PENNSYLVANIA OUTDOOR LIGHTING COUNCIL

MODEL OUTDOOR LIGHTING ORDINANCE

FOR INCLUSION IN THE

SUBDIVISION & LAND DEVELOPMENT ORDINANCE

This Model Lighting Ordinance is intended to be placed in the SALDO as a separate section covering lighting throughout the municipality. However, as a first choice, it is recommended that the lighting requirements be placed in the Zoning Ordinance using the Model Lighting Section for Zoning Ordinances and cross-referencing them in the SALDO.

PENNSYLVANIA OUTDOOR LIGHTING COUNCIL

10/09

MODEL LIGHTING SECTION FOR SUBDIVISION & LAND DEVELOPMENT ORDINANCES

LIGHTING REQUIREMENTS AND DESIGN STANDARDS

A. Purpose – To require and set 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 or poorly 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 venues of the Municipality

B. Applicability

1. Uses that are proposed to operate during hours of darkness where there is public assembly and traverse, including but not limited to the following: multi-family residential, residential developments, commercial, industrial, recreational and institutional uses, and sign, billboard, architectural and landscape lighting applications.
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.

C. Definitions

1. Footcandle – Unit of light density incident on a plane (assumed to be horizontal unless otherwise specified), measurable with an illuminance meter, a.k.a. light meter.
2. Full Cutoff – Attribute of a lighting fixture from which no light is emitted at or above a horizontal plane drawn through the bottom of the fixture and no more than 10% of the lamp's output is emitted at or above an angle 10º below that horizontal plane, at all lateral angles around the fixture. By definition a full-cutoff luminaire is also fully shielded.
3. 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.
4. Glare – Excessive brightness in the field of view that is sufficiently greater than thsy to which the eyes are adapted, to cause annoyance or loss in visual performance and visibility, so as to jeopardize health, safety or welfare
5. Illuminance – Quantity of incident light, measured in footcandles
6. Light Trespass – Light emitted by a lighting fixture or installation, which is cast beyond the boundaries of the property on which the lighting installation is sited.
7. Lumen – As used in the context of this Ordinance, the light-output rating of a lamp (light bulb).
8. Shielded – A luminaire 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.

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 current recommended practices of the Illuminating

Engineering Society of North America (IES) as contained in the IES Lighting Handbook and applicable Recommended Practices.

2. Light Power Densities – Lighting shall conform to the exterior LPDs as set forth by the current edition of ASHRAE/IESNA 90.1 Standard.

3. 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, fixtures shall be aimed straight down and shall meet IESNA full-cutoff criteria. Fixtures, except those containing directional lamps, with an aggregate rated lamp output not exceeding 500 lumens, e.g., the rated output of a standard non-directional 40-watt incandescent lamp, are exempt from the requirements of this paragraph. In the case of decorative/period street lighting, the Municipality may approve the use of luminaires that are fully shielded or comply with IES cutoff criteria rather than full cutoff.

   c. For the lighting of predominantly non-horizontal surfaces such as, but not limited to: facades, landscaping, signs, billboards, fountains, displays and statuary, when such lighting is specifically approved by the Municipality, it shall be shielded and shall be installed and aimed so as to not project light output into the windows of neighboring residences, adjacent uses, past the object being illuminated, skyward or onto a public roadway. Fixtures, except those containing directional lamps, with an aggregate rated lamp output not exceeding 500 lumens, e.g., the rated output of a standard non-directional 40-watt incandescent lamp or 10-watt compact fluorescent lamp, are exempt from the requirements of this paragraph.

4. Control of Glare

   a. All lighting shall be aimed, located, designed, fitted 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 fixtures, e.g., floodlights and spotlights, shall be so shielded, installed and aimed that they do not project their output into the windows of neighboring residences, adjacent uses, past the object being illuminated, skyward or onto a public roadway or pedestrian way.

   c. Parking and vehicular and pedestrian way lighting (except for safety and security applications and all-night business operations), for commercial, industrial and institutional uses shall be automatically extinguished, using a programmable controller, no later than one-half hour after the close of business or facility operation. When safety or security lighting is proposed for after-hours illumination, it shall not be in excess of twenty-five (25) percent of the number of fixtures or illuminance required or permitted for illumination during regular business hours. Alternatively, where reduced but continued activity requires even illumination, the use of dimming circuitry to lower illumination levels by 50% after 11:00 p.m. or after normal business hours, shall be permitted.

   d. 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 for a commercial establishment may remain illuminated while the establishment is actually open for business, and until no more than one-half hour after closing. Such lighting shall be automatically extinguished using a programmable controller.

e. 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 cutoff fixtures, shields and baffles, and appropriate application of fixture mounting height, wattage, aiming angle and placement.

f. The illumination projected from any property onto a residential use shall at no time exceed 0.1 initial footcandle, measured line-of-sight from any point on the receiving property.

g. The illumination projected from any property to a non-residential use at no time shall exceed 1.0 initial footcandle, measured line-of-sight from any point on the receiving property.

h. Externally illuminated billboards and signs shall be lighted by fixtures mounted at the top of the billboard or sign and aimed downward. The fixtures shall be designed, shielded and aimed to shield the source from off-site view and to restrict the light output onto and not beyond the sign or billboard. At no point on the face of the sign or billboard shall the illumination exceed 30 initial vertical footcandles with a maximum to minimum uniformity ratio not to exceed 6:1.

i. Only the United States and the state flag shall be permitted to be illuminated from dusk till dawn. All other flags shall not be illuminated past 11:00 p.m. Flag lighting sources shall not exceed 7,000 initial lamp lumens per flagpole. The light source shall have a beam spread no greater than necessary to illuminate the flag and shall be fully shielded.

j. 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 fixtures aimed straight down and shielded in such a manner that the lowest opaque edge of the fixture shall be below the light source at all lateral angles. The illumination in the area directly below the canopy shall not exceed 20 average footcandles and the maximum shall not exceed 30 footcandles.

k. The use of white strobe lighting for tall structures such as smokestacks, chimneys and radio/communications/television towers is prohibited during hours of darkness, except as specifically required by FAA.

