



VILLAGE OF MOUNT HOREB

E. Main Street

Mount Horeb, WI 53572

Phone: (608) 437-6884 Fax: (608) 437-3190

Email: mhinfo@mounthorebwi.info Web: mounthorebwi.info

SUSTAINABILITY & NATURAL RESOURCES COMMITTEE

Tuesday, January 23, 2024 at 7:00 PM

Municipal Building Board Room

138 E. Main Street

Mount Horeb, WI

- 1) Call to order
- 2) Agenda Items
 - a. Consideration of November 28, 2023 Meeting Minutes
 - b. Presentation/Discussion: Solar 101 Program
 - c. Discussion on Light Pollution
 - d. SNR Column Approval/Discussion
 - e. Presentation/Discussion Idling Reduction
 - f. Update on Energy Audit/Planning Grants
 - g. Adopt A Community Program
 - h. Consider Strategic Plan for 2024
 - i. Discussion on Composting Program
 - j. Solsmart Update
 - k. Update/Discussion on keeping bees
 - l. Future Agenda Items
- 3) Meeting adjournment.

UPON REASONABLE NOTICE, EFFORTS WILL BE MADE TO ACCOMMODATE THE NEEDS OF DISABLED INDIVIDUALS THROUGH APPROPRIATE AIDS AND SERVICES. FOR INFORMATION OR TO REQUEST THIS SERVICE, CONTACT ALYSSA GAFFNEY, CLERK, AT 138 E MAIN STREET, MOUNT HOREB, WI (608) 437-9404.



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SUSTAINABILITY & NATURAL RESOURCES COMMITTEE

Tuesday, November 28, 2023 at 7:00 PM

DRAFT MEETING MINUTES

- 1) Call to order
 - a. Roll Call

Chair White called the meeting to order at 7:00 p.m. Members present: White, Beheler, Grabe, Saltes, Gottwald, Butusov and Fendrick. Absent: Gauger. Also Present: Administrator Owen.
- 2) Agenda Items
 - a. Consideration of October 24, 2023 Meeting Minutes

Motion by Beheler to approve the October 24, 2023 minutes, second by Saltes. Motion carried.
 - b. Presentation: RENEW Challenge

Students from the High School and Middle School were present to discuss the Renew our Schools challenge. During the 5-week challenge, students presented to teachers and students to encourage and educate on energy-saving measures. The winning team will receive \$2,500 to go towards energy efficiency projects at their school. The committee thanked the students for their efforts and presenting at the meeting.
 - c. Report on Sustainability Leaders Collaborative Meeting

White informed the group about his attendance at the Sustainability Leaders Collaborative Meeting. The SLC is a partnership of cities, towns, villages and school districts across the county focused on climate change. The purpose of the group is to facilitate collaboration, enabling all Dane County Communities to achieve their sustainability goals.
 - d. Report on Sustain Dane Summit

Members Grabe and White attended the 2023 Sustain Dane Summit. Grabe reported that the summit was an excellent opportunity to view booths of sustainability vendors, view presentations on various topics including efforts to communicate the importance of climate awareness and network with others regarding sustainability topics.
 - e. Update on Lorrie Otto Seeds for Education Program

Butosov reported that he was not able to submit the application before the deadline, but thanks to members Beheler and Grabe, he has all the

background information needed for a future application. He added Grabe informed him of a Rotary Club of Mount Horeb grant that would be a funding opportunity as well. The Rotary Grant would provide greater flexibility in how the funds are used. Beheler volunteered to complete the Rotary grant application. The committee is interested in applying for the Seeds for Education grant in the future.

f. Solsmart Update

White reported that he and Administrator Owen will be attending Solar Friendly Planning workshop on Thursday which will help achieve the planning and zoning requirements for the SolSmart designation. White feels we are still on schedule to submit for bronze designation by the end of the year.

g. Municipal procurement presentation and discussion

White provided a presentation on municipal procurement policies that include requiring sustainable options. The committee felt including sustainability options in a procurement policy was a great idea but did not feel we had enough background information to make that recommendation to the Board yet. Committee will continue discussion on sustainability goals that can be incorporated into a purchasing plan that is right for Mount Horeb.

h. Discussion/consideration : Adopt a Community Strategy

White presented the idea for each committee member to "adopt" one of the other municipalities that have sustainability committees in Dane County. Once a month, the committee member would look up what their adopted community's sustainability committee was doing and report back to our committee to determine if there is a new item we should take up. The committee discussed the logistics of the program and what communities should be included. Committee members will research the other municipalities with committees and will discuss and pick municipalities to adopt at the next meeting.

i. Discussion: SNR Strategic Planning

Gottwald and White prepared a draft concept of options for a strategic plan for the committee. The consensus of the committee was that a simple plan was better and that they liked the plan that focused on which audience to focus our efforts on. The committee also agreed that the School District should be added as an audience. Gottwald and White will revise the plan using this feedback for consideration at the next meeting.

j. Discussion on SNR Flyer/Post Cards

The idea behind a flyer or post card would be to hand out at SNR events or to people members meet that are interested in the committee. The committee discussed the desire to limit any printing and use of recycled paper, double-sided printing and using QR codes to direct individuals to our website to maximize sustainability. Discussion will continue at a future meeting.

- k. Discussion on Bike Trail Grants
White reported he has been in discussion with a resident that is interested in increasing biking options in the Village. White is researching the requirements for designation as a bike-friendly community.
 - l. Update on Solar 101 Program
White reported that the event has been set for Saturday, February 3rd at the Children's Community School. Speakers have been lined up and White is working on logistics. The consensus of the committee was to set the time as: noon to 1:00 school tour and program from 1:00 to 3:00.
 - m. NAR Pearl Certification
Grabe reported on the National Association of Realtors Pearl Certification. Pearl is a third-party that certifies energy-efficient homes and trains realtors to work with sellers to leverage efficiency in the real estate market. MLS listings will include if a home is certified and the program helps to highlight the economics of investing in energy efficiency in homes.
 - n. Discussion: Sustainability Column for Mount Horeb Mail
The committee reviewed the column drafted by White with edits by Beheler highlighting the progress of the committee during its first year. The committee approved the column. The committee discussed future columns advertising the Solar 101 event, residential composting and residential efficiency programs.
 - o. Discussion/Consideration of December Meeting
The December meeting will fall on December 26th. The consensus of the committee was to cancel the December meeting. Future agenda items include the Adopt a Community program, consideration of a strategic plan, a program on composting and regular progress updates.
- 3) Meeting adjournment.
Motion by Gottwald to adjourn, second by Beheler. Motion carried at 8:56 p.m.

Sustainability Notes
from the Sustainability and Natural Resources Committee
Written by Kerry Beheler

Even though we are firmly in the grip of Winter's cold and snow, the sun is shining and providing power! How is this possible? We invite you to a free Solar 101 open house program to find out! Join us on Saturday February 3, 2024, starting at 1 pm, at the newly constructed net-zero energy Children's Community School, 1175 Cox Drive Mount Horeb, to learn more.

At this free Children's Community School (CCS) net-zero building tour, sponsored by the Mount Horeb Sustainability and Natural Resources Committee, we have partnered with experts who will educate you and answer questions about affordable solar and energy efficiency. You will have many interesting options in which to learn, have fun, and be eligible for great door prizes!

On Saturday February 3, at the CCS Solar 101 event, you can discover the substantial savings benefits of solar installations, watch real time solar energy generation and powering of the CCS school, and learn about net metering. Attendees also will hear from a representative of Glow Solar, the company who designed and installed the CCS solar. You can also learn about Mount Horeb Utilities permitting process and the Village's solar advocacy. The Coulliard Solar Foundation and the Solar on School organizations will also have representatives at the CCS Solar 101 event, highlighting their advocacy and expertise for solar powered schools. Best of all, you can participate in the Dane County Office of Energy & Climate Change Climate Champion presentation to CCS. Join us!

What is net-zero? CCS, a nonprofit Montessori preschool in Mount Horeb, is designed to operate as a net-zero building, which means it produces as much energy as it uses in a year. It is one of the first such schools in the state. The solar vendor for CCS, certified solar installer Glow Solar, will be at this free Solar 101 open house on February 3, to help you learn more, at no cost and with no obligation, and answer any questions.

The Montessori philosophy includes being a good steward of the Earth. Maria Montessori believed the outdoor environment was an extension of the indoor classroom, since establishing Montessori schools in 1907. A design-build process for the CCS school was conducted with contractor NCI-Roberts Construction and OPN Architects, and resulted in Montessori-driven features including incorporation of the natural environment.

Renewable energy has never been more affordable to install or important to combat climate change. Funding opportunities for home solar systems are available in the form of a 30% tax credit for homeowners. This substantially reduces the payback time for installing these systems, and there is also a Focus on Energy financial incentive. Importantly, these projects generate work for local contractors and installers, and maintain a healthy regional economy. Kathy Kuntz, Director of the Dane County Office

of Energy & Climate Change, will be with us at the free Solar 101 CCS open house on February 3. More information can be found on the Dane County Office of Energy & Climate Change website [Dane County Office of Energy & Climate Change](https://daneclimateaction.org/Climate-Action-Plan/CAP-Stories/Children-s-Community-School-Net-Zero-Building-Success). The Dane County Office of Energy and Climate Change has a detailed story on CCS's net-zero building success which can be found here: <https://daneclimateaction.org/Climate-Action-Plan/CAP-Stories/Children-s-Community-School-Net-Zero-Building-Success>

Each year, Dane County has a Climate Champions program that recognizes local entities who are leading on climate action. In 2023 three award recipients were designated Climate Champions in the Village of Mount Horeb! They are CCS, Home Energy Consulting, LLC and the Mount Horeb Community Garden. CCS was awarded a four-star designation in the Building Design category.

The Village of Mount Horeb issued an official Proclamation in November 2023 recognizing and congratulating our local Climate Champions. The Proclamation reads, in part: "WHERE AS, Mt. Horeb Village Board has embraced a vision which addresses the following: Improve health and wellness of all residents; Increase our ability to adapt and be resilient to a changing climate; Bridge the rural and urban divide, creating solutions that work for everyone in the county; and Enhance our natural environments, delivering ecosystem benefits."

The Proclamation continues with: "...the Village of Mount Horeb encourages other entities to strive to obtain Dane County Climate Champion recognition, and applauds not only the before mentioned Climate Champions, but also individual efforts, great and small, to lower the community's carbon footprint."

Just think what more our Mount Horeb municipal, schools, businesses, and individuals can achieve to create and maintain a stable and healthier sustainable community! Please join us on Saturday February 3 to learn more and help celebrate and tour the net-zero CCS.



FOR IMMEDIATE RELEASE

Contact:

Tim White

608-294-0394



Mount Horeb Presents “Solar 101”

When: Saturday, February 3, 2024, 1-2:15 PM

Where: The Children’s Community School
(1175 Cox Drive, Mount Horeb, WI)

Why: Learn how to harvest energy from the sun

A solar informational event and celebration of the growth of solar technology in America will take place **Saturday, February 3, at 1 PM**. The venue for the event is the Children’s Community School ([CCS](#)) located at **1175 Cox Drive in Mount Horeb, Wisconsin**. The school was recently awarded Climate Champion status by the Dane County Office of Energy and Climate Change ([OECC](#)). The school is a net zero facility, creating more energy than it uses.

Whether folks are considering solar installation for a home or business or just want to learn more about the benefits of solar photovoltaic (PV) cells, everyone is invited to attend. This event will be a primer on solar energy. It will explore the process of harnessing the sun--from concept to installation. Thus, the name of the program, **Solar 101**.

Kathy Kuntz, Executive Director of OECC, will present the Dane County Climate Champion Award to CCS. A solar company representative will discuss the CCS solar installation and attendees can watch solar energy at work in real time.

Information will be presented about the tremendous savings available from the Federal Inflation Reduction Act and the Wisconsin Focus on Energy Program. Mount Horeb Utility Electrical Supervisor Jordan Schmitz will describe the village’s streamlined permitting process and the advantages of cooperating with a public utility.

Attendees will gain an appreciation for how renewable energy can be a game changer for dealing with the climate crisis. On a personal level, they’ll learn whether a solar installation could be beneficial to them. Finally, special door prizes will be awarded to those who attend.

This event is sponsored by the Village of Mount Horeb Sustainability and Natural Resource Committee. For more information, contact Trustee Tim White, tim.white@mounthorebwi.info.



About the Mt. Horeb Sustainability and Natural Resource Committee (S&NRC)

The S&NRC collaborates with our Village residents to create and expand sustainability practices which are inclusive, safe, and resilient, and improve quality of life for current and future generations who call Mount Horeb home; the committee advocates and promotes sustainable Village policies and practices and seeks innovative solutions while recognizing the interdependence of environmental quality, economic resiliency and growth, and social equity.

- Mount Horeb Sustainability Committee -

□ 17.144 Glare, heat and exterior lighting.

[Amended 3-2-2005 by Ord. No. 2005-05]

- (1) Purpose. The purpose of this section is to regulate glare, heat and the spillover of light and glare on land uses, properties, pedestrians and motor vehicles in the vicinity of a source in order to prevent the creation of nuisances.
- (2) Applicability. The requirements of this section apply to all private sources of glare, heat and exterior lighting within the jurisdiction of this chapter, except for sources within public rights-of-way.
- (3) Depiction on required site plan. Any and all exterior sources of glare, heat or lighting shall be depicted as to its location, orientation and configuration on the site plan required for the development of the subject property.
- (4) Requirements for glare and heat. No activity shall emit glare or heat that is visible or measurable outside its premises, except activities in the industrial district which may emit direct or sky-reflected glare which shall not be visible outside their district. All operations producing intense glare or heat shall be conducted within a completely enclosed building.
- (5) Requirements for exterior lighting.
 - (a) Location of exterior lighting. Light fixtures for multifamily and nonresidential uses shall only be permitted in locations depicted on approved site plans.
 - (b) Orientation of exterior lighting fixture. In no instance shall an exterior lighting fixture be oriented so that the lighting element (or a transparent shield) is visible from any neighboring property in any zoning district. The use of shielded luminaries, flat lenses and careful fixture placement is encouraged so as to facilitate compliance with this requirement. Decorative lighting fixtures using bulbs of less than 100 watts shall be not subject to the requirements of this subsection.
 - (c) Maximum intensity and timing of exterior lighting.
 1. In no instance shall the amount of illumination attributable to exterior lighting, as measured at the property line, exceed 0.50 footcandle above ambient lighting conditions on a cloudless night. In no instance shall the ratio of average illumination intensity to minimum illumination intensity exceed 4:1 for any development. Except for security lighting, exterior illumination shall be consistent with and limited to the hours open to customer service, plus 1/2 hour before and after customer service periods.
 2. The maximum average on-site lighting in nonresidential zoning districts shall be 2.4 footcandles. The maximum fixture power shall be 250 watts.
 3. The maximum average on-site lighting in residential zoning districts shall be 0.90 footcandles. The maximum fixture power shall be 100 watts.
 4. The following exceptions shall be permitted:
 - a. Outdoor display lots and in-vehicle use under-canopy areas: Maximum average on-site lighting of 3.60 footcandles, with a maximum fixture power of 200 watts. Fixtures with full cutoffs and flat lenses are required. Fully recessed fixtures with flat horizontal lenses meet this requirement.
 - b. Outdoor public recreation facilities are exempt from the provisions of this subsection.
 - (d) Minimum intensity of exterior lighting in vehicle circulation areas. All areas designated on required site plans for vehicular parking, loading, or circulation and used for any such purpose after sunset shall provide artificial illumination in such areas at a minimum intensity of 0.2 footcandle.
 - (e) Flashing, flickering and other distracting lighting. Flashing, flickering and/or other lighting which may distract motorists are prohibited.
 - (f) Nonconforming lighting. All lighting fixtures existing prior to the effective date of this chapter shall be considered as legal conforming light fixtures. However, any additional or replacement fixtures shall meet the requirements of this section. Full compliance with this section may also be included as a condition of approval for any revised site plan, conditional use or planned development request.
 - (g) Special events lighting. Any temporary use using exterior lighting which is not in complete compliance with the requirements of this section shall secure a conditional use permit.

Light Pollution Discussion -



Twinkle, twinkle, little star,
How I wonder where you are.
Looking up is no solution;
The sky's so full of light pollution.
-David H. Levy, astronomer



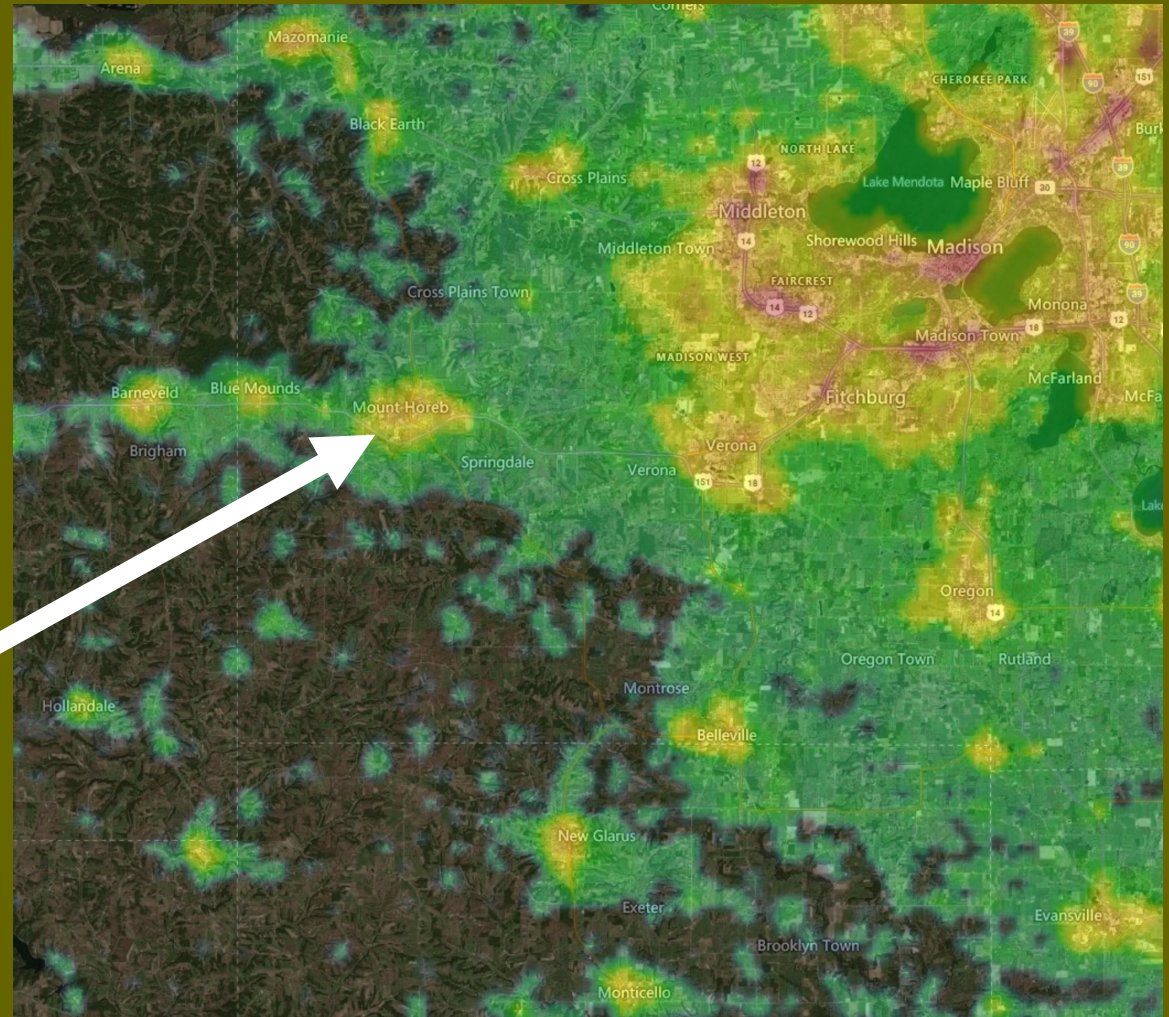
Forms of Light Blight

❖ Skyglow

❖ Glare

❖ Light Trespass

US



SKYGLOW

Skyglow is the dome of brightness on the horizon that obscures our view of the night sky. Skyglow is caused by misdirected light scattering through our atmosphere. Here we can see the skyglow of an urban area to the right of the image, and dark skies revealing the milky way to the left.



Glare

Have you ever been driving down a lonely road at night, only to be blinded by oncoming high beams that someone forgot to turn off? You have experienced glare! Glare is when light enters our eyes at shallow angles, causing pain and restriction of the pupil, reducing visual acuity.



LIGHT TRESPASS

light trespass, is when light is falling outside of the property boundary onto another property or home. We can think of light trespass as a private property rights issue.

