



Dark Sky In Lake County

PBZE Committee Presentation

**Planning, Building & Development
August 30, 2023**

Agenda

- **Background**
 - Light Pollution
 - Dark Sky
- **Policy Options**
 - Examples
 - Case Study
- **Committee Direction**
 - Anticipated Timeline
 - First Discussion



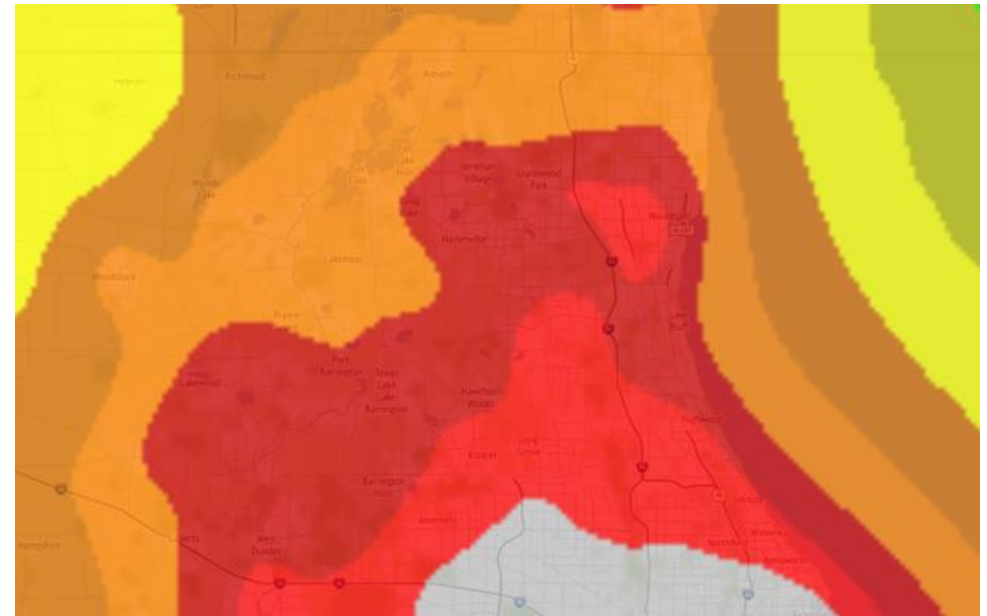
Source: DarkSky



Background

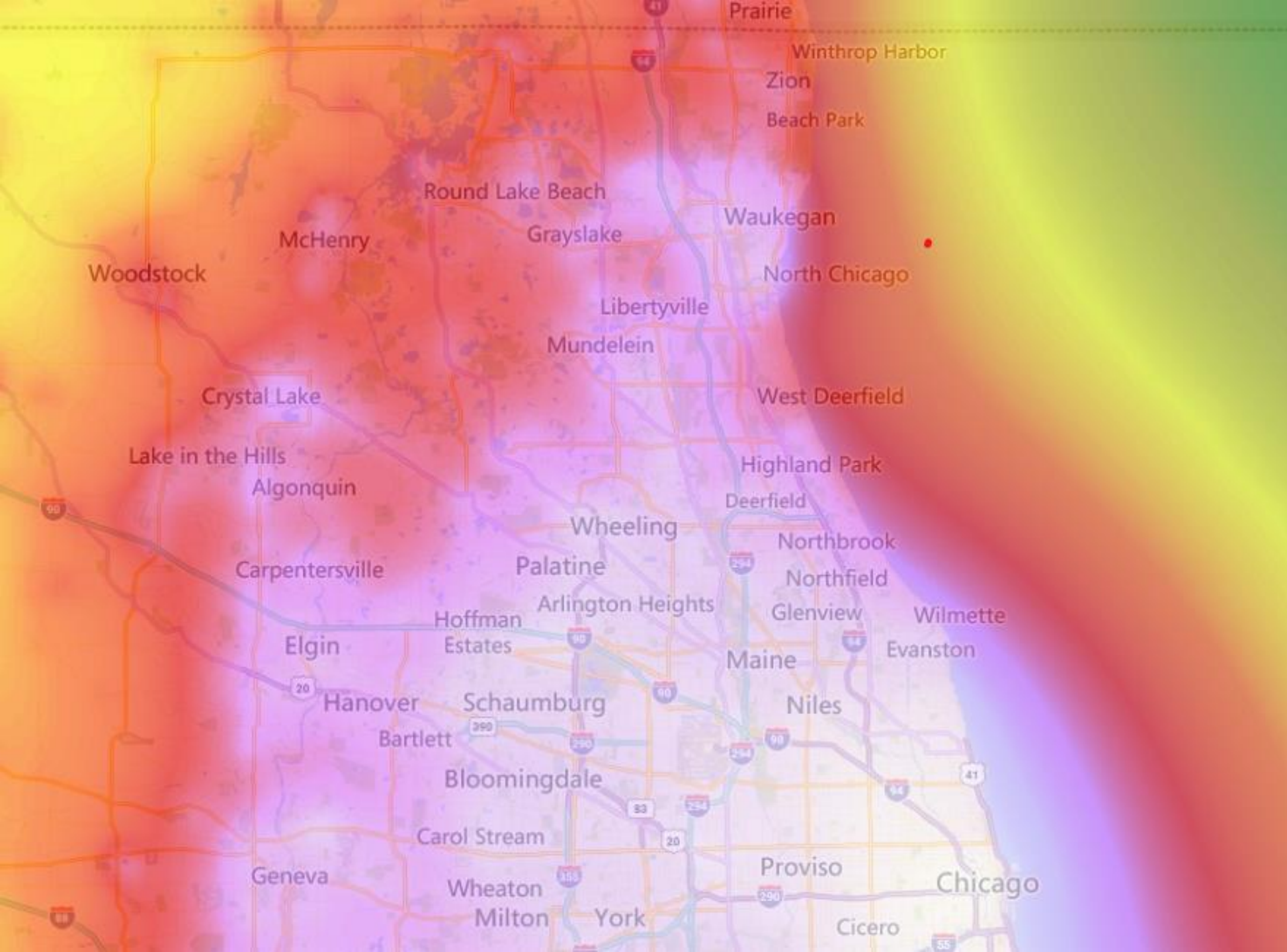
Light Pollution

- The inappropriate or excessive use of artificial light – known as light pollution – can have serious environmental consequences for humans, wildlife, and climate
- 8 out of 10 people worldwide live in an area with light pollution¹



Light Pollution Map

[1] DarkSky



Feature ⓘ

None selected ▼ 

75

Basemap ⓘ

- ☒ Road
- ☐ Hybrid

Map legend

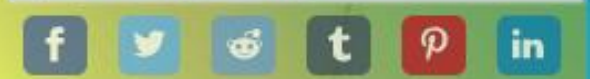
Zenith sky brightness
magnitude/arc second²



22.0 21.9 21.7 20.6 18.5 <17.5

> My locations

> Privacy settings



<https://www.lightpollutionmap.info/>

Wildlife Impacts

- **Migratory Birds and Insects**
 - Glass strikes kill an est. 599 million birds annually^[1]
 - Insects are attracted to artificial light and population sizes are declining^[3]
- **Nocturnal Reproduction**
 - For many species, interactions with mates occur at nighttime^[2]
- **Predation**
 - Changes to interspecies interaction^[4]



^[1] Loss, et al., 2014, *Bird-building collisions in the United States*, The Condor.

