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STATE OF MAINE
DEPARTMENT OF AGRICULTURE, CONSERVATION & FORESTRY
LAND USE PLANNING COMMISSION
22 STATE HOUSE STATION
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AMANDA E. BEAL
COMMISSIONER

JUDY C. EAST
EXECUTIVE DIRECTOR

Memorandum

To: LUPC Commissioners
CC: Judy C. East, Executive Director
From: Hannah Bonine, LUPC Intern; and
Ben Godsoe, Chief Planner
Date: August 5, 2021
Re: 2021 Summer Intern Report: Dark Skies Research and Communication Towers Visual Impacts Assessment Field Study

Overview of Internship

During the summer of 2021, the Land Use Planning Commission (LUPC or the Commission) hosted Hannah Bonine as a student intern for 12 weeks. The internship was made possible through collaboration with the University of Maine Margaret Chase Smith Government Summer Internship Program. Hannah graduated in the spring of 2021 with a master's degree in public policy and management from the Muskie School for Public Service at the University of Southern Maine.

Over the course of the summer, Hannah was a tremendous help researching two important issues related to land use planning and regulation, described in more detail below and in the attached report. The internship resulted in a detailed report on lighting regulations and best practices for protection of dark skies, and field data that will be useful in evaluating the Commission's approach to reviewing visual impact assessments (VIAs) for communications towers.

Lighting Regulations and Dark Skies Research

The full report on the lighting regulations and dark skies research is attached to this memo. It describes the project, outlines the methodology used, and highlights certain topics the Commission

may want to consider in any updates to its lighting regulations. At the August 2021 Commission meeting, Hannah will present a summary of the methodology and results of this preliminary research.

Communication Towers Field Study

Applications to construct communication towers routinely include a visual impact assessment (VIA) providing evidence for whether the proposed tower meets the Commission's standards on scenic character (Chapter 10, Section 10.25,E,1). The Communication Towers Field Study included field surveys of the visibility of communication towers to examine agency and applicant practice regarding VIAs. This work required:

- Familiarity with VIA methodology and current LUPC practice for providing guidance to applicants who must complete a VIA;
- Working with planning staff to develop a methodology and select towers to survey in the field;
- Reviewing VIAs for two communication towers permitted in 2015, one in T2 R8 NWP and one in Ebeemee Township; and
- Completing field surveys examining the visibility of the towers. Surveys of two additional towers are planned for later this month.

Presentation of the study at the August Commission meeting will include sample photos and observations based on the work completed so far. LUPC staff have found the information generated from these initial field surveys to be helpful and plan to pick up where this year's study left off by examining additional permitted communication towers as time and resources allow.

Attachment: 2021 LUPC Internship Dark Skies Report

Dark Skies Preliminary Research Project

By Hannah Bonine, LUPC Summer 2021 Intern

Introduction

The LUPC Summer 2021 internship project included preliminary research on dark skies and regulatory approaches used to reduce the impact of night-time lighting. The purpose of the research was to provide the Land Use Planning Commission (LUPC or the Commission) and its staff with information that can be used for any future updates to its development standards for exterior lighting. The current standards, as outlined in Chapter 10, Section 10.25,F,2 (attached), are outdated (last updated in 2004), and do not reflect certain measures considered by many, including the International Dark Skies Association (IDA) and the Illuminating Engineering Society (IES), as best practices for outdoor lighting that reduce light pollution and protect dark skies. This report includes:

- A description of the methodology used to gather information – including a list of people interviewed;
- A dark sky definition, and information about potential benefits of reducing light pollution;
- Information about the International Dark Skies Association, the process they use to designate Dark Sky Places, and known efforts to designate places in Maine; and
- Topics for consideration should the Commission decide to pursue rule changes in the future.

Methodology

Research for this project consisted of a combination of internet research, familiarization with existing LUPC lighting standards and the 2010 State Planning Office Lighting Manual, as well as meetings and interviews with interested parties. Interviews were completed with a variety of people and perspectives, including: town officials, a development consultant, and non-profit staff and volunteers. Two meetings were held jointly by Dark Sky Maine and the Rangeley Lakes Heritage Trust, the second of which was attended by stakeholders from across the state, some of whom provided individual interviews.

During the internship, LUPC staff visited the Appalachian Mountain Club's (AMC) 100 Mile Wilderness Area in the Moosehead Lake region for an informational meeting covering a variety of topics including recent designation of AMC's properties by the IDA. Attending the meeting were several people involved with economic development in the Moosehead Lake region, and the setting provided a unique opportunity to learn about potential economic benefits occurring from regulation of exterior lighting as well as designation by the IDA. These interviews introduced new perspectives and information that could not have been captured solely with internet research.

