

Lighting Issues for Municipalities

presented by

Pennsylvania Outdoor Lighting Council



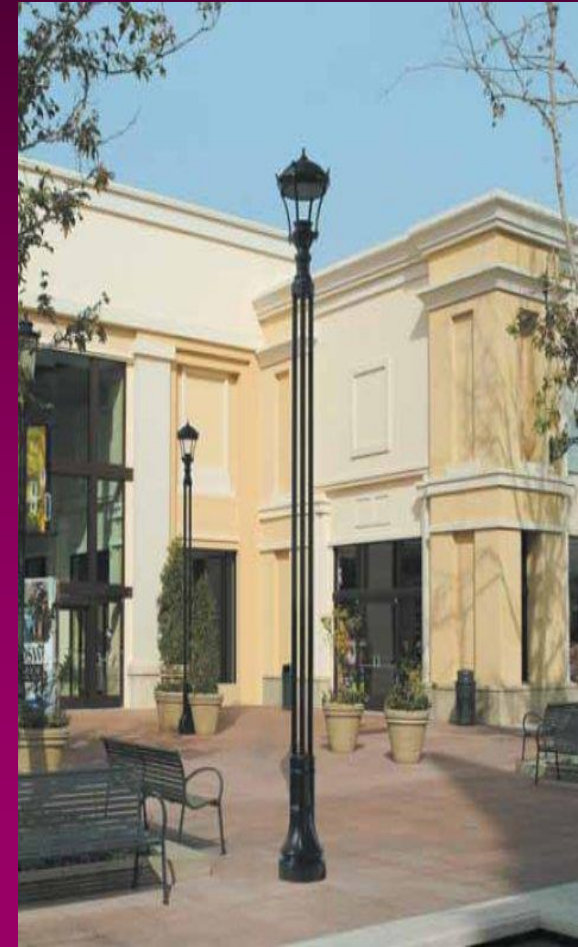
Why is good outdoor lighting important?

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



Why is good outdoor lighting important?

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



Lighting Terminology

- **Glare** – the *sensation* produced by 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.
 - Older eyes have less tolerance to glare.

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!



No Glare!

