

Lighting Issues for Planners

presented by
the

Pennsylvania Outdoor Lighting Council



Why is good outdoor lighting important to municipalities?

- Good outdoor lighting is a community asset
 - Enhances safety and sense of security
 - Provides visibility for nighttime activities



Why is good outdoor lighting important to municipalities? (Cont'd)

- Strengthen the themes and goals of the community while highlighting its amenities
- Communicate a positive visual image of the community, and visual order



Goals of Good Outdoor Lighting

- Optimize visibility at night
- Minimize glare
- Minimize energy consumption
- Minimize light trespass
- Minimize impact on the environment





Today's Situation

- Too much money and energy is wasted in providing bad outdoor lighting
- “Bad” lighting causes glare, and provides light at inappropriate levels with inappropriate uniformity for the outdoor seeing task
- Most people in the U.S. are unaware that much of our outdoor lighting fails to follow recognized good lighting practices

Common Myths of Outdoor Lighting

- “More light means better visibility.”
 - If more light simply means more glare, then visibility can actually be reduced. Glare is never helpful for visibility.
 - Lighting *quality* is often more important to visibility than lighting quantity.



Myths of Outdoor Lighting (Cont'd)

- “More light means more security.”
 - Poorly executed security lighting that creates glare and deep shadows can reduce *visibility* and actually aid criminals.
 - Bright lighting can give an *illusion* of security. People can be induced to take risks that are not really justified by the overall situation.

National Institute of Justice study, Feb., 1997

PREVENTING CRIME: WHAT WORKS, WHAT DOESN'T, WHAT'S PROMISING

- A REPORT TO THE UNITED STATES CONGRESS
Prepared for the National Institute of Justice
by Lawrence W. Sherman, Denise Gottfredson,
Doris MacKenzie, John Eck, Peter Reuter, and
Shawn Bushway
- Department of Criminology and Criminal Justice
University of Maryland

Myths of Outdoor Lighting (Cont'd)

- “Security Lighting will reduce crime in urban outdoor areas.”
 - National Institute of Justice in a 1997 report to Congress said, "In short, the effectiveness of lighting [as a crime deterrent] is unknown.”
 - ...”results are mixed. We can have very little confidence that improved lighting prevents crime, particularly since we do not know if offenders use lighting to their advantage.”

Myths of Outdoor Lighting (Cont'd)

- ◉ “In the absence of better theories about when and where lighting can be effective, and rigorous evaluations of plausible lighting interventions, we cannot make any scientific assertions regarding the effectiveness of lighting. In short, the effectiveness of lighting is unknown.”

Myths of Outdoor Lighting (Cont'd)

- “We may speculate that lighting is effective in some places, ineffective in others, and counter productive in still other circumstances. The problematic relationship between lighting and crime increases when one considers that offenders need lighting to detect potential targets and low-risk situations (Fleming and Burrows 1986). Consider lighting at outside ATM machines, for example. An ATM user might feel safer when the ATM and its immediate surrounding area are well lit. However, this same lighting makes the patron more visible to passing offenders. Who the lighting serves is unclear. “

How Did We Get Here?

- Municipal codes have not kept pace with today's lighting needs and practices
- Municipalities have comprehensive building codes & electrical codes, but too few communities have *effective* outdoor lighting codes



How Did We Get Here? (Cont'd)

- We have yesterday's fixtures with today's more powerful lamps
- Businesses are using glare for "advertising"

Impacts of Poor Outdoor Lighting Practices

- Safety/Security
 - Glare and deep shadows limit visibility
- Social
 - Aesthetic Blight - Visual Clutter
 - Light trespass -- light where it isn't wanted

Impacts of Poor Outdoor Lighting Practices (Cont'd)

- Economic
 - Billions of energy dollars wasted on *excessive and careless* use of outdoor lighting
 - IDA estimated the waste is at least \$1.5 billion per yr
 - Pennsylvania's share is about \$75 million per yr
 - Approx. 750 million kilowatt-hours
 - 375,000 tons of coal (at 2000kWh per ton)



Impacts of Poor Outdoor Lighting Practices (Cont'd)

- Environmental
 - Pollution from unnecessary electric power generation
 - Negative impact on nocturnal animals and migratory birds
 - Negative impact on plant life



The Urban Wildlands Group

The Urban Wildlands Group is dedicated to the conservation of species, habitats, and ecological processes in urban and urbanizing areas.



