

Chapter 15.22 Outdoor Lighting

Section 15.22.010 Short Title. This Ordinance may be cited as the “Outdoor Lighting Ordinance” of the City of Cambridge (the “City”).

Section 15.22.020 Purpose. The purpose of this Outdoor Lighting Ordinance is to regulate outdoor lighting, as defined in this Ordinance, in the City, the intent being to permit an amount of outdoor lighting that is appropriate to allow for the safe use and enjoyment of outdoor areas, while also mitigating light trespass and glare to abutters and the public at large, reducing light pollution, and promoting energy conservation.

Section 15.22.030 Definitions.

- A. Administrative Waiver** means a partial or complete waiver of the requirements of this Ordinance according to the procedures set forth in Section 15.22.060.
- B. Building thermal envelope** means the basement walls, exterior walls, floor, roof, and any other building elements that enclose conditioned space or provides a boundary between conditioned space and unconditioned space.
- C. Commissioner** means the Commissioner of Inspectional Services of the City of Cambridge Department of Inspectional Services or, if that position is vacant, the person designated to act in his or her stead.
- D. Conditioned space** means an area or room within a building being heated or cooled, containing uninsulated ducts, or with a fixed opening directly into an adjacent conditioned space.
- E. Correlated color temperature (“CCT”)** means a specification of the color appearance of the light emitted by a lamp, relating its color to the color of light from a reference source when heated to a particular temperature, measured in Kelvin (“K”).
- F. District** means a section of the City for which the zoning regulations governing the use of land, the use of buildings and premises, and the permitted height of buildings, and the area of open space about the buildings are uniform.
- G. Façade lighting** means illumination of exterior surfaces of buildings for the enhancement of their nighttime appearance, achieved by shining light onto building surfaces, or by internal or external illumination of translucent building surfaces.
- H. Glare** means light entering the eye directly from light fixtures, or indirectly

from reflective surfaces that causes visual discomfort or reduced visibility.

- I. Illuminance** means the density of the luminous flux incident on a surface; it is the quotient of the luminous flux by the area of the surface when the latter is uniformly illuminated.
- J. Lamp** means a source of optical radiation, often called a “bulb” or “tube,” such as incandescent lamps, fluorescent lamps, high-intensity discharge (“HID”) lamps, and low pressure sodium (“LPS”) lamps, as well as light-emitting diode (“LED”) modules and arrays.
- K. Landscape lighting** means lighting of trees, shrubs, or other plant material, as well as water features and sculptural objects.
- L. Laser** means a device that emits light through a process of optical amplification based on the stimulated emission of electromagnetic radiation which is also a term that originated as an acronym for "light amplification by stimulated emission of radiation".
- M. Light fixture** means a complete lighting unit consisting of one or more lamps together with the parts designed to distribute the light, to position and protect the lamps and to connect the lamps to the power supply. Sometimes this includes ballasts or drivers, and photocells.
- N. Light trespass** means lighting that falls beyond the boundaries of the property it is intended to illuminate.
- O. Lighting** means electric, man-made, or artificial lighting. See “lighting equipment.”
- P. Lighting equipment** means equipment specifically intended to provide gas or electric illumination, including, but not limited to, lamp(s), luminaire(s), ballast(s), poles, posts, lens(es), electrical wiring, and related structures or other necessary or auxiliary components.
- Q. Lighting plan** means a site plan depicting the property lines of all properties for which lighting is proposed, the location and specification of all exterior light fixtures to be installed within the property, their lumen values, mounting heights, shielding, directionality and controls, protections provided to minimize light pollution, other relevant site conditions, and any additional information required to demonstrate compliance with applicable standards.
- R. Light pollution** means adverse effects of lighting, as defined in this Ordinance, including, but not limited to, glare, light trespass, sky glow, energy waste, compromised safety and security, and impacts on the nocturnal environment.

