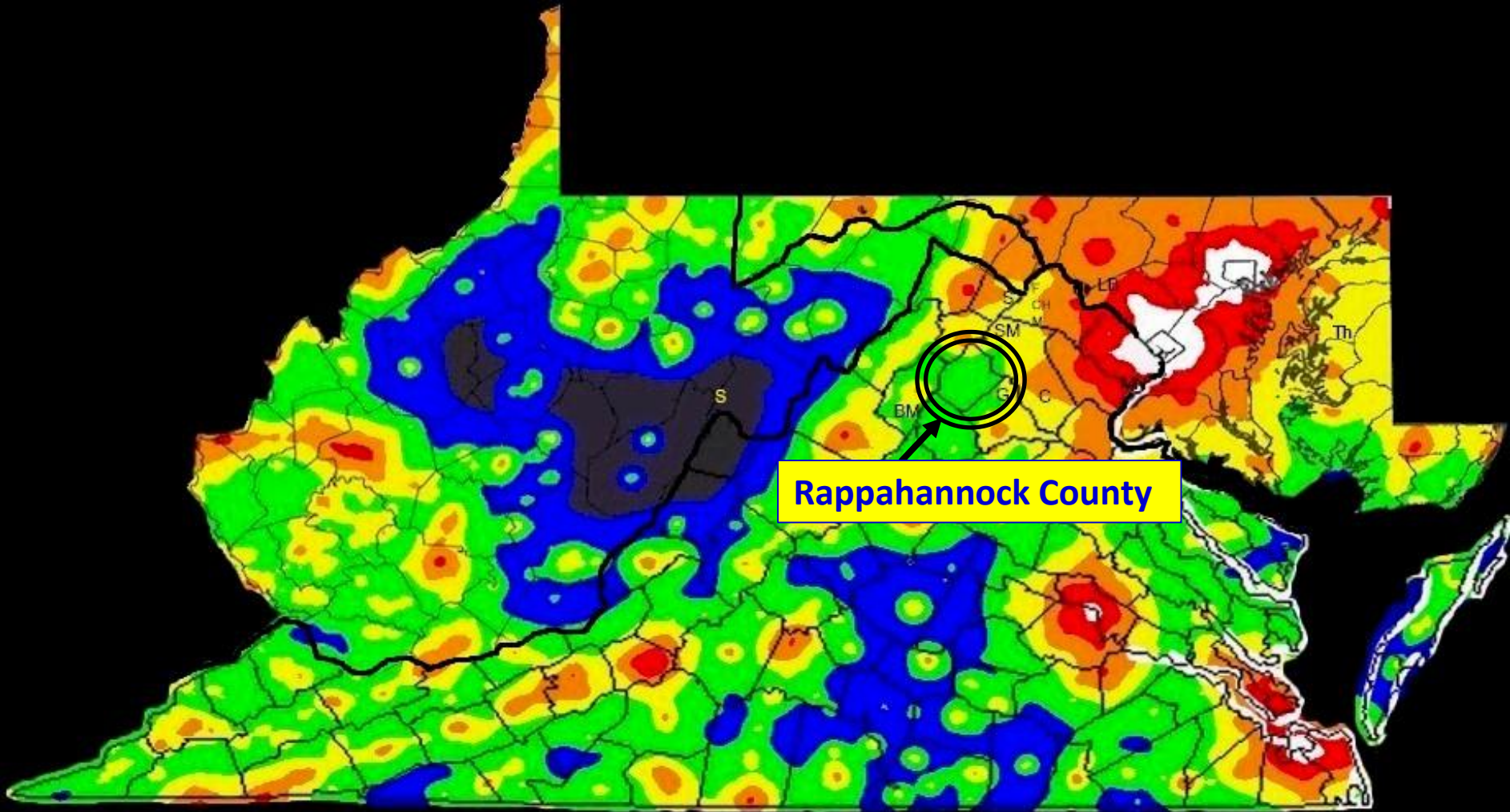


Why Smart Outdoor Lighting Matters

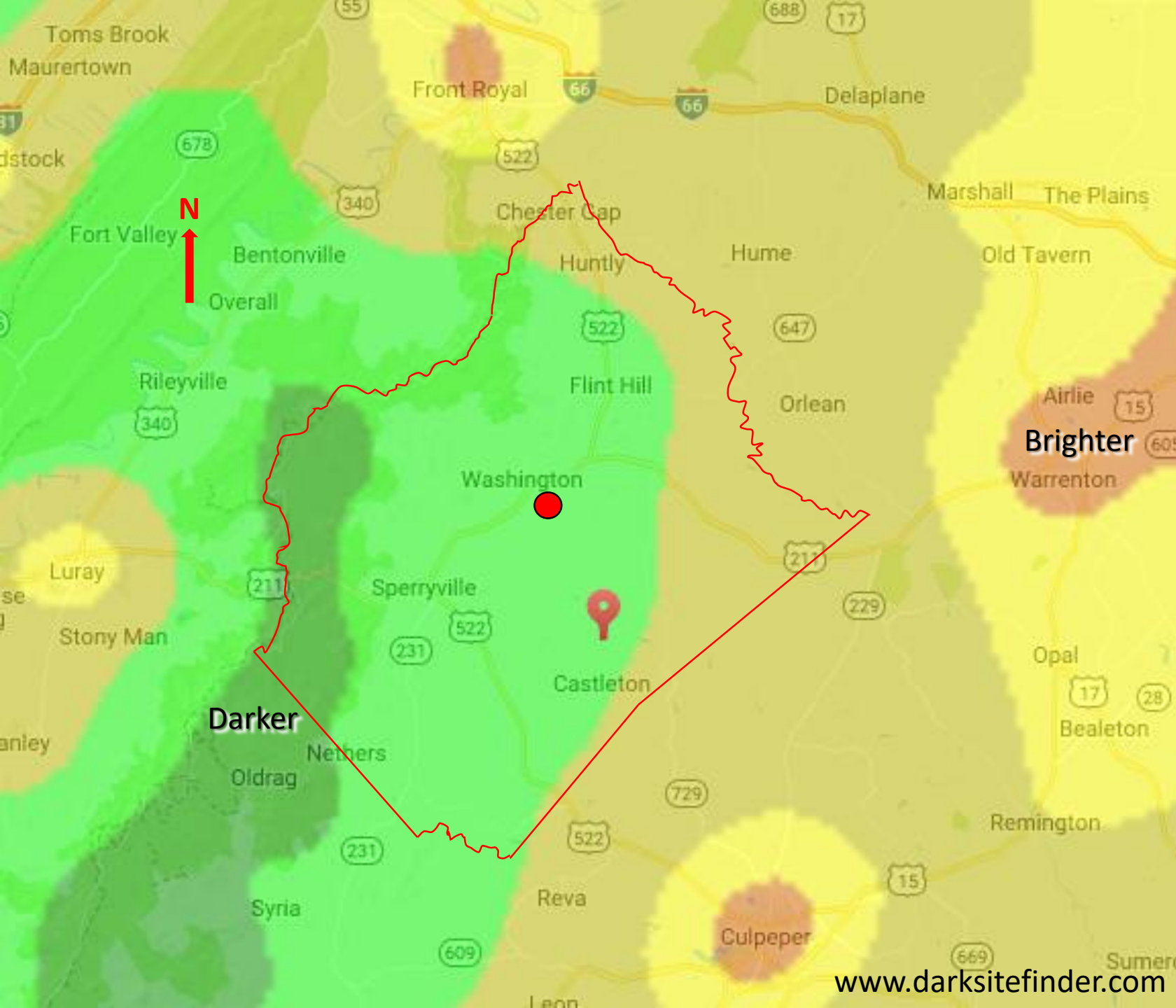
RLEP

14 April 2018

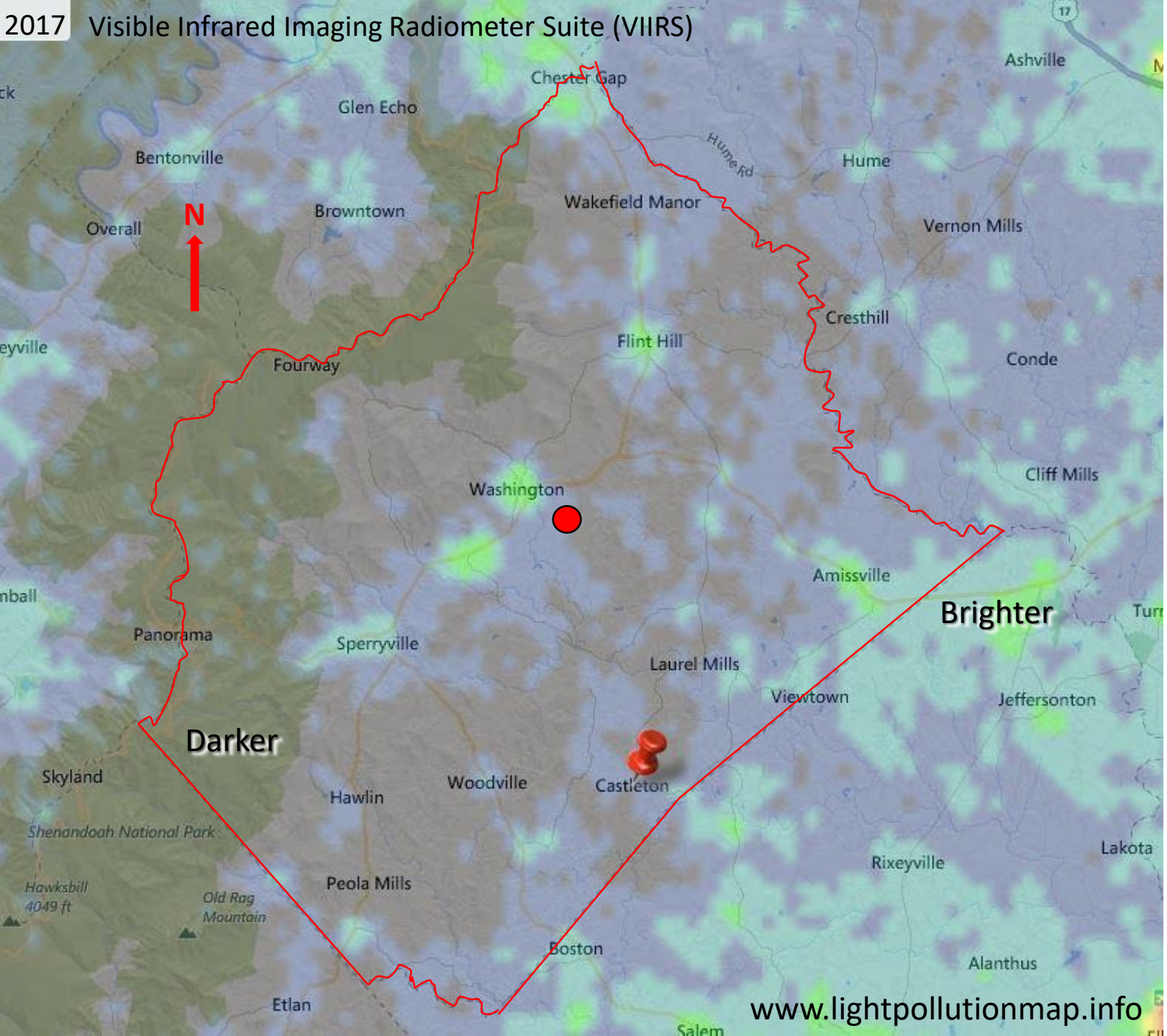
Where Are You?



**Light Pollution Map with Rappahannock County Highlighted
(dark, but not as dark as parts of West Virginia)**



Dark Skies Map of Rapp. County



Dark Skies Map of Rapp. County



LIGHT POLLUTION LEVEL - 3
CRATER LAKE NATIONAL PARK, OR

LIGHT POLLUTION LEVEL - 4
PIGEON POINT LIGHTHOUSE, CA

Rappahannock skies
range between
Bortle Class 3 (rural)
and
Bortle Class 4
(rural/suburban
transition)