Figure 1 outlines the list of stakeholders who were interviewed individually, or who discussed this topic with LUPC staff.

Figure 1: Stakeholder Research Interviews/Discussions		
Name	Affiliation	Notes
Jenny Ward, Eliza Townsend, Steve Tatko	AMC staff Jenny Ward is an Alternate Member of the Planning Board in Greenville	Interested in ordinance changes in Greenville to protect dark skies; Point of contact for AMC Dark Sky Park (designated: 2021)
Kelly Beatty	Lighting expert associated with IDA (IDA Outreach Committee and former board member)	Knowledgeable about IDA lighting best practices; Works with communities seeking designation from IDA, particularly in New England
Bailey Beers	Code Enforcement Officer for the Town of Rangeley	Staff support for ordinance changes that include proposed lighting and signage rules that are IDA compliant
Susan Adams	Member of Planning Board in the Town of Patten; Recreation Manager, Elliotsville Foundation	Interested in ordinance changes to protect dark skies; involved in the application for the Katahdin Woods and Waters National Monument Dark Sky Sanctuary (First IDA designation in Maine, 2020)
Terry DeWan	Terrence J. DeWan & Associates Landscape Architects & Planners Has worked on several development projects in the Commission's service area	Early stages of design and development of the Big Moose ski resort includes plans for exterior lighting supportive of dark skies protection
Nancy Hathaway	President, Dark Sky Maine	Advocacy organization for the preservation of Dark Skies in Maine
David Miller David Stein Nancy Perlson	Rangeley Lakes Heritage Trust	Contacted LUPC staff about current regulations and potential designation of a Dark Skies Reserve
Donna Moreland	Destination Development Specialist, Maine Office of Tourism	Attended AMC Maine Woods trip, resident of Greenville
Carolann Oullette	Director, Office of Outdoor Recreation, Department of Economic and Community Development	Attended AMC Maine Woods trip, knowledgeable on rural Maine businesses
Mike McClellan	Operations Manager, North Maine Woods	North Maine Woods recently updated lighting fixtures at two gatehouses

Ron Hunt, Jocelyn Hubbel, Bill Patterson, Rex Turner	Bureau of Parks and Lands staff	Discussed survey findings from the update to the State Comprehensive Outdoor Recreation Plan (SCORP), and current lighting used in state parks.
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What are Dark Skies?

Dark skies are free of artificial light, allowing uninhibited views of the night sky. Maine is fortunate to have dark skies across a large portion of the state, much of which is the unorganized territories. While communities do require lighting to some degree at night, many places have excess, and often unnecessary, artificial lighting that causes glare and bleeds upwards into the night sky¹. Increased development has the potential to erode the quality of dark skies in the Commission’s service area over time.

The darkness of a sky can be measured using the Bortle Scale, which estimates the brightness of celestial features. Created by John E. Bortle and originally published in 2001, the scale contains nine classes, which range from pristine dark skies to inner-city skies. Each class is based on the number of celestial features that can be seen in the night sky. In areas with a Class 1 dark sky, the most celestial features can be seen. On the opposite end of the spectrum, essentially no celestial features can be identified in a Class 9 sky (Bortle, 2006).

Benefits of Dark Skies and Impacts from Light Pollution

Benefits

Dark skies can bring significant economic, health, and environmental benefits. Transitioning to efficient lighting fixtures that do not waste energy emitting unnecessary light or reducing the amount of time lights are running can result in substantial cost savings over time for individuals, businesses, and municipalities. In addition to savings, promoting dark skies can also be a draw for visitors to a region. There are few places in the United States that can claim they have nearly perfect dark skies, so receiving IDA designations, as AMC and the Katahdin Woods and Waters National Monument have done, has the potential to attract visitors from all over. Astro-tourism, or tourism involving astronomy and the night sky, can be another reason to visit a town or region in the Commission’s service area. For example, interviewees indicated that hotels and other commercial rentals are already filling up for the 2024 solar eclipse, as rural Maine is projected to be one of the prime viewing locations due to its lack of light pollution.

¹ In 2010, the State Planning Office drafted a report on Dark Skies for the 124th session of the Maine Legislature.