- S. Lighting Zone (“LZ”)** means an area or district within which particular lighting standards apply as set forth in this Ordinance. Lighting Zones are based on the U.S. Green Building Council’s Leadership in Energy Environmental Design (“LEED”) Light Pollution Reduction (“LPR”) credit v4 BD+C four lighting zones and are delineated by reference to the Districts established in the Zoning Map of the City of Cambridge Zoning Ordinance (“Zoning Districts”). For the purposes of this Ordinance, only Lighting Zone 2 (“LZ2”) and Lighting Zone 3 (“LZ3”) are allowed in the City.
- T. Lighting Zone 2 (“LZ2”)** means Low Design exterior lighting so that all site and building-mounted luminaires produce a maximum initial illuminance value no greater than 0.10 horizontal and vertical foot candles (1.0 horizontal and vertical lux) at the LEED project boundary and no greater than 0.01 horizontal foot candles (0.1 horizontal lux) 10 feet (3 meters) beyond the LEED project boundary. LZ2 includes primarily residential districts, neighborhood business districts, light industrial areas with limited nighttime use and residential mixed-use areas. Document that no more than 2% of the total initial designed fixture lumens (sum total of all fixtures on site) are emitted at an angle of 90 degrees or higher from nadir (straight down). LZ2 includes all Zoning Districts not listed under Lighting Zone 3.
- U. Lighting Zone 3 (“LZ3”)** means Medium Design exterior lighting so that all site and building-mounted luminaires produce a maximum initial illuminance value no greater than 0.20 horizontal and vertical foot candles (2.0 horizontal and vertical lux) at the LEED project boundary and no greater than 0.01 horizontal foot candles (0.1 horizontal lux) 15 feet (4.5 meters) beyond the site. LZ 3 includes all other areas not included in LZ2, such as commercial/ industrial, and high-density residential. Document that no more than 5% of the total initial designed fixture lumens (sum total of all fixtures on site) are emitted at an angle of 90 degrees or higher from nadir (straight down). LZ3 includes the following Zoning Districts: Residence C-3; C-3A or C-3B; Office 2, 2A or 3; Business B or C; Industry B, B-1, B-2 or C; Special Districts 1, 3, 4, 4A, 5, 6, 7, 8, 11, 15 and any other Special Zoning District whose general zoning limitations derive from one of the previously listed base Zoning Districts; Mixed-Use Development District: Kendall Square (“MXD”) and Cambridgeport Revitalization Development District (“CRDD”); all Planned Unit Development (“PUD”) Zoning Districts and Alewife Overlay Districts (“AOD”).
- V. Lumen** means the unit of measure used to quantify the amount of light produced by a lamp or emitted from a light fixture (as distinct from “watt” or other measure of a lamp’s power consumption).
- W. Lux** means the SI (International System of Units) unit of illuminance. One lux equals one lumen per square meter and is approximately equal to 1/10 of a foot candle.

- X. New lighting** means lighting for areas not previously illuminated, or newly installed lighting of any type, except for replacement lighting or lighting repairs.
- Y. Notice Recipients** means the applicant for an Administrative Waiver, abutters to the property for which the Administrative Waiver is sought, owners of land directly opposite on any public or private street or way, and abutters to the abutters within three hundred feet of the property line of the applicant as they appear on the most recent applicable tax list from the City’s Assessing Department.
- Z. Outdoor lighting** means lighting equipment installed within the property line and outside the building thermal envelope of a subject property, whether attached to poles, the building thermal envelope, building structures, the earth, or any other location, and any associated lighting control equipment, including façade and landscape lighting.
- AA. Partly shielded light fixture** means a light fixture with opaque top and translucent or perforated sides, designed and maintained to emit most light downward.
- BB. Public art** means art in any media that has been planned and executed with the intention of being staged in the physical public domain, usually outside or in publically accessible buildings that are open to all.
- CC. Replacement lighting** means lighting equipment, fixtures, or parts, including lamps installed in order to replace existing lighting equipment.
- DD. Seasonal lighting** means lighting in use for not longer than a six-week period in any calendar year.
- EE. Shielded directional light fixture** means a fixed or adjustable light fixture that also contains a shield, hood, cowl, louver, or baffle to minimize direct view of the lamp.
- FF. Substantial renovation** means work area as defined in the building permit that is 50% or more of the Gross Floor Area of the building or 50% of the exterior wall area of the building.
- GG. Sky glow** means the brightening of the nighttime sky that results from scattering and reflection of artificial light by moisture and dust particles in the atmosphere, caused by light directed or reflected upwards or sideways, and which reduces ability to view the night sky.
- HH. Unshielded light fixture** means a light fixture capable of emitting light in any direction.

