

PENNSYLVANIA OUTDOOR LIGHTING COUNCIL



MODEL OUTDOOR LIGHTING ORDINANCE

FOR INCLUSION IN

ZONING ORDINANCES

This Model Lighting Ordinance is intended to be placed in the zoning ordinance as a section covering lighting in all zoning districts in the municipality. If there are special or unique lighting requirements for a particular zoning district that do not apply to other districts, it is recommended they be included in that district's or an overlay district's requirements. As a model, it is recommended it be tailored, as appropriate, to suit the municipality's unique needs.

MODEL LIGHTING SECTION
FOR ZONING ORDINANCES

OUTDOOR LIGHTING

- A. Purpose – To set and require minimum standards for outdoor lighting to:
1. Provide for and control lighting in outdoor public places where public health, safety and welfare are potential concerns
 2. Protect drivers and pedestrians from the glare of non-vehicular light sources
 3. Protect neighbors, the environment and the night sky from nuisance glare and light trespass from improperly selected, placed, aimed, applied, maintained or shielded light sources
 4. Promote energy efficient lighting design and operation
 5. Protect and retain the intended visual character of the various Municipality venues
- B. Applicability
1. All uses within the Municipality where there is interior or exterior lighting that creates or has the potential to create a nuisance or hazard as viewed from outside, or exterior lighting with the potential to create or that creates a nuisance when viewed from inside or outside, including but not limited to, residential, commercial, industrial, public and private recreational/sports and institutional uses, and sign, billboard, architectural and landscape lighting.
 2. The Municipality may require lighting be incorporated for other uses, applications and locations or may restrict lighting in any of the above uses or applications when health, safety and welfare are issues.
 3. The glare-control requirements herein contained apply to lighting in all uses, applications and locations.
 4. Temporary seasonal decorative lighting is exempt from all but the glare-control requirements of this Ordinance.
 5. Emergency lighting, as may be required by any public agency while engaged in the performance of their duties, or for illumination of the path of egress during an emergency as described in NFPA 75 and NFPA 101, are exempt from the requirements of this Ordinance.
- C. Definitions
1. Adequately Shielded – The attribute of a light source from which no direct glare is visible at normal viewing angles by virtue of its being properly aimed, oriented, and located and properly fitted with such devices as shields, barn doors, baffles, louvers, skirts or visors as needed.
 2. BUG - An IES rating system of the Backlight, Uplight and Glare light distribution of a luminaire.
 3. CCT - Correlated Color Temperature - A rating of the warmth or coolness of all light output expressed in degrees Kelvin.
 4. Footcandle – Unit of light density incident on a plane (assumed to be horizontal unless otherwise specified), and measurable with an illuminance meter, a.k.a. light meter.
 5. Full Cutoff – Attribute of a luminaire from which no light is emitted at or above a horizontal plane drawn through the highest light-emitting portion of the luminaire and no more than 10% of the lamp's intensity is emitted at or above an angle 10° below that horizontal plane, at all lateral angles around the luminaire. A full-cutoff luminaire, by definition, also is “fully shielded.”
 6. Fully Shielded – Attribute of a luminaire from which no light is emitted at or above a horizontal plane drawn through the lowest light-emitting portion of the luminaire.
 7. Glare – Excessive brightness in the field of view that is sufficiently greater than that to which the eyes are adapted, so as to cause annoyance or loss in visual performance and visibility, so as to jeopardize health, safety or welfare

8. Illuminance – Quantity of incident light, measured in footcandles
9. Light Trespass – Light emitted by a luminaire or lighting installation, which is cast beyond the boundaries of the property on which the lighting installation is sited.
10. Lumen – As used in the context of this Ordinance, the light-output rating of a lamp (light bulb).
11. Luminaire - A complete lighting fixture assembly consisting of lamp(s), lamp holders, electrical components, light directing devices, shielding devices and lenses or diffusers.
12. Nits - A unit of measure of the luminance or brightness of the light emitted or reflected from a surface, e.g., sign face. Also referred to as candelas per square meter (cd/m²).