Video clip
“Lost in Light” by Sriram Murali

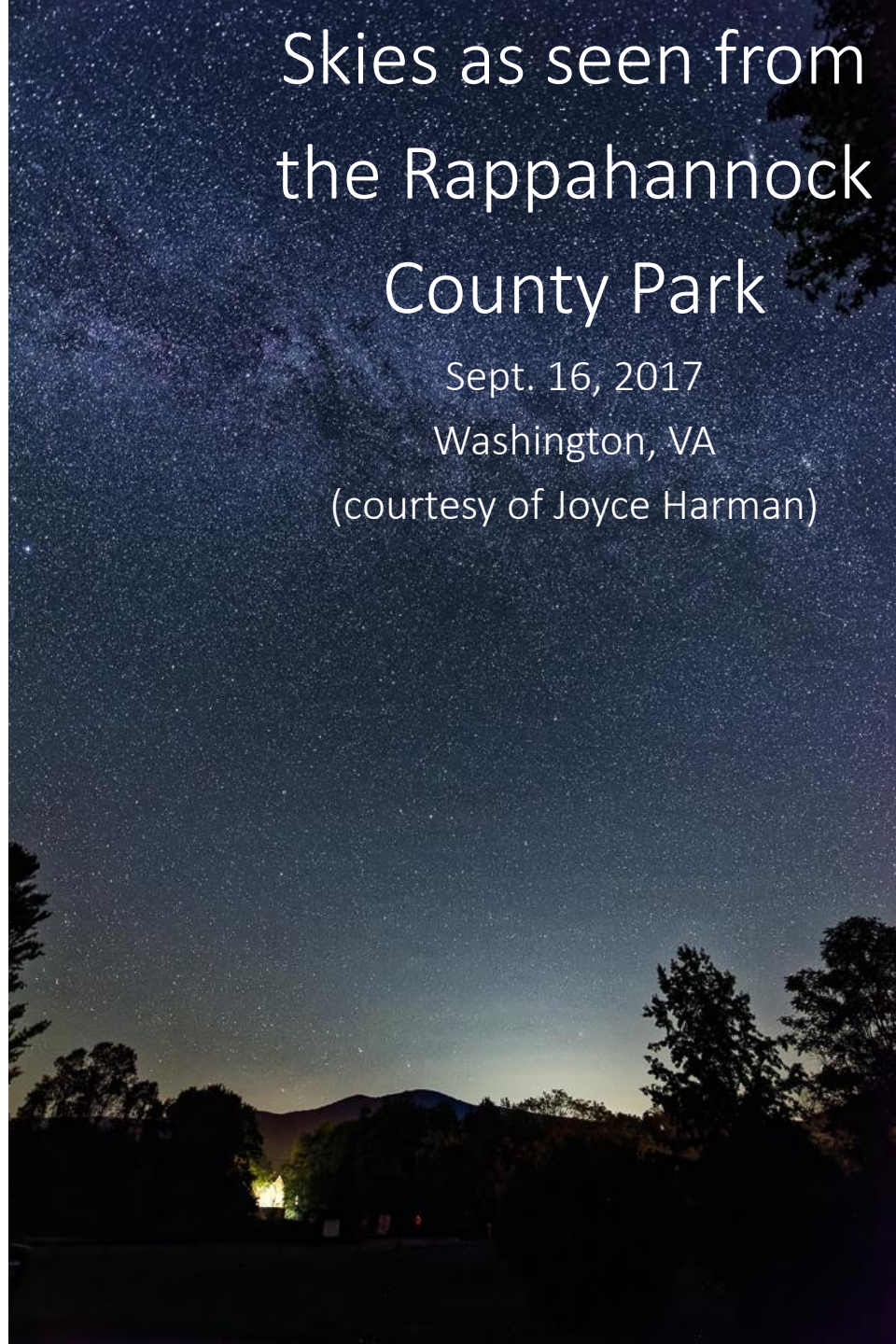


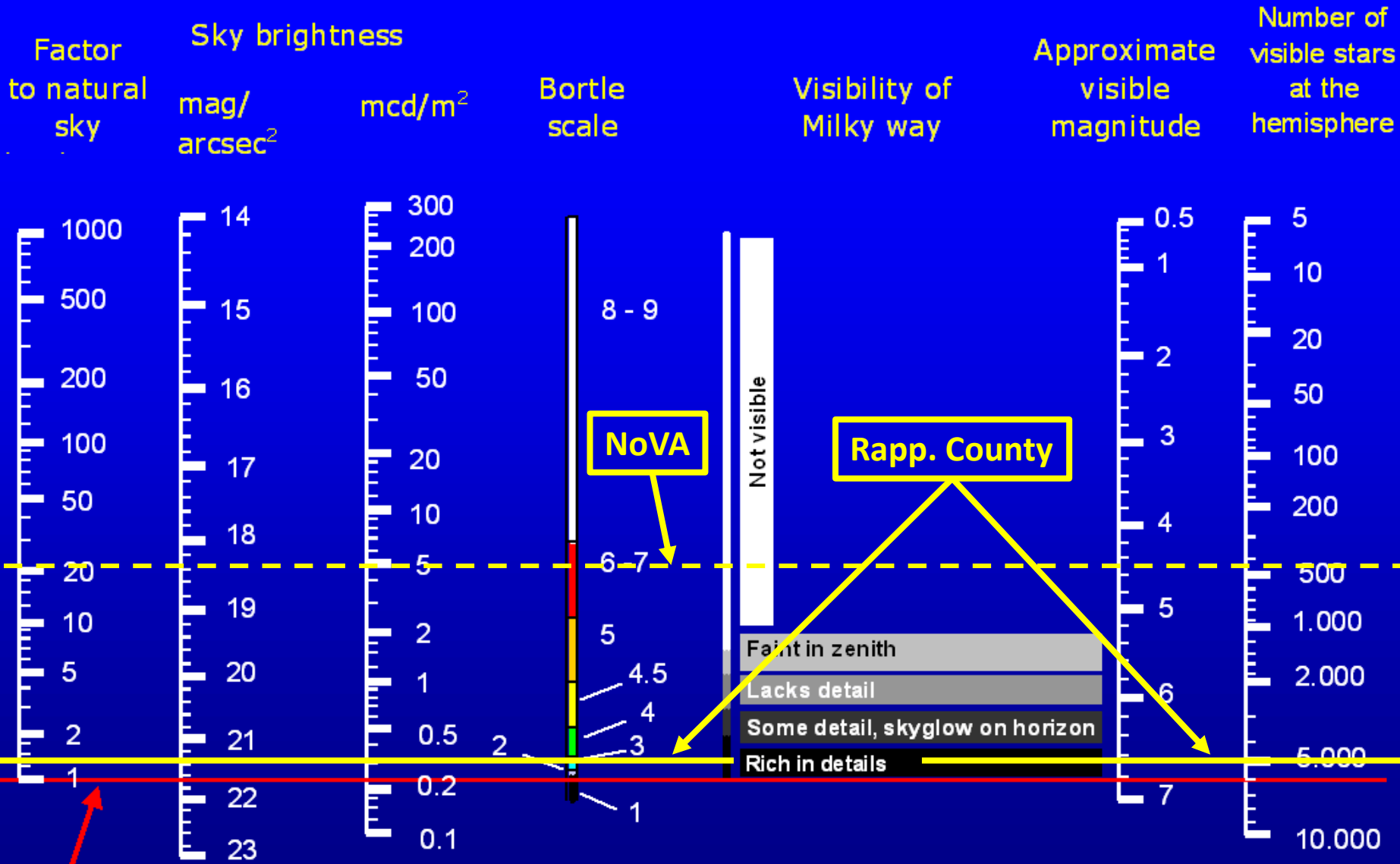
Skies as seen from the Rappahannock County Park

Sept. 16, 2017

Washington, VA

(courtesy of Joyce Harman)





NoVA

Rapp. County

Natural unpolluted starry sky

