

“planning on the urban fringe”

PPA 2007 Annual Conference

OUTDOOR LIGHTING ISSUES FOR PLANNERS AND MUNICIPALITIES

Presented by:

The Pennsylvania Outdoor Lighting Council

PA Section of the International Dark-Sky Association

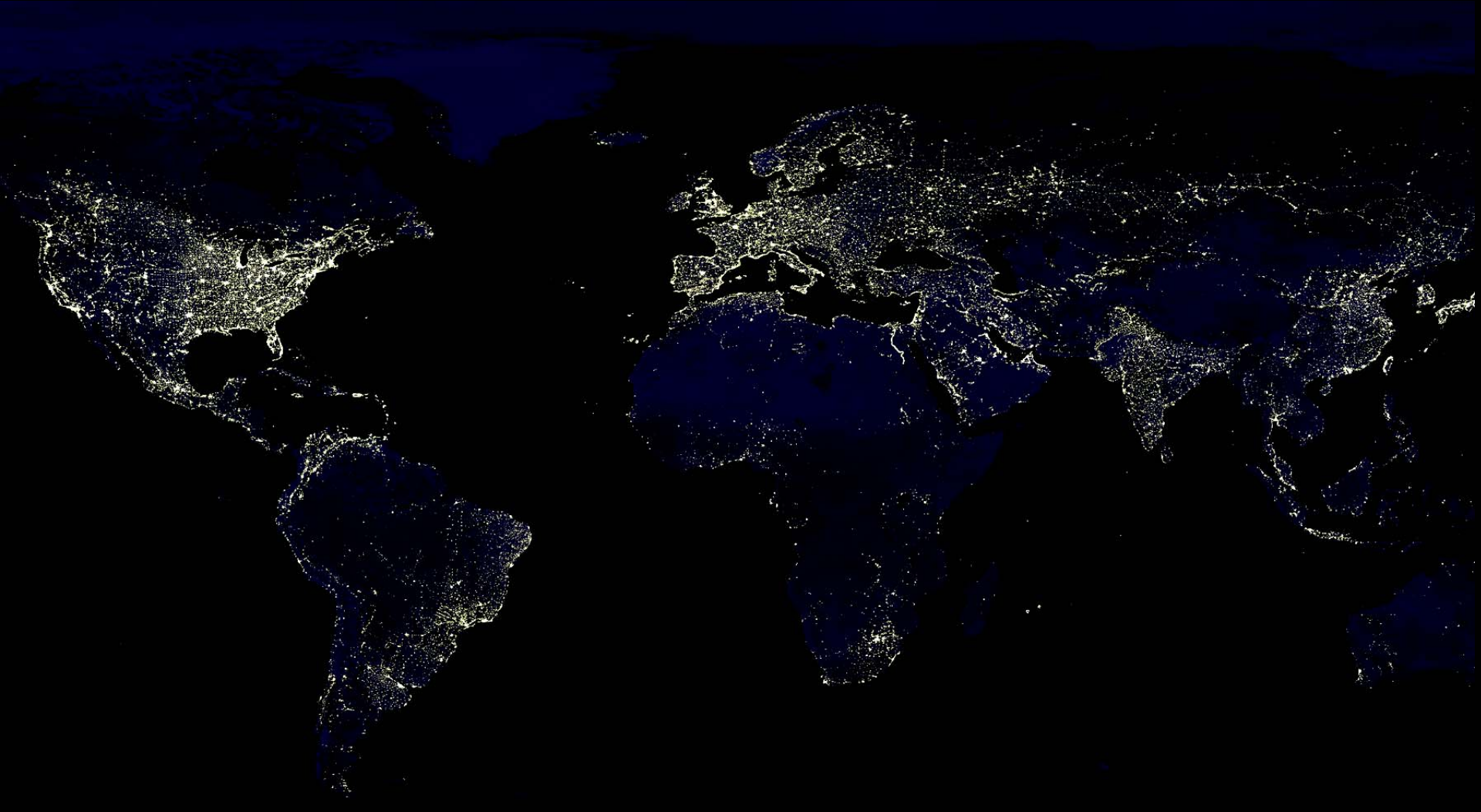


Topics

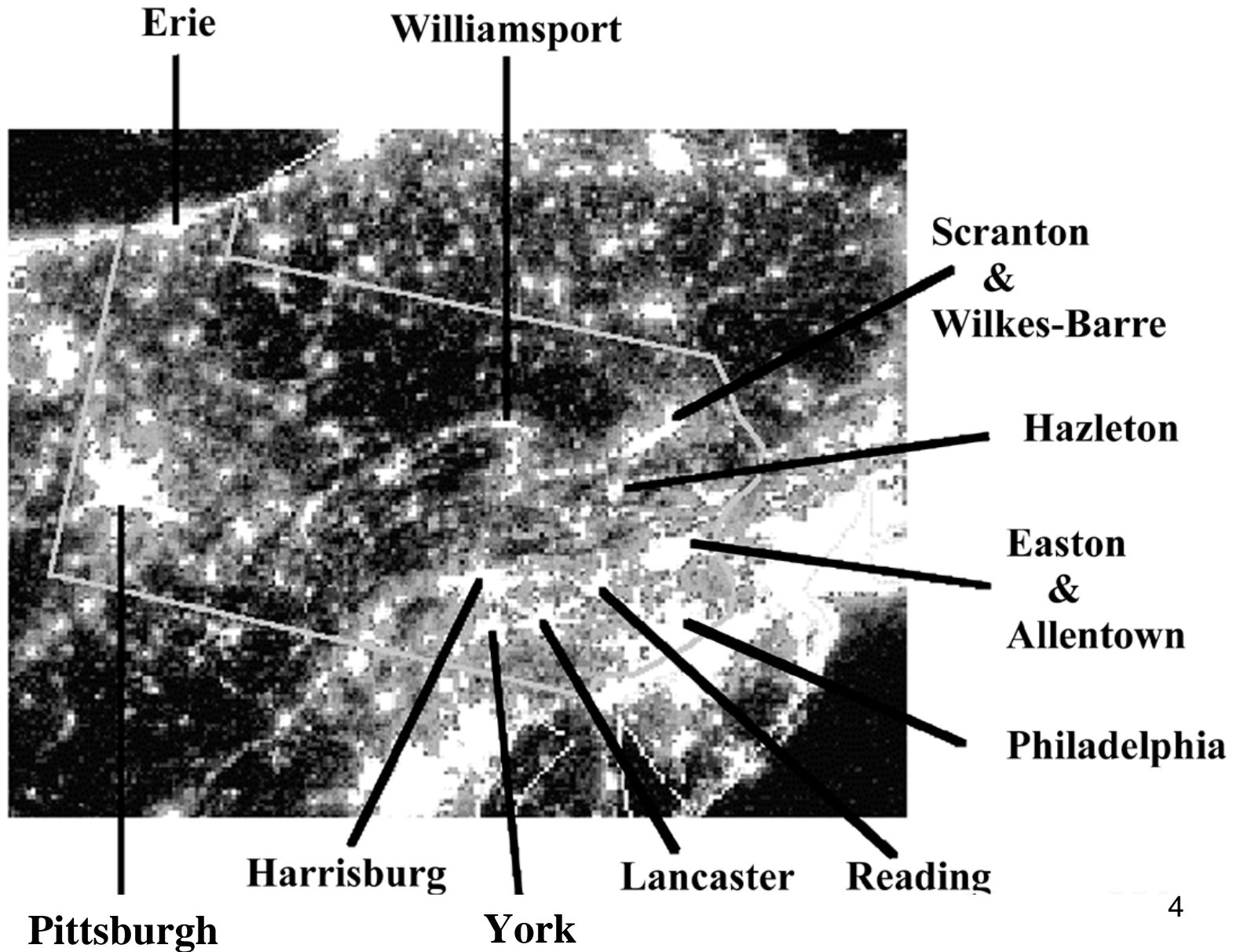
- OUTDOOR LIGHTING – AN ORIENTATION
- THE IMPORTANCE OF GOOD LIGHTING
- HOW MUNICIPALITIES CAN PLAN FOR,
GET AND ENFORCE AN EFFECTIVE
LIGHTING ORDINANCE

Lighting Trends

Light pollution and billions of dollars of wasted energy



Lighting Trends



Lighting Trends

LA Basin 99 Years Ago



Los Angeles basin from Mt. Wilson Observatory, 1 hour exposure by Ferdinand Ellerman, 1908.

