

# Illuminating the Path: Municipal Planners and Light Pollution in Massachusetts

by Leo Smith, DarkSky International

**M**assachusetts boasts a rich history, picturesque and biodiverse landscapes, and vibrant city and town centers. However, development, energy incentives and the increasing use of more and brighter artificial light at night across the state have given rise to a new and concerning issue: light pollution and its many adverse consequences. As awareness grows about the detrimental impacts of excessive night-time artificial illumination on human health, wildlife, and the environment, municipal planners in Massachusetts may be looking for ways to combat the problem. In this article, we will explore the important role of municipal planners in formulating effective light pollution control policies and the strides being made towards creating a more sustainable and safer nocturnal environment in the state for residents as well as for wildlife and plant life.

## Understanding Light Pollution and its Adverse Consequences

Before delving into municipal planners' efforts, it is essential to grasp the concept of light pollution and light trespass with respect to Massachusetts's applicable laws and regulations. As a first principle, outdoor lighting should only be used where and when it is needed. Light pollution refers to "excessive, misdirected, or poorly designed artificial lighting," which disrupts natural darkness and obscures celestial views. It adversely affects human sleep patterns, and circadian rhythms, damages ecosystems, disorients species like insects, bats, and migratory birds, and wastes energy. In 2009 and 2016 the American Medical Association recognized light pollution as "a probable carcinogen" and adopted new policies recommending that outdoor lights be shielded and that the color temperature of LED lights not exceed 3000 degrees Kelvin. The lower the Kelvin the better, and 2000-3000K is considered a "warm white." This color recommendation stems from the availability of many LED lights with high levels of blue wavelength light over 3000K, with increasingly negative impacts on ecosystems and human health. Recognizing these negative consequences, some municipalities in Massachusetts have started to actively develop and implement solutions to control light pollution.

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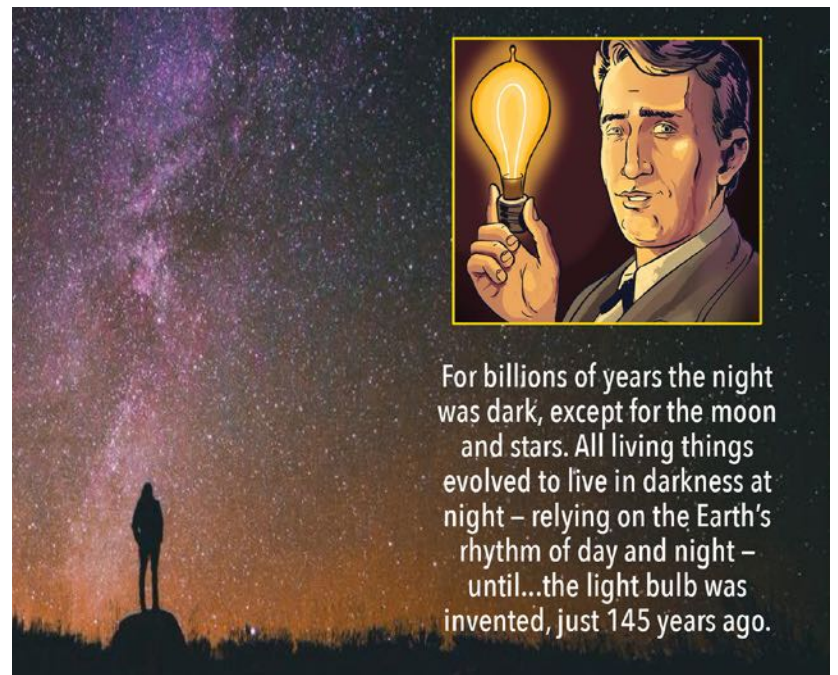
## Massachusetts Building Code Rules on Light Pollution

For new buildings and renovations, the International Energy Conservation Code requires all landscape and façade lighting to be extinguished one hour after the close of business. Some municipalities in Massachusetts focus lighting regulations on the basics: Shielding, Light Trespass restrictions and Glare limits. More comprehensive regulations are now coming to the fore, including the submission of a lighting plan at the time of permit application and using lights that emit warmer colors, under 3000K.

