



Community Health Commission

CONSENT CALENDAR
July 9, 2024

To: Honorable Mayor and Members of the City Council

From: Community Health Commission

Submitted by: Andy Katz, Chairperson, Community Health Commission

Subject: Community Health Commission Comments on Dark Skies Ordinance

RECOMMENDATION

For the City Council to (a) refer to the Planning Commission, the Public Health Comments on the Dark Skies Ordinance which was previously referred to the Planning Commission; (b) refer to the City Manager, a request to ask the Department of Public Works to implement a moratorium on installation of street lighting and building lighting for use at night exceeding 3,000 Kelvin.

SUMMARY

- The purpose of this recommendation is to communicate the Community Health Commission's (CHC) support to the City Council regarding its prior referral to the Planning Commission to consider the Dark Skies Ordinance.
- While the Dark Skies Ordinance originates from the Community Environmental Advisory Commission, the control of "cool" light temperatures would provide public health benefits for Berkeley residents, based on scientific studies.
- To achieve the intended environmental and health benefits, the scope of the proposed Dark Skies Ordinance should be expanded to include a reasonable phase-in for existing construction, not just new construction. It should also reflect unique aspects of Berkeley's building stock compared to existing model ordinances.
- In advance of the Planning Commission's recommendation to the City Council, the health and environmental benefits are sufficiently clear to support an immediate moratorium on installation of street lighting and building lighting exceeding 3,000 Kelvin.

FISCAL IMPACTS OF RECOMMENDATION

- Potential for small additional ongoing costs associated with slightly increased requirements for staff review to ensure compliance.
- Minimal staff time to implement city procurement of compliant light bulbs.

CURRENT SITUATION AND ITS EFFECTS

The Community Environmental Advisory Commission stated in its report before the City Council on November 19, 2019 that “Unfettered outdoor lighting also poses known risks to birds, as well as generating unwanted light pollution.” The City of Berkeley’s Downtown Area Plan, as well as Southside zoning regulations (BMC 23E.52.070.F.7), provide guidance or limitations on outdoor lighting, but no general policy exists citywide to prevent excessive light pollution from outdoor lighting. The Community Health Commission has reviewed scientific studies of light pollution on health, the proposed Dark Skies Ordinance and developments in cities across the United States.

Action: M/S/C (Adams/Webber/Katz) Motion to approve the Commission recommendation.

Votes: Ayes- Webber, Smart, Spigner, Adams, Katz; Noes –None ; Abstain –None ; Absent –None .

BACKGROUND

The American Medical Association (AMA) has adopted guidance on human and environmental effects of light emitting diode (LED) community lighting, particularly where the correlated color temperature exceeds 3,000 Kelvin, characterized by an excessive blue wavelength. The AMA found that the wavelengths for this type of light as associated with more scattering in the human eye, damages the retina, impacts disability glare that can impair roadway safety, and most significantly, disrupt circadian rhythmicity and sleep patterns. The AMA found some evidence supporting a long-term increase in the risk for cancer, diabetes, cardiovascular disease and obesity from chronic sleep disruption associated with exposure to brighter light sources in the evening or night. The AMA therefore, in 2016, encouraged the use of 3,000 Kelvin or lower lighting for outdoor installations, for lighting to be properly shielded, and for consideration to dim lighting for off-peak time periods.¹ For example, one study found a modest, but positive association between light at night (“LAN”) and breast cancer risk, increasing risk by 10-14% among a population of predominantly Black women in neighborhoods with increased LAN exposure.² Another study found an association between artificial light at night and thyroid cancer.³ One study found a significant association between diabetes prevalence and LAN exposure, linked to the disruption of circadian rhythms.⁴

¹ [Report of the American Medical Association, Council on Science and Health, on Human and Environmental Effects of Light Emitting Diode \(LED\) Community Lighting](#), 2016

² Qian Xiao, Gretchen L. Gierach, Cici Bauer, William J. Blot, Peter James, and Rena R. Jones 2021 [The Association between Outdoor Artificial Light at Night and Breast Cancer Risk in Black and White Women in the Southern Community Cohort Study](#) Environmental Health Perspectives 129:

³ Zhang D, Jones RR, James P, Kitahara CM, Xiao Q. [Associations between artificial light at night and risk for thyroid cancer: A large US cohort study](#). Cancer. 2021 May 1;127(9):1448-1458.