Impacts

A primary component to outdoor lighting rules that help maintain dark skies is the minimization of blue light emitting light sources. The American Medical Association has found that excessive exposure to artificial light at night, especially blue light, will disrupt the natural circadian rhythm in humans. LED fixtures often used in outdoor lighting, along with electronic screens such as televisions and cell phones, emit large amounts of blue light (Kraus, 2016). Using a cell phone or watching television late at night can make it more difficult to fall asleep because it suppresses melatonin production inside the body. Excessive light generated by outdoor fixtures can have the same effect.²

Similarly, excessive artificial light can negatively impact wildlife and the natural environment. Animals that rely on the consistent cycle of light and dark can have difficulty distinguishing between artificial light and natural sunlight. This may adversely affect their sleep and wake cycles, especially for nocturnal species. Migratory birds and baby sea turtles are two examples of animals that suffer if artificial light is present. Both groups are guided by the sun and moon, and lights can steer them off course and not allow them to return to a safe habitat. Additionally, insects are drawn to light sources. Abundant artificial light makes them more vulnerable to predators because their location becomes predictable and they are easily spotted. Decreased insect populations can have detrimental effects on all levels of the ecosystem.³

International Dark Sky Association and Designated Dark Sky Places

The International Dark Sky Association is a non-profit organization advocating for the protection of dark skies through published research and educational programming across the globe. A large portion of the IDA's research focuses on use of effective outdoor lighting to reduce light pollution. The IDA also created a system for recognizing places that adopt lighting ordinances and education programs that support dark sky preservation. This system, known as the International Dark Sky Places Program, contains five designation categories, as listed below in Figure 2.

² The IDA website and the State Planning Office discuss potential negative impacts of blue light on human health.

³ The IDA website and the State Planning Office discuss potential negative impacts of outdoor lighting on wildlife. Before considering any updates to the Commission's current lighting standards, planning staff may consider consultation with experts at Inland Fisheries and Wildlife about issues or concerns related to lighting and wildlife impacts.

Figure 2: International Dark Sky Association (IDA) Place Designation Categories⁴

International Dark Sky Community	...Legally organized cities and towns that adopt quality outdoor lighting ordinances and undertake efforts to educate residents about the importance of dark skies.
International Dark Sky Park	...Publicly- or privately-owned spaces that are conserved, and which implement good outdoor lighting and provide dark sky programs for visitors.
International Dark Sky Reserve	...A dark “core” zone surrounded by a populated periphery where policy controls are enacted to protect the darkness of the core.
International Dark Sky Sanctuary	...The most remote (and often darkest) places in the world whose conservation state is most fragile.
Urban Night Sky Place	...Sites near or surrounded by large urban environs whose planning and design actively promote an authentic nighttime experience in the midst of significant artificial light at night, and that otherwise do not qualify for designation within any other International Dark Sky Places category.

There are currently two places in Maine designated by the IDA as International Dark Sky Places. The Katahdin Woods and Waters National Monument (KWWNM) was the first such place in Maine and received an International Dark Sky Sanctuary designation in 2020. The designated land includes approximately 87,500 acres and is located east of Baxter State Park. As the first IDA designated place in Maine, KWWNM boasts some of the darkest skies in the eastern United States. Stargazing is a common activity for visitors, and the park hosts astronomy programs to educate visitors about the importance and the beauty of dark skies. The Appalachian Mountain Club recently received a designation by the IDA of the Maine Woods International Dark Sky Park located outside of Greenville. Public education is at the forefront of the park, and a “Mountains of Stars”⁵ program is held at each of the three lodging facilities on the property.

Some towns in Maine have expressed interest in adopting lighting ordinances that help maintain dark skies, both independently and in conjunction with neighboring dark sky designation efforts. The town of Mount Desert has implemented such an ordinance. The town of Rangeley is in the process of adopting a new lighting ordinance. Interviewees indicated that the Patten and Greenville Planning Boards are discussing whether to adopt new, or change existing, regulations. A group of advocates in the Rangeley region, led by the Rangeley Lakes Heritage Trust, have applied to IDA for a Dark Sky Reserve designation. If successful, the effort in Rangeley could potentially be contiguous to the Megantic Dark Skies Preserve located across the border in the Canadian Province of Quebec.

⁴ Definitions from IDA website.

⁵ Mountains of Stars is an organization that offers astronomy-based programs throughout New England for people of all ages. For more information, visit www.mountainsofstars.org.

Updating LUPC Standards for Exterior Lighting: Topics for Consideration

The current LUPC lighting standards are attached (see: Chapter 10, Section 10.25,F,2), and apply to exterior lighting for development requiring a permit. Section 10.25,F,2 regulates lighting factors such as: the type of fixture (full cutoff required); wattage of light source; and the direction of lighting to minimize impacts on neighboring properties or roadways that could result in nuisance or unsafe conditions.