Lighting Trends

LA Basin Now



Lighting Trends

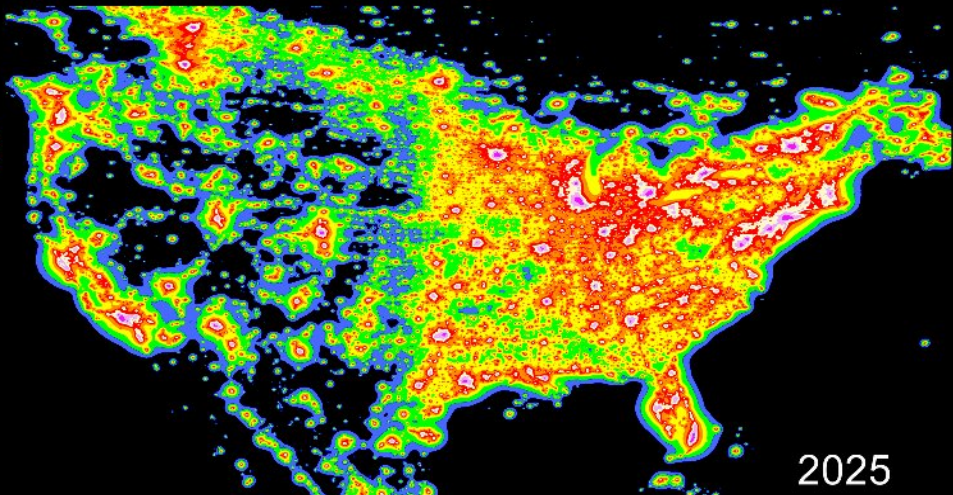
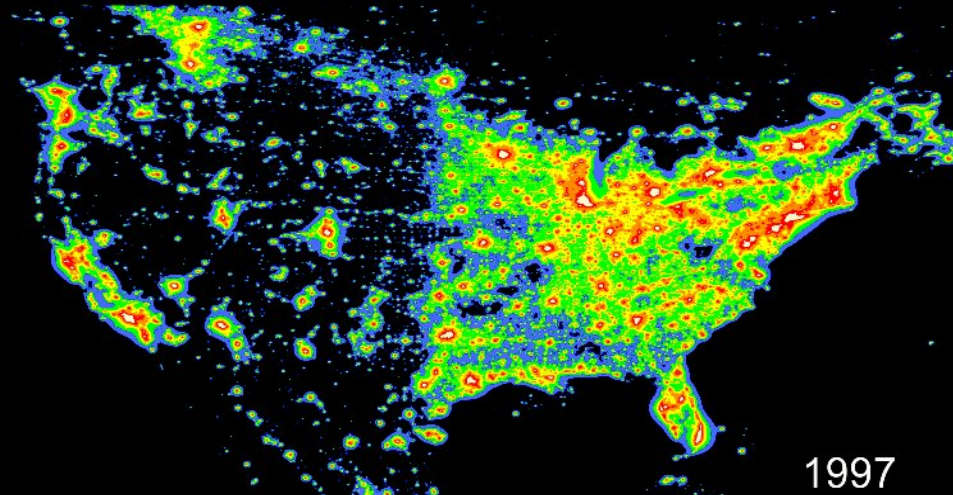
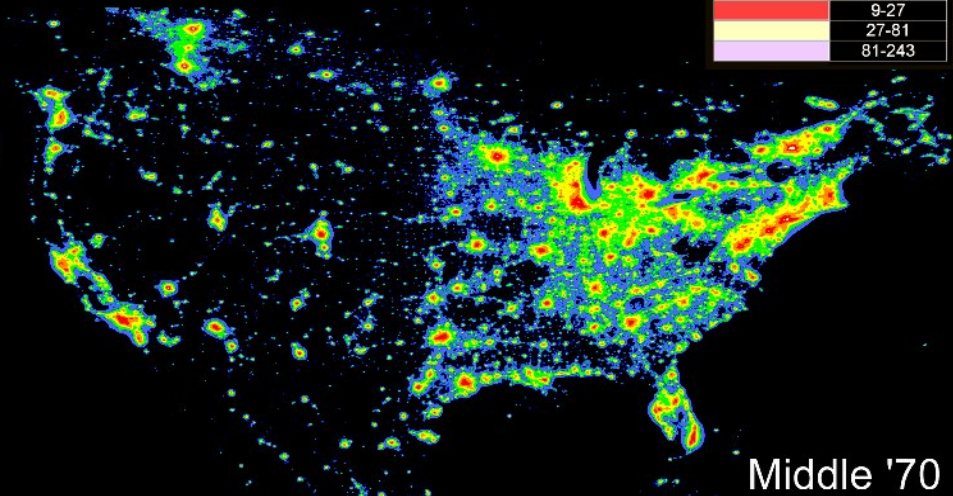
Typical Suburban Sky Glow