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Ecological Consequences of Artificial Night Lighting: Conference Abstracts

The Urban Wildlands Group

and



**ECOLOGICAL CONSEQUENCES OF
ARTIFICIAL NIGHT LIGHTING**

<http://www.urbanwildlands.org/abstracts.html>

February 23-24, 2002
Los Angeles, California

Impacts of Poor Outdoor Lighting Practices (Cont'd)

- Sky Glow
 - Our children are growing up never seeing the stars, robbed of the inspiration of the ages.
 - Loss of the naturally dark star-filled sky is a tragic consequence akin to the loss of our forested landscapes.

How can outdoor lighting quality be promoted?

- *Education:* municipalities, businesses, contractors, residents
- *Ordinances* that:
 - promote outdoor lighting quality
 - control the obtrusive aspects of outdoor lighting
- *Enforcement by municipality:* supervisors, code enforcement officer, zoning hearing board and municipal engineer

What can you do to ensure good outdoor lighting?

- Create a good lighting ordinance that defines community expectations for outdoor lighting quality and quantity
 - We have the experience to help you through that process
- Be committed to having the ordinance enforced once it is in place

Lighting Terminology

- **Glare** - unwanted and excessive light emitted from a source that creates discomfort, a visual nuisance or a hazard.
 - Glare commonly occurs when light travels *directly* from the source to the eye.
 - For *visibility*, light should be aimed at what needs to be seen, not directly into our eyes.

Terms (cont'd)

- **Disabling Glare** - severe glare that impairs visibility and creates a hazard.
 - Disabling glare must be corrected for public safety.

Terms (cont'd)

- **Nuisance Glare** - Glare that creates an annoyance but not a potentially hazardous situation.

Glare, Aging and Vision

- The ability of the eye to transmit light decreases with age. At age 75, the typical eye transmits to the brain only 25% of the amount of light transmitted by that of a 25 year old.
- The typical 75 year old eye has 75% less tolerance to glare than a 25 year old.
- The aging eye loses sensitivity to blues and violets because of yellowing of the lens.

Glare!