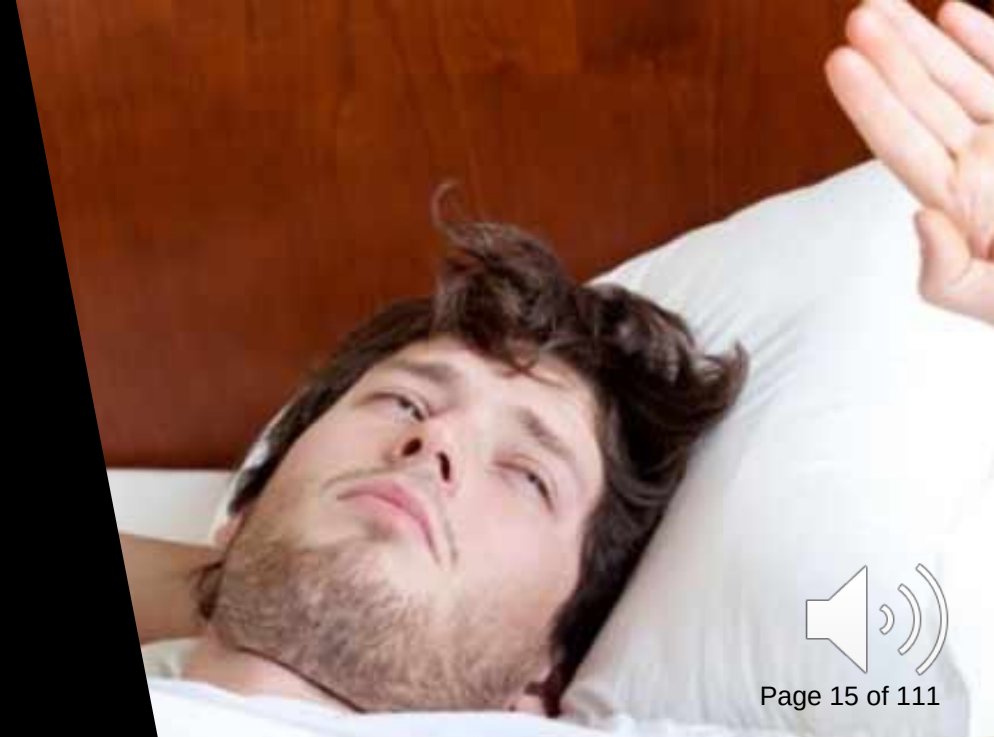


**Light Trespass steals
human health!**



Stealing Dark Steals Human Health

At night, light can become a big problem as it suppresses melatonin and disrupts sleep. Not getting a good night sleep doesn't just make you feel drowsy the next day, it also negatively affects our body fat levels, brain function, insulin resistance, and can even disrupt our appetite.



Light pollution linked to preterm birth increase

In the first study of its kind, researchers find that light pollution, based on a direct measure of skyglow, could increase the likelihood of preterm birth by as much as 1.48 percentage points, or 12.9%.

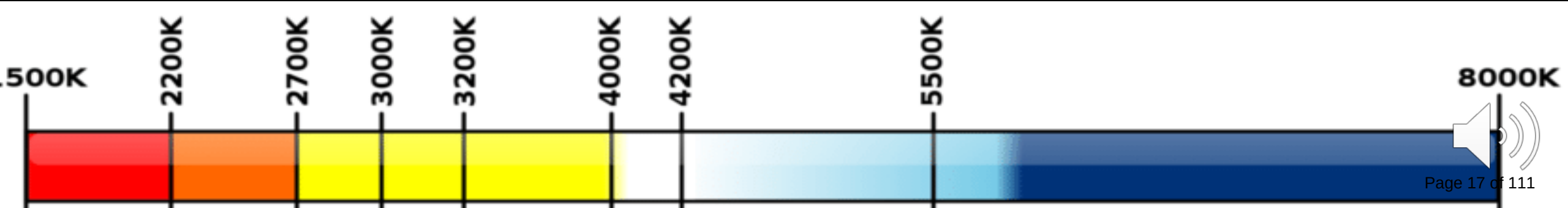
Peer-Reviewed Publication
LEHIGH UNIVERSITY



The American Medical Association Weighs In

LIGHTING COLOR TEMPERATURE SCALE				
	COLOR TEMPERATURE	EFFECTS	MOOD	APPLICATION
9000 - 10000 °K	Daylight (5000 - 6000k)	Adds bluish tint, flattens reds and enhances existing blues	Vibrant & Attentive	Warehouses, Manufacturing, Industrial Facilities
6500 - 8000 °K				
5000 - 6500 °K				
5000 - 5500 °K	Bright White (4000K)	Enhances all colors equally	Efficient & Neutral	Retail, Offices, Showrooms
4000 - 5000 °K				
3000 - 4000 °K				
2500 - 3500 °K	Warm White (2700-3000K)	Adds yellow tint while enhancing reds and oranges	Warm & Inviting	Homes, Restaurants, Hospitality
1000 - 2000 °K				

The AMA recommends that outdoor lighting at night, particularly street lighting, should have a color temperature of no greater than 3000 Kelvin(K).





MYTH:
MORE LIGHTING IS SAFER



REALITY:
WELL DESIGNED LIGHTING
IS SAFER



Aiming lights down at the task at hand dramatically reduces glare, increasing visibility and better illuminating the intended area.

Outdoor Lighting Can Be Dark Sky Friendly



- Light what you need
- When you need it
- No brighter than necessary
- Fully shielded to point downward



Ecological Impacts of Light pollution

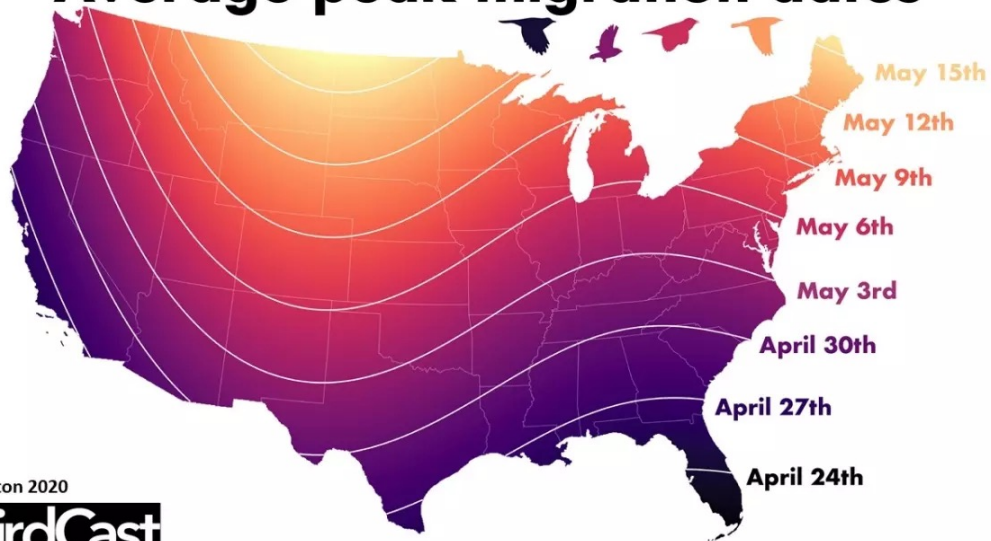




Daily light and dark cycles create a natural rhythm that is important for many organisms. Some species are only active at night, some migrate by night, most set their internal clocks to the changing length of days and seasons.



Average peak migration dates



Nighttime Lights and Birds:

Artificial light is scattered across the landscape of the entire country, and birds are frequently attracted to lighting, especially during inclement weather events during migration. Unfortunately, lights can cause confusion, disorientation, and exhaustion - directly impacting their ability to migrate.



BIRDS

* Every year nearly one billion birds collide with glass in the U.S

*US Fish and Wildlife Service



Many of these deaths are from interior lighting





TREES

bud earlier and
lose their leaves
later under artificial
light



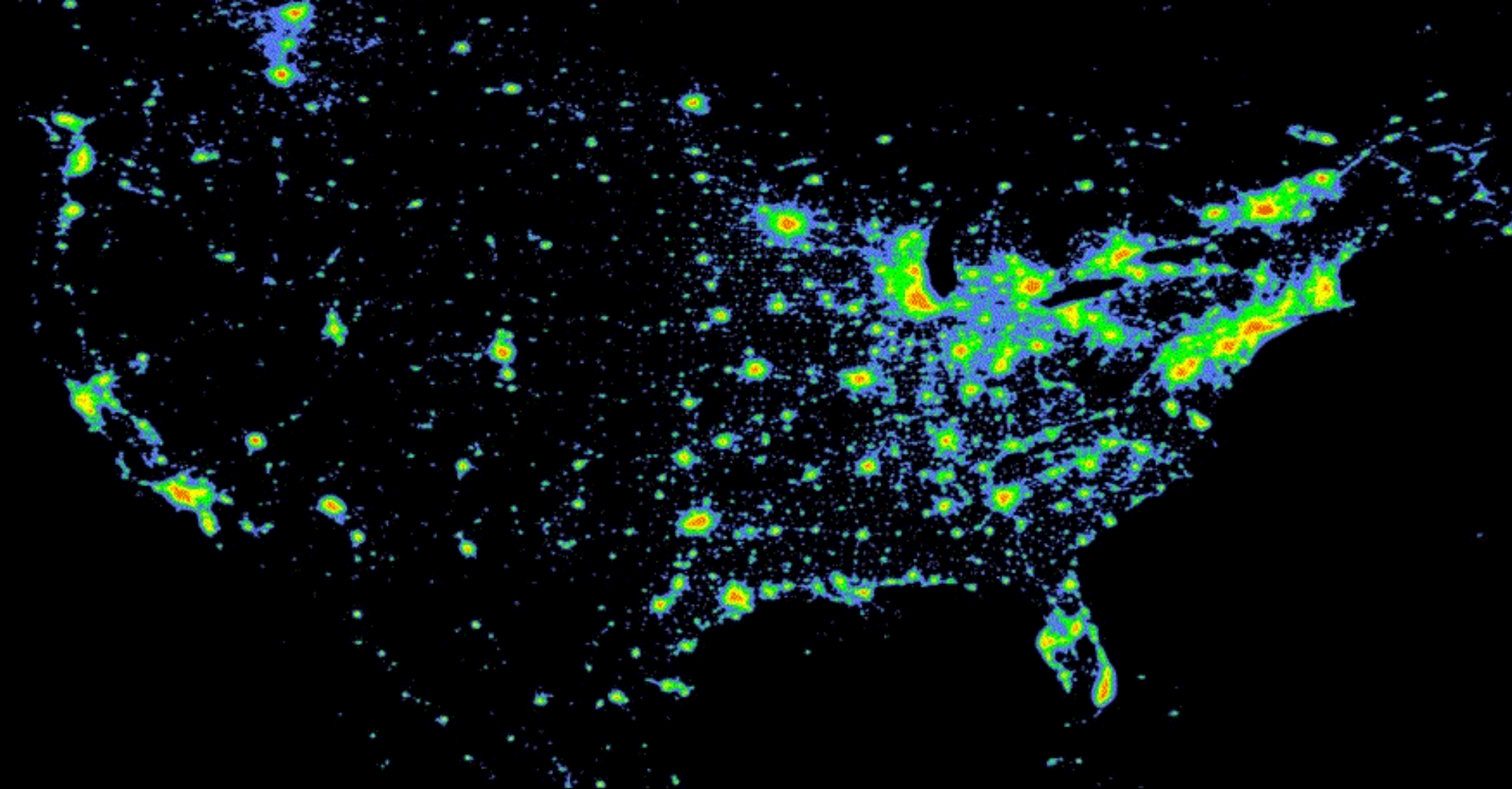
A vertical rectangular image on the left side of the slide. It shows a person standing on a dark, silhouetted horizon, looking up at a night sky. The Milky Way galaxy is clearly visible, stretching diagonally from the bottom left towards the top right. The sky is dark with many stars, and the Milky Way itself is a bright, hazy band of light.

The Theft Of The Heavens

**ONLY 2 OUT OF 10 PEOPLE ON EARTH CAN
SEE THE MILKY WAY**

**99% OF THE USA AND EUROPE Live Under
light polluted Skies**





Late 1950's

©2014 Giovanni R. Falchi I.F., Elvidge C.D.

Light pollution is increasing at 2 % per year





3-7 BILLION DOLLARS

spent every year on unneeded lighting

21 MILLION TONS OF CO₂

burned by unnecessary lighting

What A Waste!



WANTING WARRANTING

Using the amount of light needed for the task at hand and making sure that a light really is needed in the first place! That is called warranting.



**HOW CAN
MOUNT HOREB DECREASE
VILLAGE LIGHT POLLUTION
AND SAVE THE STARS**



Public Outreach

The Village Board of Trustees approved an outdoor lighting ordinance in January 2006. This brochure explains the basic provisions of the ordinance (Chapter 22) and offers some suggestions for compliance. We encourage you to acquaint yourself with the specifics of the regulations, modifications and exceptions by visiting the Village website: www.shorewood-hills.org and click on Village Ordinances, Chapter 22.

This is particularly important for residents involved in any construction requiring a building permit. Your contractor needs to comply with these provisions.

The city of Madison and the Town of Westport have passed outdoor lighting ordinances that were reviewed by the Village of Shorewood Hills' Dark Sky Committee. The Committee also reviewed lighting ordinances from other cities around the country.

Why do we have an Outdoor Lighting Ordinance?

Several reasons led to its adoption:

- 1) To improve nighttime visibility, security and safety in the Village;
- 2) To eliminate harsh glare and "light trespass" between properties;
- 3) To reduce the deleterious effects of artificial lighting on the nighttime sky.

By encouraging lighting practices that direct appropriate amounts of light where and when it is needed, we will use less energy, save dollars and will be good neighbors.



Shielded, downward directed light

Like many other things, how we use exterior lighting on our own property can affect our neighbors and other village residents. Glare (light causing visual impairment) from poor lighting has the potential to cause severe problems because of its effect on the dark-adapted eye. Problems associated with glare can include transient night blindness in drivers and pedestrians, as well as more pervasive visual problems associated with night vision in the older eye.

High levels of illumination caused by over-lighting create many problems. For example, over-lit surroundings can create security problems when the eye fails to adapt to seeing in adjoining dark areas and shadows, compromising personal security and safety. High illumination levels can also deprive residents of the darkness needed for sound sleep. The cumulative illumination of a large city brightens the night sky for surrounding communities, changing their rural character and robbing them of the stars.



Madison's skyglow as seen from Dodgeville

Understanding our Outdoor Lighting Ordinance

To achieve lighting improvements in our village, the ordinance includes the following provisions:

- Use of shielded light fixtures to prevent glare and skyglow (light spilling into the night sky.)
- Proper installation of shielded fixtures to prevent

light trespass (glare and spill light that shines onto neighboring properties)

- A maximum allowed lighting limit and light curfews for residential and commercial properties.

Outdoor lighting for all proposed new land uses, developments, buildings and structures that require a permit need to meet the requirements. Minor additions or modifications that require a permit need to submit an outdoor lighting inventory/plan.

Owners of existing residential and commercial properties need to comply with the ordinance regulations no later than January 2009.

Sensible Outdoor Lighting Principles and Practices

1. Shielding the Light Source -

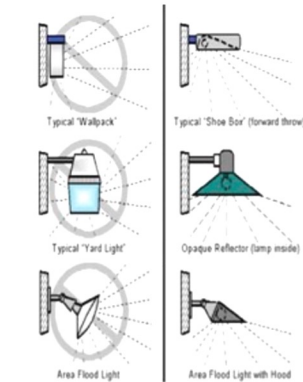
Illuminate only what you wish to see by using shielded fixtures that direct the light properly. In most cases, a light source must be enclosed in a non-adjustable shield that is aimed downward. If your eye is above the fixture, you should not be able to see glare from the light source or lens.

For all residential and commercial properties, any exterior light fixture with a light source (bulb) brighter than:

150 watts (450 watts for commercial)- must be "fully shielded", i.e. no light above the horizontal plane;

60 watts (100 watts for commercial)- must be "shielded", i.e. less than 2% of its light output above the horizontal plane.

Modifications and exemptions from these requirements include street lighting, emergency lighting, recreational lighting and holiday lighting. See Chap. 22.06.



Unshielded vs. Shielded Lighting

2. Preventing Light Trespass -

Install lighting fixtures carefully to maximize their effectiveness on the target area and minimize their adverse impact beyond your property line. Brighter is not always better; provide adequate light for the intended task, but never over-light.

Proper position and aiming are important. Properly installed and adjusted motion detectors can minimize the amount of time your lights are on and provide better security.

All village outdoor lighting must be shielded or installed so that there is no direct line of sight between the light source or its reflection at a point 3 feet or higher above the ground at the property line of the source. Light that does not meet this requirement constitutes light trespass.

Specific regulations and exceptions regarding shielding, installation and height limits for pole mounted lighting and lights mounted to buildings or structures are listed in Chap. 22.08 and 22.09.



Municipal Advocacy For Dark Skies

Resolutions and Proclamations allow municipalities and other groups to show support and inform the general public about night sky preservation efforts in a community or region. Adopting a resolution can also serve as an intermediate step for a village on its way towards adopting ordinances.

Example: Verona's Resolution

2023 PROCLAMATION DECLARING DARK SKY WEEK IN THE CITY OF VERONA

WHEREAS, it is recognized that the continued existence of light pollution, as the standard living condition for over 83% of all people, has clear and detrimental impacts on the health and wellness of every citizen of the City of Verona, regardless of where in the city they live, and on the health and survival of the wide diversity of wildlife and habitats within its urban borders; and

WHEREAS, the future vibrancy and economic competitiveness of the City of Verona depends on the transition of energy consumption policies, practices and procedures to those of a carbon neutrality. The City of Verona has a proud heritage of incorporating green spaces and the engagement with the natural world and is valued and prioritized in the decision-making process of City governance and the safety of every citizen is a fundamental product of this effective governance; and

WHEREAS, the City of Verona is in close proximity to the home of the MMSD Observatory, and is in close proximity to the former University of Wisconsin – Madison's historic Student Observatory (now rededicated as the Bell-Burnell Observatory UW Space Place, the Madison Metropolitan School District Planetarium, and the Madison Astronomical Society). It is a city recognized as a center for the exploration of the Universe through research and an educational focus on science, technology, engineering and mathematics through which we explore and engage with the Cosmos around us; and

WHEREAS, the five principles of Responsible Outdoor Lighting, promoted by the International Dark Sky Association, which state that lighting must be useful, targeted, at the lowest useful intensity, controlled to be "on" only when needed and of the warmest possible color, as recognized in the City of Verona ordinances and regulations.

WHEREAS, light pollution is an issue that can be greatly impacted and mitigated in its negative impact through effective education, development of community awareness and action steps that focus on light pollution issues. The effectiveness of carbon neutrality and energy efficiency efforts, and on accessibility to the splendor of the Universe, can be experienced by looking into a dark sky.

NOW, THEREFORE, BE IT RESOLVED that I, Luke Diaz, Mayor of Verona, Wisconsin, do hereby proclaim April 15 through April 22, 2023, in alignment with the International Dark Sky Association, as Dark Sky Week in the City of Verona.



Signed and dated this 10th day of April 2023

By: _____
Luke Diaz, Mayor



Update and strengthen Zoning & Ordinances

Dark Sky Lighting Ordinance

- I Purpose
- II Applicability
- III Severability
- IV Definitions
- V General Prohibition of Non-Dark Sky Lights and Fixtures
- VI Light Fixtures Permitted by this Ordinance
- VII Replacement of Non-Dark Sky Fixtures
- VIII Installation of new Dark Sky Fixtures and Dark Sky Cutoff Fixtures
- IX Light Fixtures Encouraged but not Required under this Ordinance
- X Exemptions
- XI Liability
- XII Enforcement and Penalties
- XIII Disclaimer
- XIV Effective Date

SECTION I - PURPOSE

This ordinance is intended to promote the preservation of dark skies over the Town of Springdale and to protect the view of the night sky for the enjoyment of the citizens of the Town of Springdale.

SECTION II - APPLICABILITY

- A. This ordinance applies to all outdoor lighting within the Town of Springdale unless otherwise exempted in this Section.
- B. This ordinance does not apply to emergency lighting.
- C. This ordinance does not apply to temporary lighting.
- D. This ordinance does not apply to vehicular lighting.
- E. This ordinance does not apply to lighting on wheeled farm machines.

SECTION III - SEVERABILITY

Should any portion of this ordinance be declared unconstitutional or invalid by a court of competent jurisdiction, the remainder of this ordinance shall not be affected.