Section 15.22.040 Effective Date. This Ordinance shall take effect three (3) months from the date of enactment.

Section 15.22.050 General Requirements.

- A. Conformance with all Applicable Codes.** The provisions of this Ordinance shall be interpreted and applied at all times consistently with the provisions of all applicable federal, state, and local laws, rules, and regulations, including, but not limited to, applicable sections of the Massachusetts Building Code, the Cambridge Zoning Ordinance, and the Cambridge Municipal Code. Nothing in this Ordinance shall relieve property owners of the obligation to comply with all other applicable federal, state, and local laws, rules, and regulations.
- B. Applicability.** Except as set forth in this Ordinance, all outdoor lighting installed after the effective date of this Ordinance shall comply with the requirements of this Ordinance. This includes, but is not limited to, new lighting equipment, light fixtures, replacement lighting, or any other lighting whether attached to structures, poles, the earth, or any other location. Except as otherwise provided in this Ordinance, all outdoor lighting installed prior to the effective date of this Ordinance shall be altered or changed so as to comply with these requirements within five (5) years of the effective date of this Ordinance. Nothing in this Ordinance shall be construed so as to extend a five-year compliance period to lighting already regulated under existing codes and zoning provisions.
- C. Interim Modifications.** Upon the effective date of this Ordinance, property owners shall make improvements to eliminate or minimize light trespass on other properties by: (1) replacing one or more lamps within an existing light fixture to be in conformance with the Prescriptive Standard's lumen limitations and Light Color Standard of this Ordinance; and/or (2) changing the shielding and direction of elements of an existing fixture to be directed downward and/or away from other properties.
- D. Light Color Standard.** Correlated color temperature of any outdoor light source shall not exceed 3500 Kelvin unless introduced as part of a façade or landscape lighting scheme used exclusively for the decorative illumination through color of certain building façade or landscape features.
- E. Substantial Renovation.** If any substantial renovation of an existing building or property occurs after the effective date of this Ordinance, then that property shall be required to meet the Standards set forth in this Ordinance.
- F. Laser Light Ban.** Laser light is strictly prohibited for outdoor use unless otherwise exempted in this Ordinance.

- G. Flashing or Intermittent Light.** Any lighting which flashes, moves, or incorporates rapid color or intensity changes is prohibited unless otherwise provided in this Ordinance.
- H. Prescriptive and Performance Standards.** All outdoor lighting must comply with the Light Color Standard and either the Prescriptive Standard or the Performance Standard, as set forth below. For properties with building(s) totaling 10,000 square feet or larger of Gross Floor Area as defined by the Cambridge Zoning Ordinance, a lighting plan must be submitted to the City of Cambridge Inspectional Services Department (the “ISD”).