^[2] Firebaugh & Haynes, 2019 ^[3] Davies, 2022 ^[4] DarkSky, 2016

Human Health Impacts

- **Disrupted Sleep Patterns**
 - Blue light and the circadian rhythm
 - Increased stress from decreased sleep quality
 - Chronic diseases related to sleep loss
- **Cultural Value of Night Sky**
 - Inspiration
 - Education
 - Beauty



*Kenosha County, looking south towards
Lake County and Chicago, 60 miles away*

Public Safety

- **Glare and driving**
 - Impact of intense blue light emitted from outdoor light fixtures
- **Traffic Collisions**
 - Reducing street lighting trespass or duration has not been shown to have an impact on the aggregate counts of traffic collisions in an area¹
- **Crime**
 - Reduction of lighting has not been shown to have a correlation with an increase in crime^{1,2}
- **A dark sky does not mean a dark ground**

[1] Steinbach et al., 2015, [2] Thompson et al., 2022, [3] "The Chicago Alley Lighting Project: Final Evaluation Report," 2000



LED Energy Efficiency

- LEDs use up to 90% less energy and last up to 25 times longer than traditional incandescent bulbs¹
- LED lighting is no longer an emerging technology
- As energy savings emerge, increased use of lighting may occur
- Transitioning to dark sky practices now will mitigate the growing LED light pollution: A dark sky does not equal a dark ground

- [1] Department of Energy



International Dark Sky Community Designation

- Designation through DarkSky for local communities
- Highest standards for outdoor lighting ordinances, dark sky education, and citizen support
- Requires regular reporting of low sky-glow with light meters
- DarkSky provides free public model ordinances, scientific research, and endorsed light fixture lists
- An International Dark Sky Community designation is typically only immediately practical for rural communities but aspirational for more urbanized communities



Hawthorn Woods at dusk. Photo by Village of Hawthorn Woods

Case Study: San Diego County

- **San Diego County has private outdoor lighting regulations that minimize light pollution in the unincorporated area of the County as follows:**
 - Require fully shielded commercial and industrial uses for lighting
 - Require fully shielded decorative lighting
 - Prohibit lighting above a certain lumen (brightness) threshold
 - No requirement to fully shield marketing signs
- **San Diego County is not an International Dark Sky Community**



Dark Sky Effects: Marketing

- Preventing light trespass from the site does not limit visibility onsite or from the street
- No available study has demonstrated that dark sky fixtures limit marketability



Speedway franchise in Tucson, AZ

Dark Sky Effects: Tourism

- **Dark skies policies in communities can become a vital part of their identity**
- **Policies can influence lighting plans in neighboring communities**
- **Stargazing can be a draw for tourists**
- **Nocturnal wildlife ecotourism events**



Stargazing at a star party in Homer Glen, Illinois.
Photo by Jean Lachat.

Dark Sky Effects: Harm Reduction

- As soon as the source of the unnecessary light is removed from the environment, there are immediate and tangible improvements
 - Kozushima Island, Japan, documented the return of nesting sea turtles after they retrofitted their lights to be warm-colored and fully shielded, and eliminated light spill on critical nesting habitat.



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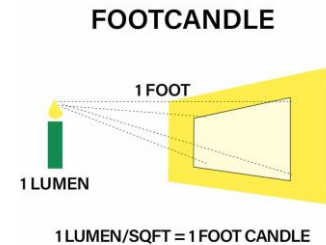
Source: Nocturnal conservation and Dark Sky Places, DarkSky.org



Policy Options

Current Outdoor Lighting Standards (§ 151.168)

- Does not apply to single family detached housing, public streetlights, and exempt active outdoor recreational uses
- Does apply to all other development types (i.e., industrial, commercial, multifamily, etc.)
- General standards applicable to all outdoor lighting:
 - (a) Outdoor lighting shall not exceed one-half footcandle at any point on the adjoining property if the subject property abuts a residential zoning district or a lot containing a residential use;
 - (b) Outdoor lighting shall not exceed one footcandle at any point on the adjoining property if the subject property abuts a nonresidential zoning district or lot containing a nonresidential use or at the right-of-way line;
 - (c) All luminaires shall be shielded to prevent light and glare spillover to adjacent residential property and abutting rights-of-way;
 - (d) No flickering or flashing lights, search lights, laser source lights or mercury vapor lamps shall be permitted; and
 - (e) Subject to the above standards, security lighting shall be installed on the site of nonresidential development in accordance with industry standards for security lighting.