The IDA maintains a model lighting ordinance, and other outreach materials, capturing measures they consider best practices for protection of the night sky. The former Maine State Planning Office produced a lighting manual with similar suggestions about regulation of lighting. Many of these elements are now incorporated into draft municipal ordinances or under active consideration by towns in Maine. Some of the stakeholders consulted during this research also expressed interest in, or advocated for, many of these changes.

Before the Commission considers any changes to the rules, the planning staff would conduct additional research and outreach, particularly considering potential impacts to residential and commercial uses in the Commission's service area. The following list is meant to capture takeaways from this preliminary research and describes some of the topics that could be included in any update to the lighting standards.

1. Fully shielded fixtures

Fully shielded light fixtures are those that direct light downward. These fixtures are recommended by IDA and others because they minimize upward light that will negatively impact the dark sky. Current LUPC standards use the term "full cutoff" for the required fixture type, which is a term being phased out by lighting professionals.⁶ The Illuminating Engineering Society (IES) has more specific standards for lighting fixtures. This system is called the BUG standard, which considers backlight, uplight, and glare. Backlight is the amount of light emitted behind the fixture. Uplight is the amount of light emitted above the fixture, and glare refers to the amount of light observed by oncoming traffic. Rated on a 0-5 scale with 0 being a fixture where absolutely no light is emitted above 90 degrees and where 5 is an uncontrolled fixture, the IES considers a fully shielded fixture to have a score of U-0 (uplight of 0). BUG measurements cannot be taken without a photometric analysis, so the current lighting recommendations are simplified by describing fixtures as fully shielded.⁷

2. Light Source Output and Color Temperature

Wattage measures the amount of electricity a light consumes but does not indicate the brightness or the output of the bulb. The lighting industry more commonly now uses lumens, which measures light output, and kelvin, which measures color temperature.

⁶ The State Planning Office Lighting Manual, published in 2010, also recommends full cutoff fixtures.

⁷ See International Dark Skies Association-Illuminating Engineering Society Model Lighting Ordinance for further explanation. Located on IDA website (listed in Sources, below).

As previously mentioned, blue light can be harmful to humans and wildlife. The IDA recommends installing light fixtures that emit light with a warmer hue. Color Correlated Temperature (CCT) measures how warm or cool toned a light is. Measured in degrees Kelvin, most light sources will fall between 2000 and 6500 K. Fixtures with a higher CCT rating are considered blue light. These fixtures give off bright white light that appears blue to the human eye. Conversely, warmer toned light sources will have a lower CCT rating, appearing orange or yellow in color. The IDA recommends outdoor lighting have a CCT of 3000K or below. As shown in Figure 3, these lights will be warmer in tone.

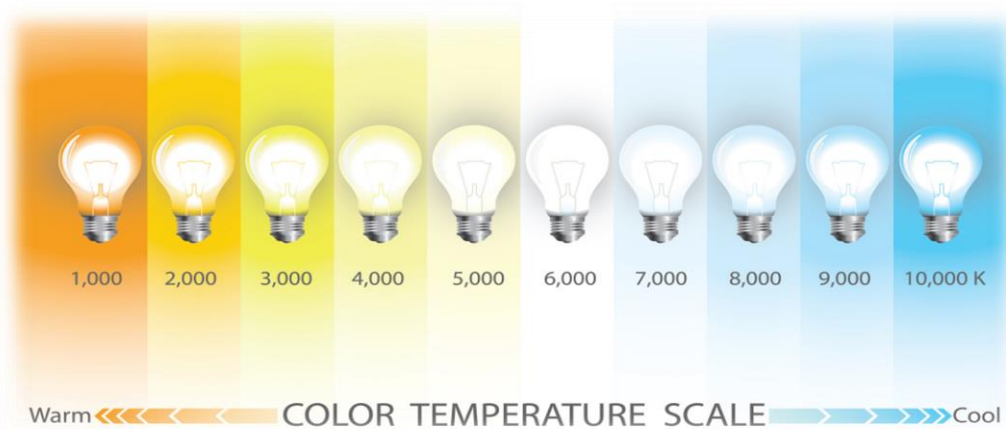


Figure 3: Color Correlated Temperature (CCT) Scale in Kelvins

Source: <https://www.prolighting.com/blog/2020/06/16/choosing-the-right-color-temperature-for-your-home/>

3. Retrofitting Lighting

To fully satisfy IDA requirements for designation of a dark skies place, a plan must be in place to retrofit existing outdoor lighting that may be inconsistent with a newly adopted lighting ordinance or policy. In the Model Lighting Ordinance developed by the IDA and the IES, the recommendation is to implement a gradual approach to bring fixtures into compliance over time. For example, an ordinance could allow a grace period of 10 years, or require a dwelling or business to come into compliance when they need to get a permit for change in use, improvements, etc.