## Five Principles for Dark Sky Compliant Lighting

The Illuminating Engineering Society and DarkSky International jointly have adopted five principles to control light pollution caused by outdoor lighting. The principles can be used

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For billions of years the night was dark, except for the moon and stars. All living things evolved to live in darkness at night – relying on the Earth's rhythm of day and night – until...the light bulb was invented, just 145 years ago.

to guide municipal planners in developing light pollution control standards.

### Municipal Planners as Catalysts for Change

Municipal planners play a pivotal role in shaping the physical, social, and environmental development of our communities. Massachusetts planners can become catalysts for change by incorporating strategies and promoting local regulations that prioritize responsible outdoor lighting, to combat light pollution and its widely recognized harms. This is already happening in several towns and cities that have passed regulations to control light pollution. As the negative impacts of light pollution become more understood, municipal planners should collaborate with stakeholders, such as local government agencies, businesses, and community groups, to evaluate existing lighting practices in their

LIGHT TO PROTECT THE NIGHT		Five Principles for Responsible Outdoor Lighting		 <b>Illuminating</b> ENGINEERING SOCIETY	
USEFUL		<b>ALL LIGHT SHOULD HAVE A CLEAR PURPOSE</b>	Before installing or replacing a light, determine if light is needed. Consider how the use of light will impact the area, including wildlife and the environment. Consider using reflective paints or self-luminous markers for signs, curbs, and steps to reduce the need for permanently installed outdoor lighting.		
TARGETED		<b>LIGHT SHOULD BE DIRECTED ONLY TO WHERE NEEDED</b>	Use shielding and careful aiming to target the direction of the light beam so that it points downward and does not spill beyond where it is needed.		
LOW LIGHT LEVELS		<b>LIGHT SHOULD BE NO BRIGHTER THAN NECESSARY</b>	Use the lowest light level required. Be mindful of surface conditions as some surfaces may reflect more light into the night sky than intended.		
CONTROLLED		<b>LIGHT SHOULD BE USED ONLY WHEN IT IS USEFUL</b>	Use controls such as timers or motion detectors to ensure that light is available when it is needed, dimmed when possible, and turned off when not needed.		
COLOR		<b>USE WARMER COLOR LIGHTS WHERE POSSIBLE</b>	Limit the amount of shorter wavelength (blue-violet) light to the least amount needed.		

towns or cities, identify areas for improvement, and develop comprehensive policies for light-pollution control. Planners play a key role in public education as well.

### Encouraging Sustainable Outdoor Lighting Practices

Effective policies aim to promote sustainable outdoor lighting practices that reduce light pollution

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## Illuminating the Path *cont'd*

and light trespass, while maintaining safety and security. Municipal planners can encourage the use of motion sensors and timers and require shielded fixtures that direct light downward to illuminate specific areas rather than dispersing it in all directions. By adopting energy-efficient technologies like LED lights at the lowest Kelvin rating possible and implementing smart lighting controls and motion-activated lighting, municipal policies can set the standard for significantly controlling light pollution and light trespass while also protecting the community and lowering their energy costs and carbon footprint.

An effective enforcement mechanism is to simply require that any building permit application be accompanied by a detailed lighting plan that shows the location of all outdoor lighting fixtures, and the cut-off classification, lumen output and correlated color temperature for each.

## The state's municipalities can also work together and learn from one another's experiences to develop best practices for managing light pollution.