Friendly Lighting

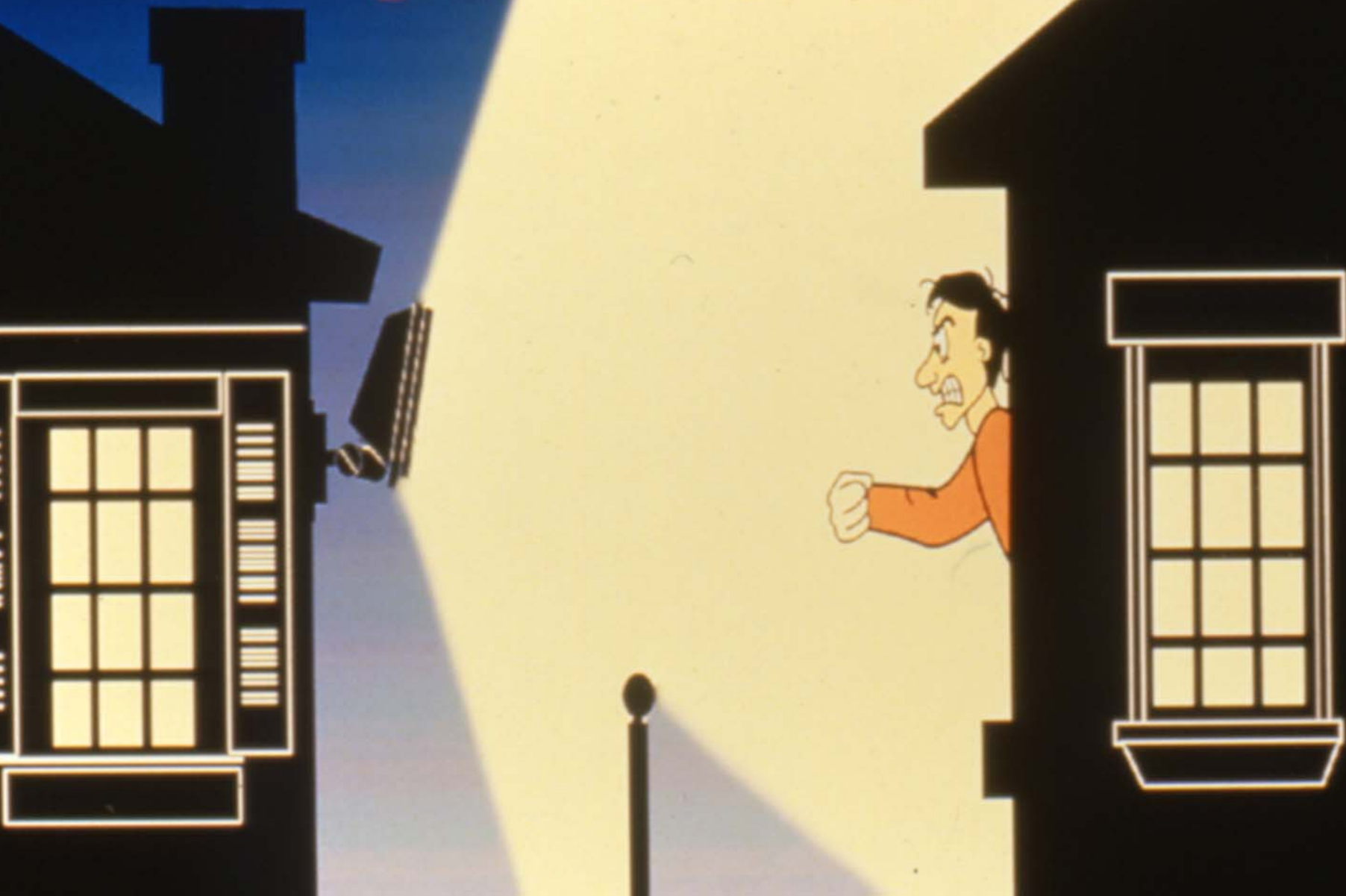


RAB

Terms (cont'd)

- **Light trespass** - light going where it isn't wanted.
 - Our lights should illuminate as far as our property lines, and generally not beyond.
 - Few people want someone else's light shining into their bedroom window