Financial incentives can also encourage lighting retrofit on a business or dwelling. Unlike a municipality, the LUPC does not have the authority to provide monetary incentives to encourage lighting retrofit for dwellings or businesses, or to directly affect infrastructure like streetlights, lighting at schools, etc., all of which may already be in place. Additionally, with such a large and diverse service area, it is extremely difficult to enforce this type of rule. However, it is possible that applicants for designation of a dark skies place in the unorganized territories, such as a land trust or economic development organization, could independently initiate an incentive program.

4. Temporary Lighting and Other “Exemptions”

Section 10.25,F,2,e lists types of lighting that are exempt from LUPC lighting standards. The list of exemptions includes temporary lighting such as fairs and events, emergency lights, and motion-activated lights. The IDA-IES Model Lighting Ordinance, the Maine State Planning Office Lighting Manual, and other municipal ordinances, list other temporary uses that are exempt including sports events, seasonal holiday lighting, and construction. There may be other uses/activities that occur in the Commission’s service area that may be appropriate to add to the list of exemptions; this is an area that would benefit from additional research.

5. Illuminated Signage

The current LUPC standards for illuminated signage are intended to reduce excess lighting and eliminate glare to neighbors and oncoming traffic. However, the IDA has additional recommendations for regulating sign lighting design and operation. For example, in accordance with IDA recommendations, lights would need to meet output/brightness requirements and be turned off one hour after sunset, with use resumed one hour prior to sunrise. Under the IDA recommendations, signs should only use one color and have a black background. Additionally, the illuminated area of a sign should not be greater than 200 square feet.

6. Use of Diagrams or Illustrations in Lighting Regulations

Upon reviewing other Municipal ordinances and IDA recommendations, it is clear that technical terms related to lighting can cause confusion if not properly explained or defined. Because of this, it may be useful to include a section in the lighting rules defining terms such as fully shielded fixture, CCT, lumen, and glare. The Maine State Planning Office Lighting Manual includes multiple images and diagrams depicting favorable lighting options. These images are helpful in explaining the appearance of preferred fixtures. Currently, Section 10.25,F,2 has a helpful diagram showing a full cutoff light fixture (this may need to change depending on what kind of rule update the Commission considers). The inclusion of additional diagrams may be a good way to help explain and illustrate specific provisions.

Next Steps

This project produced preliminary research that will be helpful to the Commission and LUPC planning staff as they continue to investigate potential updates or changes to the Commission’s lighting standards. The information above helps identify specific topics that could be addressed in any update. In particular, the Commission should consider updating Section 10.25,F,2 to reflect current terms used in the industry and certain methods now considered best practices for regulating lighting. Additionally, updates to the current lighting standards would enable a community or region, such as the Rangeley Region, to apply for designation as a Dark Sky Place within the LUPC service area by the International Dark Skies Association.

The LUPC planning staff intend to pick up where this report leaves off and will continue to research potential rule changes. However, timing for further action on this project will depend on staff workload and other pressing rulemaking initiatives.

Sources

Ordinances, Standards, and Guidance Documents

IES and IDA Model Lighting Ordinance, Adopted: June 15, 2011

Lighting Manual: Promoting Quality Outdoor Lighting in Your Community. (2010) Maine State Planning Office, Technical Assistance Bulletin.

Town of Mount Desert, Outdoor Lighting Ordinance, Adopted: May 4, 2021

Town of Rangeley, Draft Lighting Ordinance, Accessed: March 25, 2021

Internet Sources

Bortle, John E. (2006) Gauging Light Pollution: The Bortle Dark-Sky Scale. *Sky & Telescope*. Accessed August 5, 2021. <https://skyandtelescope.org/astronomy-resources/light-pollution-and-astronomy-the-bortle-dark-sky-scale>.