⁴ Zheng R, Xin Z, Li M, Wang T, Xu M, Lu J, Dai M, Zhang D, Chen Y, Wang S, Lin H, Wang W, Ning G, Bi Y, Zhao Z, Xu Y. [Outdoor light at night in relation to glucose homeostasis and diabetes in Chinese](#)

The CHC offers the following recommendations to strengthen the proposed Dark Skies Ordinance:

1. The purpose of the ordinance should state public health as a purpose of the ordinance.
2. Aspects of the Dark Skies ordinance should be applicable to existing construction after a reasonable phase-in period, like in Los Angeles County, Malibu, CA, Ann Arbor, MI, Ithaca, NY, Pittsburg, PA, Maricopa County, AZ, Washington, DC, and several other states and cities.
3. The primary purpose of near-term applicability to existing construction is to achieve the health benefits of limiting night light exposure to color temperatures of 3,000 Kelvin or below. The Planning Commission may consider limiting the requirement to install motion sensors or timers where it would be unduly costly or burdensome on existing construction, or similarly costly or burdensome to install shielding in difficult to access areas without a major construction event. Such situations may have a longer phase-in period or remain exempt, while bulb replacements at the compliant color temperature should be phased in faster.
4. When considering features of exemplar ordinances, Berkeley's Dark Skies ordinance should also consider our local context by applying color temperature requirements to building interior walkways or lighting that shines into residential windows, which is particularly common in some multi-family buildings. Additionally, while color temperature of 3,000 or below, and shielding should be achieved, standards restricting light intensity (lumens) in commercial areas should be balanced with public safety benefits of adequate lighting.

ENVIRONMENTAL SUSTAINABILITY AND CLIMATE IMPACTS

The Community Environmental Advisory Commission stated in its report before the City Council on November 19, 2019 that "Unfettered outdoor lighting also poses known risks to birds, as well as generating unwanted light pollution." The City of Berkeley's Downtown Area Plan, as well as Southside zoning regulations (BMC 23E.52.070.F.7), provide guidance or limitations on outdoor lighting, but no general policy exists citywide to prevent excessive light pollution from outdoor lighting. The Community Health Commission has reviewed scientific studies of light pollution on health, the proposed Dark Skies Ordinance and developments in cities across the United States.

RATIONALE FOR RECOMMENDATION

- While the Dark Skies Ordinance originates from the Community Environmental Advisory Commission, the control of "cool" light temperatures would provide public health benefits for Berkeley residents, based on scientific studies.

[adults: a national and cross-sectional study of 98,658 participants from 162 study sites](#). Diabetologia. 2023 Feb;66(2):336-345.

ALTERNATIVE ACTIONS CONSIDERED

The CHC considered no action and opted to communicate the health benefits of these recommendations to the City Council.

CITY MANAGER

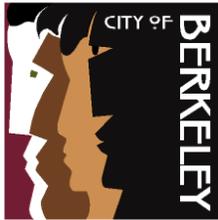
The City Manager takes no position on the content and recommendations of the Commission's Report.

CONTACT PERSON

Kellie Knox, Commission Secretary, HHCS, (510) 981-5301

Attachments:

1: Bird Safe Berkeley Requirements, including Dark Skies Ordinance, Referral from CEA 11-12-2019



Community Environmental Advisory Commission

ACTION CALENDAR
November 12, 2019

To: Honorable Mayor and Members of the City Council
From: Community Environmental Advisory Commission (CEAC)
Submitted by: Ben Gould, Chairperson, CEAC
Subject: Bird Safe Berkeley Requirements

RECOMMENDATION:

Refer to the Planning Commission and the City Attorney the attached ordinance amending Berkeley Municipal Code Title 23C, adding a new Chapter 23C.27 establishing bird safety requirements for new construction and significant renovations and a new Chapter 23C.28 establishing a dark skies ordinance, for review and approval.

FISCAL IMPACTS OF RECOMMENDATION:

Potential for small additional ongoing costs associated with slightly increased requirements for staff review of new construction proposals to ensure compliance.