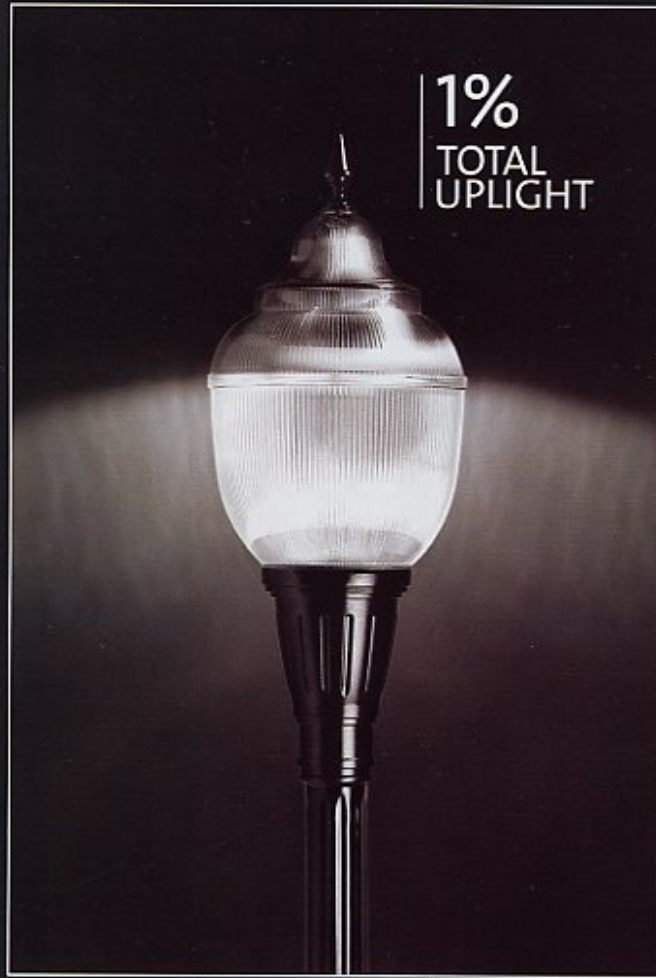
Light Trespass!



Friendly Lighting



1%
TOTAL
UPLIGHT



SERENADE DSX SERIES

Glass or polymer globe · IES cutoff · Smartseal (IP66) · Toolfree

www.lumec.com/dsx01.html | T: 450.430.7040 | A Genlyte Company



Inspired by light

Light Trespass Lawsuit - Pennsylvania

- "Montgomery County Law Reporter"

Judge Honeyman, February 1, 1968 (page 142)

Hetzer et al v. Paparo et al
Paparo et al v. Hetzer et al

property located on Church Rd., Lafayette Hill

Light Trespass Lawsuit - Pennsylvania

- The test for nuisance applied by Judge Honeyman in *Hetzer v. Paparo* was that if the intensity of the light shining from the adjoining land is strong enough to disturb a person of ordinary sensibilities, it is a nuisance and must be corrected.

Light Trespass Lawsuit - Pennsylvania

- The court did not recognize any right to protection for persons who were hypersensitive to outdoor lighting.

Light Trespass Lawsuit - Colorado

- <http://www.lightlawsuit.com>
- Cash vs. Emich d.b.a. Elway Chrysler Jeep West & Elway Subaru West, West Colfax Avenue and Poppy Streets, Golden, Colorado
- Colorado Court of Appeals in Denver. The oral arguments took place in August 2006 and the appealed ruling was announced in September 7, 2006

Light Trespass Lawsuit - Colorado

- The court held that the lights were an actionable nuisance. The jury also found that the defendants (the car dealerships) were creating, maintaining and/or allowing a nuisance to exist. Paraphrasing, the court held that *the laws are sensitive to property owners rights to use and enjoy their private property, without having to close blinds or curtains on their windows to accommodate a business interest (the bright lights).*

Light Trespass Lawsuit - Colorado

- lawsuit has set a new precedent for nuisance light.
- relief from bright light that is interfering with the use and enjoyment of their private property.

Recommendations

- Improve Outdoor Lighting Practices
 - Improves quality of life in our communities while *saving money*
 - Promotes energy efficiency throughout the Commonwealth
- Identify Waste Outdoor Lighting as a significant environmental issue

Recommendations (Cont'd)

- Promote the use of:
 - *Intelligent light controls*, e.g. motion sensors
 - *Late night turn-off* of architectural & advertising lighting
 - *Fully shielded light fixtures* to minimize glare and wasted uplight

Resources

- ◉ Illuminating Engineering Society of North America (IESNA)
 - the recognized technical authority on illumination
 - communicate information on all aspects of good lighting practice
 - nearly 100 publications including recommended practices on a variety of applications, design guides, technical memoranda, and publications on energy management and lighting measurement
 - www.iesna.org

Conclusion

- Now that we've considered the problems and issues, we'll more closely examine the elements of a good lighting ordinance and how to create and enforce one