Friends of Katahdin Woods and Waters (2021). Dark Sky Guide. Accessed August 5, 2021. www.friendsofkww.org/darkskyguide

International Dark Sky Association (2021). Accessed August 5, 2021. www.darksky.org

Kraus, Louis J. (2016). Human and Environmental Effects of Light Emitting Diode (LED) Community Lighting. CSAPH Report 2-A-16. Accessed August 5, 2021. <https://www.ama-assn.org/sites/ama-assn.org/files/corp/media-browser/public/about-ama/councils/Council%20Reports/council-on-science-public-health/a16-csaph2.pdf>

Rensselaer Polytechnic Institute (2004). What is Correlated Color Temperature? *NLPIP Lighting Answers*, 8(1). Accessed August 5, 2021. <https://www.lrc.rpi.edu/programs/nlpip/lightinganswers/lightsources/whatisccct.asp>

Other Sources and References

State Planning Office (2010). A Report to the Business, Research, and Economic Development Committee of the 124th Session of the Maine Legislature in response to LD 11 Resolve, To Encourage the Preservation of Dark Skies. Draft January 7, 2010

Interview conducted via Microsoft Teams with Jenny Ward, Maine Business and Community Relations Manager at AMC and Eliza Townsend, Maine Conservation Policy Director at AMC on June 24, 2021

Interview conducted via telephone with Terry DeWan, Landscape Architect on July 1, 2021

Interview conducted via telephone with Bailey Beers, Code Enforcement Officer for the Town of Rangeley on July 12, 2021

Interview conducted via telephone with Susan Adams, Member of Planning Board for the Town of Patten on July 28, 2021

Interview conducted via telephone with Kelly Beatty, lighting expert and member of the International Dark Sky Association Outreach Committee on July 29, 2021

Interview conducted via telephone with Mike McClellan, Operations Manager for North Maine Woods, June 24, 2021

Outreach by email to Bureau of Parks and Lands staff (Ron Hunt, Bill Patterson, Jocelyn Hubbel, and Rex Turner), June 17, 2021

F. NOISE AND LIGHTING

1. Noise.

- a. The maximum permissible sound pressure level of any continuous, regular or frequent source of sound produced by any commercial, industrial and other non-residential development shall be as established by the time period and type of land use subdistrict listed below. Sound pressure levels shall be measured at all property boundary lines, at a height of at least 4 feet above the ground surface. The levels specified below may be exceeded by 10 dB(A) for a single period, no longer than 15 minutes per day.

Subdistrict (Category)	7:00 AM to 7:00 PM	7:00 PM to 7:00 AM
D-CI, D-MT, D-RB (<i>Category 3</i>), and D-ES	70 dB(A)	65 dB(A)
D-GN, D-GN2, D-RB (<i>Categories 1 & 2</i>), D-RF, and D-RD	65 dB(A)	55 dB(A)
D-PD, D-PR	As determined by the Commission.	
All Other Subdistricts	55 dB(A)	45 dB(A)

Table 10.25,F-1. Sound pressure level limits.

- b. The following activities are exempt from the requirements of Section 10.25,F,1,a:
- (1) Sounds emanating from construction-related activities conducted between 7:00 A.M. and 7:00 P.M.;
 - (2) Sounds emanating from safety signals, warning devices, emergency pressure relief valves, and other emergency activities; and
 - (3) Sounds emanating from traffic on roadways or other transportation facilities:
- c. Control of noise for a wind energy development as defined in 35-A M.R.S. § 3451(11), with a generating capacity greater than 100 kilowatts is not governed by Section 10.25,F, and instead is governed solely by the provisions of 12 M.R.S. § 685-B(4-B)(A).

2. Lighting standards for exterior light levels, glare reduction, and energy conservation.

- a. All residential, commercial and industrial building exterior lighting fixtures will be full cut-off, except for incandescent lights of less than 160 watts, or any other light less than 60 watts. Full cut-off fixtures are those that project no more than 2.5% of light above the horizontal plane of the luminary's lowest part. Figure 10.25,F-1 illustrates a cut-off fixture as defined by the Illuminating Engineering Society of North America (IESNA).

