

Proposed Revision to Zoning Bylaw New §13.5 – Exterior Lighting

13.5 Exterior Lighting

Purpose: The purpose of this Section 13.5 is to ensure that all exterior lighting permanently installed in any zoning district after the adoption of this Section 13.5 is designed, installed, operated, and maintained to minimize glare, light trespass, and sky glow in recognition of the negative effects on people, wildlife and the natural ecosystem, while providing reasonable illumination for safety, security and use of property.

13.5.1 Definitions

Active Use: Active use occurs when lighting is required for outdoor human activity or in anticipation of human activity such as a planned arrival to a residence.

Correlated Color Temperature (CCT): A specification of the color appearance of the light emitted by a light source, measured in Kelvin (K). Light with a warmer tone is created at lower Kelvin values, while light with a colder bluer tone is produced at higher Kelvin values.

Environmentally Sensitive Area: Wetlands and wetland buffers, conservation land or land subject to a conservation restriction, agricultural land and any priority habitats as defined by the Commonwealth of Massachusetts.

Fully Shielded Luminaire: A fully shielded luminaire that is designed so that no light is emitted above the horizontal plane passing through the lowest point of the fixture. All light is directed downward toward the ground.

Illuminance: A way to measure how much light is shining on a surface, like the ground or a driveway. It tells us how bright a place is where the light lands. Illuminance is measured in foot-candles (fc), which means how much light reaches one square foot of area.

Lumen: A measure of how bright a light is; more technically, a unit that measures light energy generated by a light source. For the purposes of this Section 13.5, the lumen output shall be the initial lumen output of a lamp, as rated by the manufacturer and provided in the manufacturer's specification sheets.

Luminaire: A complete lighting assembly, consisting of a lamp/bulb, housing, optic(s), and other structural elements, but not including any mounting pole or surface.

13.5.2 Applicability

This Section 13.5 shall apply to exterior luminaires installed after adoption of this Section 13.5, located on any property within the Town, whether publicly or privately owned, and in any zoning district.

All such lighting shall be installed, aimed, and maintained to prevent direct light from illuminating Environmentally Sensitive Areas.

Existing exterior lighting lawfully installed before adoption of this Section 13.5 may remain, except when the Public Safety Department determines that it is a public safety hazard or in the following instances:

a. Installation or Replacement of Exterior Luminaires

Installation or replacement of exterior luminaires shall comply with this Section 13.5.

b. Additions and Expansions

Any addition or expansion of a structure that requires a building permit and that increases the gross floor area of a building or structure by thirty percent (30%) or more, or that increases the impervious area of the lot by thirty percent (30%) or more, shall require all exterior lighting to comply with this Section 13.5.

c. Substantial Renovation or Site Reconstruction

Any project involving alteration, reconstruction, or renovation of a structure, parking area, driveway or walkway with a construction cost (as determined by the construction cost recited on building permit applications for the project) exceeding thirty percent (30%) of the current assessed value of structures, as shown on the records of the Assessors of the Town, shall require all exterior lighting to comply with this Section 13.5.

d. Change of Use

Any change of use requiring a building permit, site plan review, or special permit shall require all exterior lighting serving the new use to comply with this Section 13.5.

13.5.3 Fixture Shielding

Exterior luminaires shall be fully shielded luminaires which, when installed, cause no direct light to be emitted above a horizontal plane of the lowest light-emitting part of the fixture.

13.5.4 Correlated Color Temperature

All exterior lamps and luminaires shall have a CCT of 2700 K or less.

Where exterior lighting with a CCT of 2700 K rating or below is not commercially available for the intended application, the Planning Board may grant a waiver, provided that:

- a. The applicant demonstrates to the satisfaction of the Planning Board that compliant lighting is not reasonably available for the intended application; and
- b. The proposed lighting minimizes glare, light trespass, and impacts on neighboring properties and the night sky to the maximum extent practicable.

13.5.5 Total Lumens

Except as provided in Section 13.5.9, all exterior luminaires shall not exceed the individual or aggregate lumen outputs provided below:

a. Per Fixture

Driveway lighting will not be allowed; however, lighting in parking areas adjacent to a home or business may be allowed. Additionally, walkway lighting in areas adjacent to a home or business may also be allowed. Such walkway lighting should be mounted no more than 3 feet above finished grade, shall not exceed 450 lumens per fixture and, if solar powered, shall be motion activated or on timers.