Rapp. skies are quite dark allowing view of about 5000 stars

LIFE

5:28 P.M., NOV. 9th
THE LIGHTS
WENT
OUT



In view looking east from Times Square during blackout, moon reflects in windows of Green Carbine Building

NOVEMBER 19 - 1965 - 354

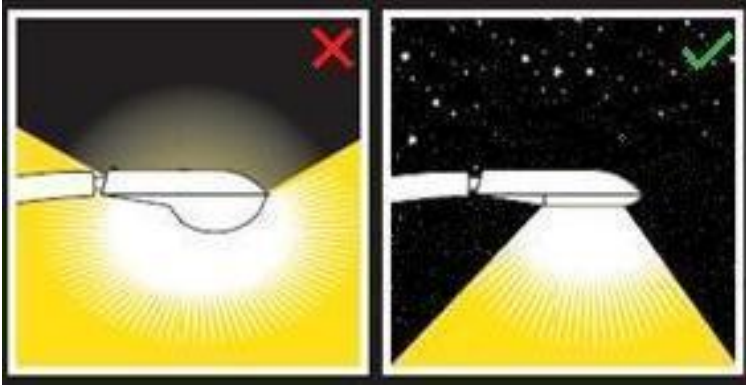
Blackouts of 1965 and 2003 (not what we want!)