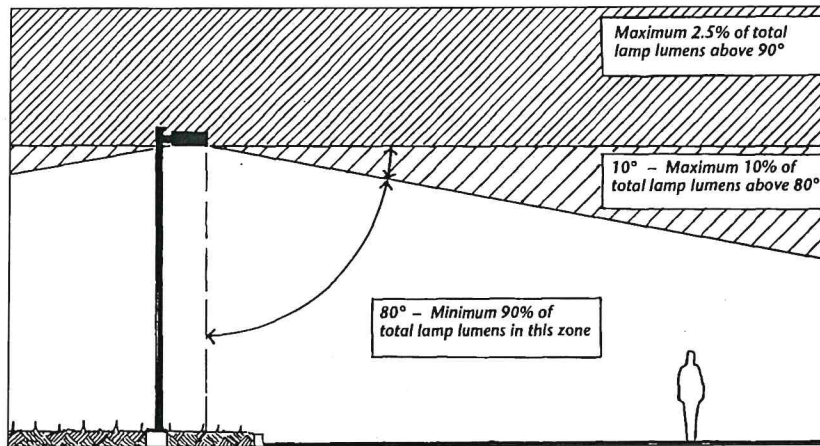


Figure 10.25,F-1. Cut-off fixture as defined by IESNA.

Light fixtures mounted on gasoline station or convenience store canopies shall be recessed so that fixtures are flush with the canopy. Alternatively, canopies may be indirectly lit using light beamed upward and then reflected down from the underside of the canopy. In this case light fixtures must be shielded so that direct illumination is focused exclusively on the underside of the canopy.

- b. All exterior lighting shall be designed, located, installed and directed in such a manner as to illuminate only the target area, to the extent practicable. No activity shall produce a strong, dazzling light or reflection of that light beyond lot lines onto neighboring properties, onto any water bodies with a significant or outstanding scenic resource rating, or onto any roadway so as to impair the vision of the driver of any vehicle upon that roadway or to create nuisance conditions.
- c. For commercial, industrial and other non-residential development, all non-essential lighting shall be turned off after business hours, leaving only the minimal necessary lighting for site security. The term “non-essential” applies, without limitation, to display, aesthetic and parking lighting.
- d. In addition to the lighting standards in Section 10.25,F,2, lighted signs shall also comply with the standards in Section 10.27,J.
- e. The following activities are exempt from the lighting standards of Section 10.25,F,2,a through d:
 - (1) Roadway and airport lighting, and lighting required by the Federal Aviation Administration for air traffic safety;
 - (2) Temporary fair, event, or civic uses;
 - (3) Emergency lighting, provided it is temporary and is discontinued upon termination of the work;
 - (4) Lighting that is activated by motion-sensors; and

(5) Lighting that was in place on April 1, 2004.

3. Lighting standards for non-residential greenhouses.

- a.** Greenhouse lighting must be fully shielded between sunset and sunrise and must not illuminate exterior areas or otherwise make the greenhouse appear to glow.

J. SIGNS

Signs not in conformance with the standards of Section 10.27,J may be allowed upon issuance of a permit from the Commission provided that such types of activities are allowed in the subdistrict involved. An applicant for such permit shall show by a preponderance of the evidence that the proposed sign, which is not in conformance with the standards of Section 10.27,J, shall be erected and maintained in a manner which produces no undue adverse impact upon the resources and uses in the area.

1. Signs Not Requiring a Permit.

The following signs do not require a permit from the Commission, provided such signs are in conformance with the requirements of Section 10.27,J,1 and 2, below. The following limitations may be exceeded only under the provisions of a permit from the Commission:

- a. Signs identifying stops or fare zone limits of common carriers;
- b. Signs erected and maintained outside the highway right-of-way, by a governmental body, showing places of interest (other than commercial establishments), the place and time of services or meetings of churches and civic organizations. Not more than two such signs may be erected and maintained which are readable by traffic proceeding in any one direction on any one highway in any one township;
- c. Residential directional signs, each of which does not exceed 4 square feet in area, along roadways other than limited access highways;
- d. Traffic control signs or devices;
- e. Signs displayed for the direction, instruction or convenience of the public, including signs which identify rest rooms, freight entrances, posted areas, property boundaries, trails, fire precautions, campsites, or the like, with a total surface area not exceeding 12 square feet. This exemption shall not apply to signs visible from any public roadway promoting or advertising commercial enterprises;
- f. Signs to be maintained for not more than six weeks announcing an auction, public supper, lawn sale, campaign drive or other like event of a public, civic, philanthropic or religious organization;
- g. Memorial signs or tablets;
- h. Signs erected by county fairs and expositions for a period not to exceed six weeks;
- i. Directional signs visible from a public roadway with a total surface area not to exceed 4 square feet providing directions to places of business offering for sale agricultural products harvested or produced on the premises where the sale is taking place;
- j. Signs displayed in building windows, provided that the aggregate area of such signs does not exceed 25% of the area of the window; and
- k. Official business directional signs as defined and authorized by 23 M.R.S. § 21.
- l. Sign kiosks near trail intersections that do not exceed 128 square feet of surface area used for the placement of multiple individual signs including those advertising a place of business. No more than one sign kiosk may be located near any trail intersection and

individual signs (other than maps) on such kiosks shall not exceed 4 square feet in size. No other signs advertising a place of business shall be located at such intersections. Such kiosks shall not be visible from a public roadway.