CURRENT SITUATION AND ITS EFFECTS

Bird safety is aligned with the City of Berkeley's Strategic Plan, advancing our goal to be a global leader in addressing climate change, advancing environmental justice, and protecting the environment.

According to the Audubon Society, bird collisions with windows is a leading cause of human-induced bird deaths (second only to outdoor house cats). Berkeley is located in the midst of the Pacific Flyway, a major migratory route for birds including hummingbirds, robins, blackbirds, numerous shorebirds, raptors, and more. When these birds encounter unfamiliar urban areas along the migratory path, they are at particular risk for collisions and death.

At present, there are no bird safety measures required for new construction or renovations. As a result, it is possible that new and existing buildings may incorporate features which pose preventable hazards to local and migratory birds.

Unfettered outdoor lighting also poses known risks to birds, as well as generating unwanted light pollution. The City of Berkeley's Downtown Area Plan¹, as well as

¹ Lighting, City of Berkeley Downtown Area Plan. Accessed August 2019:
https://www.cityofberkeley.info/uploadedFiles/Planning_and_Development/Level_3_-_DAP/Chapter%2012%20Lighting.pdf

Bird Safe Berkeley Requirements

ACTION CALENDAR
November 12, 2019

Southside zoning regulations (BMC 23E.52.070.F.7), provide guidance or limitations on outdoor lighting, but no general policy exists citywide to prevent excessive light pollution from outdoor lighting.

At its September 12, 2019 meeting, the Community Environmental Advisory Commission voted to recommend the adoption of Bird Safe Berkeley requirements. Moved by Goldhaber, second by Hetzel, carried 6-0-0-2 (Ayes: Simmons, Ticconi, Hetzel, De Leon, Goldhaber, Gould. Noes: None. Abstained: None. Absent: Varnhagen, De Leon).

BACKGROUND

Berkeley is in the midst of the Pacific Flyway, a major migratory route for birds. The city is also adjacent to San Francisco Bay, one of North America's most ecologically important estuaries and a site of Western Hemispheric importance for shorebirds and waterfowl. Alameda County has recorded 407 species of resident and migratory bird species, including least terns, Ridgway's rails, and a variety of other uniquely local and/or threatened species.

New buildings can be designed to reduce bird deaths from collisions without compromising cost or aesthetics – in fact, many of the compliance methods in the attached ordinance can be incorporated into design or construction with virtually no additional cost or difficulty for architects or engineers, and in some cases facilitate achieving other environmental goals (like improved building energy efficiency).

Several other Bay Area cities have adopted bird safety ordinances, including San Francisco, Oakland, Alameda, and Richmond. The attached proposed ordinance is developed from the City of Alameda's adopted ordinance.

In addition, birds are drawn to light, whether from the moon or artificial lights, and lights affixed to buildings or structures pose a risk that birds may crash into them. A special danger comes from very bright lights, as well as lights aimed upward.

ENVIRONMENTAL SUSTAINABILITY

Implementing the Bird Safe Berkeley ordinance will ensure new construction does not pose undue hazards to local and migratory birds, thereby reducing human impact and benefiting the environment.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

The proposed amendment to BMC Title 23C is categorically exempt from CEQA under CEQA Guidelines Sections 15061(b)(3), 15307, and 15308.

RATIONALE FOR RECOMMENDATION

Bird Safe Berkeley Requirements

ACTION CALENDAR
November 12, 2019

Berkeley's strategic plan calls for being a global leader in protecting the environment. The bird-safe glazing design standards contained within have been found to be effective at reducing or eliminating bird deaths, and can be implemented with little or no additional costs. The window size threshold for requiring implementation is the most stringent in the nation, and as a result adopting this policy strongly aligns with Berkeley's strategic plan. The dark skies ordinance is straightforward and simple, yet effective at reducing excessive and unwanted light pollution while conserving energy.

ALTERNATIVE ACTIONS CONSIDERED

CEAC considered taking no action on bird safety standards, but concluded that the environmental benefits substantially outweighed the burden imposed. CEAC also considered a less stringent window size requirement (of twenty-four (24) square feet instead of eight (8) square feet), but determined that window size was not a significant factor in either bird safety or cost or ease of compliance.