1. Prescriptive Standard

Outdoor Lighting Category	Maximum - Allowed Lumens Light	Maximum Height	Shielding and Direction
Unshielded or partly shielded light fixture placed not less than 4 feet apart.	315	12 feet above the surface of the area to be illuminated	Not applicable
Up to two unshielded or partly shielded light fixtures located in a main entry area, placed not less than 4 feet apart.	630	12 feet above the surface of the area to be illuminated	Not applicable
Shielded directional light fixtures, placed not less than 4 feet apart, for entries, walkways, and façade lighting.	1,050	12 feet above the surface of the area to be illuminated.	All light fixtures shall be located, aimed, and shielded so as to minimize light pollution and light trespass across property boundaries. Light fixtures for entries and walkways shall emit light in a downward direction only.

Shielded directional light fixtures for parking areas, driveways, or outdoor loading bays.	1,260	14 feet above the surface of the parking area, driveway or loading bay	All light fixtures shall be located, aimed, and shielded so as to minimize light pollution and light trespass across property boundaries.
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2. Performance Standard.

In order to apply the Performance Standard, permit applicants must submit a lighting plan and accompanying calculations that demonstrate compliance with the U.S. Green Building Council’s Leadership in Energy Environmental Design (“LEED”) Light Pollution Reduction (“LPR”) credit v4 BD+C. Once installed, actual compliance to the LPR credit must be certified by a registered architect or professional engineer licensed in the Commonwealth of Massachusetts and such certification must be submitted to the ISD. Even if approved and certified, should the lighting as installed and maintained fail to meet the Light Color Standard and/or the minimum LEED LPR Credit requirements, and be determined to be in violation of the light pollution and light trespass protections in this Ordinance, then that lighting shall be considered in violation of this Ordinance. For properties in Lighting Zone 3 (“LZ3”) that are adjacent to Lighting Zone 2 (“LZ2”), compliance with the LZ2 Light Trespass requirements in the LEED LPR credit v4 BD+C must be shown for portions of the property that lie within 100 feet of LZ2. Where the Lighting Zone boundary occurs within a public street, the 100 feet shall be measured from the centerline of the street. Where the Lighting Zone boundary lies within a lot, the 100 feet shall begin at the lot line that divides the subject lot from another lot in a different Lighting Zone.

I. Exemptions from Applicability. Property owners are encouraged to make good faith efforts to achieve near or partial compliance with the provisions of the Ordinance, including minimizing light trespass and light pollution; however, exemptions from the provisions of the Ordinance are as follows.

1. Lighting within public ways for the principal purpose of illuminating public ways.
2. Lighting for public parks or public art that is accessible to the general public and is commissioned, owned, or operated by the City or by a state or federal entity, or that is otherwise required by special permit, or law.

3. Lighting for public monuments, statuary, or the national flag in cases where compliance with the Standards of this Ordinance are specifically prohibited by law or conflicting with superseding requirements.
4. Lighting of historic buildings that has been reviewed by and has received a Certificate of Appropriateness from the Cambridge Historical Commission.
5. Lighting solely for signs as regulated under Article 7 of the Cambridge Zoning Ordinance.
6. Lighting for theatrical or television production or performance areas, if an electrical permit has been received from the ISD.
7. Lighting for work areas at construction sites, if an electrical permit has been received from the ISD.
8. Underwater lighting in swimming pools and other water features.
9. Seasonal lighting as defined in this Ordinance.
10. Lighting that is only used under emergency conditions.
11. Lighting required by federal, state, or local laws, rules or regulations.
12. Lighting for sports facilities, including, but not limited to, outdoor conditioned or unconditioned rinks, open courts, fields, and stadiums. All light fixtures shall be directed and shielded in a way that minimizes light trespass and sky glow. Lighting for the playing surfaces and spectator areas must be turned off after the activities have ceased or 11:00 PM, whichever is earlier.
13. Lighting as otherwise required or requested by the City for purposes of safety or security.
14. Lighting undertaken as a result of a City-appointed or City-authorized expert review panel to identify significant buildings, monuments, public spaces and streetscapes, and to recommend alternative or new lighting designs to accentuate their historic and aesthetic value, while preserving this Ordinance's intent to minimize light pollution and light trespass.