D. Criteria

1. Illumination Levels – Lighting, where required by this Ordinance, or otherwise required or allowed by the Municipality or other applicable jurisdiction, shall have illuminances, uniformities and glare control in accordance with the latest edition of the IES Lighting Handbook or current Recommended Practices of the Illuminating Engineering Society of North America (IES). Future amendments to said Lighting Handbook and Recommended Practices shall become a part of this Ordinance without further action by the Municipality.
2. Luminaire Design
 - a. Luminaires shall be of a type and design appropriate to the lighting application and shall be aesthetically acceptable to the Municipality.
 - b. For the lighting of predominantly horizontal surfaces such as, but not limited to parking areas, roadways, vehicular and pedestrian passage areas, merchandising and storage areas, automotive-fuel dispensing facilities, automotive sales areas, loading docks, cul-de-sacs, active and passive recreational areas, building entrances, sidewalks, bicycle and pedestrian paths, and site entrances, luminaires shall be aimed straight down, have no uplight and shall meet IESNA full-cutoff/fully shielded criteria. Except as may be specified elsewhere in this Ordinance, luminaires shall have a rating of B1-U0-G1 Luminaires with an aggregate rated lamp output not exceeding 500 lumens, e.g., the rated output of a standard non-directional 40-watt incandescent, 10-watt LED or 10-watt compact fluorescent lamp, are exempt from the requirements of this paragraph. In the case of decorative street lighting luminaires, the Municipality may approve the use of luminaires with an uplight component not exceeding 1%.
 - c. For the lighting of predominantly non-horizontal tasks or surfaces, such as, but not limited to, facades, landscaping, signs, billboards, fountains, displays and statuary, when their use is specifically permitted by the Municipality, luminaires shall be adequately shielded and shall be installed and aimed so as to not project their output into the windows of neighboring residences, adjacent uses, past the object being illuminated, skyward or onto a public roadway. Luminaires with an aggregate rated lamp output not exceeding 500 lumens, e.g., the rated output of a standard non-directional 40-watt incandescent, 6-watt LED or 10-watt compact fluorescent lamp, are exempt from the requirements of this paragraph.
3. Color Temperature – LED light sources shall have a correlated color temperature that does not exceed 3000K.
4. Lighting Control
 - a. All lighting shall be aimed, located, designed, fitted, shielded and maintained so as not to present a hazard to drivers or pedestrians by impairing their ability to safely traverse and so as not to create a nuisance by projecting or reflecting objectionable light onto a neighboring use or property.