SECTION IV - DEFINITIONS

fixture means any device intended to produce outdoor light that emits light from 0 to 180 degrees vertical.

LE XIV. - EXTERIOR LIGHTING STANDARDS

1300. - Purpose and intent.

Purpose. The purpose of this article is to regulate exterior lighting in order to promote transportation safety and to prevent the creation of nuisance trespass and glare have negligible impact on surrounding property and roadways.

Intent. This article XIV is entitled the Village of Waunakee exterior lighting standards.

§ 223. § 5)

Applicability.

The requirements of this subsection apply to all private exterior lighting, including exterior lighting of governmental bodies other than the Village of Waunakee.

General lighting requirements.

1. All light sources shall be full cutoff fixtures with the light source fully shielded and directed downwards. No light source shall be visible from the street or from any adjacent property or right-of-way, outside of those lighting fixtures as specified in 33.05(1)(a) above. In no instance shall the amount of illumination attributable to exterior lighting, as measured at the property line, exceed 0.5 foot-candles above ambient lighting conditions on a cloudless night. Flashing, flickering and/or other lighting which may distract motorists are prohibited.

2. All areas designated on required site plans for pedestrian circulation shall be illuminated to a minimum intensity of 0.4 foot-candles and at a maximum intensity of 3.0 footcandles during hours of operation. Light fixtures shall not be permitted closer than 10 feet to the property line. Wall mounted accent lighting shall be integrated with the architectural character of the building and shall not spill over roof lines or building edges.

3. All outdoor lighting shall be recessed and/or constructed so that no light fixture is visible from the street or from any adjacent property or right-of-way, outside of those lighting fixtures as specified in 33.05(1)(a) above. The maximum height of parking lot light fixtures abutting residential development shall not exceed 15 feet. Light fixtures that are themselves, or related to, accessory uses or structures shall be directed away from the street and adjacent properties.

4. As otherwise exempt, all outdoor lighting shall be recessed and/or constructed so that no light fixture is visible from the street or from any adjacent property or right-of-way, outside of those lighting fixtures as specified in 33.05(1)(a) above. The maximum height of parking lot light fixtures abutting residential development shall not exceed 15 feet. Light fixtures that are themselves, or related to, accessory uses or structures shall be directed away from the street and adjacent properties.

5. All outdoor lighting shall be recessed and/or constructed so that no light fixture is visible from the street or from any adjacent property or right-of-way, outside of those lighting fixtures as specified in 33.05(1)(a) above. The maximum height of parking lot light fixtures abutting residential development shall not exceed 15 feet. Light fixtures that are themselves, or related to, accessory uses or structures shall be directed away from the street and adjacent properties.

6. All outdoor lighting shall be recessed and/or constructed so that no light fixture is visible from the street or from any adjacent property or right-of-way, outside of those lighting fixtures as specified in 33.05(1)(a) above. The maximum height of parking lot light fixtures abutting residential development shall not exceed 15 feet. Light fixtures that are themselves, or related to, accessory uses or structures shall be directed away from the street and adjacent properties.

7. All outdoor lighting shall be recessed and/or constructed so that no light fixture is visible from the street or from any adjacent property or right-of-way, outside of those lighting fixtures as specified in 33.05(1)(a) above. The maximum height of parking lot light fixtures abutting residential development shall not exceed 15 feet. Light fixtures that are themselves, or related to, accessory uses or structures shall be directed away from the street and adjacent properties.

8. All outdoor lighting shall be recessed and/or constructed so that no light fixture is visible from the street or from any adjacent property or right-of-way, outside of those lighting fixtures as specified in 33.05(1)(a) above. The maximum height of parking lot light fixtures abutting residential development shall not exceed 15 feet. Light fixtures that are themselves, or related to, accessory uses or structures shall be directed away from the street and adjacent properties.

9. All outdoor lighting shall be recessed and/or constructed so that no light fixture is visible from the street or from any adjacent property or right-of-way, outside of those lighting fixtures as specified in 33.05(1)(a) above. The maximum height of parking lot light fixtures abutting residential development shall not exceed 15 feet. Light fixtures that are themselves, or related to, accessory uses or structures shall be directed away from the street and adjacent properties.

10. All outdoor lighting shall be recessed and/or constructed so that no light fixture is visible from the street or from any adjacent property or right-of-way, outside of those lighting fixtures as specified in 33.05(1)(a) above. The maximum height of parking lot light fixtures abutting residential development shall not exceed 15 feet. Light fixtures that are themselves, or related to, accessory uses or structures shall be directed away from the street and adjacent properties.

11. All outdoor lighting shall be recessed and/or constructed so that no light fixture is visible from the street or from any adjacent property or right-of-way, outside of those lighting fixtures as specified in 33.05(1)(a) above. The maximum height of parking lot light fixtures abutting residential development shall not exceed 15 feet. Light fixtures that are themselves, or related to, accessory uses or structures shall be directed away from the street and adjacent properties.

12. All outdoor lighting shall be recessed and/or constructed so that no light fixture is visible from the street or from any adjacent property or right-of-way, outside of those lighting fixtures as specified in 33.05(1)(a) above. The maximum height of parking lot light fixtures abutting residential development shall not exceed 15 feet. Light fixtures that are themselves, or related to, accessory uses or structures shall be directed away from the street and adjacent properties.

13. All outdoor lighting shall be recessed and/or constructed so that no light fixture is visible from the street or from any adjacent property or right-of-way, outside of those lighting fixtures as specified in 33.05(1)(a) above. The maximum height of parking lot light fixtures abutting residential development shall not exceed 15 feet. Light fixtures that are themselves, or related to, accessory uses or structures shall be directed away from the street and adjacent properties.

14. All outdoor lighting shall be recessed and/or constructed so that no light fixture is visible from the street or from any adjacent property or right-of-way, outside of those lighting fixtures as specified in 33.05(1)(a) above. The maximum height of parking lot light fixtures abutting residential development shall not exceed 15 feet. Light fixtures that are themselves, or related to, accessory uses or structures shall be directed away from the street and adjacent properties.

15. All outdoor lighting shall be recessed and/or constructed so that no light fixture is visible from the street or from any adjacent property or right-of-way, outside of those lighting fixtures as specified in 33.05(1)(a) above. The maximum height of parking lot light fixtures abutting residential development shall not exceed 15 feet. Light fixtures that are themselves, or related to, accessory uses or structures shall be directed away from the street and adjacent properties.

City of Middleton Outdoor Lighting Ordinance

Section 33.05: General Outdoor Lighting Standards

Chapter 33: Outdoor Lighting Code

- 2. 12 feet in the MH-D, MR-L, MR-M, MR-U, MR-H, and MU-N zoning districts
- 3. 20 feet INST, MU-A, MU-U, MU-D, and PR zoning districts
- 4. 30 feet in the I-L, R-P, I-M, I-H, AGR, IOS, IOC, EXD, and AIR zoning districts

(f) All areas designated on required site plans for vehicular parking, loading, or circulation and used for any such purpose after sunset shall provide artificial illumination in such areas at a minimum intensity of 0.4 foot-candles.

(2) Intensity of Illumination.

(a) In no instance shall an exterior lighting fixture be oriented so that the lighting element (or a clear shield) is visible from an adjacent property or right-of-way, outside of those lighting fixtures as specified in 33.05(1)(a) above. In no instance shall the amount of illumination attributable to exterior lighting, as measured at the property line, exceed 0.5 foot-candles above ambient lighting conditions on a cloudless night. Flashing, flickering and/or other lighting which may distract motorists are prohibited.

(b) The maximum average on-site lighting in nonresidential zoning districts (see Section 10.02.02 of the City of Middleton Zoning Code, Chapter 10) shall be 2.5 foot-candles, unless otherwise specified in this Chapter.

(c) The maximum average on-site lighting in residential zoning districts (see Section 10.02.02 of the City of Middleton Zoning Code, Chapter 10) shall be 1.0 foot-candles, unless otherwise specified in this Chapter.

(3) On-Building Lighting.

(a) Building mounted lights shall be mounted and installed so that all light is directed downward, unless the lights are decorative lighting in which case the light shall be directed toward the building.

(b) Fixtures shall be fully shielded.

(c) No wall packs or similar lights shall be permitted unless the cutoff angle effectively eliminates visible glare from beyond the property lines.

(d) No lights shall be mounted above the parapet, or for pitched roofs above the eave except for motion detection security lighting, decorative building lighting.

(e) Functional lighting shall not exceed 400 watts. Decorative building or landscape lighting shall not exceed 100 watts.

(f) The maximum light trespass allowed on adjacent properties is one-half (0.5) footcandles.

(g) If swivel mountings are used, lights may be raised a maximum of twenty (20) degrees from horizontal and must be full cutoff fixtures.

(h) Each exterior building entrance shall have an exterior light per the requirements of the City of Middleton Building Code (Chapter 11) and Electrical Code (Chapter 12).

(i) For residential uses, exterior lighting with automatic controls shall be provided so that the house numbers are visible from the adjacent street and interior drive. For units with individual exterior entrances, such lighting shall be provided so that the unit numbers are visible to pedestrians on the sidewalk.

(j) Exterior lighting with automatic controls shall be provided for all sidewalk entrances and exits to provide safe travel between the parking areas and the building.

Draft



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Sustainability & Natural Resource Committee Discussion



☐ **17.144 Glare, heat and exterior lighting.**

[Amended 3-2-2005 by Ord. No. 2005-05]

- (1) Purpose. The purpose of this section is to regulate glare, heat and the spillover of light and glare on land uses, properties, pedestrians and motor vehicles in the vicinity of a source in order to prevent the creation of nuisances.
- (2) Applicability. The requirements of this section apply to all private sources of glare, heat and exterior lighting within the jurisdiction of this chapter, except for sources within public rights-of-way.
- (3) Depiction on required site plan. Any and all exterior sources of glare, heat or lighting shall be depicted as to its location, orientation and configuration on the site plan required for the development of the subject property.
- (4) Requirements for glare and heat. No activity shall emit glare or heat that is visible or measurable outside its premises, except activities in the industrial district which may emit direct or sky-reflected glare which shall not be visible outside their district. All operations producing intense glare or heat shall be conducted within a completely enclosed building.
- (5) Requirements for exterior lighting.
 - (a) Location of exterior lighting. Light fixtures for multifamily and nonresidential uses shall only be permitted in locations depicted on approved site plans.
 - (b) Orientation of exterior lighting fixture. In no instance shall an exterior lighting fixture be oriented so that the lighting element (or a transparent shield) is visible from any neighboring property in any zoning district. The use of shielded luminaries, flat lenses and careful fixture placement is encouraged so as to facilitate compliance with this requirement. Decorative lighting fixtures using bulbs of less than 100 watts shall be not subject to the requirements of this subsection.
 - (c) Maximum intensity and timing of exterior lighting.
 1. In no instance shall the amount of illumination attributable to exterior lighting, as measured at the property line, exceed 0.50 footcandle above ambient lighting conditions on a cloudless night. In no instance shall the ratio of average illumination intensity to minimum illumination intensity exceed 4:1 for any development. Except for security lighting, exterior illumination shall be consistent with and limited to the hours open to customer service, plus 1/2 hour before and after customer service periods.
 2. The maximum average on-site lighting in nonresidential zoning districts shall be 2.4 footcandles. The maximum fixture power shall be 250 watts.
 3. The maximum average on-site lighting in residential zoning districts shall be 0.90 footcandles. The maximum fixture power shall be 100 watts.
 4. The following exceptions shall be permitted:
 - a. Outdoor display lots and in-vehicle use under-canopy areas: Maximum average on-site lighting of 3.60 footcandles, with a maximum fixture power of 200 watts. Fixtures with full cutoffs and flat lenses are required. Fully recessed fixtures with flat horizontal lenses meet this requirement.
 - b. Outdoor public recreation facilities are exempt from the provisions of this subsection.
 - (d) Minimum intensity of exterior lighting in vehicle circulation areas. All areas designated on required site plans for vehicular parking, loading, or circulation and used for any such purpose after sunset shall provide artificial illumination in such areas at a minimum intensity of 0.2 footcandle.
 - (e) Flashing, flickering and other distracting lighting. Flashing, flickering and/or other lighting which may distract motorists are prohibited.
 - (f) Nonconforming lighting. All lighting fixtures existing prior to the effective date of this chapter shall be considered as legal conforming light fixtures. However, any additional or replacement fixtures shall meet the requirements of this section. Full compliance with this section may also be included as a condition of approval for any revised site plan, conditional use or planned development request.
 - (g) Special events lighting. Any temporary use using exterior lighting which is not in complete compliance with the requirements of this section shall secure a conditional use permit.



Illuminating
ENGINEERING SOCIETY



JOINT IDA - IES

**MODEL
LIGHTING
ORDINANCE
(MLO)**

with USER'S GUIDE

June 15, 2011

The User Notes

The User Notes are intended to clarify the sections of the MLO for the various audiences who will use it: lighting designers, city officials, engineers, citizen groups, and others. Every effort has been made to keep the language technically accurate and clear, but since different disciplines may use the same term in different ways, or have different interpretations, some guidance may be helpful. While these Notes can not be a full tutorial on modern lighting design, it is hoped that the Notes will help facilitate the dialogue necessary to adopt the MLO.

Background

The problems of light pollution first became an issue in the 1970s when astronomers identified the degradation of the night sky due to the increase in lighting associated with development and growth. As more impacts to the environment by lighting have been identified, an international “dark sky” movement is advocating for the precautionary approach to outdoor lighting design.

Many communities have passed anti-light-pollution laws and ordinances. However, there is little or no agreement among these laws, and they vary considerably in language, technical quality, and stringency. This is confusing for designers, engineers, and code officials. The lack of a common basis prevents the development of standards, educational programs, and other means of achieving the goal of effective lighting control.

This MLO will allow communities to drastically reduce light pollution and glare and lower excessive light levels. The recommended practices of the IES can be met using readily available, reasonably priced lighting equipment. However, many conventional lighting practices will no longer be permitted, or will require special permits.

This Model Lighting Ordinance (MLO) is the result of extensive efforts by the International Dark Sky Association (IDA) and the Illuminating

Engineering Society of North America (IES). Among its features is the use of lighting zones (LZ0-4) which allow each governing body to vary the stringency of lighting restrictions according to the sensitivity of the area as well as accommodating community intent. In this way, communities can fine-tune the impact of the MLO without having to customize the MLO. The MLO also incorporates the Backlight-Uplight-Glare (BUG) rating system for luminaires, which provides more effective control of unwanted light.

Joint IDA-IESNA
Model Outdoor Lighting
Ordinance (MLO)

June 15, 2011

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General Notes in Adopting this Model Ordinance

Adoption of this ordinance should follow the established development, review, and approval processes of the adopting authority. If no such processes are in place, this ordinance may be adopted as a new independent section of the Municipal Code.

The MLO is probably best adopted as an “overlay zoning” ordinance. This means that it overlays, but is different from, land-use zoning. It can be added to or integrated into existing ordinances or codes and cross-referenced to other applicable codes and ordinances such as the electrical code, the sign code, planning ordinances, etc.

The MLO may best be managed by assigning it to planning officials and using existing administrative structures.

Because of the diverse community and lighting needs across large areas, this MLO is not intended for adoption as a state, provincial or national ordinance. Regional coordination is encouraged. Light pollution knows no boundaries, and the effects of polluting light persist as far as 200 kilometers (about 120 miles) from the source. One large city could adopt the MLO and dramatically affect a region, but adoption in suburbs and small towns must be part of a regional effort to achieve significant improvements in the overall quality of the night sky.

Adopting agencies should also consider that the MLO, like all other modern codes, is designed to evolve over time. Lighting technology will change, and MLO changes will be needed every few years. On-going renewal cycles are strongly recommended as any part of an adopting ordinance.

MLO Development and Task Force Members

This Model Lighting Ordinance has been developed as a joint undertaking by the Illuminating Engineering Society and the International Dark-Sky Association.

The Joint Task Force responsible for developing the MLO include

IDA
Co-Chair: Jim Benya
Co-Chair: Nancy Clanton
Leslie Lipstein
Leo Smith
Michael Mutmanský

IES
Naomi Miller
Cheryl English
Denis Lavoie
Eric Gibson

John Walter representing the electric utility industry also contributed as a member of the Joint Task Force.

I. PREAMBLE - User's Guide

In general, the preamble is part of the ordinance but is typically not part of the code. It establishes the reasons why the municipality is undertaking these regulations.

Local governments may add other purposes to the Preamble including established local government environmental or energy goals that support the model lighting ordinance. The environmental impacts of outdoor lighting fall into two categories: carbon footprint (energy used in the life of a lighting product) and obtrusive light.

CARBON FOOTPRINT	OBTRUSIVE LIGHT
Cost & Impact of Mining the Materials Used	Impact on Humans
Energy Used in Production	Impact on the Environment
Energy Used during Product Life	
Disposal/Recycling Costs	

II. LIGHTING ZONES - User's Guide

Lighting zones reflect the base (or ambient) light levels desired by a community. The use of lighting zones (LZ) was originally developed by the International Commission on Illumination (CIE) and appeared first in the US in IES Recommended Practice for Exterior Environmental Lighting, RP-33-99.

It is recommended that lower lighting zone(s) be given preference when establishing zoning criteria. Selection of lighting zone or zones should be based not on existing conditions but rather on the type of lighting environments the jurisdiction seeks to achieve. For instance, new development on previously rural or undeveloped land may be zoned as LZ-1. Using lighting zones allows a great deal of flexibility and customization without the burden of excessive regulation. For example, a jurisdiction may choose to establish vertical lighting zones with the lighting zone at street level at a higher zone than the residential housing on upper levels.

I. PREAMBLE - Ordinance Text

The purpose of this Ordinance is to provide regulations for outdoor lighting that will:

- Permit the use of outdoor lighting that does not exceed the minimum levels specified in IES recommended practices for night-time safety, utility, security, productivity, enjoyment, and commerce.
- Minimize adverse offsite impacts of lighting such as light trespass, and obtrusive light.
- Curtail light pollution, reduce skyglow and improve the nighttime environment for astronomy.
- Help protect the natural environment from the adverse effects of night lighting from gas or electric sources.
- Conserve energy and resources to the greatest extent possible.

II. LIGHTING ZONES - Ordinance Text

The Lighting Zone shall determine the limitations for lighting as specified in this ordinance. The Lighting Zones shall be as follows:

LZ0: No ambient lighting

Areas where the natural environment will be seriously and adversely affected by lighting. Impacts include disturbing the biological cycles of flora and fauna and/or detracting from human enjoyment and appreciation of the natural environment. Human activity is subordinate in importance to nature. The vision of human residents and users is adapted to the darkness, and they expect to see little or no lighting. When not needed, lighting should be extinguished.

II. LIGHTING ZONES (cont.) - User's Guide

However, if an adjacent use could be adversely impacted by allowable lighting, the adopting authority may require that a particular site meet the requirements for a lower lighting zone. For example, the authority could specify Lighting Zone 1 or 2 requirements if a commercial development were adjacent to a residence, hospital or open space, or to any land assigned to a lower zone.

Lighting zones are best implemented as an overlay to the established zoning especially in communities where a variety of zone districts exists within a defined area or along an arterial street. Where zone districts are cohesive, it may be possible to assign lighting zones to established land use zoning. It is recommended that the lighting zone includes churches, schools, parks, and other uses embedded within residential communities.

Zone	Recommended Uses or Areas	Zoning Considerations
LZ-0	Lighting Zone 0 should be applied to areas in which permanent lighting is not expected and when used, is limited in the amount of lighting and the period of operation. LZ-0 typically includes undeveloped areas of open space, wilderness parks and preserves, areas near astronomical observatories, or any other area where the protection of a dark environment is critical. Special review should be required for any permanent lighting in this zone. Some rural communities may choose to adopt LZ-0 for residential areas.	Recommended default zone for wilderness areas, parks and preserves, and undeveloped rural areas. Includes protected wildlife areas and corridors.
LZ-1	Lighting Zone 1 pertains to areas that desire low ambient lighting levels. These typically include single and two family residential communities, rural town centers, business parks, and other commercial or industrial/storage areas typically with limited nighttime activity. May also include the developed areas in parks and other natural settings.	Recommended default zone for rural and low density residential areas. Includes residential single or two family; agricultural zone districts; rural residential zone districts; business parks; open space include preserves in developed areas.

II. LIGHTING ZONES (cont.) - Ordinance Text

LZ1: Low ambient lighting

Areas where lighting might adversely affect flora and fauna or disturb the character of the area. The vision of human residents and users is adapted to low light levels. Lighting may be used for safety and convenience but it is not necessarily uniform or continuous. After curfew, most lighting should be extinguished or reduced as activity levels decline.