### Balancing Safety and Aesthetics

While addressing light pollution, Massachusetts municipal planners can recognize the importance of balancing safety and aesthetics. Adequate outdoor lighting ensures public safety, enhances visibility in critical areas, and reduces the risk of accidents. However, planners can strive consistently for lighting designs that are mindful of surroundings and minimize glare, light trespass, and skyglow. This delicate balance ensures safe environments while preserving the tranquil beauty of Massachusetts's night skies. Simply being a good role model will help disseminate these principles to

the general public. Nobody would recommend turning off all lights at night. That is not a safe approach to municipal lighting. The right approach is to use modern technologies and available science to install nighttime lighting only where, when, and in the minimum amount needed.

### Public Awareness and Community Engagement

Municipal planners may also realize that addressing light pollution requires collective efforts. They may engage in public awareness campaigns, educational initiatives, and community involvement programs to foster a better understanding of the problems from light pollution and gain public support. The municipal website is a useful place to provide information even if the municipality does not have a light pollution control policy in place. By actively involving citizens, planners create a shared vision for

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sustainable outdoor lighting, encouraging residents and businesses to adopt responsible lighting practices.

### Collaboration and Best Practices

The state's municipalities can also work together and learn from one another's experiences to develop best practices for managing light pollution. Networking platforms, conferences, and workshops facilitate collaboration between planners and conservation organizations. These shared resources help create a framework for comprehensive policies that consider the diverse needs and unique characteristics of each community. Massachusetts towns with outdoor lighting ordinances are online [here](#).

### Conclusion

Some municipal planners in Massachusetts have started taking significant steps to address light pollution by participating in DarkSky zoning changes and recognizing

light pollution's impact on the environment, wildlife, and human wellbeing. By promoting sustainable outdoor lighting practices, engaging the public, and collaborating with various stakeholders, they are instrumental in shaping policies that strike a balance between functionality and preserving the beauty of the night sky.

As efforts to minimize light pollution and its harms move forward, there is an important role to be played by municipal planners in creating a future where our nights are not only safer and more beautiful for people but also where are our birds

and other nocturnal creatures are able to use darkness for navigation and safety. A vision for the future is one where the night sky is filled with the enchantment of natural darkness.

— Leo Smith is Northeast Regional Director for DarkSky International; he was a voting member of the Model Outdoor Lighting Task Force. He received the President's Award from the Illuminating Engineering Society and the Lifetime Achievement Award from DarkSky International. He can be reached at [leo@smith.net](mailto:leo@smith.net).

### Resources

**DarkSky Massachusetts Chapter** (<https://darksourcemass.org>): **Chapter Chair James Lowenthal**—[jamesastron@gmail.com](mailto:jamesastron@gmail.com)

**Facebook:** [www.facebook.com/DarkSkyMA](https://www.facebook.com/DarkSkyMA)

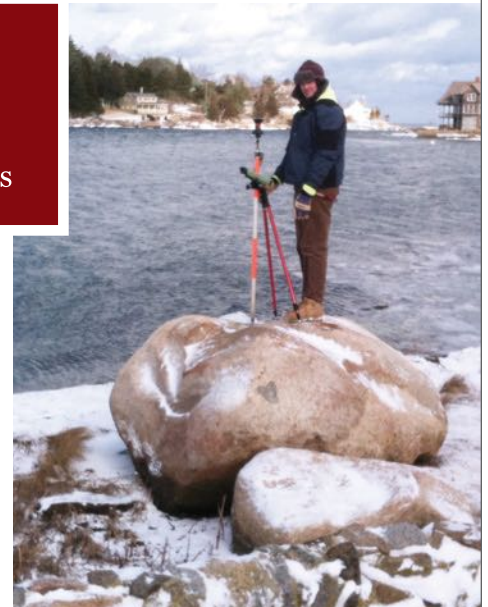
**DarkSky International:** [www.darksky.org](http://www.darksky.org)

**DarkSky Massachusetts – 10-Point Checklist for Dark Sky Compliant Lighting:** <https://darksourcemass.org/resources/checklist-for-dark-sky-compliant-municipal-lighting/>

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