- b. Directional luminaires such as floodlights and spotlights, when their use is specifically approved by the Municipality, shall be so shielded, installed and aimed that they do not project their output onto the properties of neighboring residences, adjacent uses, past the object being illuminated, skyward or onto a public roadway or pedestrian way. Floodlights installed above grade on residential properties shall not be aimed out more than 45° from straight down. When a floodlight creates glare as viewed from an adjacent residential property or use, the floodlight shall be required to be reaimed and/or fitted with a shielding device to block the direct view of the glare from that property.
- c. Illumination for signs, billboards, building facades and/or surrounding landscapes for decorative, advertising or aesthetic purposes is prohibited between 11:00 p.m. and dawn, except that such lighting situated on the premises of a commercial establishment may remain illuminated while the establishment is actually open for business, and until no more than one-half hour after closing.
- d. “Barn lights,” aka “dusk-to-dawn lights,” when judged by Municipality to be a source of glare as viewed from an adjacent residential use or roadway, shall not be permitted unless effectively shielded as viewed from the adjacent property or roadway.
- e. The use of floodlights and wall-mounted luminaires (wall packs) to illuminate parking areas, shall not be permitted unless it can be proven to the satisfaction of the Municipality that the employment of no other acceptable means of lighting is possible.
- f. Lighting for parking areas and vehicular and pedestrian traffic ways for commercial, industrial and institutional uses shall be automatically extinguished nightly within 1/2 hour of the close of the facility. On/off control shall be by astronomic programmable controller with battery or capacitor power-outage reset. When after-hours site safety/security lighting is proposed, such lighting shall not be in excess of twenty-five (25) percent of the number of luminaires required or permitted for illumination during regular business hours. The use of greater than 25% of the number of luminaires for normal lighting for all-night safety/security lighting shall require Municipality approval, based on the unique nature of the use or elevated area crime justification. Alternatively, where there is reduced but continued onsite activity throughout the night that requires site-wide even illumination, the use of dimming circuitry to lower illumination levels by at least 50% after 11:00 p.m. or after normal business hours, or the use of motion-sensor control, shall be permitted.
- g. Vegetation screens shall not be employed to serve as the primary means for controlling glare. Rather, glare control shall be achieved primarily through the use of such means as full cutoff/fully shielded luminaires, shields and baffles, and appropriate application of luminaire mounting height, wattage, aiming angle and luminaire placement.
- h. The illumination projected from any use onto a residential use shall at no time exceed 0.1 footcandle, measured line-of-sight and from any point on the receiving residential property. This footcandle value, however, shall not be used as a criterion for assessing glare control onto the property.
- i. Except as permitted for certain recreational lighting and/or permitted elsewhere in this paragraph, full cutoff/fully shielded luminaires shall not be mounted in excess of twenty (20) feet above finished grade of the surface being illuminated. Where proposed parking lots consist of 100 or more contiguous spaces and the light sources are full-cutoff/fully shielded, the Municipality may, at its sole discretion, based partially on mitigation of potential off-site impacts, allow a luminaire mounting height not to exceed 25’ AFG. Luminaires not meeting full-cutoff or fully shielded criteria, when their use is specifically permitted by Municipality, shall not be mounted in excess of 16’ AFG. Mounting height shall be defined as the distance from the finished grade of the surface being illuminated to the optical center of the luminaire. For recreational lighting maximum mounting height requirements, refer to “Recreational Uses” elsewhere in the Ordinance.

- j. Only the United States and the state flag shall be permitted to be illuminated past 11:00 p.m. The light source shall have a beam spread no greater than necessary to illuminate the flag and shall be shielded so the light source (lamp and reflector) is not visible at normal viewing angles.
 - k. Under-canopy lighting for such applications as gas/service stations, hotel/theater marquees, fast-food/bank/drugstore drive-ups, shall be accomplished using flat-lens full-cutoff luminaires aimed straight down and shielded in such a manner that the lowest opaque edge of the luminaire shall be below the light source and its light-directing surfaces, at all lateral angles around the luminaire. The average maintained illumination in the area directly below the canopy shall not exceed 20 initial footcandles, with no value exceeding 30 initial footcandles.
5. Installation
- a. Electrical feeds for lighting standards shall be run underground, not overhead and shall be in accordance with the NEC Handbook.
 - b. Poles supporting luminaires for the illumination of parking areas and located within the parking area or directly behind back-in parking spaces, or where they could be hit by snow plows or wide-swinging vehicles, shall be suitably protected by being placed a minimum of five (5) feet outside paved area or tire stops, or placed on concrete pedestals at least thirty (30) inches high above the pavement or suitably protected by steel bollards or other Municipality-approved means.
 - c. Pole mounted luminaires for lighting horizontal tasks shall be aimed straight down and poles shall be plumb.
 - d. Poles and brackets for supporting luminaires shall be those specifically manufactured for that purpose and shall be designed and rated for the luminaire and mounting accessory weights and wind loads involved.
 - e. Pole foundations shall be designed consistent with manufacturer's wind load requirements and local soil conditions involved and shall be reviewed and approved by a qualified civil/structural engineer.
 - f. Any employed shielding elements shall be permanently affixed to luminaire.
6. Maintenance – Luminaires and ancillary equipment shall be maintained so as to always meet the requirements of this Ordinance.
7. Billboards (aka off-premises signs), and Signs – Unless regulated elsewhere in this Ordinance or in another of this Municipalities ordinances, the following regulation shall apply to the lighting of new or relighting of existing billboards and signs, whether from an internal or external lighting source, shall require a Building Permit, which shall be granted only when Municipality is satisfied that excessive illumination, light pollution, glare and light trespass have been adequately mitigated, and shall be subject to the following requirements:
- a. Externally-illuminated billboards and signs shall have luminaires mounted at the top of the billboard or sign and aimed downward. The luminaires shall be designed, fitted and aimed to shield the lamp and its reflective surfaces from direct off-site view and to place the light output onto and not beyond the sign or billboard face.
 - b. Internally illuminated billboards and signs shall have a dark field/background and light message. The maximum luminance at any point on the sign face shall not exceed 150 cd/m² during hours of darkness.
 - c. Channel letter signs shall have dimming capability to allow adjustment of sign brightness when required by the Municipality to accommodate local ambient conditions.