LZ2: Moderate ambient lighting

Areas of human activity where the vision of human residents and users is adapted to moderate light levels. Lighting may typically be used for safety and convenience but it is not necessarily uniform or continuous. After curfew, lighting may be extinguished or reduced as activity levels decline.

LZ3: Moderately high ambient lighting

Areas of human activity where the vision of human residents and users is adapted to moderately high light levels. Lighting is generally desired for safety, security and/or convenience and it is often uniform and/or continuous. After curfew, lighting may be extinguished or reduced in most areas as activity levels decline.

LZ4: High ambient lighting

Areas of human activity where the vision of human residents and users is adapted to high light levels. Lighting is generally considered necessary for safety, security and/or convenience and it is mostly uniform and/or continuous. After curfew, lighting may be extinguished or reduced in some areas as activity levels decline.

II. LIGHTING ZONES (cont.) - User's Guide

Zone	Recommended Uses or Areas	Zoning Considerations
LZ-2	Lighting Zone 2 pertains to areas with moderate ambient lighting levels. These typically include multifamily residential uses, institutional residential uses, schools, churches, hospitals, hotels/motels, commercial and/or businesses areas with evening activities embedded in predominately residential areas, neighborhood serving recreational and playing fields and/or mixed use development with a predominance of residential uses. Can be used to accommodate a district of outdoor sales or industry in an area otherwise zoned LZ-1.	Recommended default zone for light commercial business districts and high density or mixed use residential districts. Includes neighborhood business districts; churches, schools and neighborhood recreation facilities; and light industrial zoning with modest nighttime uses or lighting requirements.
LZ-3	Lighting Zone 3 pertains to areas with moderately high lighting levels. These typically include commercial corridors, high intensity suburban commercial areas, town centers, mixed use areas, industrial uses and shipping and rail yards with high night time activity, high use recreational and playing fields, regional shopping malls, car dealerships, gas stations, and other nighttime active exterior retail areas.	Recommended default zone for large cities' business district. Includes business zone districts; commercial mixed use; and heavy industrial and/or manufacturing zone districts.
LZ-4	Lighting zone 4 pertains to areas of very high ambient lighting levels. LZ-4 should only be used for special cases and is not appropriate for most cities. LZ-4 may be used for extremely unusual installations such as high density entertainment districts, and heavy industrial uses.	Not a default zone. Includes high intensity business or industrial zone districts.

III. GENERAL REQUIREMENTS - User's Guide

This Section sets out the requirements that apply to all lighting, both residential and non-residential.

Each adopting jurisdiction should incorporate their existing standards as to when compliance with new regulations is required, when repair or remodeling triggers compliance and if the new ordinance will be retroactive to existing development. The Applicability section of this model ordinance should serve as a guide if the adopting jurisdiction does not have standards or policies in place. Likewise, the adopting jurisdiction should use their existing policies and definitions of what constitutes public monuments, and temporary and/or emergency lighting. Community attitudes and precedents should be taken into account in deciding to regulate seasonal holiday lighting.

EXEMPTIONS - User's Guide

This is standard language intended to prevent conflict of laws and to give the community the ability to set specific lighting requirements in special plans and under use permits. It can be amended to conform to similar language in other ordinances. For example, while public monuments, statuary, and flags should be lighted, the lighting also should be limited to avoid excess.

Lighting for streets, roads, and highways is usually regulated by a street lighting ordinance, and is not covered by this model ordinance. However, since street lighting can affect nearby areas, some recognition of its effect is appropriate. (See Section XI)

SIGN LIGHTING - User's Guide

A sign lighting ordinance is strongly recommended if not already in place. It should carefully limit lighting to prevent over-lighted signs from being used to circumvent lighting ordinances.

III. GENERAL REQUIREMENTS - Ordinance Text

A. *Conformance with All Applicable Codes*

All outdoor lighting shall be installed in conformance with the provisions of this Ordinance, applicable Electrical and Energy Codes, and applicable sections of the Building Code.

B. *Applicability*

Except as described below, all outdoor lighting installed after the date of effect of this Ordinance shall comply with these requirements. This includes, but is not limited to, new lighting, replacement lighting, or any other lighting whether attached to structures, poles, the earth, or any other location, including lighting installed by any third party.

Exemptions from III.(B.) The following are not regulated by this Ordinance

- a. Lighting within public right-of-way or easement for the principal purpose of illuminating streets or roads. No exemption shall apply to any lighting within the public right of way or easement when the purpose of the luminaire is to illuminate areas outside the public right of way or easement, unless regulated with a streetlighting ordinance.

Note to adopting agency: if using the street lighting ordinance (Section XI), this exemption should read as follows:

Lighting within the public right-of-way or easement for the principal purpose of illuminating roads and highways. No exemption shall apply to any street lighting and to any lighting within the public right of way or easement when the purpose of the luminaire is to illuminate areas outside of the public right of way or easement.

- b. Lighting for public monuments and statuary.
- c. Lighting solely for signs (lighting for signs is regulated by the Sign Ordinance).
- d. Repairs to existing luminaires not exceeding 25% of total installed luminaires.

III. GENERAL REQUIREMENTS (cont.) - Ordinance Text

- e. Temporary lighting for theatrical, television, performance areas and construction sites;
- f. Underwater lighting in swimming pools and other water features
- g. Temporary lighting and seasonal lighting provided that individual lamps are less than 10 watts and 70 lumens.
- h. Lighting that is only used under emergency conditions.
- i. In lighting zones 2, 3 and 4, low voltage landscape lighting controlled by an automatic device that is set to turn the lights off at one hour after the site is closed to the public or at a time established by the authority.

Exceptions to III. (B.) All lighting shall follow provisions in this ordinance; however, any special requirements for lighting listed in a) and b) below shall take precedence.

- a. Lighting specified or identified in a specific use permit.
- b. Lighting required by federal, state, territorial, commonwealth or provincial laws or regulations.

C. *Lighting Control Requirements*

1. Automatic Switching Requirements

Controls shall be provided that automatically extinguish all outdoor lighting when sufficient daylight is available using a control device or system such as a photoelectric switch, astronomic time switch or equivalent functions from a programmable lighting controller, building automation system or lighting energy management system, all with battery or similar backup power or device.

LIGHTING CONTROLS - User's Guide

This section requires all outdoor lighting to have lighting controls that prohibit operation when sufficient daylight is available, and to include the capability, either through circuiting, dimming or alternating sources, to be able to reduce lighting without necessarily turning all lighting off.

CURFEW REQUIREMENTS - User's Guide

The intent is to reduce or eliminate lighting after a given time. Benefits include reduced environmental impact, longer hours of improved astronomy, energy savings, and improved sleeping conditions for residents. Additionally, some police departments have indicated that post-curfew light reductions make drive-by patrolling easier because it allows them to see further into and through a site.

The authority should determine the time of curfew and the amount of lighting reduction based on the character, norms and values of the community.

Typically, curfews go into effect one hour after the close of business. Restaurants, bars and major entertainment facilities such as sports stadiums, may require the curfew go into effect two hours after the close of business. The authority may elect to have no curfew for facilities with shift workers and 24 hour operations, or to extend the curfew time to meet specific needs. The MLO can be modified to address those concerns.

Areas without street lights or with very low ambient light levels should consider turning off all non-emergency lighting at curfew while commercial areas or urban areas may prefer a reduction in lighting levels. A reduction of at least 30% is recommended for most uses.

III. GENERAL REQUIREMENTS (cont.) - Ordinance Text

Exceptions to III.(C.) 1. Automatic lighting controls are not required for the following:

- a. Lighting under canopies.
- b. Lighting for tunnels, parking garages, garage entrances, and similar conditions.

2. Automatic Lighting Reduction Requirements

The Authority shall establish curfew time(s) after which total outdoor lighting lumens shall be reduced by at least 30% or extinguished.

Exceptions to III.(C.) 2. Lighting reductions are not required for any of the following:

- a. With the exception of landscape lighting, lighting for residential properties including multiple residential properties not having common areas.
- b. When the outdoor lighting consists of only one luminaire.
- c. Code required lighting for steps, stairs, walkways, and building entrances.
- d. When in the opinion of the Authority, lighting levels must be maintained.
- e. Motion activated lighting.
- f. Lighting governed by special use permit in which times of operation are specifically identified.
- g. Businesses that operate on a 24 hour basis.

IV. NON-RESIDENTIAL LIGHTING - User's Guide

This section addresses non-residential lighting and multiple-family residences having common spaces, such as lobbies, interior corridors or parking. Its intent is to:

- Limit the amount of light that can be used
- Minimize glare by controlling the amount of light that tends to create glare
- Minimize sky glow by controlling the amount of uplight
- Minimize the amount of off-site impacts or light trespass

This MLO provides two methods for determining compliance. The *prescriptive method* contains precise and easily verifiable requirements for luminaire light output and fixture design that limit glare, uplight, light trespass and the amount of light that can be used. The *performance method* allows greater flexibility and creativity in meeting the intent of the ordinance. Note that both the prescriptive and the performance method limit the *amount* of light that can be used, but do not control *how* the lighting is to be used.

Most outdoor lighting projects that do not involve a lighting professional will use the prescriptive method, because it is simple and does not require engineering expertise.

For the prescriptive method, the initial luminaire lumen allowances defined in Table A (Parking Space Method) or B (Hardscape Area Method) will provide basic lighting (parking lot and lighting at doors and/or sensitive security areas) that is consistent with the selected lighting zone. The prescriptive method is intended to provide a safe lighting environment while reducing sky glow and other adverse offsite impacts. The Per Parking Space Method is applicable in small rural towns and is a simple method for small retail “mom and pop” operations without drive lane access and where the parking lot is immediately adjacent to the road. A jurisdiction may

IV. NON-RESIDENTIAL LIGHTING - Ordinance Text

For all non-residential properties, and for multiple residential properties of seven domiciles or more and having common outdoor areas, all outdoor lighting shall comply either with Part A or Part B of this section.

PRESCRIPTIVE METHOD - User's Guide

also allow a prescriptive method for classes of sites, such as car dealerships, gas stations, or other common use areas.

Note that the values are for initial luminaire lumens, not footcandles on the target (parking lot, sidewalk, etc). Variables such as the efficiency of the luminaire, dispersion, and lamp wear can affect the actual amount of light so the lumens per square foot allowance is not equal to footcandles on the site. By specifying initial luminaire lumen values, it is easier for officials to verify that the requirement is being met. Initial luminaire lumens are available from photometric data. Each initial luminaire lumens calculation should be supplied on the submittal form.

Solid state luminaires, such as LEDs, do not have initial lamp lumens, only initial luminaire lumens (absolute photometry). Other luminaires tested with relative photometry will have initial luminaire lumens which can be calculated by multiplying initial lamp lumens by the luminaire efficiency. In this example, three types of luminaires are used to light a parking area and building entry in a light commercial area. Two of these three luminaires use metal halide lamps: 70 watt wall mounted area lights and 150 watt pole mounted area lights. For these, the Initial Luminaire Lumens is equal to the initial lamp lumens multiplied by the luminaire efficiency. These values are entered into the compliance chart. The lumen value for the building mounted LED luminaires is equal to the lumens exiting the luminaire. Therefore, the value already represents the Initial Luminaire Lumens and no luminaire efficiency is needed. The total Luminaire Lumens for the site is equal to 247,840.

The allowable lumens are based on the lighting zone and the total hardscape area. Referencing Table B, the allowed lumens are 2.5/SF for LZ2. Multiplying this by the total hardscape square footage gives a value of 250,000 lumens allowed. Because this value is greater than the value calculated for the site, the project complies. Listed below is an example on a typical compliance worksheet for the Prescriptive Method.

IV. NON-RESIDENTIAL LIGHTING (cont.) - Ordinance Text***A. Prescriptive Method***

An outdoor lighting installation complies with this section if it meets the requirements of subsections 1 and 2, below.

1. Total Site Lumen Limit

The total installed initial luminaire lumens of all outdoor lighting shall not exceed the total site lumen limit. The total site lumen limit shall be determined using either the Parking Space Method (Table A) or the Hardscape Area Method (Table B). Only one method shall be used per permit application, and for sites with existing lighting, existing lighting shall be included in the calculation of total installed lumens.

The total installed initial luminaire lumens is calculated as the sum of the initial luminaire lumens for all luminaires.

IV. NON-RESIDENTIAL LIGHTING (cont.) - User's Guide

In this example, three types of luminaires are used to light a parking area and building entry in a light commercial area. Two of these three luminaires use metal halide lamps: 70 watt wall mounted area lights and 150 watt pole mounted area lights. For these, the Initial Luminaire Lumens is equal to the initial lamp lumens multiplied by the luminaire efficiency. These values are entered into the compliance chart. The lumen value for the building mounted LED luminaires is equal to the lumens exiting the luminaire. Therefore, the value already represents the Initial Luminaire Lumens and no luminaire efficiency is needed. The total Luminaire Lumens for the site is equal to 247,840. The allowable lumens are based on the lighting zone and the total hardscape area. Referencing Table B, the allowed lumens are 2.5/SF for LZ2. Multiplying this by the total hardscape square footage gives a value of 250,000 lumens allowed. Because this value is greater than the value calculated for the site, the project complies.

PRESCRIPTIVE METHOD EXAMPLE - COMPLIANCE CHART			
<i>Lamp Descriptions</i>	<i>QTY</i>	<i>Initial Luminaire Lumens</i>	<i>Total</i>
70 W Metal Halide	8	3,920	31,360
150 W Metal Halide	20	9,600	192,000
18 W LED	24	1,020	24,480
TOTAL INITIAL LUMINAIRE LUMENS			247,840
SITE ALLOWED TOTAL INITIAL LUMENS*			250,000
PROJECT IS COMPLIANT?			YES

* Listed below is the method of determining the allowed total initial lumen for non-residential outdoor lighting using the hardscape areamethod. (Table B).

SITE ALLOWED TOTAL INITIAL LUMENS	
<i>Site Description</i>	Light Commercial
<i>Lighting Zone</i>	LZ-2
<i>Hardscape Area (SF)</i>	100,000
<i>Allowed Lumens per SF of Hardscape (Table B)</i>	2.5
<i>Site Allowed Total Initial Lumens (lumens per SF X hardscape area)</i>	250,000

IV. NON-RESIDENTIAL LIGHTING (cont.) - Ordinance Text

PRESCRIPTIVE METHOD (cont.) - User's Guide**LIMITS TO OFFSITE IMPACTS**

The prescriptive method of the MLO restricts uplighting, including upward light emitted by decorative luminaires. A jurisdiction may choose to preserve some types of lighting, including lighting of monuments or historic structures. In this case, the adopting jurisdiction should exempt or otherwise regulate these types of lighting carefully so that it does not inadvertently allow glaring or offensive lighting systems.

Offsite effects of light pollution include glare, light trespass, sky glow, and impacts on the nocturnal environment. All of these are functions of the fixture or luminaire design and installation. This document replaces the previous luminaire classification terminology of full cut-off, semi cut-off, and cut-off because those classifications were not as effective in controlling offsite impacts as with the new IESNA luminaire classification system as described in TM-15-07.

A traditional method of defining light trespass is to identify a maximum light level at or near the property line. However, this method does not address offensive light that is not directed toward the ground, or the intensity of glaring light shining into adjacent windows. The requirements defined in Table C limit the amount of light in all quadrants that is directed toward or above the property line. The Backlight/Uplight/Glare (BUG) rating will help limit both light trespass and glare. (A detailed explanation of the BUG system is provided in the section on Table C.)

The limits for light distribution established in Table C (for the BUG rating system) prevent or severely limit all direct upward light. A small amount of uplight reflected by snow, light-colored pavement or a luminaire's supporting arms is inevitable and is not limited by the prescriptive method of this ordinance.

IV. NON-RESIDENTIAL LIGHTING (cont.) - Ordinance Text**PRESCRIPTIVE METHOD****2. Limits to Off Site Impacts**

All luminaires shall be rated and installed according to Table C.

3. Light Shielding for Parking Lot Illumination

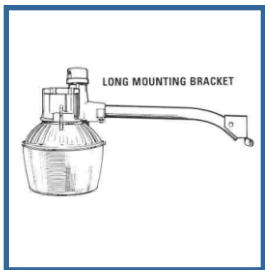
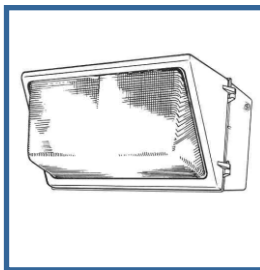
All parking lot lighting shall have no light emitted above 90 degrees.

Exception:

a) Ornamental parking lighting shall be permitted by special permit only, and shall meet the requirements of Table C-1 for Backlight, Table C-2 for Uplight, and Table C-3 for Glare, without the need for external field-added modifications.

PRESCRIPTIVE METHOD (cont.) - User's Guide**LIMITS TO OFFSITE IMPACTS**

A seemingly non-compliant fixture, such as a post-top translucent acorn luminaire, may in certain cases meet the BUG ratings, as long as it has proper interior baffling within the acorn globe. However, the BUG ratings in Table C will limit the use of the following types of luminaires in all lighting zones:

**Barn Lights****Non-Shielded
Wall Packs****Floodlights or
lights not aimed
downward****IV. NON-RESIDENTIAL LIGHTING (cont.) - Ordinance Text**

PERFORMANCE METHOD - User's Guide

The performance method is best for projects with complex lighting requirements or when the applicant wants or needs more flexibility in lighting design. The performance method is also used when any lighting designer plans to aim or direct any light fixture upward (above 90 degrees). An engineer or lighting professional generally will be required to design within the performance method. An adopting jurisdiction may also wish to hire an engineer or lighting professional to review and approve projects using this method and/or incorporate review of the performance method into special review procedures.

The Performance Method is also best for projects where higher lighting levels are required compared to typical area lighting. An example might be a car sales lot where more light might be required on the new cars than would be needed for a standard parking lot. Another example is a gas station canopy requiring more light than a building entrance canopy.

The first step in the Performance Method regulates overlighting by establishing the Total Initial Site Lumens (Table D) that are allowed.

Allowances include the summation of the following (Table D):

- 1) Initial lumen allowance per site
- 2) Per area (SF) of hardscape

Table E allows additional lumens for unique site conditions.

Examples of allowances include:

- 1) Per building entrance/exit
- 2) Per length (linear feet) of Outdoor Sales Frontage Perimeter
- 3) Per area (SF) of Vehicle Service Station Canopy
- 4) Plus more ...

The Site Total Initial Site Lumens allowed are a combination of allowances from Table D and Table E.

IV. NON-RESIDENTIAL LIGHTING (cont.) - Ordinance Text

B. Performance Method

1. Total Site Lumen Limit

The total installed initial luminaire lumens of all lighting systems on the site shall not exceed the allowed total initial site lumens. The allowed total initial site lumens shall be determined using Tables D and E. For sites with existing lighting, existing lighting shall be included in the calculation of total installed lumens.

The total installed initial luminaire lumens of all is calculated as the sum of the initial luminaire lumens for all luminaires.

IV. NON-RESIDENTIAL LIGHTING (cont.) - User's Guide**LIMITS TO OFFSITE IMPACTS (cont.)**

The second step in the Performance Method is to determine if the proposed luminaires are producing off site impacts such as glare, sky glow and light trespass. One may either use Option A which are the Maximum Allowable BUG Ratings in Table C, or Option B through computer lighting calculations show compliance with Maximum Vertical Illuminance at any point in the plane of the property line in Table F. Option B will be required for all non-residential luminaires that

- A) do not have BUG ratings, or
- B) exceed the BUG ratings,
- C) are not fully shielded, or
- D) have adjustable mountings.

For the performance method, Option B (2) requires photometric calculations for the site perimeter, to a height of no less than 33 feet (10 meters) above the tallest luminaire. Vertical illuminances at eye height (5 feet above grade) will give values that can be used to verify compliance by comparing actual site conditions to the photometric plan submitted during review.

Note that the MLO specifies 'total initial luminaire lumens' as a measurement in addition to footcandles/lux. The footcandle (lux) is equal to one lumen per square meter. Lux is the metric unit and is equal to one lumen per square meter.

IV. NON-RESIDENTIAL LIGHTING (cont.) - Ordinance Text**PERFORMANCE METHOD****2. Limits to Off Site Impacts**

All luminaires shall be rated and installed using either Option A or Option B. Only one option may be used per permit application.

Option A: All luminaires shall be rated and installed according to Table C.

Option B: The entire outdoor lighting design shall be analyzed using industry standard lighting software including inter-reflections in the following manner:

- 1) Input data shall describe the lighting system including luminaire locations, mounting heights, aiming directions, and employing photometric data tested in accordance with IES guidelines. Buildings or other physical objects on the site within three object heights of the property line must be included in the calculations.
- 2) Analysis shall utilize an enclosure comprised of calculation planes with zero reflectance values around the perimeter of the site. The top of the enclosure shall be no less than 33 feet (10 meters) above the tallest luminaire. Calculations shall include total lumens upon the inside surfaces of the box top and vertical sides and maximum vertical illuminance (footcandles and/or lux) on the sides of the enclosure.