The US in 2025?

Artificial Night Sky Brightness due to Light Pollution in North America
A preliminary picture of the growth from 1950 to 2025

Artificial night sky brightness
at zenith, at sea level, for
standard clean atmosphere
as fraction of the average
natural night sky brightness



A Case in Point

BOWLING ALLY PARKING LOT

\$ 3,000 IN ENERGY COST WASTED A YEAR =

15 TONS OF COAL OR 55 BARRELS OF OIL



Case in Point

Light Pollution Viewed from Neighbor's Window



Case in Point

Light Pollution Viewed on Neighbor's Wall

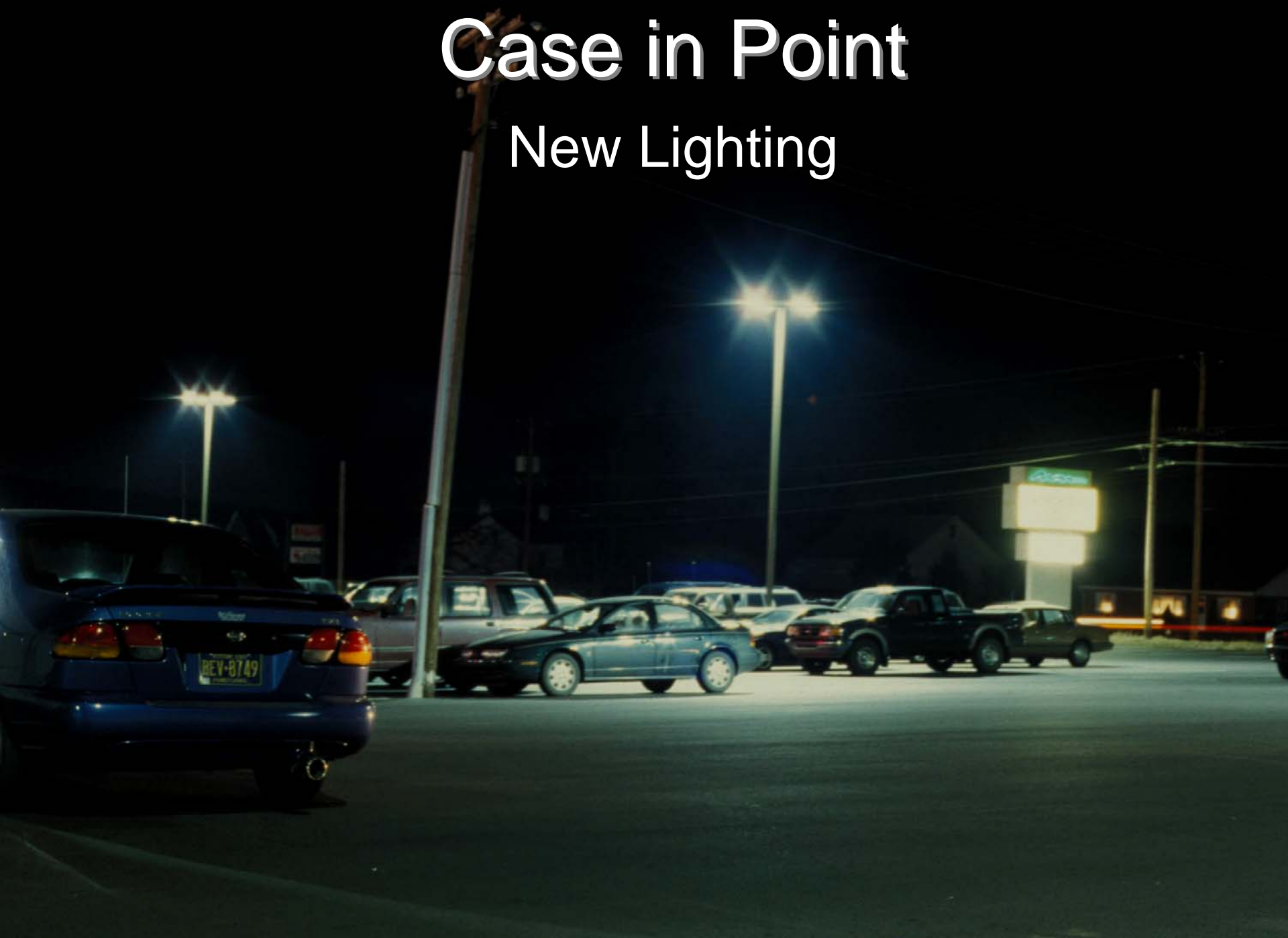


Case in Point

- Predicament
 - Sleepless nights, health concerns
 - Useless ordinance
 - Unwilling owner
- Helped township create good lighting ordinance
- Owner applied to expand operation
 - New lighting, 400-watt fixtures aimed down and turned off after hours.

Case in Point

New Lighting





BEFORE



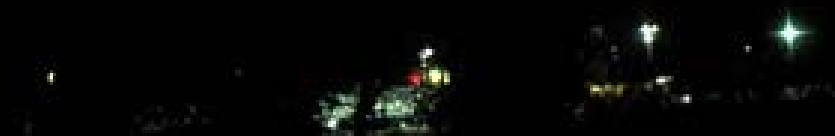
AFTER



BEFORE



AFTER



BEFORE



AFTER



WHAT IS GOOD LIGHTING?

- Good lighting starts with:
 - Using the right amount of light
 - Using fixtures that place the light on the ground.
 - Using fixtures that shield the light source from peoples' view.
 - Having lights on only when needed
- Good lighting typically means using “cutoff,” “full-cutoff” or “fully-shielded” fixtures.