- d. Illumination of billboards shall be limited to commercial and industrial zoning districts and the illumination of billboards located within 400' of a residential use whose illuminated surface is visible shall not be permitted.
- e. Signs and billboards shall not resemble or simulate any warning or danger signal or any official traffic control device, sign or light.
- f. Billboards shall be extinguished automatically by a programmable controller with astronomical and semiannual time-change control and spring or battery power-outage reset, by no later than 11:00 each evening until dawn, except that signs for establishments (not companies) that operate or remain open past 11:00 p.m. may remain lighted no later than ½ hour past the time of the close of the establishment.
- g. Rotating, traveling, pulsing, flashing or oscillating light sources, lasers, beacons, searchlights or strobe lighting shall not be permitted.
- h. The use of highly reflective signage that creates nuisance glare or a safety hazard shall not be permitted.
- i. LED. electronic/digital billboard and sign lighting shall only be permitted in commercial and industrial districts, shall not be allowed to operate between 11:00 p.m. and dawn when located where the sign face or its light output is visible from a residential district or use. On limited access highways, sign shall not be located within 1,000 feet of an approaching interchange or traffic-merging lanes. Except for time and weather signs, digital message shall not be permitted to change more than once each 60 seconds. From 30 minutes after sunset to 30 minutes before sunrise, the LED output shall be automatically reduced to a level that does not exceed 150 nits. Where located in an area with existing high-ambient light levels but not visible from a residential use, a sign-face brightness not exceeding 200 nits may be permitted. The sign or billboard nighttime light output shall be capable of being further dimmed if municipality so requires when the lighting is judged to create a nuisance or hazard. Light source correlated color temperature shall not exceed 3000K.

E. Residential Developments

- 1. Street Lighting - For residential developments where lot sizes are or average less than 20,000 square feet, if the Municipality so directs, street lighting shall be provided at:
 - a. the intersection of public roads with entrance roads to the proposed development,
 - b. intersections involving proposed public or non-public major-thoroughfare roads within the proposed development,
 - c. the apex of the curve of any major-thoroughfare road, public or non-public, within the proposed development, having a radius of 300 feet or less,
 - d. at the far end of cul-de-sac bulbs
 - e. terminal ends of center median islands having concrete structure curbing, trees and/or other fixed objects not having breakaway design for speeds of 25 m.p.h. or greater,
 - f. defined pedestrian crossings located within the development,
 - g. where lot sizes prohibit the parking of more than three (3) vehicles on the residential lot, thereby necessitating on-street parking.
 - h. At other locations along the roadway as required by Municipality
- 2. Parking Spaces
 - a. In residential developments with lots of less than twenty thousand (20,000) square feet, where four (4) or more common contiguous parking spaces are proposed, such spaces shall be illuminated in accordance with Section D.