Potential Solutions

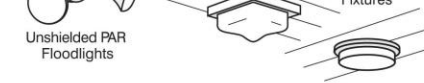
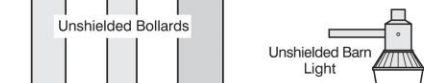
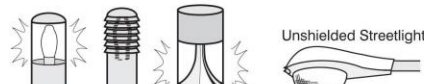
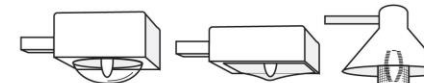
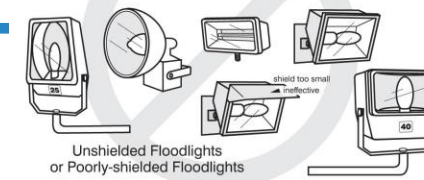
Some methods demonstrated to be effective in reducing light pollution and light trespass:

- Maintaining unlit areas
- Reducing the duration of lighting
 - Dimmers, motion sensors, timers
- Reducing trespass of lighting
 - Shielding, bulb covers
- Changing intensity of lighting
 - Warm-colored bulbs (yellow or amber)
 - Correlated color temperature (CCT) of 3000K or less

Examples of Acceptable / Unacceptable Lighting Fixtures

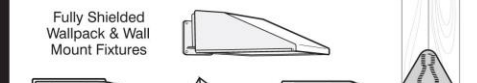
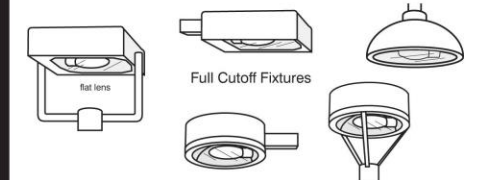
Unacceptable / Discouraged

Fixtures that produce glare and light trespass



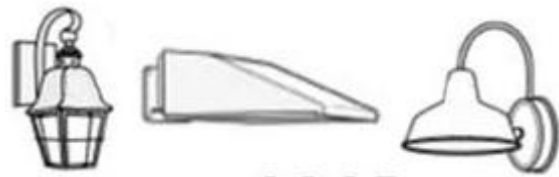
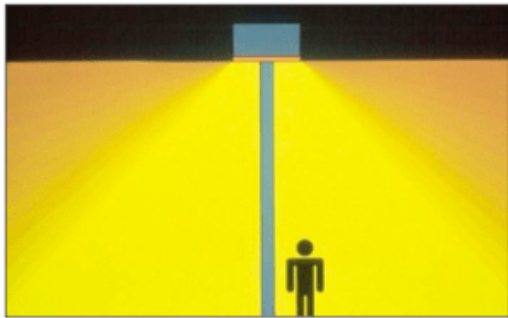
Acceptable

Fixtures that shield the light source to minimize glare and light trespass and to facilitate better vision at night



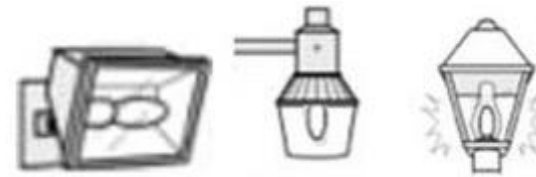
Illustrations by Bob Crelin© 2005. Rendered for the Town of Southampton, NY. Used with permission.

Shielding Examples



GOOD

Bulbs not directly visible



BAD

Bulbs directly visible



Dark Sky Internal Policy for LC Facilities

- **Lead by example with Lake County facilities and buildings.**
- **Impact study of dark sky amortization for County facilities:**
 - Unclear what percentage of exterior lights would need updating
 - Cost estimation for facilities over amortization period
 - Replacement or change of signage due to light changes
 - Energy conservation and greenhouse gas emissions reduction
 - Skyglow and ambient light measurements
- **Example language can be brought to committee with options.**

Timeline





Committee Discussion & Questions