Property Type	Maximum Lumens per Fixture
Residential	450 lumens for walkway luminaires 900 lumens for all other exterior luminaires
Non-residential	450 lumens for walkway luminaires 3,000 lumens for parking area luminaires 900 lumens for all other exterior luminaires

b. Total Per Property

Except as provided in Section 13.5.9, total aggregate lumens per lot shall not exceed the lumen output as determined by the number of exterior doors on all structures multiplied by 900 lumens multiplied by 1.5.

13.5.6 Light Trespass

The maximum vertical illuminance at any property line shall not exceed the following:

Adjacent Use	Maximum Illuminance
Environmentally sensitive areas	0.05 foot-candles
Any other property	0.10 foot-candles

Vertical illuminance is measured using a calibrated light meter at the property line at a height of 5 feet above grade, on a vertical plane facing the brightest portion of the luminaire(s), under

maintained lighting conditions.

13.5.7 Hours of Operation for Exterior Lighting

Except as otherwise provided below, exterior lighting shall be turned off when a property or use is not actively occupied or in operation. Exterior lighting shall be extinguished or reduced in accordance with the following requirements:

a. Inactive Uses

Exterior lighting subject to Section 13.5.2 b, c, or d, and not associated with an active use shall be extinguished between the hours of 10:00 PM and sunrise, unless otherwise approved by the Planning Board through Site Plan Review or Special Permit.

b. Non-Residential Uses

For non-residential uses, exterior lighting shall be extinguished within one (1) hour after the close of business or the end of the activity or use for which the lighting is provided.

c. Public Safety Exception

Where the Public Safety Department determines that extended lighting is necessary for safety or security purposes, such lighting may remain operational; however, lighting shall be dimmed to twenty percent (20%) or less of full illumination and shall be motion-activated to return temporarily to full illumination when triggered.

d. Motion-Activated Lighting

Motion-activated lighting may operate during overnight hours if it complies with shielding, lumen limits and CCT requirements as defined in this Section 13.5. Such motion-activated lighting must automatically extinguish within ten (10) minutes or less after activation and must be designed and aimed so as not to be triggered by traffic in a public or private way.

13.5.8 Lighting Plans

Any application for a building permit that includes exterior lighting shall include a lighting plan showing:

- a. fixture location and mounting height
- b. lumen output
- c. CCT
- d. shielding type
- e. timers, sensors, motion activation, or dimming, photos and specifications of fixtures for which approval is requested.

Where conditions warrant, the Building Inspector and/or Planning Board may require photometric data to verify compliance.

13.5.9 Rules and Regulations, Waivers

a. Rules and Regulations. The Planning Board may promulgate or amend Rules and Regulations which pertain to and conform to this Section 13.5. The adoption or amendment of Rules and Regulations shall be after a public hearing to receive comments on the proposed or amended Rules and Regulations. The public hearing shall be advertised once in a newspaper of general local circulation at least 14 days prior to the date of the public hearing.

b. Waivers. The Planning Board may, in any particular case where it determines such action to be consistent with the purpose and intent of the Zoning By-law and otherwise in the public interest, waive strict compliance with its Rules and Regulations and with the requirements contained in Section 13.5.

13.5.10 Exemptions

The following shall be exempt from the requirements of this Section 13.5, provided that such lighting is installed and operated in a manner that minimizes glare and light trespass to the maximum extent practicable:

a. Emergency lighting used by police, fire, ambulance, or other emergency responders, and lighting installed at emergency facilities and activated during emergency conditions.

b. Temporary lighting used for construction, maintenance, repair, or special events, provided such lighting does not remain in place for more than thirty (30) consecutive days.

c. Holiday lighting, provided such lighting is not permanently installed.

d. Lighting required by federal or state law, regulation, or safety code, including but not limited to motor vehicles, aviation, marine, or road and utility related lighting.

e. American Flag illumination.

f. Education related recreational and athletic field lighting.

g. Streetlights on public ways.

13.5.11 Enforcement

Requirements of this Section 13.5 shall be enforced by the Building Inspector in accordance with Section 19.3 of the Zoning Bylaw.

13.5.12 Severability

All the clauses of this by-law are distinct and severable, and if any clause shall be deemed illegal, void, or unenforceable, it shall not affect the validity, legality, or enforceability of any other clause or portion of this by-law.