- b. In multi-family developments, common parking areas of 4 spaces or greater shall be illuminated.
 - 3. On-Lot Lighting - For subdivisions with lot sizes of 40,000 sq. ft. or smaller, on-lot lighting shall be provided in accordance with the following restrictions:
 - a. Lighting Fixtures
 - (1) Floodlights, spotlights and other directional sources, whether for security, architectural/decorative, facade, landscaping, task lighting or recreational purposes, shall be located, aimed and shielded in a manner that prevents the lighted aperture of the source (direct glare) from being directly visible off premises.
 - (2) Residential recreational lighting shall not project beyond the recreational surface.
 - (3) Facade-mounted and post-top luminaires shall be fully shielded.
 - (4) LED light sources shall have a correlated color temperature not exceeding 2700K.
 - b. On/Off Control
 - (1) All exterior lighting, except security lighting, shall be extinguished nightly by no later than 11 p.m.
 - (2) Lighting intended for all-night safety/security purposes shall be motion-sensor controlled.
 - (3) Recreational lighting shall be extinguished no later than 10:30 p.m.
- F. Recreational Uses – The nighttime illumination of outdoor recreational facilities for such aerial sports as baseball, basketball, soccer, tennis, track and field, and football typically necessitate higher than normally allowed luminaire mounting heights and aiming angles, utilize very high-wattage lamps and potentially produce unacceptable levels of light trespass and glare when located near residential properties. Permission to illuminate such facilities shall be granted only when the Municipality is satisfied that the health, safety and welfare rights of nearby property owners, and the municipality as a whole, have been properly protected. When recreational uses are specifically permitted by the Municipality for operation during hours of darkness, the following requirements shall apply:
 - 1. Race tracks and such recreational venues as golf driving ranges and trap-shooting facilities that necessitate the horizontal or near horizontal aiming of luminaires and projection of illumination, shall not be permitted to be artificially illuminated.
 - 2. Recreational facilities for basketball, baseball, football, soccer, miniature golf, tennis or track shall not be illuminated if located within a residential district or sited on a nonresidential property located within 1,000 feet of a property containing a residential use.
 - 3. Sporting events shall be timed to end at such time that all lighting in the sports facility, other than lighting for safe exit of patrons, shall be extinguished by ten (10:00) p.m., regardless of such occurrences as extra innings or overtimes.
 - 4. The Municipality reserves the right to limit the number of illuminated sporting events per week or season.
 - 5. Maximum mounting heights for recreational lighting shall be in accordance with the following:
 - a. Basketball 20'
 - b. Football 70'
 - c. Soccer 70'
 - d. Lacrosse 70'
 - e. Little League Baseball
 - (1) 200' Radius 60'

	(2)	300' Radius	70'
f.		Miniature Golf	20'
g.		Swimming Pool Aprons	20'
h.		Tennis	20'
i.		Track	20'

6. The use of engine/generator portable boom lighting shall not be permitted within the Municipality.
7. To assist the Municipality in determining whether the potential impacts of proposed lighting have been suitably managed, applications for illuminating recreational facilities shall be accompanied not only with the information required under Section G. below but also by a visual impact plan that contains the following:
 - a. Plan views containing a layout of the recreational facility and showing pole locations and the location of residences on adjoining properties.
 - b. Elevations containing pole and luminaire mounting heights, horizontal and vertical aiming angles and luminaire arrays for each pole location
 - c. Elevations containing initial vertical illuminance plots at the boundary of the site, taken at a height of 5' line-of-sight
 - d. Elevations containing initial vertical illuminance plots on the windowed facades of all residences facing and adjacent to the recreational facility. Such plots shall demonstrate compliance with the light trespass and glare control requirements of this Ordinance.
 - e. Proposed frequency of use of the facility during hours of darkness on a month-by-month basis and proposed time when all of the sports lighting will be extinguished.
 - f. A narrative describing the measures proposed to achieve minimum off-site disturbance.

G. Plan Submission – Where site lighting is required by this Ordinance, is otherwise required by Municipality or is proposed by Applicant, lighting plans shall be submitted for Municipality review and approval for Subdivision & Land Development, Conditional Use, Variance, Building Permit and Special Exception applications. The submitted information shall include the following:

1. A site plan or plans, complete with all structures, parking spaces, building entrances, traffic areas (both vehicular and pedestrian), existing and proposed trees, and adjacent uses that might be adversely impacted by the lighting. The lighting plan shall contain a layout of all proposed and existing luminaires, including but not limited to area, architectural, building entrance, canopy, soffit, landscape, flag, sign, etc., by location, orientation, aiming direction, mounting height, lamp photometry and type.
2. A 10'x10' illuminance grid (point-by-point) plot of maintained horizontal footcandles overlaid on the site plan, plotted out to 0.0 footcandles, which demonstrates compliance with the light trespass, illuminance and uniformity requirements as set forth in this Ordinance or as otherwise required by Municipality. When the scale of the plan, as judged by the Municipality, makes a 10'x10' grid plot illegible, a more legible grid spacing may be permitted.
3. Light-loss factors, IES candela test-filename, BUG rating, initial lamp-lumen ratings and specific lamp manufacturer's lamp ordering nomenclature, used in calculating the plotted illuminance levels
4. Description of proposed equipment, including luminaire catalog cuts, photometrics, glare reduction devices, lamps, lamp correlated color temperature, on/off control devices, mounting heights, pole foundation details, pole protection means and mounting methods.
5. Landscaping plans shall contain luminaire locations, demonstrating that the site lighting and landscaping have been coordinated to minimize conflict between vegetation and intended light distribution, both initially and at vegetation maturity.

6. When requested by Municipality, Applicant shall also submit a visual-impact plan that demonstrates appropriate steps have been taken to mitigate potential consequences of on-site and off-site glare and to retain the intended character of the Municipality. This plan may require the inclusion of initial vertical footcandle values at specific off-site venues, e.g., bedroom windows of adjacent residential uses.
7. Plan Notes – The following notes shall appear on the Lighting Plan:
 - a. Post-approval alterations to lighting plans or intended substitutions for approved-plan specified lighting equipment shall be submitted to Municipality for review and approval prior to installation. Requests for substitutions shall be accompanied by catalog cuts of the proposed equipment that demonstrate proposed substitution is equal to or exceeds the quality, optical characteristics and maintainability of the specified luminaires; and accompanied by a lighting plan, including a point-by-point plot, which demonstrates proposed substitutions will result in a lighting design that equals or exceeds the quality of the lighting on the approved plan.
 - b. Municipality reserves the right to conduct post-installation inspections to verify compliance with Ordinance requirements and approved Lighting Plan commitments, and if deemed appropriate by the Municipality, to require remedial action at no expense to Municipality.
 - c. All exterior lighting, including building-mounted lighting, shall meet IESNA full-cutoff or fully-shielded criteria unless otherwise specifically approved by the Municipality.
 - d. Installer shall notify Municipality to arrange for inspection and approval of all exterior lighting, including building-mounted lighting, prior to its installation.

H. Compliance Monitoring

1. Safety Hazards
 - a. If Municipality judges a lighting installation creates a safety hazard, the person(s) responsible for the lighting shall be notified and required to take remedial action without undue delay.
 - b. If appropriate corrective action has not been effected within fifteen (15) days of notification or valid reason for needed extra time, the Municipality may initiate appropriate legal action.
2. Nuisance Glare and Inadequate Illumination Levels
 - a. When the Municipality judges an installation produces unacceptable levels of nuisance glare, skyward light, excessive or insufficient illumination levels or otherwise varies from this Ordinance, the Municipality may cause notification of the person(s) responsible for the lighting and require appropriate remedial action.
 - b. If the infraction so warrants, the Municipality may act to have the problem corrected as in H.1.b. above.

I. Nonconforming Lighting – Any luminaire or lighting installation existing on the effective date of this Ordinance that does not conform with the requirements of this Ordinance, shall be considered as a lawful nonconformance.

1. A nonconforming luminaire or lighting installation shall be made to conform with the requirements of this Ordinance when:
 - a. Minor corrective action, such as reaiming or shielding can achieve conformity with the applicable requirements of this Ordinance
 - b. It is deemed by the Municipality to create a safety hazard
 - c. It is replaced by another luminaire or luminaires or abandoned or relocated

- d. The number of existing luminaires is increased by 30% or more
 - e. There is a change in use
2. Regardless of the requirements of Section I.1. above, when requested by Municipality, nonconforming luminaires and lighting installations shall be made to conform with the requirements of this Ordinance or removed within three (3) years from the effective date of this Ordinance.