The design complies if:

- a) The total lumens on the inside surfaces of the virtual enclosure are less than 15% of the total site lumen limit; and
- b) The maximum vertical illuminance on any vertical surface is less than the allowed maximum illuminance per Table F.

DESIGN COMPLIANCE - User's Guide

The application form will require information about the number of luminaires, the number of lamps in each luminaire, the initial luminaire lumens for each luminaire and the initial lumen output for each lamp (based on the wattage and type of lamp selected) as well as plans showing the site area measurements. This will allow the reviewer to verify that the lumen output of all the luminaires does not exceed the allowance.

Field verification can be achieved by asking the applicant and/or owner to verify that the luminaire type, lamp type and wattages specified have been used. Also ask the applicant for photometric data for each luminaire, since the initial luminaire lumens and B-U-G ratings are stated on the photometric report.

However, if a jurisdiction requires additional on-site verification, it may also request a point-by-point photometric plan. While this will not be a true measure of compliance with the criteria of this Ordinance, comparing the actual measured levels on site to the photometric plan can be an indication whether or not the installed lighting varies from the approved design.

V. RESIDENTIAL LIGHTING - User's Guide

This section applies to single family home, duplexes, row houses, and low rise multi-family buildings of 6 dwelling units or less.

RESIDENTIAL LIGHTING EXCEPTIONS

The exceptions allow for typical lighting that might exceed the specified limits.

Landscape Lighting - While not common in residential areas, it can cause light pollution and light trespass if it is not controlled.

Lighting controlled by Vacancy (Motion) Sensor - Reduces light pollution and light trespass and should be encouraged.

RESIDENTIAL LIGHTING EXAMPLE

In this example on the following page, five different luminaires are used on a residential property. Each luminaire must comply to meet the requirements. The site plan following shows luminaire types followed by a tabulation of each luminaire, whether or not it is fully shielded, lamp type, and initial luminaire lumens. If the luminaire lumens are not known, multiply the initial lamp lumens by the luminaire efficiency. If the efficiency is not known, multiply the initial lamp lumens by 0.7 as a reasonable assumption. The maximum allowable lumen values come from Table G, based on the shielding classification and location on the site. In this case, each luminaire complies with the requirements of Table G.

Comparison of efficacy by power
(120 Volt Incandescent lamps)

Output (Lumens)	Power (Watt)		
	Incan	CFL	LED
500	40	8 - 10	9
850	60	13 - 18	12 - 15
1,200	75	18 - 22	15
1,700	100	23 - 28	18

V. RESIDENTIAL LIGHTING - Ordinance Text

A. General Requirements

For residential properties including multiple residential properties not having common areas, all outdoor luminaires shall be fully shielded and shall not exceed the allowed lumen output in Table G, row 2.

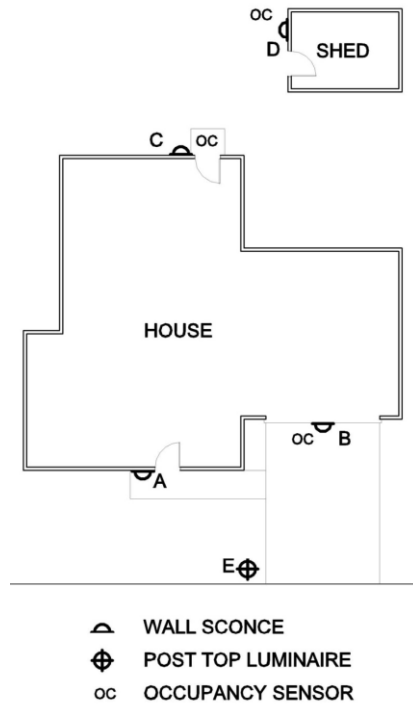
Exceptions

1. One partly shielded or unshielded luminaire at the main entry, not exceeding the allowed lumen output in Table G row 1.
2. Any other partly shielded or unshielded luminaires not exceeding the allowed lumen output in Table G row 3.
3. Low voltage landscape lighting aimed away from adjacent properties and not exceeding the allowed lumen output in Table G row 4.
4. Shielded directional flood lighting aimed so that direct glare is not visible from adjacent properties and not exceeding the allowed lumen output in Table G row 5.
5. Open flame gas lamps.
6. Lighting installed with a vacancy sensor, where the sensor extinguishes the lights no more than 15 minutes after the area is vacated.
7. Lighting exempt per Section III (B.).

B. Requirements for Residential Landscape Lighting

1. Shall comply with Table G.
2. Shall not be aimed onto adjacent properties.

V. RESIDENTIAL LIGHTING - User's Guide



Property Type: Residential Lighting Zone 1								
Luminaire Type	Location	Luminaire Description	Fully Shielded	Lamp Type	Initial Luminaire Lumens*	Maximum Allowed Initial Luminaire Lumens (Table G)	Controls	Compliant
A	Front Entry	Decorative wall sconce	No	9W CFL	420	420	None	Yes
B	Garage Door	Fully shielded wall pack	Yes	23W CFL	1050	1260	Occupancy Sensor	Yes
C	Back Entry	Decorative wall sconce	No	7W CFL	280	315	Occupancy Sensor	Yes
D	Shed Entry	Fully shielded wall pack	Yes	40W INC	343	1260	Occupancy Sensor	Yes
E	Driveway	Fully shielded post top	Yes	13W CFL	1260	1260	None	Yes

*Initial Luminaire Lumens are calculated by multiplying the total initial lamp lumens by the luminaire efficiency.
If the luminaire efficiency is not known, assume an efficiency of 70% and multiply the lamp lumens value by 0.7.

VI. LIGHTING BY SPECIAL PERMIT ONLY - User's Guide

This section addresses types of lighting that are intrusive or complex in their impacts and need a higher level of scrutiny and/or site sensitivity.

It should be noted that safety could be compromised if lighting conforming to this ordinance is located adjacent to excessively bright and/or glaring lighting.

It is important that the authority set clear and reasonable guidelines for applying for a special lighting use permit, and establish rules and procedures for granting or refusing them. They may differ from existing special use policies, in which case one or the other may be changed to achieve the overall goal of effective lighting without glare, sky glow, or light trespass.

SPORTS FIELD LIGHTING

For athletic and sports fields, the appropriate level of lighting will depend on the Class of Play and Facilities. Class of Play is divided into 4 categories, depending on the number of fixed spectator seats. (Competition play intended for nighttime TV broadcast may require higher lighting levels).

CLASS I: Competition play at facilities with 5,000 or more fixed spectator seats. (Professional, Colleges & Universities, some Semi-Professional & Large Sports Clubs)

CLASS II: Games at facilities with over 1,500 fixed spectator seats. (Smaller Universities and Colleges, some Semi-pro, large amateur leagues and high schools with large spectator facilities)

CLASS III: Games at facilities with over 500 fixed spectator seats. (Sports Clubs and amateur leagues, some high schools and large training professional training facilities with spectator sections)

CLASS IV: Competition or recreational play at facilities with 500 fixed spectator seats or less. Class IV Class of Play applies to games at which family and close friends of the players and staff are usually the majority of spectators. (Smaller amateur leagues, park and recreation department facilities, most Little Leagues smaller high schools, elementary and middle schools, and social events)

VI. LIGHTING BY SPECIAL PERMIT ONLY - Ordinance Text

A. High Intensity and Special Purpose Lighting

The following lighting systems are prohibited from being installed or used except by special use permit:

1. Temporary lighting in which any single luminaire exceeds 20,000 initial luminaire lumens or the total lighting load exceeds 160,000 lumens.
2. Aerial Lasers.
3. Searchlights.
4. Other very intense lighting defined as having a light source exceeding 200,000 initial luminaire lumens or an intensity in any direction of more than 2,000,000 candelas.

B. Complex and Non-Conforming Uses

Upon special permit issued by the Authority, lighting not complying with the technical requirements of this ordinance but consistent with its intent may be installed for complex sites or uses or special uses including, but not limited to, the following applications:

1. Sports facilities, including but not limited to unconditioned rinks, open courts, fields, and stadiums.
2. Construction lighting.
3. Lighting for industrial sites having special requirements, such as petrochemical manufacturing or storage, shipping piers, etc.
4. Parking structures.
5. Urban parks
6. Ornamental and architectural lighting of bridges, public monuments, statuary and public buildings.
7. Theme and amusement parks.
8. Correctional facilities.

To obtain such a permit, applicants shall demonstrate that the proposed lighting installation:

- a. Has sustained every reasonable effort to mitigate the effects of light on the environment and surrounding properties, supported by a signed statement describing the mitigation measures. Such statement shall be accompanied by the calculations required for the Performance Method.

SPORTS FIELD LIGHTING

When Class of Play is above Class IV, a dual control should be installed to limit illumination to Class IV levels during practices where spectators are fewer than 500.

(See IES Recommended Practice for Sports and Recreational Area Lighting RP-6)

VII. EXISTING LIGHTING - User's Guide

Adoption of this section on existing lighting is strongly encouraged.

If the adopting jurisdiction has criteria in place that require a property to come into compliance with the current zoning ordinance, it is recommended that the criteria also be applied to bringing existing lighting into compliance. If there are no established criteria, this section of the MLO is recommended.

Amortization allows existing lighting to gradually and gracefully come into compliance. Substantial changes or additions to existing properties are considered the same as new construction, and must comply.

Most outdoor lighting can be fully depreciated once it is fully amortized, usually no longer than 10 years, if not sooner, from the date of initial installation. Some jurisdictions may prefer to require phase-out in a substantially shorter period. The Authority may also wish to require compliance much sooner for "easy fixes" such as re-aiming or lowering lumen output of lamps. Where lighting is judged to be a safety hazard, immediate compliance can be required.

VI. LIGHTING BY SPECIAL PERMIT ONLY (cont.) - Ordinance Text

- b. Employs lighting controls to reduce lighting at a Project Specific Curfew ("Curfew") time to be established in the Permit.
- c. Complies with the Performance Method after Curfew.

The Authority shall review each such application. A permit may be granted if, upon review, the Authority believes that the proposed lighting will not create unwarranted glare, sky glow, or light trespass.

VII. EXISTING LIGHTING - Ordinance Text

Lighting installed prior to the effective date of this ordinance shall comply with the following.

A. Amortization

On or before [amortization date], all outdoor lighting shall comply with this Code.

B. New Uses or Structures, or Change of Use

Whenever there is a new use of a property (zoning or variance change) or the use on the property is changed, all outdoor lighting on the property shall be brought into compliance with this Ordinance before the new or changed use commences.

C. Additions or Alterations

1. Major Additions.

If a major addition occurs on a property, lighting for the entire property shall comply with the requirements of this Code. For purposes of this section, the following are considered to be major additions:

VII. EXISTING LIGHTING (cont.) - Ordinance Text

Additions of 25 percent or more in terms of additional dwelling units, gross floor area, seating capacity, or parking spaces, either with a single addition or with cumulative additions after the effective date of this Ordinance.

Single or cumulative additions, modification or replacement of 25 percent or more of installed outdoor lighting luminaires existing as of the effective date of this Ordinance.

2. Minor Modifications, Additions, or New Lighting Fixtures for Non-residential and Multiple Dwellings

For non-residential and multiple dwellings, all additions, modifications, or replacement of more than 25 percent of outdoor lighting fixtures existing as of the effective date of this Ordinance shall require the submission of a complete inventory and site plan detailing all existing and any proposed new outdoor lighting.

Any new lighting shall meet the requirements of this Ordinance.

3. Resumption of Use after Abandonment

If a property with non-conforming lighting is abandoned for a period of six months or more, then all outdoor lighting shall be brought into compliance with this Ordinance before any further use of the property occurs.

VIII. ENFORCEMENT & PENALTIES - Ordinance Text

(Reserved)

VIII. ENFORCEMENT AND PENALTIES - User's Guide

Enforcement and penalties will vary by jurisdiction. There are, however, certain practices that will promote compliance with lighting regulations. Education is a key tool in promoting compliance. Proactive enforcement procedures can include providing a copy of the lighting regulations to every contractor at the time they visit to obtain a building permit. Another effective tool is a requirement that the builder or developer acknowledge in writing that the he or she is familiar with the lighting requirements and will submit a lighting plan for approval.

VIII. ENFORCEMENT AND PENALTIES (cont.) - User's Guide

Submission of the Lighting Plan should be required as a precondition to any approvals. The Lighting Plan should include the location and BUG rating for each luminaire, specify whether compliance is by the performance or prescriptive method, and a worksheet to show that the luminaires and their BUG ratings are compliant.

IX. TABLES - User's Guide

The tables are to be reviewed periodically by a joint committee of the IES and IDA, and adjusted as standards and technology permit. If more research on the impacts of outdoor lighting shows the effects of light pollution to be a significant concern, then the values in the tables may be modified. Such changes will have no significant impact to the balance of the language of the Ordinance or Code.

VIII. ENFORCEMENT & PENALTIES - Ordinance Text**IX. TABLES - Ordinance Text****Table A - Allowed Total Initial Luminaire Lumens per Site for Non-residential Outdoor Lighting, Per Parking Space Method**

May only be applied to properties up to 10 parking spaces (including handicapped accessible spaces).

LZ-0	LZ-1	LZ-2	LZ-3	LZ-4
350 lms/space	490 lms/space	630 lms/space	840 lms/space	1,050 lms/space

Table B - Allowed Total Initial Lumens per Site for Non-residential Outdoor Lighting, Hardscape Area Method

May be used for any project. When lighting intersections of site drives and public streets or road, a total of 600 square feet for each intersection may be added to the actual site hardscape area to provide for intersection lighting.

LZ-0	LZ-1	LZ-2	LZ-3	LZ-4
Base Allowance				
0.5 lumens per SF of Hardscape	1.25 lumens per SF of Hardscape	2.5 lumens per SF of Hardscape	5.0 lumens per SF of Hardscape	7.5 lumens per SF of Hardscape

IX. TABLES - Ordinance Text

Table B - *Lumen Allowances, in Addition to Base Allowance*

	LZ 0	LZ 1	LZ 2	LZ 3	LZ 4
Additional allowances for sales and service facilities. No more than two additional allowances per site, Use it or Lose it.					
Outdoor Sales Lots. This allowance is lumens per square foot of uncovered sales lots used exclusively for the display of vehicles or other merchandise for sale, and may not include driveways, parking or other non sales areas. To use this allowance, luminaires must be within 2 mounting heights of sales lot area.	0	4 lumens per square foot	8 lumens per square foot	16 lumens per square foot	16 lumens per square foot
Outdoor Sales Frontage. This allowance is for lineal feet of sales frontage immediately adjacent to the principal viewing location(s) and unobstructed for its viewing length. A corner sales lot may include two adjacent sides provided that a different principal viewing location exists for each side. In order to use this allowance, luminaires must be located between the principal viewing location and the frontage outdoor sales area	0	0	1,000 per LF	1,500 per LF	2,000 per LF
Drive Up Windows. In order to use this allowance, luminaires must be within 20 feet horizontal distance of the center of the window.	0	2,000 lumens per drive-up window	4,000 lumens per drive-up window	8,000 lumens per drive-up window	8,000 lumens per drive-up window
Vehicle Service Station. This allowance is lumens per installed fuel pump.	0	4,000 lumens per pump (based on 5 fc horiz)	8,000 lumens per pump (based on 10 fc horiz)	16,000 lumens per pump (based on 20 fc horiz)	24,000 lumens per pump (based on 20 fc horiz)

IX. TABLES - TABLE C BUG RATING - User's Guide

Work on the BUG system started in 2005 when the IES upgraded the roadway cutoff classification system. The original system, which included the ratings full cutoff, cutoff, semi-cutoff and non cutoff, had been designed as a rating system focused on brightness and glare control. However, with increasing demand for control of uplight and light trespass in addition to glare, IES realized that a more comprehensive system was needed. IES developed TM-15 *Luminaire Classification System for Outdoor Luminaires*.

As this is a relatively new rating system, and many people may not be familiar with it, more explanation of how the rating system works is provided here. For example, some people are familiar with terms such as "full cutoff" and they may expect the MLO to include those terms. It will be very important that all groups recognize that older terms and concepts are inadequate for the complex tasks of controlling light pollution. It is recommended that the new rating system adopted in TM-15, as followed herein by the MLO, be used intact and exclusively.

BUG requires downlight only with low glare (better than full cut off) in lighting zones 0, 1 and 2, but allows a minor amount of uplight in lighting zones 3 and 4. In lighting zones 3 and 4, the amount of allowed uplight is enough to permit the use of very well shielded luminaires that have a decorative drop lens or chimney so that dark sky friendly lighting can be installed in places that traditional-appearing luminaires are required. BUG typically cannot be used for residential luminaires unless they have been photometrically tested. For non-photometrically tested residential luminaires, shielding description is used instead.

The lumen limits established for each lighting zone apply to all types of lighting within that zone. This includes, but is not limited to, specialty lighting, façade lighting, security lighting and the front row lighting for auto dealerships. BUG rating limits are defined for each luminaire and

IX. TABLES (cont.) - Ordinance Text**Table C - Maximum Allowable Backlight, Uplight and Glare (BUG) Ratings**

May be used for any project. A luminaire may be used if it is rated for the lighting zone of the site or lower in number for all ratings B, U and G. Luminaires equipped with adjustable mounting devices permitting alteration of luminaire aiming in the field shall not be permitted.

TABLE C-1	Lighting Zone 0	Lighting Zone 1	Lighting Zone 2	Lighting Zone 3	Lighting Zone 4
Allowed Backlight Rating*					
Greater than 2 mounting heights from property line	B1	B3	B4	B5	B5
1 to less than 2 mounting heights from property line and ideally oriented**	B1	B2	B3	B4	B4
0.5 to 1 mounting heights from property line and ideally oriented**	B0	B1	B2	B3	B3
Less than 0.5 mounting height to property line and properly oriented**	B0	B0	B0	B1	B2

*For property lines that abut public walkways, bikeways, plazas, and parking lots, the property line may be considered to be 5 feet beyond the actual property line for purpose of determining compliance with this section. For property lines that abut public roadways and public transit corridors, the property line may be considered to be the center-line of the public roadway or public transit corridor for the purpose of determining compliance with this section. NOTE: This adjustment is relative to Table C-1 and C-3 only and shall not be used to increase the lighting area of the site.

** To be considered 'ideally oriented', the luminaire must be mounted with the backlight portion of the light output oriented perpendicular and towards the property line of concern.

IX. TABLES - TABLE C BUG RATING (cont.) - User's Guide

are based on the internal and external design of the luminaire, its aiming, and the initial luminaire lumens of the specified luminaires. The BUG rating limits also take into consideration the distance the luminaire is installed from the property line in multiples of the mounting height (See Table C).

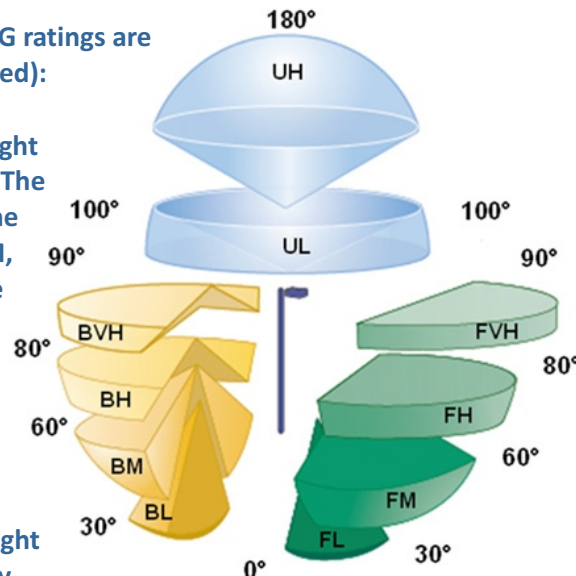
The three components of BUG ratings are based on IES TM-15-07 (revised):

Backlight, which creates light trespass onto adjacent sites. The B rating takes into account the amount of light in the BL, BM, BH and BVH zones, which are in the direction of the luminaire OPPOSITE from the area intended to be lighted.

Uplight, which causes artificial sky glow. Lower uplight (zone UL) causes the most sky glow and negatively affects professional and academic astronomy. Upper uplight (UH) not reflected off a surface is mostly energy waste. The U rating defines the amount of light into the upper hemisphere with greater concern for the light at or near the horizontal angles (UL).

Glare, which can be annoying or visually disabling. The G rating takes into account the amount of frontlight in the FH and FVH zones as well as BH and BVH zones.

