K).

Economics No Longer Needs to Dictate Source Color Selection

Human & Environmental Effects of LED Community Lighting

17



Doctors issue warning about LED streetlights

THE CONVERSATION By Richard C. "Bugs" Stevens, The Conversation
Updated 2:11 PM ET, Tue June 21, 2016



REPORT OF THE COUNCIL ON SCIENCE AND PUBLIC HEALTH

CSAPH Report 2-A-16

Subject: Human and Environmental Effects of Light Emitting Diode (LED) Community Lighting

Presented by: Louis J. Kraus, MD, Chair

Referred to: Reference Committee E
(Theodore Zanker, MD, Chair)

1 INTRODUCTION

2
3 With the advent of highly efficient and bright light emitting diode (LED) lighting, strong economic
4 arguments exist to overhaul the street lighting of U.S. roadways.^{1,2} Valid and compelling reasons
5 driving the conversion from conventional lighting include the inherent energy efficiency and longer
6 lamp life of LED lighting, leading to savings in energy use and reduced operating costs, including
7 taxes and maintenance, as well as lower air pollution burden from reduced reliance on fossil-based
8 carbon fuels.
9

RECOMMENDATIONS

The Council on Science and Public Health recommends that the following statements be adopted, and the remainder of the report filed.

1. That our American Medical Association (AMA) support the proper conversion to community-based Light Emitting Diode (LED) lighting, which reduces energy consumption and decreases the use of fossil fuels. (New HOD Policy)
2. That our AMA encourage minimizing and controlling blue-rich environmental lighting by using the lowest emission of blue light possible to reduce glare. (New HOD Policy)
3. That our AMA encourage the use of 3000K or lower lighting for outdoor installations such as roadways. All LED lighting should be properly shielded to minimize glare and detrimental human and environmental effects, and consideration should be given to utilize the ability of LED lighting to be dimmed for off-peak time periods. (New HOD Policy) **June 14, 2016**

Lighting Preferences and Needs Can Be As Different As Night and Day

27



Preferred Choices

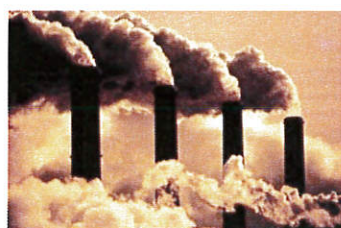
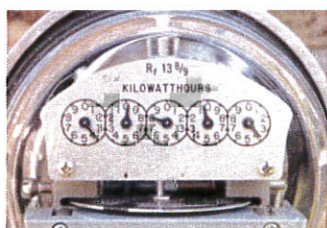


2700K

3000K

Known Benefits – Case Study: City of Los Angeles, CA (2009 – 2017)

31



- 64% Energy Savings
- 62K MT Annual CO2 Reduction
- \$9.3M in Annual Energy Savings

~\$2.5M
Maintenance Savings

City of Los Angeles
Department of Public Works
Bureau of Street Lighting
January 10, 2017

LADWP Energy Efficiency Program
Year Savings by Control Device - December 2016 Month Progress

Control Device	2009 Savings (\$/yr)	2010 Savings (\$/yr)	2011 Savings (\$/yr)	2012 Savings (\$/yr)	2013 Savings (\$/yr)	2014 Savings (\$/yr)	2015 Savings (\$/yr)	2016 Savings (\$/yr)	2017 Savings (\$/yr)
LED	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100
...	...	...	...	...	...	...	...	...	...
Total	173,634	173,634	173,634	173,634	173,634	173,634	173,634	173,634	173,634

Source: Los Angeles Bureau of Street Lighting



173,634 LED Street Lights



Night Crime Statistics (7 P.M. to 7 A.M.)

	2009	2011
VEHICLE THEFT	15,778	13,632
BURGLARY/ROBBERY/THEFT	19,967	18,406
VANDALISM	11,115	9,906

10.5% Reduction in Burglary and Theft



- 1,000 Public Chargers installed in the city, including 100 on city property
- Over the next five years, LADWP is aiming for over 10,000 chargers installed, including 1,000 on city property