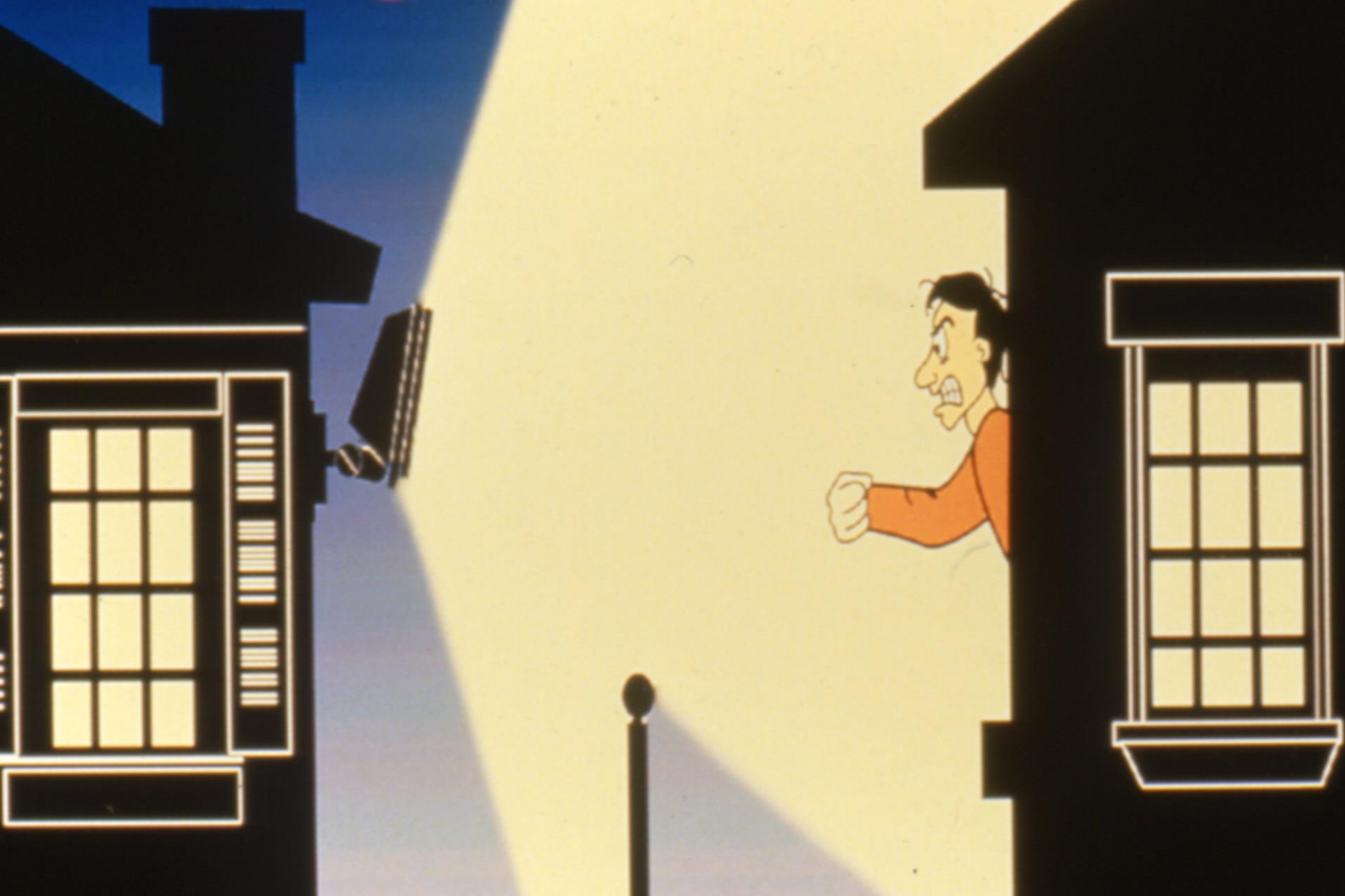


RAB

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



Goals of Good Outdoor Lighting

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

The Good and the Bad



The Good and the Bad



Today's Situation

- Too much money and energy are 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 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 as important to visibility as 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.

Myths of Outdoor Lighting (Cont'd)

- The Myth: “Security Lighting will reduce crime in urban outdoor areas.”
 - A 1997 National Institute of Justice report to Congress said, “- - 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.”

National Institute of Justice study, Feb., 1997

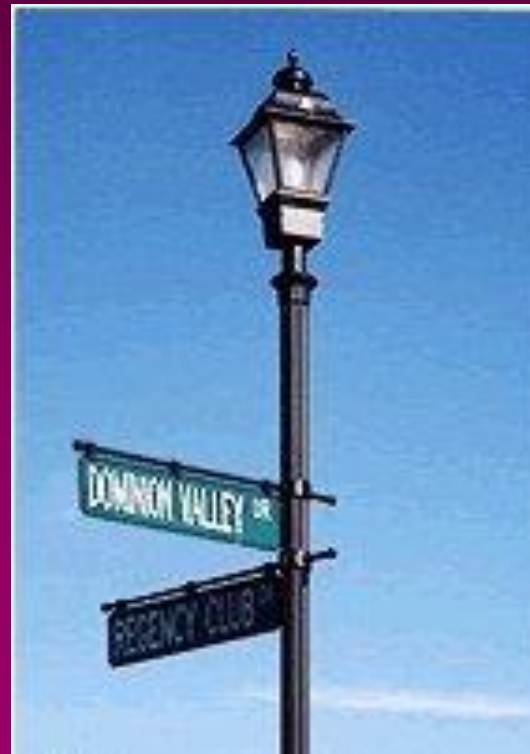
- ***PREVENTING CRIME:
WHAT WORKS, WHAT DOESN'T, WHAT'S PROMISING***
- A REPORT TO THE UNITED STATES CONGRESS
Prepared for the National Institute of Justice
by Lawrence W. Sherman, Denise Gottfredson, Doris
MacKenzie, John Eck, Peter Reuter, and Shawn Bushway
- Department of Criminology and Criminal Justice
University of Maryland

How Did We Get Here?

- Municipal codes have not kept pace with today's lighting technology, needs and practices
- Municipalities have comprehensive building codes & electrical codes, but too few have an *effective* outdoor lighting ordinance
- Costs have not been as important as they are now.
 - PECO residential rate 15.9 cents per kWhr. (U.S.avg. 10.6 cents). Rate caps expire Dec. 31, 2010. Expect ~20% increase.

How Did We Get Here? (Cont'd)

- We have yesterday's fixtures with today's more powerful HID lamps, producing much more glare.



How Did We Get Here? (Cont'd)

- Fixtures less than 50 percent efficient



How Did We Get Here? (Cont'd)

Glare is being used as “advertising”



Impacts of Poor Outdoor Lighting Practices

- Safety/Security
 - Glare and deep shadows limit visibility
- Social
 - Aesthetic Blight - Visual Clutter
 - Light trespass



□ Visual Clutter

Impacts of Poor Outdoor Lighting Practices (Cont'd)

- Economic
 - Billions of energy dollars wasted on *careless* and *excessive* use of outdoor lighting
 - An estimated \$2 billion *wasted annually* in the U.S.
 - Pennsylvania's share is about \$100 million per yr
 - Approx. 1 billion kilowatt-hours
 - 500 thousand *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
 - Exposure to light at night can adversely affect human health (melatonin suppression)



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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 consequence akin to the loss of our forested landscapes.

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

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

Resources (cont'd)

- International Dark-Sky Association (IDA)
- www.darksky.org Tucson, AZ
- Est. 1988, educational, environmental 501(c)(3) nonprofit dedicated to protecting and preserving the nighttime environment and our heritage of dark skies through quality outdoor lighting.
- With thousands of members in more than 70 countries, IDA is the leading authority concerning the problems and solutions related to *light pollution*.

Recommendations

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

Recommendations (Cont'd)

- Promote the use of:
 - *Intelligent light controls*, e.g. motion sensors, timers, programmable controllers
 - *Late night turn-off* of all lighting except as needed for safety/security
 - *Fully shielded light fixtures* to minimize glare and wasted uplight

Conclusion

- Don't settle for bad lighting
- Enact an effective ordinance and enforce it
- The Pennsylvania Outdoor Lighting Council will help you develop an *effective* ordinance

What's Next

- How to create an effective lighting ordinance, and help get it enacted, and enforced