BUG ratings apply to the Lighting Zone of the property under consideration.



IX. TABLES (cont.) - Ordinance Text

IX. TABLES - TABLE C BUG RATING (cont.) - User's Guide

(Key: UH=Uplight High, UL=Uplight Low, BVH=Backlight Very High, BH=Backlight High, BM=Backlight Medium, BL=Backlight Low, FVH=Forward Light Very High, FH=Forward Light High, FM=Forward Light Medium, FL=Forward Light Low.)

In general, a higher BUG rating means more light is allowed in solid angles, and the rating increases with the lighting zone. However, a higher B (backlight) rating simply indicates that the luminaire directs a significant portion of light behind the pole, so B ratings are designated based on the location of the luminaire with respect to the property line. A high B rating luminaire maximizes the spread of light, and is effective and efficient when used far from the property line. When luminaires are located near the property line, a lower B rating will prevent unwanted light from interfering with neighboring properties.

At the 90-180 degree ranges:

- Zone 0 allows no light above 90 degrees.
- Zone 1 allows only 10 lumens in the UH and UL zones, 20 lumens total in the complete upper hemisphere. (This is roughly equivalent to a 5 W incandescent lamp).
- Zone 2 allows only 50 lumens in the UH and UL zones, 100 lumens total (less than a 25W incandescent lamp).
- Zone 3 allows only 500 lumens in the UH and UL zones, 1000 lumens total (about the output of a 75W incandescent bulb).
- Zone 4 allows only 1,000 lumens in the UH and UL zones, 2000 lumens total (about the output of a 100W incandescent bulb).

IX. TABLES (cont.) - Ordinance Text

Table C - 2 Maximum Allowable Uplight (BUG) Ratings - Continued

TABLE C-2	Lighting Zone 0	Lighting Zone 1	Lighting Zone 2	Lighting Zone 3	Lighting Zone 4
Allowed Uplight Rating	U0	U1	U2	U3	U4
Allowed % light emission above 90° for street or Area lighting	0%	0%	0%	0%	0%

Table C - 3 Maximum Allowable Glare (BUG) Ratings - Continued

TABLE C-3	Lighting Zone 0	Lighting Zone 1	Lighting Zone 2	Lighting Zone 3	Lighting Zone 4
Allowed Glare Rating	G0	G1	G2	G3	G4
Any luminaire not ideally oriented*** with 1 to less than 2 mounting heights to any property line of concern	G0	G0	G1	G1	G2
Any luminaire not ideally oriented*** with 0.5 to 1 mounting heights to any property line of concern	G0	G0	G0	G1	G1
Any luminaire not ideally oriented*** with less than 0.5 mounting heights to any property line of concern	G0	G0	G0	G0	G1

*** Any luminaire that cannot be mounted with its backlight perpendicular to any property line within 2X the mounting heights of the luminaire location shall meet the reduced Allowed Glare Rating in Table C-3.

TABLE D EXAMPLE - PERFORMANCE METHOD - User's Guide

The first step in the Performance Method is to establish the Site Total Initial Site Lumens which regulates overlighting. The performance method allows layers of light depending on the complexity of the site.

Table D establishes the basic total initial site lumens allowed. These lumen allowances are added together for a total initial site lumen allowance. Allowances include:

- 1) Initial lumen allowance per site
- 2) Per area (SF) of hardscape

IX. TABLES (cont.) - Ordinance Text**Table D Performance Method Allowed Total Initial Site Lumens**

May be used on any project.

Lighting Zone	LZ 0	LZ 1	LZ 2	LZ 3	LZ 4
Allowed Lumens Per SF	0.5	1.25	2.5	5.0	7.5
Allowed Base Lumens Per Site	0	3,500	7,000	14,000	21,000

Table E Performance Method Additional Initial Luminaire Lumen Allowances. All of the following are “use it or lose it” allowances.

All area and distance measurements in plan view unless otherwise noted.

Lighting Application	LZ 0	LZ 1	LZ 2	LZ 3	LZ 4
Additional Lumens Allowances for All Buildings except service stations and outdoor sales facilities. A MAXIMUM OF THREE (3) ALLOWANCES ARE PERMITTED. THESE ALLOWANCES ARE “USE IT OR LOSE IT”.					
Building Entrances or Exits. This allowance is per door. In order to use this allowance, luminaires must be within 20 feet of the door.	400	1,000	2,000	4,000	6,000
Building Facades. This allowance is lumens per unit area of building façade that are illuminated. To use this allowance, luminaires must be aimed at the façade and capable of illuminating it without obstruction.	0	0	8/SF	16/SF	24/SF

TABLE E PERFORMANCE METHOD - User's Guide

The allowable light levels for these uses defined in Table E may be used to set a prescriptive lighting allowance for these uses in each lighting zone. It should be noted that the lighting allowance defined in Table E is only applicable for the area defined for that use and cannot be transferred to another area of the site. For some uses, such as outdoor sales, the jurisdiction is encouraged to define a percentage of the total hardscape area that is eligible for the additional lighting allowance. For example, a set percentage of a car dealership's lot may be considered a display area and receive the additional lighting allowance where the remainder of the lot would be considered storage, visitor parking, etc. and cannot exceed the base light levels defined in Table A.

TABLE E EXAMPLE - PERFORMANCE METHOD - User's Guide**IX. TABLES (cont.) - Ordinance Text****Table E - Performance Method Additional Initial Lumen Allowances (cont.)**

Lighting Application	LZ 0	LZ 1	LZ 2	LZ 3	LZ 4
Sales or Non-sales Canopies. This allowance is lumens per unit area for the total area within the drip line of the canopy. In order to qualify for this allowance, luminaires must be located under the canopy.	0	3/SF	6/SF	12/SF	18/SF
Guard Stations. This allowance is lumens per unit area of guardhouse plus 2000 sf per vehicle lane. In order to use this allowance, luminaires must be within 2 mounting heights of a vehicle lane or the guardhouse.	0	6/SF	12/SF	24/SF	36/SF
Outdoor Dining. This allowance is lumens per unit area for the total illuminated hardscape of outdoor dining. In order to use this allowance, luminaires must be within 2 mounting heights of the hardscape area of outdoor dining.	0	1/SF	5/SF	10/SF	15/SF
Drive Up Windows. This allowance is lumens per window. In order to use this allowance, luminaires must be within 20 feet of the center of the window.	0	2,000 lumens per drive-up window	4,000 lumens per drive-up window	8,000 lumens per drive-up window	8,000 lumens per drive-up window
Additional Lumens Allowances for Service Stations only. Service stations may not use any other additional allowances.					
Vehicle Service Station Hardscape. This allowance is lumens per unit area for the total illuminated hardscape area less area of buildings, area under canopies, area off property, or areas obstructed by signs or structures. In order to use this allowance, luminaires must be illuminating the hardscape area and must not be within a building below a canopy, beyond property lines, or obstructed by a sign or other structure.	0	4/SF	8/SF	16/SF	24/SF

IX. TABLES (cont.) - Ordinance Text

Table E - Performance Method Additional Initial Lumen Allowances (cont.)

Lighting Application	LZ 0	LZ 1	LZ 2	LZ 3	LZ 4
Vehicle Service Station Canopies. This allowance is lumens per unit area for the total area within the drip line of the canopy. In order to use this allowance, luminaires must be located under the canopy.	0	8/SF	16/SF	32/SF	32/SF
Additional Lumens Allowances for Outdoor Sales facilities only. Outdoor Sales facilities may not use any other additional allowances. NOTICE: lighting permitted by these allowances shall employ controls extinguishing this lighting after a curfew time to be determined by the Authority.					
Outdoor Sales Lots. This allowance is lumens per square foot of uncovered sales lots used exclusively for the display of vehicles or other merchandise for sale, and may not include driveways, parking or other non sales areas and shall not exceed 25% of the total hardscape area. To use this allowance, Luminaires must be within 2 mounting heights of the sales lot area.	0	4/SF	8/SF	12/SF	18/SF
Outdoor Sales Frontage. This allowance is for lineal feet of sales frontage immediately adjacent to the principal viewing location(s) and unobstructed for its viewing length. A corner sales lot may include two adjacent sides provided that a different principal viewing location exists for each side. In order to use this allowance, luminaires must be located between the principal viewing location and the frontage outdoor sales area.	0	0	1,000/LF	1,500/LF	2,000/LF

IX. TABLES (cont.) - Ordinance Text

Table F Maximum Vertical Illuminance at any point in the plane of the property line

Lighting Zone 0	Lighting Zone 1	Lighting Zone 2	Lighting Zone 3	Lighting Zone 4
0.05 FC or 0.5 LUX	0.1 FC or 1.0 LUX	0.3 FC or 3.0 LUX	0.8 FC or 8.0 LUX	1.5 FC or 15.0 LUX

IX. TABLES (cont.) - Ordinance Text

Table G - Residential Lighting Limits

Lighting Application	LZ 0	LZ 1	LZ 2	LZ 3	LZ 4
Row 1 Maximum Allowed Luminaire Lumens* for Unshielded Luminaires at one entry only	Not allowed	420 lumens	630 lumens	630 lumens	630 lumens
Row 2 Maximum Allowed Luminaire Lumens* for each Fully Shielded Luminaire	630 lumens	1,260 lumens	1,260 lumens	1,260 lumens	1,260 lumens
Row 3 Maximum Allowed Luminaire Lumens* for each Unshielded Luminaire excluding main entry	Not allowed	315 lumens	315 lumens	315 lumens	315 lumens
Row 4 Maximum Allowed Luminaire Lumens* for each Landscape Lighting	Not allowed	Not allowed	1,050 lumens	2,100 lumens	2,100 lumens
Row 5 Maximum Allowed Luminaire Lumens* for each Shielded Directional Flood Lighting	Not allowed	Not allowed	1,260 lumens	2,100 lumens	2,100 lumens
Row 6 Maximum Allowed Luminaire Lumens* for each Low Voltage Landscape Lighting	Not allowed	Not allowed	525 lumens	525 lumens	525 lumens

* Luminaire lumens equals Initial Lamp Lumens for a lamp, multiplied by the number of lamps in the luminaire

TABLE G RESIDENTIAL LIGHTING - User's Guide

Residential Light Levels

Most residential lighting has traditionally used incandescent lamps which are identified by their wattage. However, since new technologies provide more light for fewer watts, it is no longer possible to regulate residential lighting solely by providing a maximum wattage. Table G, therefore, lists maximum initial luminaire lumens only.

X. DEFINITIONS - User's Guide

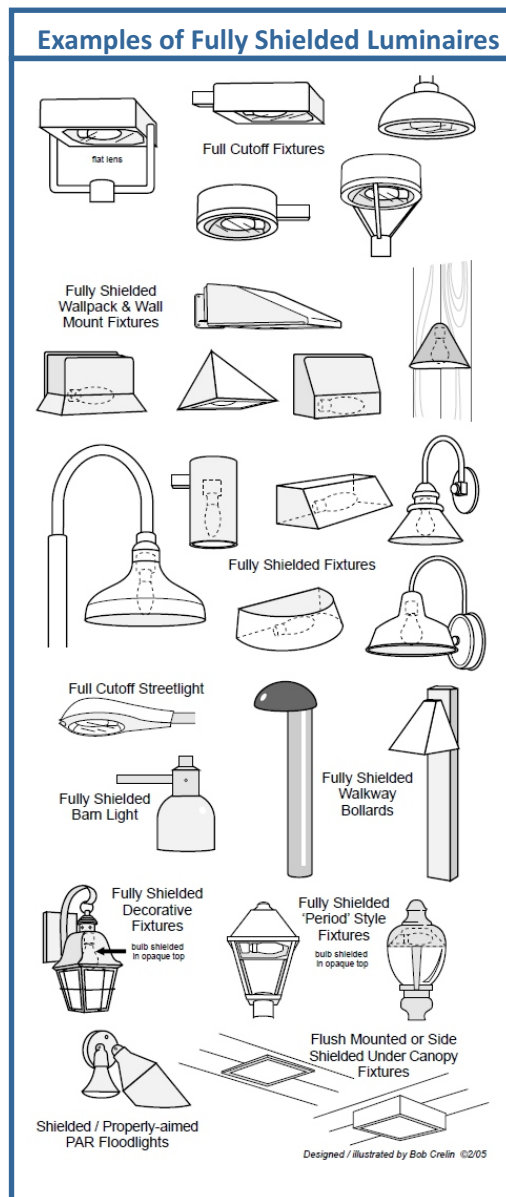
Definitions are typically generally added to any code when new code sections are added. The definitions are legally required and play a significant role in the interpretation of the ordinance and code.

Most city attorneys will not accept references to outside sources regardless of credibility, such as the IES Handbook. Thus as a general rule, a definition for an unfamiliar term (e.g. lumens) must be added by the adopting ordinance.

When adopting or integrating the MLO definitions, be sure to retire conflicting technical terminology. In particular, the latest IES Luminaire Classification System as defined in IES TM-15-07 is likely to need attention.

X. DEFINITIONS - Ordinance Text

<i>Absolute Photometry</i>	Photometric measurements (usually of a solid-state luminaire) that directly measures the footprint of the luminaire. Reference Standard IES LM-79
<i>Architectural Lighting</i>	Lighting designed to reveal architectural beauty, shape and/or form and for which lighting for any other purpose is incidental.
<i>Authority</i>	The adopting municipality, agency or other governing body.
<i>Astronomic Time Switch</i>	An automatic lighting control device that switches outdoor lighting relative to time of solar day with time of year correction.
<i>Backlight</i>	For an exterior luminaire, lumens emitted in the quarter sphere below horizontal and in the opposite direction of the intended orientation of the luminaire. For luminaires with symmetric distribution, backlight will be the same as front light.
<i>BUG</i>	A luminaire classification system that classifies backlight (B), uplight (U) and glare (G).
<i>Canopy</i>	A covered, unconditioned structure with at least one side open for pedestrian and/or vehicular access. (An unconditioned structure is one that may be open to the elements and has no heat or air conditioning.)
<i>Common Outdoor Areas</i>	One or more of the following: a parking lot; a parking structure or covered vehicular entrance; a common entrance or public space shared by all occupants of the domiciles.
<i>Curfew</i>	A time defined by the authority when outdoor lighting is reduced or extinguished.

**X. DEFINITIONS - Ordinance Text**

<i>Emergency conditions</i>	Generally, lighting that is only energized during an emergency; lighting fed from a backup power source; or lighting for illuminating the path of egress solely during a fire or other emergency situation; or, lighting for security purposes used solely during an alarm.
<i>Footcandle</i>	The unit of measure expressing the quantity of light received on a surface. One footcandle is the illuminance produced by a candle on a surface one foot square from a distance of one foot.
<i>Forward Light</i>	For an exterior luminaire, lumens emitted in the quarter sphere below horizontal and in the direction of the intended orientation of the luminaire.
<i>Fully Shielded Luminaire</i>	A luminaire constructed and installed in such a manner that all light emitted by the luminaire, either directly from the lamp or a diffusing element, or indirectly by reflection or refraction from any part of the luminaire, is projected below the horizontal plane through the luminaire's lowest light-emitting part.
<i>Glare</i>	Lighting entering the eye directly from luminaires or indirectly from reflective surfaces that causes visual discomfort or reduced visibility.
<i>Hardscape</i>	Permanent hardscape improvements to the site including parking lots, drives, entrances, curbs, ramps, stairs, steps, medians, walkways and non-vegetated landscaping that is 10 feet or less in width. Materials may include concrete, asphalt, stone, gravel, etc.
<i>Hardscape Area</i>	The area measured in square feet of all hardscape. It is used to calculate the Total Site Lumen Limit in both the Prescriptive Method and Performance Methods. Refer to Hardscape definition.

X. DEFINITIONS - Ordinance Text

<i>Hardscape Perimeter</i>	The perimeter measured in linear feet is used to calculate the Total Site Lumen Limit in the Performance Method. Refer to Hardscape definition.
<i>IDA</i>	International Dark-Sky Association.
<i>IESNA</i>	Illuminating Engineering Society of North America.
<i>Impervious Material</i>	Sealed to severely restrict water entry and movement
<i>Industry Standard Lighting Software</i>	Lighting software that calculates point-by-point illuminance that includes reflected light using either ray-tracing or radiosity methods.
<i>Lamp</i>	A generic term for a source of optical radiation (i.e. "light"), often called a "bulb" or "tube". Examples include incandescent, fluorescent, high-intensity discharge (HID) lamps, and low pressure sodium (LPS) lamps, as well as light-emitting diode (LED) modules and arrays.
<i>Landscape Lighting</i>	Lighting of trees, shrubs, or other plant material as well as ponds and other landscape features.
<i>LED</i>	Light Emitting Diode.
<i>Light Pollution</i>	Any adverse effect of artificial light including, but not limited to, glare, light trespass, sky-glow, energy waste, compromised safety and security, and impacts on the nocturnal environment.

X. DEFINITIONS - Ordinance Text

<i>Light Trespass</i>	Light that falls beyond the property it is intended to illuminate.
<i>Lighting</i>	“Electric” or “man-made” or “artificial” lighting. See “lighting equipment”.
<i>Lighting Equipment</i>	Equipment specifically intended to provide gas or electric illumination, including but not limited to, lamp(s), luminaire(s), ballast(s), poles, posts, lens(s), and related structures, electrical wiring, and other necessary or auxiliary components.
<i>Lighting Zone</i>	An overlay zoning system establishing legal limits for lighting for particular parcels, areas, or districts in a community.
<i>Lighting Equipment</i>	Equipment specifically intended to provide gas or electric illumination, including but not limited to, lamp(s), luminaire(s), ballast(s), poles, posts, lens(s), and related structures, electrical wiring, and other necessary or auxiliary components.
<i>Low Voltage Landscape Lighting</i>	Landscape lighting powered at less than 15 volts and limited to luminaires having a rated initial luminaire lumen output of 525 lumens or less.
<i>Lumen</i>	The unit of measure used to quantify the amount of light produced by a lamp or emitted from a luminaire (as distinct from “watt,” a measure of power consumption).
<i>Luminaire</i>	The complete lighting unit (fixture), consisting of a lamp, or lamps and ballast(s) (when applicable), together with the parts designed to distribute the light (reflector, lens, diffuser), to position and protect the lamps, and to connect the lamps to the power supply.

Mounting Height: The horizontal spacing of poles is often measured in units of “mounting height”. Example: “The luminaires can be spaced up to 4 mounting heights apart.”

X. DEFINITIONS - Ordinance Text

<i>Luminaire Lumens</i>	For luminaires with relative photometry per IES, it is calculated as the sum of the initial lamp lumens for all lamps within an individual luminaire, multiplied by the luminaire efficiency. If the efficiency is not known for a residential luminaire, assume 70%. For luminaires with absolute photometry per IES LM-79, it is the total luminaire lumens. The lumen rating of a luminaire assumes the lamp or luminaire is new and has not depreciated in light output.
<i>Lux</i>	The SI unit of illuminance. One lux is one lumen per square meter. 1 Lux is a unit of incident illuminance approximately equal to 1/10 footcandle.
<i>Mounting height</i>	The height of the photometric center of a luminaire above grade level.
<i>New lighting</i>	Lighting for areas not previously illuminated; newly installed lighting of any type except for replacement lighting or lighting repairs.
<i>Object</i>	A permanent structure located on a site. Objects may include statues or artwork, garages or canopies, outbuildings, etc.
<i>Object Height</i>	The highest point of an entity, but shall not include antennas or similar structures.
<i>Ornamental lighting</i>	Lighting that does not impact the function and safety of an area but is purely decorative, or used to illuminate architecture and/or landscaping, and installed for aesthetic effect.

X. DEFINITIONS - Ordinance Text

<i>Ornamental Street Lighting</i>	A luminaire intended for illuminating streets that serves a decorative function in addition to providing optics that effectively deliver street lighting. It has a historical period appearance or decorative appearance, and has the following design characteristics: · designed to mount on a pole using an arm, pendant, or vertical tenon; · opaque or translucent top and/or sides; · an optical aperture that is either open or enclosed with a flat, sag or drop lens; · mounted in a fixed position; and · with its photometric output measured using Type C photometry per IESNA LM-75-01.
<i>Outdoor Lighting</i>	Lighting equipment installed within the property line and outside the building envelopes, whether attached to poles, building structures, the earth, or any other location; and any associated lighting control equipment.
<i>Partly shielded luminaire</i>	A luminaire with opaque top and translucent or perforated sides, designed to emit most light downward.
<i>Pedestrian Hardscape</i>	Stone, brick, concrete, asphalt or other similar finished surfaces intended primarily for walking, such as sidewalks and pathways.
<i>Photoelectric Switch</i>	A control device employing a photocell or photodiode to detect daylight and automatically switch lights off when sufficient daylight is available.
<i>Property line</i>	The edges of the legally-defined extent of privately owned property.