CUTOFF DEFINITIONS

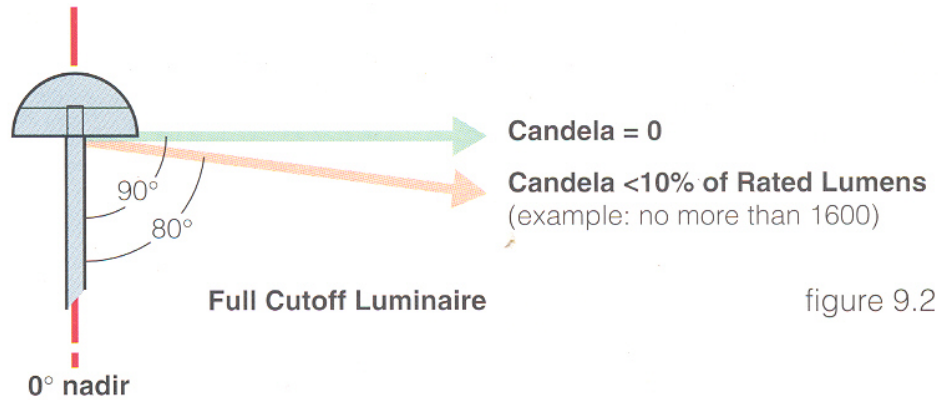


figure 9.2

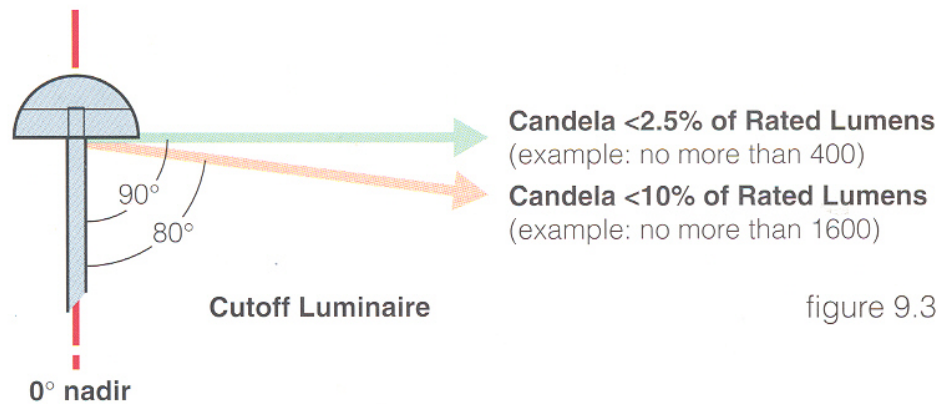


figure 9.3

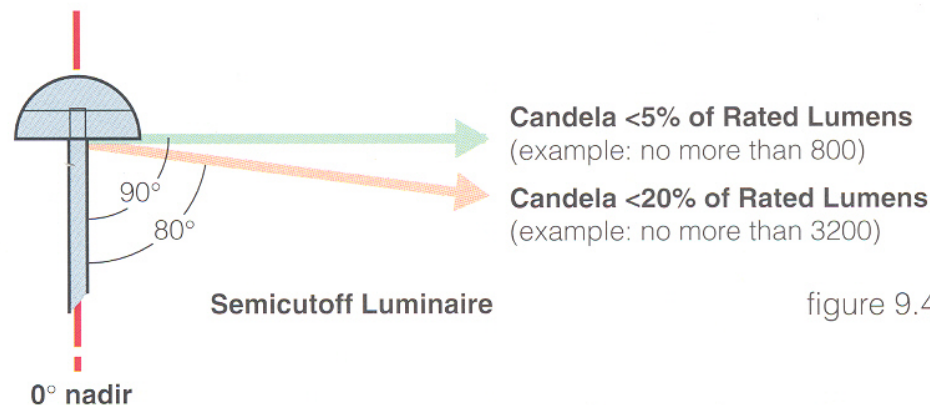


figure 9.4

Definitions

Definition of Cutoff is based on what proportion of a luminaire's output is being distributed at 80° and 90° above nadir.

Noncutoff

A luminaire's light distribution is designated as Noncutoff when there is no luminous limitation in any zone.

Full Cutoff

A luminaire's light distribution is designated as Full Cutoff when the candela at 90° above nadir is 0 and less than 10% of rated lumens at 80° above nadir.* See figure 9.2

Cutoff

A luminaire's light distribution is designated as Cutoff when the candela at 90° above nadir is less than 2.5% of rated lumens, and less than 10% of rated lumens at 80° above nadir.* See figure 9.3

Semicutoff

A luminaire's light distribution is designated as Semicutoff when the candela at 90° above nadir is less than 5% of rated lumens, and less than 20% of rated lumens at 80° above nadir.* See figure 9.4