- m. Signs containing only a symbol or design identifying gas, food or lodging services and the distance and/or direction to such services at trail intersections without a sign kiosk. Such signs are not to exceed 4 square feet in size.
- n. Signs identifying a particular place of business offering gas, food, or lodging at the intersection of a local feeder trail leading directly to that place of business. Such signs are not to exceed 4 square feet in size and shall not be visible from a public roadway.
- o. **On-Premise Signs.** Owners or occupants of real property may erect and maintain on-premise signs, except roof signs, advertising the sale or lease thereof or activities being conducted thereon. Such signs shall be subject to the following requirements and the regulations set forth in Section 10.27,J,2 below:

- (1) On-premise signs shall not exceed in size the area limitations set forth below:

Subdistricts	Maximum Size for Each Individual Sign (square feet)	Maximum Aggregate Area of all Signs for Facility Being Advertised (square feet)
D-CI, D-ES, D-GN, D-GN2, D-GN3, D-MT, D-PD, D-PR, D-RB, D-RD, D-RF, M-GN, M-HP	32	64
D-LD, D-RS, D-RS2, D-RS3, M-NC and All Protection Subdistricts	8	16

Table 10.27,J-1. Size limitations for on-premise signs.

- (2) On-premise signs shall not be located more than 1,000 feet from the building or other particular site at which the activity advertised is conducted;
- (3) Signs advertising the sale or lease of real estate by the owner or his agent shall not have an area of more than 6 square feet, except signs advertising a subdivision which shall be limited in size as provided by Section 10.27,J,1,o,(1);
- (4) On-premise signs, other than wall or projecting signs, shall not extend more than 15 feet above ground level, and shall not have a supporting structure which extends more than two feet above such sign;
- (5) Projecting signs must be at least 9 feet above pedestrian level and may project no more than 2 feet from the building; and
- (6) Signs attached to a wall shall not extend above the top of the wall.

On-premise signs which are not in conformance with the preceding requirements and all roof signs may be allowed only under the provisions of a permit from the Commission.

2. Regulations Applying to All Signs.

Notwithstanding any other provisions of this chapter, no sign may be erected or maintained which:

- a. Interferes with, imitates or resembles any official traffic control sign, signal or device, or attempts or appears to attempt, to direct the movement of traffic;
- b. Prevents the driver of a motor vehicle from having a clear and unobstructed view of official traffic control signs and approaching or merging traffic;
- c. Contains, includes, or is illuminated by any flashing, intermittent or moving light, moves or has any animated or moving parts, except that this restriction shall not apply to a traffic control sign;
- d. Has any lighting, unless such lighting is shielded so as to effectively prevent beams or rays of light from being directed at any portion of the main traveled way of a roadway, or is of such low intensity or brilliance as not to cause glare or impair the vision of the driver of any motor vehicle or otherwise interfere with the operation thereof;
- e. Is in violation of, or at variance with, any federal law or regulation, including, but not limited to, one containing or providing for conditions to, or affecting the allocation of federal highway or other funds to, or for the benefit of, the State or any political subdivision thereof;
- f. Is in violation of, or at variance with, any other applicable State law or regulation;
- g. With the exception of marijuana businesses, advertises activities which are illegal under any state or federal law applicable at the location of the sign or of the activities;
- h. Is not clean or in good repair; or
- i. Is not securely affixed to a substantial structure.

Any sign which is a combination of exempt and/or non-exempt signs shall be regulated by the most protective standards applicable.

3. Criteria for Sign Approval.

In approving, conditionally approving, or denying any application for a sign permit, the Commission shall require that the applicant demonstrate that the proposed sign complies with those criteria set forth in 12 M.R.S. § 685-B(4) as well as the following:

- a. That the sign is compatible with the overall design of the building height, color, bulk, materials and other design and occupancy elements;
- b. That the color, configuration, height, size, and other design elements of the sign will fit harmoniously into the surrounding natural and man-made environment;
- c. That the sign will not constitute a hazard to the flow of traffic; and
- d. That the applicant sufficiently demonstrates the need for any non-conformity with the size, height, and other limitations set forth in Section 10.27,J,1.