X. DEFINITIONS - Ordinance Text

<i>Relative photometry</i>	Photometric measurements made of the lamp plus luminaire, and adjusted to allow for light loss due to reflection or absorption within the luminaire. Reference standard: IES LM-63.
<i>Repair(s)</i>	The reconstruction or renewal of any part of an existing luminaire for the purpose of its on-going operation, other than relamping or replacement of components including capacitor, ballast or photocell. Note that retrofitting a luminaire with new lamp and/or ballast technology is not considered a repair and for the purposes of this ordinance the luminaire shall be treated as if new. "Repair" does not include normal relamping or replacement of components including capacitor, ballast or photocell.
<i>Replacement Lighting</i>	Lighting installed specifically to replace existing lighting that is sufficiently broken to be beyond repair.
<i>Sales area</i>	Uncovered area used for sales of retail goods and materials, including but not limited to automobiles, boats, tractors and other farm equipment, building supplies, and gardening and nursery products.
<i>Seasonal lighting</i>	Temporary lighting installed and operated in connection with holidays or traditions.
<i>Shielded Directional Luminaire</i>	A luminaire that includes an adjustable mounting device allowing aiming in any direction and contains a shield, louver, or baffle to reduce direct view of the lamp.
<i>Sign</i>	Advertising, directional or other outdoor promotional display of art, words and/or pictures.

X. DEFINITIONS - Ordinance Text

<i>Sky Glow</i>	The brightening of the nighttime sky that results from scattering and reflection of artificial light by moisture and dust particles in the atmosphere. Skyglow is caused by light directed or reflected upwards or sideways and reduces one's ability to view the night sky.
<i>Temporary lighting</i>	Lighting installed and operated for periods not to exceed 60 days, completely removed and not operated again for at least 30 days.
<i>Third Party</i>	A party contracted to provide lighting, such as a utility company.
<i>Time Switch</i>	An automatic lighting control device that switches lights according to time of day.
<i>Translucent</i>	Allowing light to pass through, diffusing it so that objects beyond cannot be seen clearly (not transparent or clear).
<i>Unshielded Luminaire</i>	A luminaire capable of emitting light in any direction including downwards.
<i>Uplight</i>	For an exterior luminaire, flux radiated in the hemisphere at or above the horizontal plane.
<i>Vertical Illuminance</i>	Illuminance measured or calculated in a plane perpendicular to the site boundary or property line.

XI. OPTIONAL STREETLIGHT ORDINANCE - User's Guide

This section was added since the first public review. It is designed to work closely with the proposed revision to ANSI/IES RP-8 Standard Practice for Roadway and Street Lighting.

Street and roadway lighting is one of the world's largest causes of artificial skyglow. Many adopting agencies will recognize that the MLO will make privately owned lighting more efficient and environmentally responsible than their street lighting systems. But because the process of designing street lighting often requires more precise lighting calculations, applying the MLO directly to street lighting is not advised. Using existing standards of street lighting is recommended, particularly IES RP-8 and AASHTO standards.

Until a new recommended practice for street lighting can be developed, this section can serve to prevent most of the uplight of street lighting systems without setting specific requirements for the amount of light, uniformity of light, or other performance factors. Adopting agencies should include these basic improvements to street lighting along with regulations to private lighting.

Lighting streets with "period" ornamental luminaires that evoke the look of a time when the light source was a gas flame can cause glare if high-lumen lamps are used. Such ornamental street lights should not exceed a BUG rating of G1. If additional illuminance and/or uniformity is desired, the ornamental fixtures should be supplemented by higher mounted fully shielded luminaires, as illustrated in RP-33-99.

Few street lighting warranting processes exist. The adopting agency needs to gauge whether a complex warranting systems is required, or if a simple one using posted speeds, presence of pedestrians, or other practical considerations is sufficient.

Examples of a current street lighting warranting system are included in the Transportation Association of Canada's Guide for the Design of Roadway Lighting 2006.

XI. OPTIONAL STREETLIGHT ORDINANCE - Ordinance Text

Note to the adopting authority: the intent of this section is that it only applies to streets and not to roadways or highways.

A. Preamble

The purpose of this Ordinance is to control the light pollution of street lighting, including all collectors, local streets, alleys, sidewalks and bike-ways, as defined by ANSI/IES RP-8 Standard Practice for Roadway and Street Lighting and in a manner consistent with the Model Lighting Ordinance.

B. Definitions

Roadway or Highway lighting is defined as lighting provided for freeways, expressways, limited access roadways, and roads on which pedestrians, cyclists, and parked vehicles are generally not present. The primary purpose of roadway or highway lighting is to help the motorist remain on the roadway and help with the detection of obstacles within and beyond the range of the vehicle's headlights.

Street lighting is defined as lighting provided for major, collector, and local roads where pedestrians and cyclists are generally present. The primary purpose of street lighting is to help the motorist identify obstacles, provide adequate visibility of pedestrians and cyclists, and assist in visual search tasks, both on and adjacent to the roadway.

Ornamental Street Lighting is defined as a luminaire intended for illuminating streets that serves a decorative function in addition to providing optics that effectively deliver street lighting. It has a historical period appearance or decorative appearance, and has the following design characteristics:

- designed to mount on a pole using an arm, pendant, or vertical tenon;
- opaque or translucent top and/or sides;
- an optical aperture that is either open or enclosed with a flat, sag or drop lens;
- mounted in a fixed position; and
- with its photometric output measured using Type C photometry per IESNA LM-75-01.

XI. OPTIONAL STREETLIGHT ORDINANCE - Ordinance Text***C. Scope***

All street lighting not governed by regulations of federal, state or other superceding jurisdiction.

EXCEPTION: lighting systems mounted less than 10.5 feet above street level and having less than 1000 initial lumens each.

D. Master Lighting Plan

The Authority shall develop a Master Lighting Plan based on the American Association of State Highway and Transportation Officials (AASHTO) Roadway Lighting Design Guide GL-6, October 2005, Chapter 2. Such plan shall include, but not be limited to, the Adoption of Lighting Zones and:

1. Goals of street lighting in the jurisdiction by Lighting Zone
2. Assessment of the safety and security issues in the jurisdiction by Lighting Zone
3. Environmentally judicious use of resources by Lighting Zone
4. Energy use and efficiency by Lighting Zone
5. Curfews to reduce or extinguish lighting when no longer needed by Lighting Zone

E. Warranting

The Authority shall establish a warranting process to determine whether lighting is required. Such warranting process shall not assume the need for any lighting nor for continuous lighting unless conditions warrant the need. Lighting shall only be installed where warranted.

XI. OPTIONAL STREETLIGHT ORDINANCE - Ordinance Text

F. Light Shielding and Distribution

All street lighting shall have no light emitted above 90 degrees.

Exception: Ornamental street lighting for specific districts or projects shall be permitted by special permit only, and shall meet the requirements of Table H below without the need for external field-added modifications.

**Table H - Uplight Control Requirements
for Ornamental Street Lights -
by Special Permit Only**

Lighting Zone	Maximum Uplight Rating
LZ-0	U-0
LZ-1	U-1
LZ-2	U-2
LZ-3	U-3
LZ-4	U-4

2023 PROCLAMATION DECLARING DARK SKY WEEK IN THE CITY OF VERONA

WHEREAS, it is recognized that the continued existence of light pollution, as the standard living condition for over 83% of all people, has clear and detrimental impacts on the health and wellness of every citizen of the City of Verona, regardless of where in the city they live, and on the health and survival of the wide diversity of wildlife and habitats within its urban borders; and

WHEREAS, the future vibrancy and economic competitiveness of the City of Verona depends on the transition of energy consumption policies, practices and procedures to those of a carbon neutrality. The City of Verona has a proud heritage of incorporating green spaces and the engagement with the natural world and is valued and prioritized in the decision-making process of City governance and the safety of every citizen is a fundamental product of this effective governance; and

WHEREAS, the City of Verona is in close proximity to the home of the MMSD Observatory, and is in close proximity to the former University of Wisconsin – Madison’s historic Student Observatory (now rededicated as the Bell-Burnell Observatory UW Space Place, the Madison Metropolitan School District Planetarium, and the Madison Astronomical Society). It is a city recognized as a center for the exploration of the Universe through research and an educational focus on science, technology, engineering and mathematics through which we explore and engage with the Cosmos around us; and

WHEREAS, the five principles of Responsible Outdoor Lighting, promoted by the International Dark Sky Association, which state that lighting must be useful, targeted, at the lowest useful intensity, controlled to be “on” only when needed and of the warmest possible color, as recognized in the City of Verona ordinances and regulations.

WHEREAS, light pollution is an issue that can be greatly impacted and mitigated in its negative impact through effective education, development of community awareness and action steps that focus on light pollution issues. The effectiveness of carbon neutrality and energy efficiency efforts, and on accessibility to the splendor of the Universe, can be experienced by looking into a dark sky.

NOW, THEREFORE, BE IT RESOLVED that I, Luke Diaz, Mayor of Verona, Wisconsin, do hereby proclaim April 15 through April 22, 2023, in alignment with the International Dark Sky Association, as Dark Sky Week in the City of Verona.



Signed and dated this 10th day of April 2023

By: _____
Luke Diaz, Mayor

MOUNT HOREB
SUSTAINABILITY
COMMITTEE
DISCUSSION

**IDLING
REDUCTION**



VEHICLE EXHAUST POLLUTANTS

These pollutants can linger in the environment and lead to long-term health impairment as well as environmental damage.

- **Hydrocarbons** - Hydrocarbon emissions result when fuel does not burn or burns only partially. (When an engine idles, it is not running at its optimum operating temperature resulting in incomplete combustion.) Hydrocarbons react in the presence of nitrogen oxides and sunlight to form ground-level ozone, a major component of smog. Ozone irritates eyes, damages the lungs and aggravates respiratory problems. A number of exhaust hydrocarbons are also toxic, with the potential to cause cancer.
 - **Nitrogen Oxides (NO_x)** – contribute to the formation of ozone and acid rain and water quality problems.
 - **Carbon monoxide (CO)**- is a product of incomplete combustion and occurs when carbon in the fuel is partially oxidized rather than fully oxidized to carbon dioxide (CO₂). Carbon monoxide reduces the flow of oxygen in the bloodstream and can impair mental functions and visual perception. It is particularly dangerous to persons with heart disease.
 - **Carbon Dioxide (CO₂)** - The U.S. Environmental Protection Agency (EPA) now views carbon dioxide as a pollution concern. Carbon dioxide does not directly impair human health, but it is a “greenhouse gas” that traps the earth’s heat and contributes to the potential for global warming.
- These pollutants can linger in the environment and lead to long-term health impairment as well as environmental damage.



THE PERSONAL VEHICLE PROBLEM

Personal-vehicle idling generates about half of all idling emissions.

- ❖ Creates 30 million tons of CO₂ annually.
- ❖ More than 3 billion gallons of fuel at a cost of more than \$10 billion each year is lost by idling.
- ❖ Is linked to increased incidences of asthma, allergies, lung and heart disease, and cancer.



ECOLOGIC BENEFITS OF NOT IDLING

Idling for more than 10 seconds uses more fuel and results in the production of more CO₂ than does stopping and restarting your engine.

Idling reduction can mitigate climate crisis and air pollution.

NO IDLING
ENGINES OFF!

1 MIN IDLING = 150 BALLOONS



ECONOMIC BENEFITS OF NOT IDLING

If each car in the United States idles just 6 minutes per day, it adds up nearly 3 billion gallons of fuel wasted annually, costing drivers more than \$7 billion (when fuel is \$2.50/gal).



WHY DO DRIVERS IDLE? HABITS AND MYTHS



- ❖ “Doesn’t restarting my engine use more gas than idling?”
- ❖ “Won’t I wear out my starter?”
- ❖ “Isn’t idling good for your engine?”

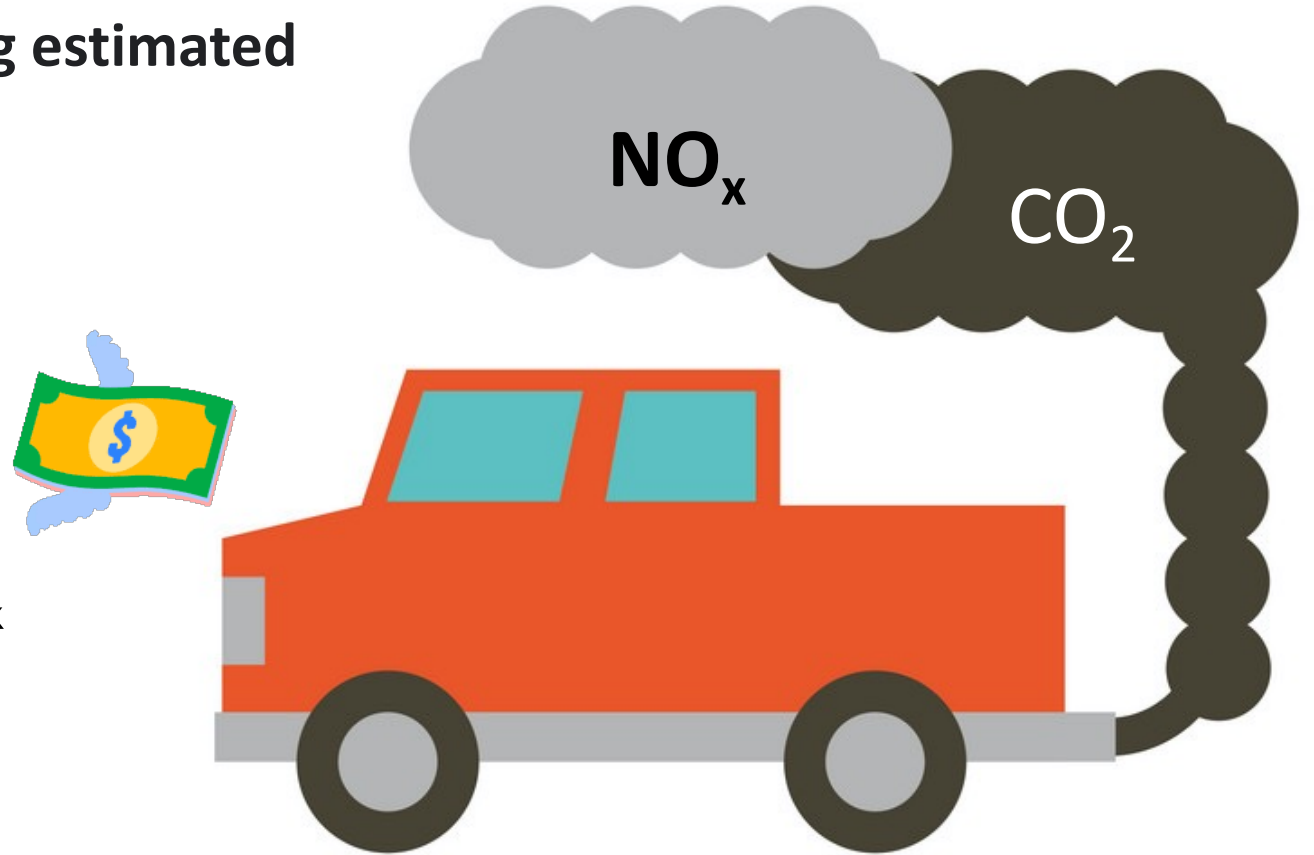
SIMPLY PUT . . NO!



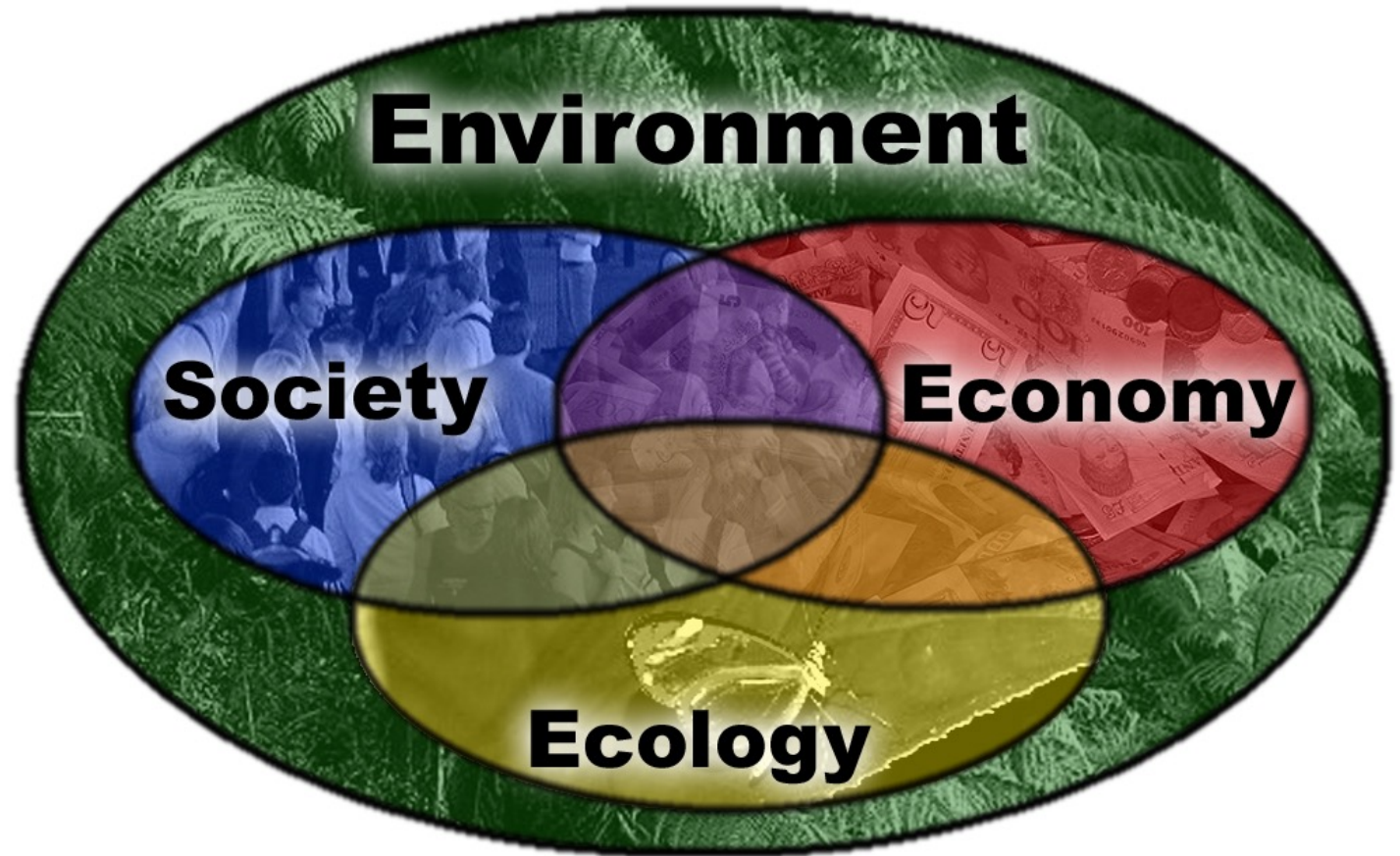
MUNICIPAL AND COMMERCIAL PROBLEM

Each year, commercial truck and municipal equipment idling results in the following estimated figures:

- ❖ 1 billion gallons of fuel consumption.
- ❖ 11 million tons of carbon dioxide (CO₂)
- ❖ 180,000 tons of nitrogen oxides (NO_x).
- ❖ Municipal equipment Idling wastes gas and tax dollars.



IDLING IS
BAD FOR
ECOLOGY
AND THE
ECONOMY



FOLLOWING FITCHBURG'S LEAD

Contact businesses who may wish to put up reminder signs.

Public education campaign with programming flyers, decals.

Updated Employee Handbook with idling information.



FOLLOWING FITCHBURG'S LEAD

- Vehicles must be returned to the designated parking spaces.
- It is the goal of the City to reduce voluntary vehicle idling and thereby reduce operating costs and emissions. City vehicles shall not be permitted to idle more than five (5) minutes, except for:
 - Police, Fire, and Public Works vehicles while being used in emergency situations;
 - Vehicles standing in traffic;
 - Vehicles operating auxiliary equipment that is required to perform intended use of the vehicle, unless other sources of power are available;
 - Conditions where temperatures are less than 32 degrees or more than 85 degrees. In these conditions idle time may not exceed 10 minutes in any 60 minute time frame for the purpose of heating or cooling. Vehicle operators are encouraged to park in shaded areas when temperatures exceed 85 degrees.
- For vehicle or equipment maintenance and diagnostic purposes;
- If the unit is not expected to restart due to mechanical problems. Mechanical problems should be repaired as soon as possible.