STREET LIGHTS

FULL CUTOFF



SEMI CUTOFF



“SHOEBOX” FULL-CUTOFF FIXTURES

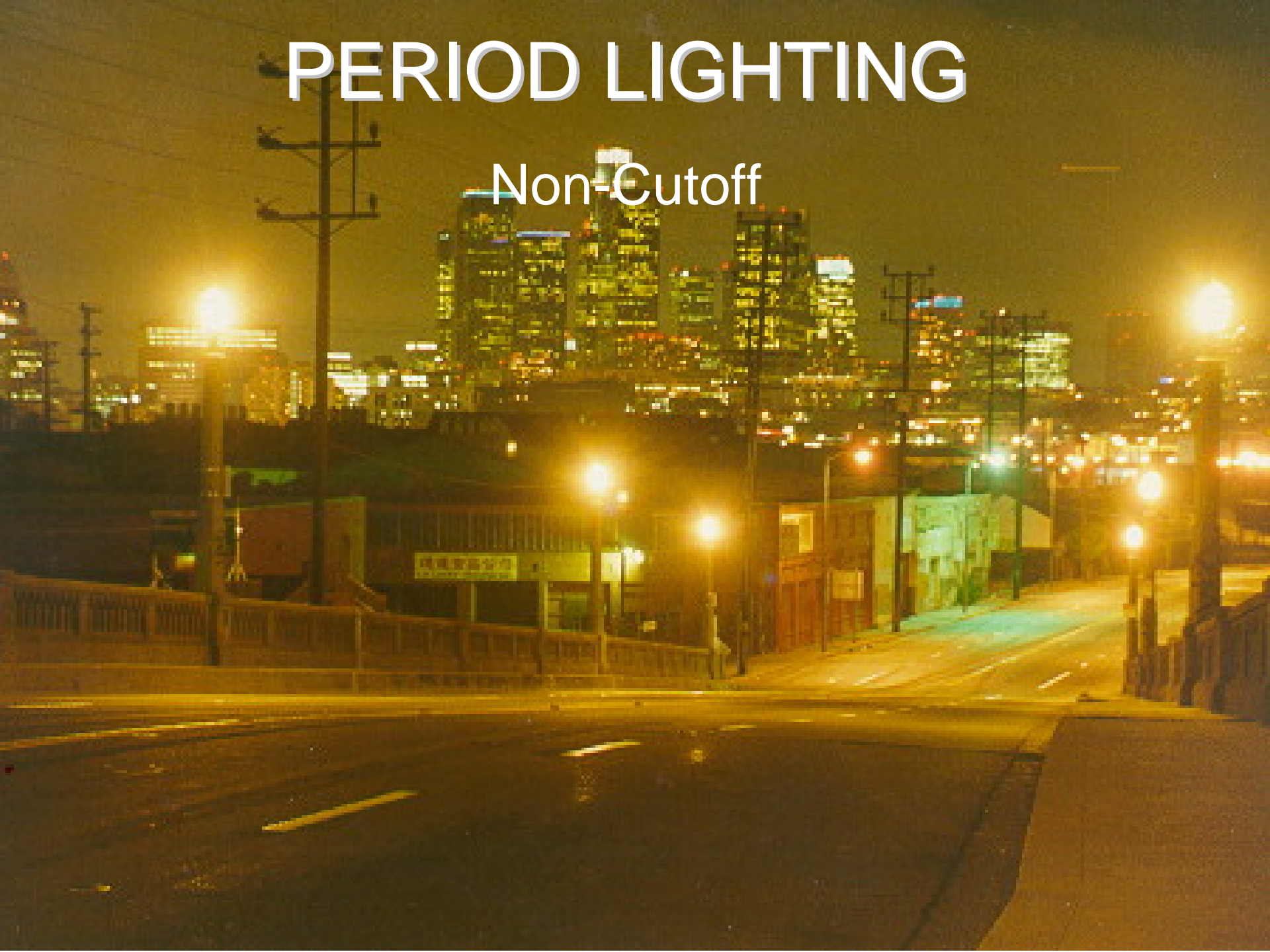


SHOPPING CENTER



PERIOD LIGHTING

Non-Cutoff



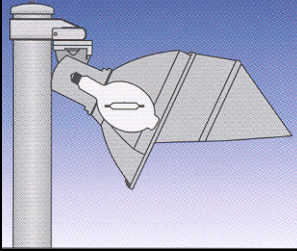
PERIOD LIGHTING



Cutoff



SPORTS LIGHTING

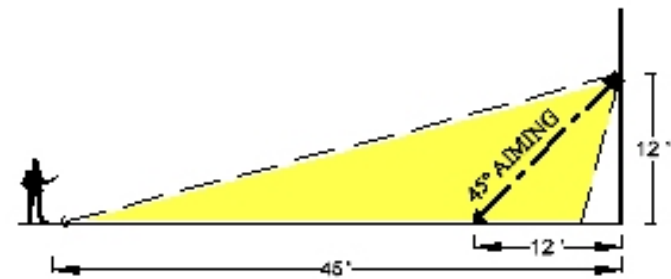


TYPICAL OFFENDERS

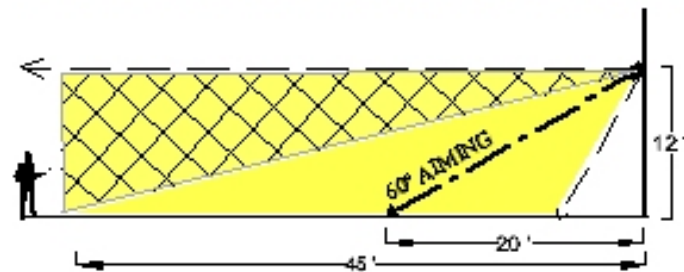
FLOODLIGHTS





AIMING FLOODLIGHTS TO REDUCE GLARE AND LIGHT POLLUTION

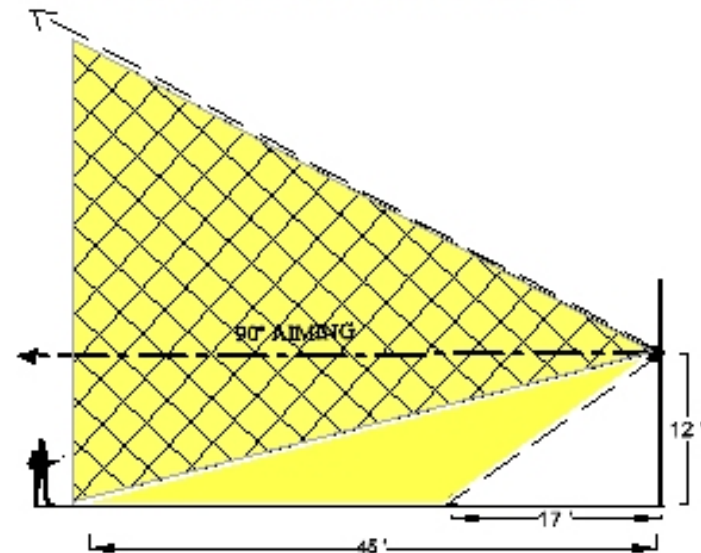


WITH FLOODLIGHT AIMED AT 45° OR LESS, LIGHT POLLUTION AND GLARE ARE CONTROLLED.



WITH HIGHER AIMING, GLARE AND LIGHT POLLUTION ARE UNCONTROLLED.

-  **USEFUL LIGHT**