Todd Carlson: Ontario, Canada (2003)

Video clip
New York City Without Light Pollution
Skyglow Project

Fully Shielded: Targeted, Efficient, Safe

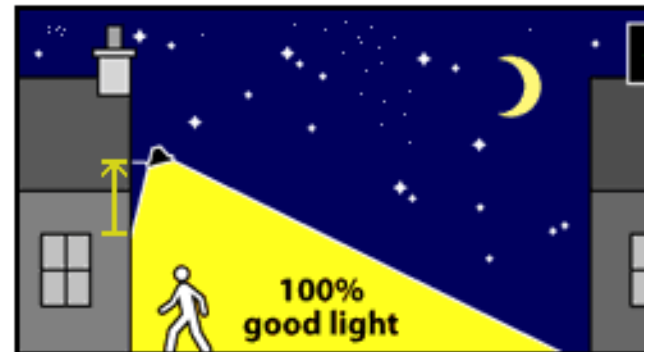


No light above the horizontal
Reduces sky glow, see stars
Reduces light trespass



BADLY AIMED 500W HALOGEN FLOODLIGHT

Directs light power to desired areas
Better coverage for safety, security
Allows lower wattage lighting (\$\$)



WELL AIMED 100W FLOODLIGHT

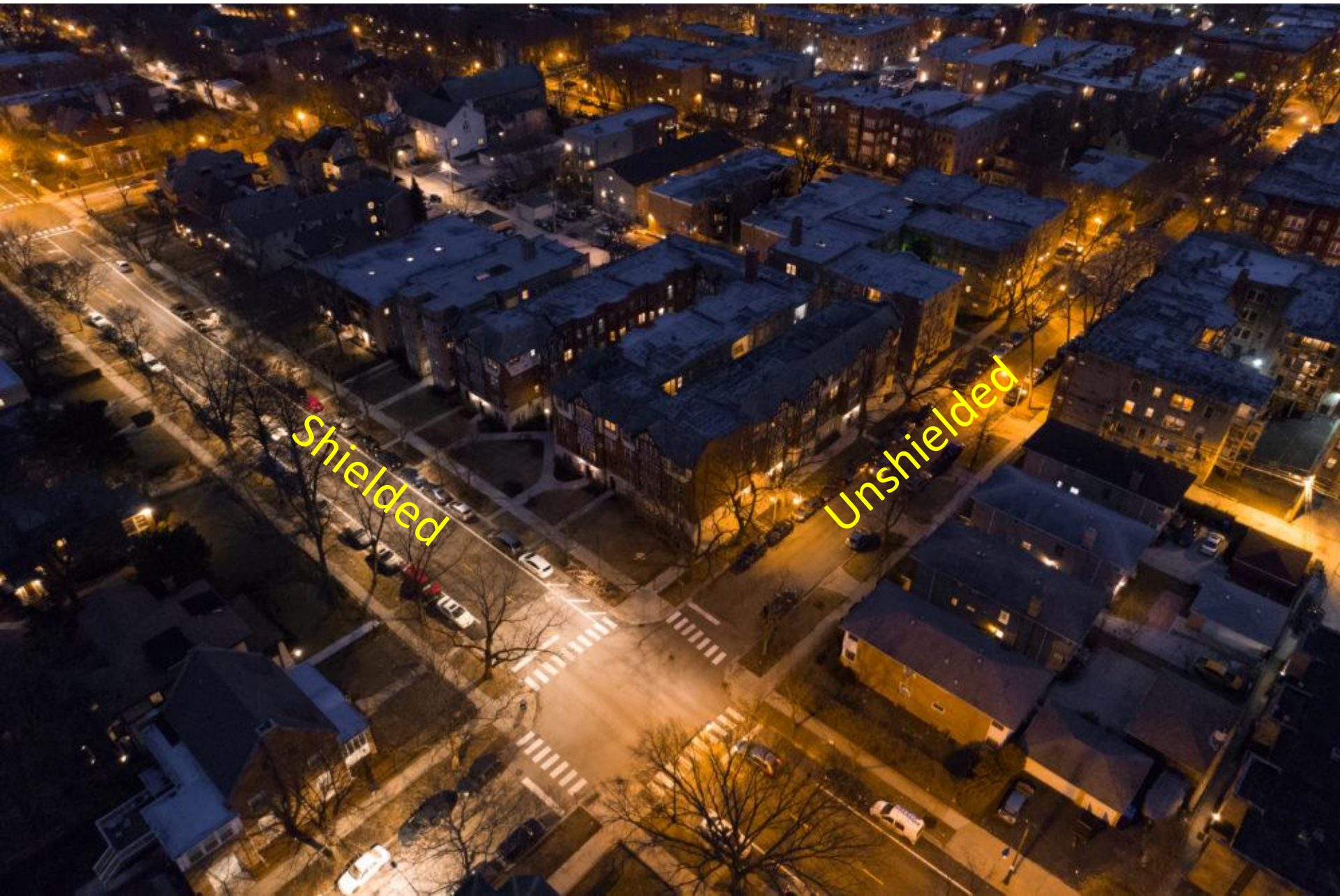


Glare hides
the intruder

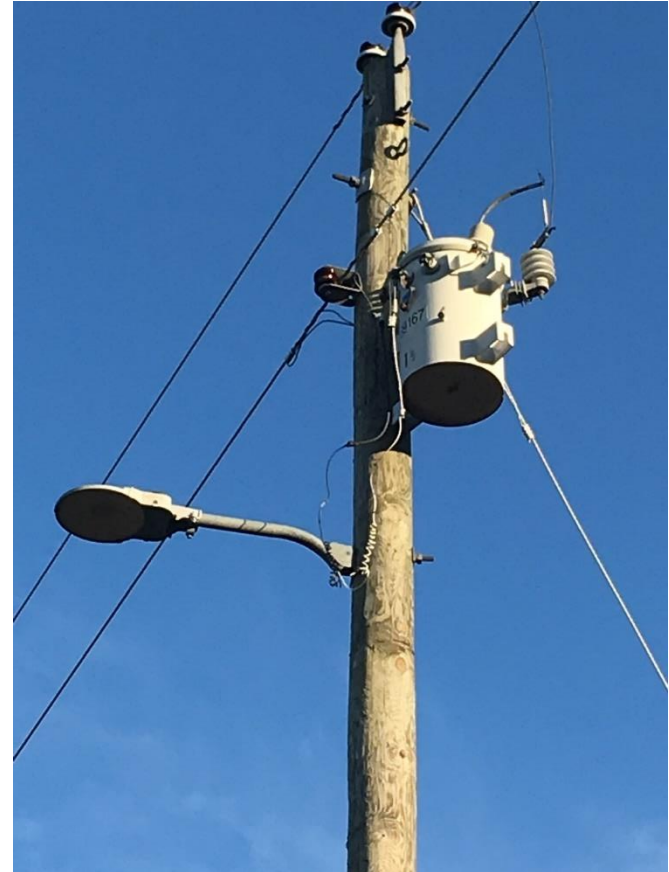
More is not
always better



Chicago: Reducing Glare and Sky Glow



Unshielded vs. Fully Shielded Fixtures



Additional Shielding is Available



Light trespass above and below horizontal



Shield orientation is adjustable

How Shielding Limits Light Trespass



Light trespass illuminates yard



Shield blocks light trespass

Light Color is Important

6000K LED

3000K LED