RESOURCES FROM DEPARTMENT OF ENERGY

Templates available for -

- ❖ Personalized flyers,
- ❖ Pledge sheets,
- ❖ Power Point presentation,
- ❖ Decals and Stickers,

are all readably available from US Department of Energy's Clean City partnership.



MANY SIGNS DESIGNS ARE AVAILABLE

Signs that remind folks not to idle could be useful for changing behavioral action.



HOW CAN THIS SUSTAINABILITY COMMITTEE WORK TO CURB IDLING



COMMITTEE
DISCUSSION





THE CITY OF FITCHBURG'S IDLING REDUCTION CAMPAIGN

Fitchburg Resource Conservation Commission
Chair Diane Streck

Vehicle Exhaust Pollutants

- **Hydrocarbons** - Hydrocarbon emissions result when fuel does not burn or burns only partially. (When an engine idles, it is not running at its optimum operating temperature resulting in incomplete combustion.) Hydrocarbons react in the presence of nitrogen oxides and sunlight to form ground-level ozone, a major component of smog. Ozone irritates eyes, damages the lungs and aggravates respiratory problems. A number of exhaust hydrocarbons are also toxic, with the potential to cause cancer.
- **Nitrogen Oxides** (NO_x) – contribute to the formation of ozone and acid rain and water quality problems.
- **Carbon monoxide** (CO) is a product of incomplete combustion and occurs when carbon in the fuel is partially oxidized rather than fully oxidized to carbon dioxide (CO₂). Carbon monoxide reduces the flow of oxygen in the bloodstream and can impair mental functions and visual perception. It is particularly dangerous to persons with heart disease.
- **Carbon Dioxide** (CO₂) - The U.S. Environmental Protection Agency (EPA) now views carbon dioxide as a pollution concern. Carbon dioxide does not directly impair human health, but it is a “greenhouse gas” that traps the earth’s heat and contributes to the potential for global warming.

These pollutants can linger in the environment and lead to long-term health impairment as well as environmental damage.

Idling Facts

- ❖ Each day Americans waste approximately 3.8 million gallons of gasoline by voluntarily idling their cars. For every gallon of gasoline used, a vehicle emits, on average, 20 lbs. CO₂. That translates to **13 million tons of CO₂ produced annually from voluntary idling!** (“Anti-Idling Primer; Every Second Counts” by Hal Hinkle, Patricia Deacon & “Kasia Duda Hinkle Charitable Foundation
- ❖ Diesel engines emit 15% more CO₂ per gallon than gasoline engines. (“Emission Facts: Average Carbon Dioxide Emissions Resulting from Gasoline and Diesel Fuel” U.S. EPA)
- ❖ **Idling gets zero miles/gallon!**
- ❖ Studies have shown that idling for over **10 seconds** (15 seconds for diesel) uses more gasoline and produces more CO₂ emissions than restarting your engine.
- ❖ Idling is not an effective way to warm up today's engines even in cold weather. The best way to warm up your engine is to drive your vehicle. In fact, your vehicle will warm up faster if you drive it rather than idle it . . . and you'll get better gas mileage.
- ❖ Excessive idling can damage your engine's components, including cylinders, spark plugs and the exhaust system. (Natural Resources Canada, Office of Energy Efficiency)

Goal: Reduce Voluntary Idling

Voluntary Idling: Idling when a vehicle is not being driven.

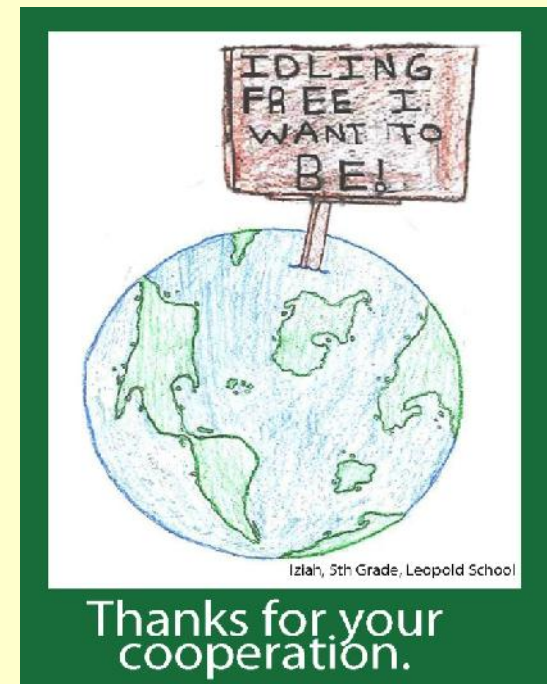
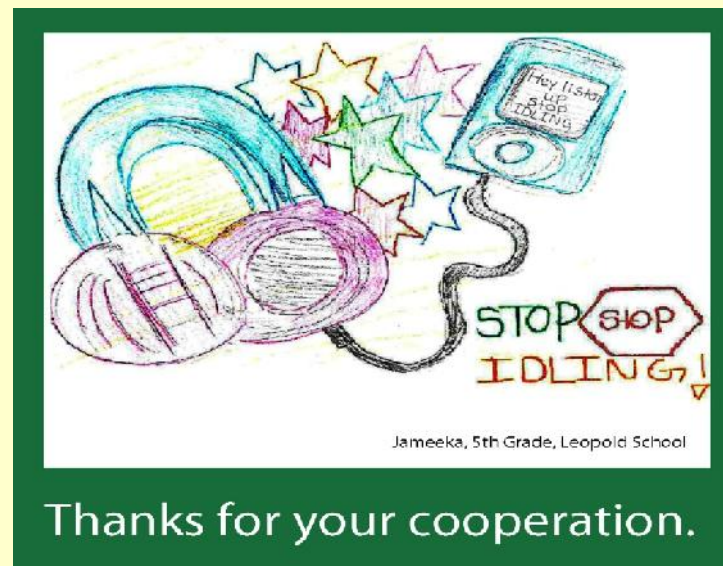
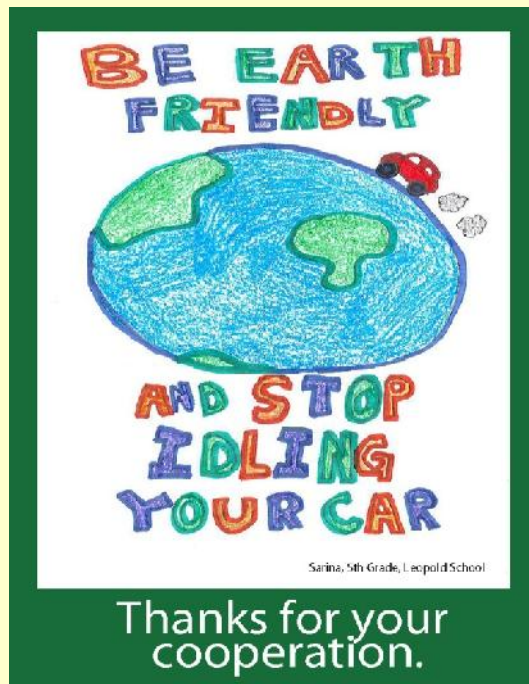
Examples:

- Drive-thru lanes
- Dropping off and picking up customers
- Delivering/picking up packages
- Car washes
- Warming up the car

Municipal Idling Reduction Sign



Community Idling Reduction Posters





**Community
Idling
Reduction
Campaign**

What is the

Idling Reduction Campaign?
Fitchburg's Idling Reduction Campaign is targeting *voluntary* idling. Voluntary idling is when the car is not actually being driven, e.g. drive-thru lanes, car washes, dropping off or picking up passengers or items.

IDLING IMPACTS...

- Air Quality
- Climate Change
- Health

BE EARTH FRIENDLY



AND STOP
IDLING
YOUR CAR

Do you Idle your Vehicle?

Have you ever idled your vehicle while:

- ◆ Picking up your children or other passengers?
- ◆ Waiting at the car wash?
- ◆ Sitting in drive-thru lanes?
- ◆ Stopping to make a delivery?

DID YOU KNOW?

> Americans idle their vehicles on average about 5 minutes a day, resulting in a combined total of more than 950 million idling minutes, wasting over 3.8 million gallons of gas and producing 78,000 tons of Greenhouse Gases a day.

> If Americans avoided idling by 3 minutes a day, in 1 year we would save:

- 832 million gallons of fuel
- 17 million tons of Greenhouse Gases
- \$3 billion in fuel costs

If it looks like you'll be idling for more than **10 seconds** (30 seconds for diesel), turn off your engine and restart when you are ready to drive. Idling for more than **10 seconds** is harder on your engine, uses more fuel and produces more emissions than restarting.

FACTS

- Idling gets 0 miles per gallon!
- Excessive idling can damage your engines components including cylinders, spark plugs and the exhaust system.
- About 40 - 50 % of toxic air pollutants come from vehicle exhaust, while large industries are responsible for only about 10% of the pollutants.

IDLING
Your car is bad
for the environment



Don't warm-up your car by idling — The best way to warm up a car is to drive it because this warms up the catalytic converter and other mechanical parts in addition to the engine. In fact, your vehicle will warm up faster if you drive it rather than idle it. After starting your car, wait a few seconds and then start out slower for the first minute or so. You save time, get underway sooner and have better gas mileage in the process. . . all without harming your vehicle's engine or polluting the air.

Sources Cited

- Natural Resources Canada, Office of Energy Efficiency
- American Society of Mechanical Engineers
- American Lung Association

Idling Reduction Cling



Why Participate?

- ✓ Reduce fuel costs
- ✓ Better gas mileage
- ✓ Don't want to be wasteful
- ✓ Minimize environmental impact
- ✓ Concerns about air quality
- ✓ Concerns about climate change



Home



Payments



Notify Me®



Jobs



Concerns?

Fitchburg Sustainability Plan

Biking

Clean Energy Resolution

Electric Vehicle Charging

Recycling



Solar Resources

Municipal Solar

Financial Incentives for Being Green

Adopt A Storm Drain

Natural Lawns and No-Mow May

Green Fitchburg Events



Green Fitchburg History

Idling Reduction Campaign

LEED Certified Buildings

OEI Energy Report

Resource Conservation Commission

Green E-Newsletters

Home » Government » Departments » Planning & Zoning » Green Fitchburg » Idling Reduction Campaign

Idling Reduction Campaign

The City of Fitchburg embarked on an Idling Reduction Campaign in 2012 to encourage all residents to reduce their voluntary idling; idling when a vehicle is not actually being driven such as waiting in drive-thru lanes, waiting to pick up or drop off passengers / packages and warming up the engine. In addition to wasting fuel, voluntary idling is a significant and easily reduced source of pollution. Vehicle idling impacts air quality, climate change, health, and your pocket book!

Effects of Idling

When an engine idles, it is not running at optimum operating temperature, resulting in incomplete combustion which in turn results in more air pollution. Americans waste approximately 3.8 million gallons of gasoline each day by voluntarily idling their cars. For every gallon of gasoline used, a vehicle emits, on average, 20 pounds of CO2. That translates to 13 million tons of CO2 annually from voluntary idling!¹ (Diesel engines emit 15% more CO2/gallon than gasoline engines.) Other pollutants from vehicle exhaust include carbon monoxide and hydrocarbons, which combine with nitrogen oxides and sunlight to form ground-level ozone, a major component of smog. These pollutants linger in the environment and lead to long-term health impairment, as well as environmental damage.

Studies have shown that idling for over 10 seconds uses more gasoline and produces more CO2 emissions than restarting your engine. In addition, idling causes excessive engine wear. If it looks like you'll be idling for longer than 10 seconds (30 seconds for diesel), please turn off your engine and restart it when you're ready to drive.

¹"Anti-Idling Primer; Every Second Counts" by Hal Hinkle, Patricia Deacon & Kasia Duda Hinkle Charitable Foundation

Resources

- [Idling Reduction Strategies for the City of Fitchburg](#)
- [Idling Reduction Study](#)
- [Idling Reduction Presentation](#)

Awareness Efforts

Signs on municipal property remind visitors to turn off their vehicle if they are going to be waiting more than 10 seconds. In addition, members of the Resource Conservation Commission have been contacting Fitchburg businesses to request their participation. Participating businesses are given idling reduction posters made by Leopold Elementary students to display as well as an informational brochure to hand out. Outdoor metal signs are also available and perfect for any parking lot, drop off, or drive through location.



Participating Businesses

- Summit Credit Union
- Oak Bank
- U.S. Bank
- BMO Harris, Jamestown Branch
- The UPS Store
- Ganshert Nursery and Landscapes, LLC
- Top Hat Fireplace and Chimney
- Independent Living, Inc.

Join the Campaign

Reducing voluntary idling is an easy way to save money and increase miles per gallon. Remember, idling gets 0 miles per gallon! So please, join in the campaign; if you'll be idling for more than 10 seconds, turn off your engine and restart it when you're ready to move.

Additional Resources

- [Anti-Idling Primer](#)
- [Idling Quiz](#)



Contact City Hall

5520 Lacy Road
Fitchburg, WI 53711
Phone: 608-270-4200
Fax: 608-270-4212
Hours: Monday - Friday,
7:30 a.m. - 4:30 p.m.

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AGENDA ITEM REPORT

MEETING DATE

January 23, 2024

PREPARED BY

AGENDA ITEM # 2.f

Update on Energy Audit/Planning Grants

BACKGROUND

Administrator Owen is working with Slipstream on an application for the PSC Rural Energy Startup program. This is the first year for the program, so we don't have a real good idea how our application will be received, but since we can use a majority of the information from last year's application, we felt it was worth submitting. One component of the scoring of applications is based on low-moderate income municipalities, and we do not qualify for those points. The application is due at the end of January. We inquired about including the School District in the application, so their buildings could be included in the audits, but it was determined they could not be included. We will work with the District on other avenues for energy efficiency.

RECOMMENDATION

ATTACHMENTS

None



AGENDA ITEM REPORT

MEETING DATE

January 23, 2024

PREPARED BY

AGENDA ITEM # 2.g

Adopt A Community Program

BACKGROUND

At the last meeting we discussed the adopt-a-community program where each member would "adopt" a municipality with a sustainability committee and report back on any initiatives they felt could be beneficial in Mount Horeb. I heard from 3 members, all wanting to adopt Cross Plains, so it looks like we will have to fight this out at the meeting.

RECOMMENDATION

ATTACHMENTS

None



AGENDA ITEM REPORT

MEETING DATE	PREPARED BY
January 23, 2024	

AGENDA ITEM # 2.h

Consider Strategic Plan for 2024

BACKGROUND

RECOMMENDATION

ATTACHMENTS

1. 2024 planning v2

Mt. Horeb SNR Committee
2024 planning
Updated after Nov. 2023 meeting

The SNR Committee will establish a short-term strategic plan for 2024. It's understood that the SNR Committee will have longer term plans and goals once funding is secured for a village sustainability report and plan. Until then, the committee wishes to focus its efforts.

What is within our purview as a committee?

Municipal committees provide advice and support to the municipal governing body. Actions that they take are either previously authorized or subsequently ratified by the governing body.

To start, here is a list of goals and activities that the committee could consider in the upcoming year.

- Funding for village sustainability report and plan
- Audit of municipal facility energy use
- Education programs for residents
- Ongoing newspaper column
- Ordinance proposals to village board
- Network building within Dane County sustainability groups
- Supporting village partners in sustainability efforts
- Implementing municipal sustainability practices
- Helping businesses with sustainability resources and practices

A simplified strategic plan could have three main concentrations, with objectives and actions under each. Below are three *potential* ways of organizing such a simplified plan. **These are all meant to be starting points for committee discussion, not full plans.**

First we can decide on how to organize three concentrations/goal/objectives, and then we can decide on 1-3 actions within each of the three we choose. We should keep in mind: the one year time frame, our role within the village, and the survey results. It will be difficult to not list too many actions.

The format below is:

1. OBJECTIVE
 - a. ACTION
 - b. ACTION

By audience: (we chose this - focus on people)

1. Village (municipal facilities and services) - Make village operations more sustainable
 - a. Audit energy usage

- b. Plan how to lower usage, and offset overall use of energy.
 - c. Consideration of lower impact vehicles, equipment and HVAC
 - d. Update and strengthen ordinance on dark skies
 - e. Guidance on village procurement
 - f. Promotion of idling reduction
- 2. Schools – Collaborate with MHASD in sustainable efforts
 - a. Collaborate on native plantings at the Middle School
 - b. Advocating and partnering on renewable energy and energy conservation
 - c. Work and mentor student Green Team and Energy Team for sustainable school facility
- 3. Residents – Assist village residents live more sustainably
 - a. Provide 3 educational events
 - 1. Solar 101 (scheduled Feb. 3, 2024)
 - 2. Composting 101 (at library – Earth day?)
 - 3. ?
 - 4. Regular MHM columns
 - 5.
- 4. Businesses – Assist village businesses operate more sustainably
 - a. Highlight sustainable practices.
 - b. Single-use plastic reduction guidance
 - c. Travel Green program.
 - d. Advocating for and providing resources for renewable energy production
 - a.



Search ...

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- Agriculture
- Horticulture »
- Teaching Garden
- FoodWise
- Families & Finances
- Food Systems
- Community Development
- Natural Resources »
- Upcoming Events
- En Español
- Blogs and Podcasts
- Climate Change

Home » Natural Resources » Composting & Food Waste » Wisconsin Composting Stewards Course

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Wisconsin Composting Stewards Course

Dane County Extension has offered periodic **Composter Trainings** to provide training for anyone who wishes to teach others about home composting, including backyard composting and vermicomposting. Currently, Extension is revamping the composting curriculum and we plan to offer Wisconsin Composting Stewards as a free online course in the Fall of 2022. This course will be asynchronous so participants can learn on their own schedule. By taking Wisconsin Composting Stewards, participants will learn the following:

- The environmental impact of landfilling organic waste, including climate change, and how composting can be a solution to address the climate crisis
- How to create and maintain a composting system at home
- How to use finished compost and how compost can improve soil health
- How to promote composting in your community
- Strategies and opportunities to start a composting project in your community

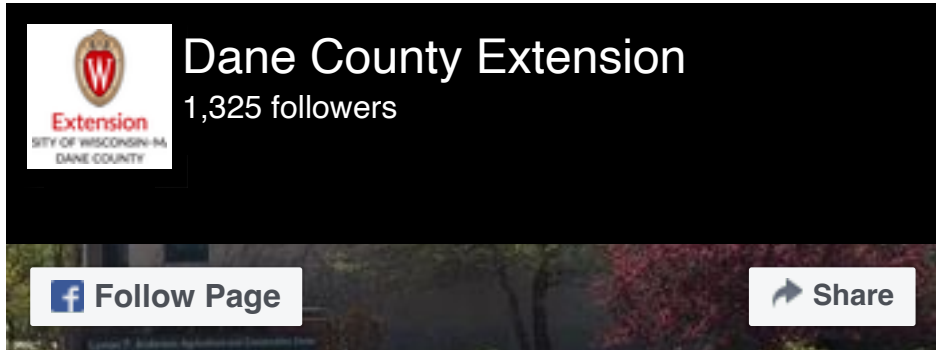
To receive updates on when Wisconsin Composting Stewards will launch, please sign up for our [composting email list](#).



Happenings

[Click to subscribe and see past issues of the monthly Dane County Extension Newsletter.](#)

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Community Development

[Videos on Parliamentary Procedure from the Local Government Education Center](#)

[Dane County Public Issues: Affordable Housing](#)

[Wisconsin One Stop Business Portal](#)

4-H & Youth News

[Dane County 4-H Youth Development Video](#)

[Dane County 4-H & COVID-19](#)

[Leadership Washington Focus Experience offered for summer 2019](#)

Agriculture News

[Private Pesticide Applicator Training](#)

[We invite you to participate in the UW-Dairy Brain survey](#)

[Information for Immigrant Workers](#)



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The Learning Store



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AGENDA ITEM REPORT

MEETING DATE	PREPARED BY
January 23, 2024	
AGENDA ITEM # 2.j	
Solsmart Update	
BACKGROUND	
RECOMMENDATION	
ATTACHMENTS	
None	



AGENDA ITEM REPORT

MEETING DATE	PREPARED BY
January 23, 2024	

AGENDA ITEM # 2.k

Update/Discussion on keeping bees

BACKGROUND

Committee member Jennifer Gottwald will provide an update on her conversations regarding bee keeping in the Village.

RECOMMENDATION

ATTACHMENTS

None



AGENDA ITEM REPORT

MEETING DATE	PREPARED BY
January 23, 2024	
AGENDA ITEM # 2.I	
Future Agenda Items	
BACKGROUND	
RECOMMENDATION	
ATTACHMENTS	
None	