CEAC considered taking no action on dark skies, but concluded that the environmental benefits outweighed the burden imposed. CEAC also considered a more stringent dark skies ordinance, but concluded it would be unnecessarily difficult to enforce with minimal additional benefits.

CITY MANAGER

The City Manager takes no position on the content and recommendations of the Commission's Report.

CONTACT PERSON

Ben Gould, Chairperson, CEAC, 510-725-9176

ORDINANCE NO. -N.S.

AMENDING BERKELEY MUNICIPAL CODE TITLE 23C TO ESTABLISH GENERAL REQUIREMENTS FOR BIRD SAFETY IN BUILDINGS AND EXTERIOR LIGHTING FIXTURES; ADDING CHAPTER 23C.27 AND CHAPTER 23C.28

BE IT ORDAINED by the Council of the City of Berkeley as follows:

Section 1. That the Berkeley Municipal Code Chapter 23C.27 is added to read as follows:

**Chapter 23C.27
BIRD SAFETY**

Sections:

- 23C.27.010 Purpose**
- 23C.27.020 Applicability**
- 23C.27.030 Exemptions**
- 23C.27.040 Standards**

23C.27.010 Purpose

The purposes of the Bird Safety related regulations contained in this Chapter is to reduce bird mortality from windows or other specific building features known to increase the risk of bird collisions.

23C.27.020 Applicability

The bird-safe building standards apply to the following types of projects when such projects require a building permit:

A. New Construction. New buildings with two (2) or more stories, and one or more façades in which glass constitutes fifty percent (50%) or more of the area of the individual façade. The bird-safe glazing requirement must be met on any window with dimensions of at least two (2) feet by four (4) feet, or an area of eight (8) square feet or more, located on such façade.

B. Window Replacement. On buildings with two (2) or more stories, and one or more facades in which glass constitutes fifty percent (50%) or more of the area of the individual façade, replacement of any window or other rigid transparent material with dimensions of at least two (2) feet by four (4) feet, or an area of eight (8) square feet or more. The requirement does not apply on existing windows that are not proposed to be replaced.

C. New or Replaced Glass Structures. Any structure that has transparent glass walls twenty-four (24) square feet or more in size, including but not limited to freestanding glass walls, wind barriers, skywalks, balconies, greenhouses, and rooftop appurtenances.

23C.27.030 Exemptions

The bird-safe building standards shall not apply to the following:

A. The replacement of existing glass on historic structures. However, the standards shall apply to new exterior additions to historic structures, and new construction on the site of historic structures, that are differentiated from the historic structures, if determined by the Planning Director to be consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties.

B. Glazing on the ground floor of commercial storefronts directly fronting a public street, alley, or sidewalk.

23C.27.040 Standards

A. Bird-Safe Glazing Requirement. At least ninety percent (90%) of the glazing on any building façade or freestanding glass structure shall include features that enable birds to perceive the glass as a solid object. The requirement can be satisfied by using one or more of the following treatments to be determined by the Planning Director as part of an application for a building permit:

1. External screens installed permanently over glass windows such that the windows do not appear reflective.
2. Light-colored blinds or curtains.
3. Opaque glass, translucent glass, or opaque or translucent window film.
4. Paned glass with mullions on the exterior of the glass.
5. Glass covered with patterns (e.g., dots, stripes, images, abstract patterns, lettering). Such patterns may be etched, fritted, stenciled, silk-screened, applied to the glass on films or decals, or another method of permanently incorporating the patterns into or onto the glass. Elements of the patterns must be at least one-eighth (1/8) inch tall and separated no more than two (2) inches vertically, at least one-quarter (1/4) inch wide and separated by no more than four (4) inches horizontally, or both (the "two-by-four rule").
6. Ultraviolet (UV)-pattern reflective glass, laminated glass with a patterned UV-reflective coating, or UV-absorbing and UV-reflecting film that is permanently applied to the glass. Where patterns are used, they shall meet the two-by-four rule.
7. Other glazing treatments providing an equivalent level of bird safety and approved by the Planning Director as part of building plan review.

