



CITY OF CAMBRIDGE
COMMUNITY DEVELOPMENT DEPARTMENT

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To: Planning Board

From: CDD Staff

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Re: **Teague, et al. Zoning Petition (Illumination Standards) – Staff Analysis**

Proposal

The Teague, et al. zoning petition proposes to modify the regulations for illumination in the Zoning Ordinance. Most significantly, it does the following:

- Creates new definitions for “lamp,” “luminaire” and “direct light.”
- Creates a new citywide regulation that prohibits a property from emitting direct light onto any street or other property within 300 feet.
- Substitutes the term “direct light” for “glare” in sections of the Ordinance related to illumination of parking facilities and signage.

Overall Discussion of Illumination

There are many important reasons to allow outdoor lighting in the city. These include providing security for residents, neighbors, employees and customers, allowing safe access and egress for pedestrians, bicycles and vehicles, facilitating use of public or private open space in the evenings, and improving visibility of signage.

However, lighting from one property can have negative impacts on neighboring properties. These include light trespass (light illuminating unintended areas), glare (light that may cause visual discomfort at particular vantage points) and light pollution (upwardly-focused light that contributes to the obscuring of the night sky). The energy expended on artificial lighting can also have broader environmental impacts. The challenge of regulating illumination is to limit the impacts without making it infeasible for a property owner to use lighting for its intended purpose.

An additional challenge is that lighting regulations are difficult to enforce through zoning. Zoning is typically applied when a property owner proposes a change of use, new construction or alteration of a building, and compliance can be determined by reviewing plans for that building or use. Since lighting can often be installed, upgraded or removed (and can be turned on and off) without needing a building permit, enforcing compliance is not as straightforward as reviewing a plan.

Despite the challenges, there are current zoning regulations on lighting that might be improved to better mitigate some of the negative impacts. This petition suggests some strategies, and some alternatives could be considered as well.

Current Zoning

The current ordinance regulates illumination in three areas – lighting of parking lots (Section 6.46), lighting of signage (Sections 7.13.3, 7.15B and others), and general illumination in the Residence A, B, C and C-1 districts (Section 7.20). As noted in the petition, these regulations generally prohibit “glare” and “direct light” on another property, but do not provide clear definitions for what those terms mean or measurable standards to determine compliance. In the regulations on lighting of parking lots, an intensity measure of one foot-candle across the surface of the parking lot is suggested, but not expressed as a strict standard.

Current zoning regulations are also limited to the scenarios listed above, and so there are some potential scenarios that are not regulated. For instance, a commercial property that creates light trespass on a house lot in an abutting residential district would not be subject to illumination requirements, except for those related specifically to signage and parking.

Proposed Zoning

The petition attempts to address the limitations of the current zoning by establishing a clear definition for “direct light” and by broadening the current restriction to apply to any direct light caused by any one property onto another, regardless of the zoning district. This provides a more comprehensive strategy that would apply to all types of lighting and all types of properties, not just those regulated under current zoning.

However, the proposed regulations may raise issues for a property owner who is seeking to comply with the standards while providing appropriate lighting for safety, access or other customary purposes.

Potential Issues

- The proposed standard for identifying “direct light” is whether any light-emitting or light-distributing part of a luminaire is visible to any person. Although this standard has the advantage of being observable in the daytime, it also presents a complication because it is not always easy to tell precisely where the source of light is located when it is not illuminated.
- Direct light is prohibited on any public street or property within 300 feet. Because direct light is caused if the light is “visible to any person,” a property owner would have to verify that the light could not be seen from a large array of vantage points in order to comply.
- In some cases, lighting that would ordinarily be allowed or desired would not comply with the proposed standards. For instance, a commercial building built to its front property line would not be able to provide lighting over the entryway or sidewalk, because it would create direct light on the public way. Another example would be lighting for parks and playing fields, which may be infeasible to light without the light source being visible to surrounding neighbors.
- Except for street lighting, there are no exceptions in the proposed zoning. In certain instances where lighting is required by state or federal law, it may be worthwhile to provide exemptions to avoid conflict between different jurisdictions.

Alternative Considerations

Other strategies for regulating lighting could be considered, either in place of or along with the types of strategies suggested in the zoning petition.

Expanding Scope of Current Regulations

The current regulations might simply be expanded to apply to any property directly abutting another property (or a residential property in particular), instead of just properties in specific zoning districts. While this would not completely resolve issues regarding the precise use of terms such as “direct light” and “glare,” it would provide additional opportunities for enforcement by working with property owners to make improvements where a possible violation might occur.

Light Intensity (Illuminance) Standards

Some communities define “light trespass” based on the intensity of light created on another property. For instance, Newton, MA has an ordinance (not within its Zoning Ordinance, but within the “Civil Fines and Miscellaneous Offenses” chapter of the Municipal Code) defining light trespass using a standard of no more than 0.35 foot-candles (or lumens per square foot) of illuminance more than five feet onto another property. Light is permitted to shine on a public way, and some lighting is exempt, including municipal lights and lights that are rated at 100 lumens or less. Property owners may also seek permission from neighbors or waivers from the planning board.

Illuminance at a specific location on a property can be calculated based on the intensity of the light source (which may be provided in the manufacturer’s rating), the distance and the angle. It can also be directly measured with a lux meter, although direct enforcement may be complicated logistically because it would have to be performed at night and the subject light would need to be turned off and on for comparison with ambient light. Officials in Newton have commented that standards are applied during site plan review for commercial facilities and parking lots, but the extent to which enforcement has been done by direct observation and measurement is unknown.

Placement of Lighting – Height, Orientation

Simpler standards could be considered for the placement of lighting fixtures, such as limiting them to a certain height and requiring that all lighting must be directed downward. A brief by the American Planning Association suggests maximum heights ranging between 15 feet and 25 feet for lighting fixtures, depending on the use of the property and the uses in the surrounding area. (For comparison, City of Cambridge street lights are typically 30 feet tall.) This type of standard has the advantage of being easier to enforce as part of plan review for a building. It also has the advantage, as suggested in the proposed zoning, that compliance can be observed at any time and does not require the light to be turned on.