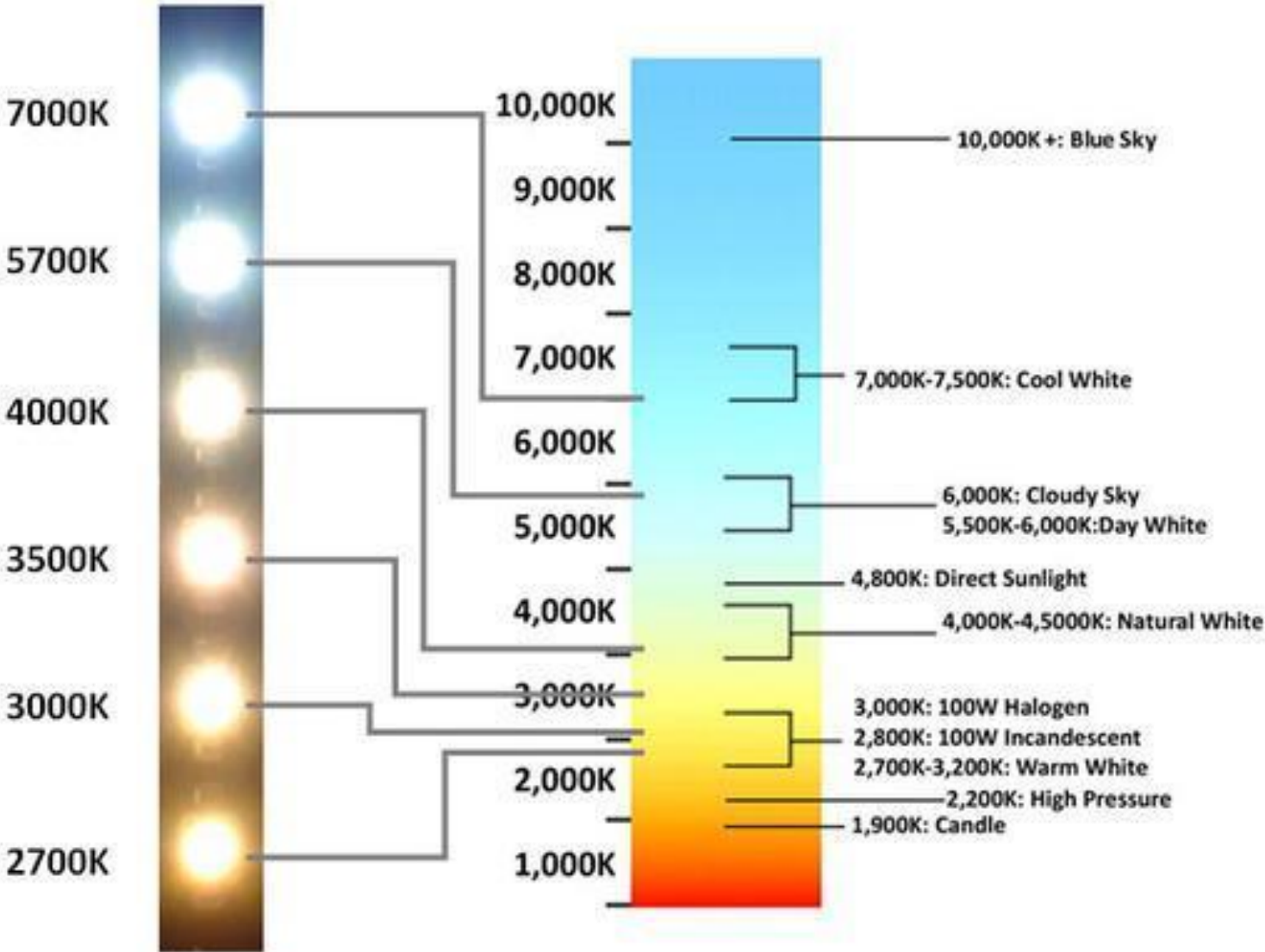
Light Color is Important

- Bright white lights contain a high proportion of blue light that makes it difficult for the eyes to focus
 - Shorter wavelength, light scatters inside eyes
 - Eyestrain and loss of night vision (disability glare)
 - Aging eyes especially vulnerable
- Bright white light from unshielded lights can affect the human circadian (24-hour) rhythm
 - Leads to no dark downtime
 - Disrupts brain wave patterns, hormone (melatonin) production and cell regulation
 - Can lead to insomnia, depression, cancer, diabetes and cardio-vascular disease
- Causes disoriented animal behavior
 - Foraging habits, reproduction, vulnerability to predators

Light Color at or Below 3000K is Preferred

Basic LED Reference Example

Kelvin Color Temperature Scale Chart



Lighting Controls Can Help

- Motion detectors
 - Activates lighting on demand for a preset duration
- Timers
 - Hardwired (part of power circuit)
 - Programmable (configure as required)
- Dimmers
 - Hardwired controls (requires additional wiring circuit)
 - Field adjustable output on lighting fixture (at installation)
 - Programmable (configure as required)
- Scheduling
 - Set light intensity for specified blocks of time
 - Available on selected programmable light fixtures

How You Can Help

- Leased pole lights from REC (electrical company)
 - Change from unshielded metal halide to shielded LED
 - Contact the REC Call Center at 800-552-3904
 - Follow the telephone prompts to get to “Culpeper Engineering”
 - Provide your name, REC account number, physical address
 - Specifically request the ‘dark skies compliant’ model (3000K)
 - There is no charge
- Privately-owned outdoor lighting
 - Contact RLEP at 703-250-7943
 - Provide information and photos of your light(s)
 - RLEP will suggest choices of replacement lighting
 - RLEP will coordinate replacement by qualified electrician
 - There is no charge