B. Alternative Glazing Compliance. As an alternative to meeting subsection 4(a), Bird-Safe Glazing Requirement, an applicant may propose building and fenestration designs and/or operational measures that will minimize bird collisions and achieve an equivalent level of bird safety. The applicant shall submit a bird collision reduction plan along with the application for design review or other discretionary permit required for the project. The bird collision reduction plan shall be prepared by a qualified biologist. Design and operational solutions may include but need not be limited to the following techniques, singularly or in combination:

1. Layering and recessing glazed surfaces.
2. Angled or faceted glazing that minimizes reflectivity and transparency.
3. Louvres.
4. Overhangs and awnings.
5. Glass block.
6. Bird netting with openings one (1) square centimeter or smaller.
7. Decorative grilles that allow birds to perceive the grilles, together with the glass behind them, as solid.
8. Glass embedded with photovoltaic cells.
9. Placement of landscaping in such a way as to minimize bird collisions.

Section 2. That the Berkeley Municipal Code Chapter 23C.28 is added to read as follows:

**Chapter 23C.28
DARK SKIES**

Sections:

- 23C.28.010 Purpose**
23C.28.020 Applicability
23C.28.030 Exemptions
23C.28.040 Standards

23C.28.010 Purpose

The purpose of the Dark Skies ordinance is to ensure exterior light fixtures are pointed downwards and turn off whenever possible, minimizing light pollution, sky glow, and hazardous risks to birds, while ensuring adequate illumination for safety, security, and the enjoyment of outdoor areas, including travel on public roads.

23C.28.020 Applicability

The dark skies ordinance applies to any project that requires a building permit or electrical permit for:

A. New exterior lighting, including lighting fixtures attached to buildings, structures, poles, or self-supporting structures; or

B. Additions or replacements of existing exterior light fixtures, including upgrades and replacements of damaged or destroyed fixtures.

23C.28.030 Exemptions

The following types of lighting are exempt from the requirements of this subsection:

A. Emergency lighting. Temporary emergency lighting used by law enforcement or emergency services personnel, a public utility, or in conjunction with any other emergency service.

B. Construction lighting. Temporary lighting used for construction or repair of roadways, utilities, and other public infrastructure.

C. Lighting Required by Building Code or Other Regulations. Lighting for exit signs, stairs, ramps, points of ingress/egress to buildings, and all other illumination required for building codes, OSHA standards, and other permitting requirements imposed by state, or federal agencies.

D. Signs. Signs and sign lighting.

E. Athletic Field Lights. Athletic field lights used within a school campus or public or private park.

F. Neon, Argon, and Krypton. All fixtures illuminated solely by neon, argon, or krypton.

G. Water Features. Lighting used in or for purposes of lighting swimming pools, hot tubs, decorative fountains, and other water features.

H. Flag Lighting. Lighting used to illuminate a properly displayed United States flag and/or State of California flag.

I. Holiday Displays. Seasonal and holiday lighting.

J. Temporary Lighting. Temporary lighting allowed under a permit.

K. Historic Fixtures. Historic lighting fixtures or fixtures that exhibit a historical period appearance, as determined by the Planning Director.

L. Architecture, Historic Structures, and Public Art. Lighting on historic structures, special architectural features, public art, monuments, and other similar objects of

interest shall be exempt if the lamps emit less than one thousand six hundred (1600) lumens per fixture and together draw less than one hundred (100) watts. However, the standards shall apply to new exterior additions to historic structures, and new construction on the site of historic structures, that are differentiated from the historic structures, if determined by the Planning Director to be consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties.

M. Low-Voltage Landscape Lighting. Low-voltage landscape lighting such as that used to illuminate fountains, shrubbery, trees, and walkways, provided that it uses no more than sixty (60) watts and no more than seven hundred and fifty (750) lumens per fixture.

23C.28.040 Standards

To minimize the harmful effects of light pollution, new construction and major renovation projects shall meet the following standards:

- A. Outdoor lighting shall be no brighter than 3000 Kelvin.
- B. Outdoor lighting shall be shielded and directed, with a full cut off fixture of no more than 2.5% of lamp lumens at or above 90°, and no more than 10% of lamp lumens at or above 80°.
- C. Wherever feasible, require motion sensors or timers to prevent unnecessary energy use and light pollution.
- D. Light shows and beams of light are not permitted during spring or fall migration seasons, roughly February 15 to May 31, and August 15 to November 30, respectively.