-  **SOURCE OF LIGHT POLLUTION AND GLARE**

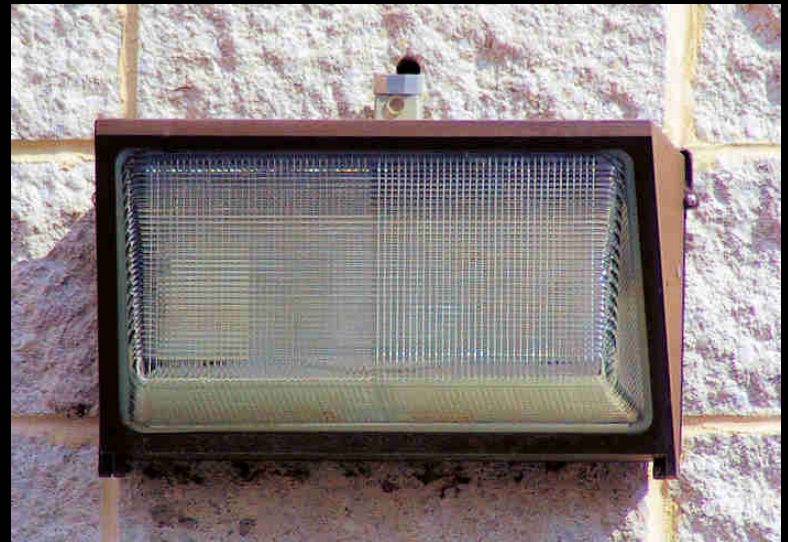


WALL PACKS

They can ruin an otherwise perfect job.



Full Cutoff



Non-Cutoff

POSTER CHILD FOR GLARE

BARN LIGHT, AKA DUSK-TO-DAWN LIGHT



UNCONTROLLED GLARE

Some light even reaches the ground!



SUMMARY

- Lighting is trending in the wrong direction
- Good lighting starts with the right amount of light from the right kind of fixtures that are on only when needed.
- A good ordinance can make a big difference

WHAT'S NEXT

- Goals of good lighting
- Lighting myths
- Negative lighting impacts
- Promoting quality lighting
- Lighting terminology
- Legal implications