Section 15.22.060 Administrative Waiver. The Commissioner shall have the authority to grant a partial or complete waiver ("Waiver") of the requirements of this Ordinance according to the following procedures:

- A. Any applicant seeking a Waiver from all or some of the requirements of this Ordinance shall file an application with the ISD describing in detail with supporting information and documentation the nature, duration, location, specifications, and other particulars of the waiver being sought. The Application for a Waiver must

demonstrate that: (a) bringing the source of light for which the Waiver is sought into full compliance with this Ordinance would constitute a demonstrably unreasonable hardship on the applicant, as balanced against the potential impacts on Notice Recipients as defined in this Ordinance; or (b) bringing the source of light for which the Waiver is sought into full compliance with this Ordinance would result in conditions that are materially detrimental to health, safety, or welfare. The applicant may also provide for consideration an alternative plan(s) that demonstrate(s) their ability to substantially mitigate the negative effects of non-compliance.

- B.** The ISD shall give written notice of any Application for a Waiver to each Notice Recipient as defined in this Ordinance, including specific information on the nature, duration, location, and specifications and other particulars of the Waiver being sought, at least 14 days in advance of any decision on the Waiver application. Any Notice Recipient who claims that he/she or occupants of his/her property would be adversely affected by a grant of the Waiver may file a statement and materials with the ISD containing information to support his/her claim.
- C.** In determining whether to grant or deny the Waiver and what, if any, conditions and limitations (including a time limit) to impose, the Commissioner shall determine whether the applicant has demonstrated that: (a) bringing the source of light for which the Waiver is sought into full compliance with this Ordinance would constitute a demonstrably unreasonable hardship on the applicant; or (b) bringing the source of light for which the Waiver is sought into full compliance with this Ordinance would result in conditions that are materially detrimental to the health, safety, or welfare of persons or property affected. The Commissioner shall place on public file a copy of the application for the Waiver, all accompanying submissions and the decision, including all conditions and limitations, and the reasons for granting or denying the Waiver, as well as any other documentation associated with the process.
- D.** Waivers shall be granted in writing to the applicant and shall contain all conditions and limitations, including any time limit on the activity. Noncompliance with any provision or condition of the Waiver may result in its termination by the Commissioner.
- E.** Any Waiver may be reviewed, adjusted, terminated or repealed by the Commissioner at any time after two years, unless a longer time is specified in the Waiver, or in the event of noncompliance with any provision or condition of the Waiver.
- F.** The Commissioner may issue guidelines further defining the procedures to be followed in applying for a Waiver and the criteria that will be considered by the Commissioner in deciding whether to grant a Waiver. The Commissioner may impose a Waiver application fee.

Section 15.22.070 Enforcement.

- A. Enforcement Officials.** The Commissioner or her/his designee shall be the authorized enforcement personnel charged with the enforcement of the provisions of this Ordinance.
- B. Complaints.** The Commissioner or his/her designee shall receive and respond to complaints of noncompliance with the Ordinance.
- C. Violations.** The Commissioner or his/her designee may order and specify remedial actions to be taken by a violator of this Ordinance to achieve compliance, or issue citations, pursuant to G. L.c. 40, § 21D, for violations of these provisions, assessing fines of three hundred dollars for each such violation. Each day such a violation continues shall constitute a separate offense. Additionally, any person found to be in violation of any of the provisions of this Ordinance may be prosecuted for a misdemeanor and upon conviction thereof shall be fined three hundred dollars for each such misdemeanor.
- D. Injunction.** As an additional remedy, any outdoor lighting installed or maintained in violation of any provision of this Ordinance may be subject to abatement summarily by a restraining order or injunction issued by a court of competent jurisdiction.
- E. Suspension or Revocation of Permit.** As an additional remedy, the Commissioner or his/her designee hereunder may summarily suspend, and after a hearing may revoke, any license or permit, including a building, demolition, or electrical permit.