5. Installation

a. New electrical feeds for lighting poles shall be run underground, not overhead.

b. Poles supporting luminaires for the illumination of parking areas and located within the parking area or directly behind 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, shielded by steel bollards or protected by other Municipality-approved means.

c. Except for certain recreational lighting covered elsewhere in this Ordinance, fixtures not meeting IESNA full-cutoff criteria shall not be mounted in excess of sixteen (16) feet above finished grade and fixtures meeting IESNA full-cutoff criteria shall not be mounted in excess of twenty (20) feet above finished grade. For the illumination of greater than 100 contiguous parking spaces, the Municipality may permit the use of a mounting height not to exceed twenty-five (25) feet for fixtures meeting IESNA full-cutoff criteria when it can be demonstrated to the satisfaction of the municipality that light trespass and glare control requirements in this Ordinance have been met.

d. Pole mounted fixtures for the illumination of horizontal tasks shall be aimed straight down and poles shall be plumb.

E. Residential Development Fixture Placement

1. For residential developments where lot sizes are or average less than 20,000 square feet, 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. 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. At other locations along the street as deemed necessary by the Municipality

2. Where lot sizes permit the parking of less than three (3) vehicles on the residential lot, thereby necessitating on-street parking, street lighting may be required along the length of the street.

3. In multi-family developments, common parking areas of 4 spaces or greater shall be illuminated.

4. In residential developments with lots of less than twenty thousand (20,000) square feet, where five (5) or more common contiguous parking spaces are proposed, such spaces shall be illuminated.

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 fixture 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 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. Maximum mounting heights for recreational lighting shall be in accordance with the following:

a.	Basketball	20’
b.	Football	70’
c.	Soccer	70’
d.	Little League Baseball	
	(1) 200’ Radius	60’
	(2) 300’ Radius	70’
e.	Lacrosse	70’
f.	Miniature Golf	20’
g.	Swimming Pool Aprons	20’
h.	Tennis	20’
i.	Track	20’

5. To assist the Municipality in determining whether lighting will be permitted, 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 fixture mounting heights, horizontal and vertical aiming angles and fixture 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 the sports lighting will be extinguished.

f. A narrative describing the measures proposed to achieve minimum off-site disturbance.

G. Plan Submission – For subdivision and land-development applications where site lighting is required by this Ordinance, is otherwise required by the Municipality or is proposed by Applicant, lighting plans shall be submitted to the Municipality for review and approval with preliminary and final subdivision/land development plan applications and conditional use applications and shall contain the following:

1. A plan or plans of the site, complete with all structures, parking spaces, building entrances, traffic areas (both vehicular and pedestrian), vegetation that might interfere with lighting, and adjacent uses that might be adversely impacted by the lighting. The lighting plan shall contain a layout of all proposed fixtures by location, orientation, aiming direction, mounting height and type. The submission shall include, in addition to existing and proposed area lighting, all other exterior lighting, e.g., architectural, building-entrance, landscape, flag, sign, etc.

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 the Municipality. When the scale of the plan, as judged by the Municipality, makes a 10'x10' grid plot illegible, a larger grid spacing may be permitted.

3. The maintenance (light-loss) factors, IES candela file nomenclature, lamp-lumen ratings and specific lamp manufacturer's lamp ordering nomenclature, used in calculating the presented illuminance levels

4. Description of the proposed equipment, including fixture catalog cuts, photometrics, glare reduction devices, lamps, on/off control devices, mounting heights, pole foundation details and mounting methods

5. When landscaping plans are involved, they shall contain the lighting fixture locations and shall demonstrate 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 the Municipality, Applicant shall also submit a visual-impact plan that demonstrates appropriate steps have been taken to mitigate the 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 specified lighting equipment on the approved plan shall be submitted to the Municipality for review and approval prior to installation. Requests for substitutions shall be accompanied by catalog cuts of the proposed equipment that demonstrate the proposed substitution is equal to or exceeds the optical quality and maintainability of the specified luminaires; and accompanied by a lighting plan, including a point-by-point plot, which demonstrates that

proposed substitutions will result in a lighting design that equals or exceeds the quality of the approved plan.

b. The Municipality reserves the right to conduct post-installation inspections to verify compliance with the Ordinance requirements and approved Lighting Plan commitments, and if deemed appropriate by the Municipality, to require remedial action at no expense to the Municipality.

c. All exterior lighting shall meet IESNA full-cutoff criteria unless otherwise 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. Street Lighting Dedication

1. When street lighting is to be dedicated to the municipality, Applicant shall be responsible for all costs involved in the lighting of streets and street intersections until the street is accepted for dedication.

2. Prior to dedication and in the event of the formation of a homeowner's association and/or property management declaration, Municipality shall require said agency to enter into an agreement guaranteeing the Municipality payment of all costs associated with dedicated street lighting.

3. Assumption of Costs of Dedicated Street Lighting – Upon dedication of public streets, the Municipality shall assess the homeowners' association, individual property owners, or corporations, as may be necessary to collect all revenues required that are directly or indirectly associated with all costs of each specific street lighting fixture. These costs shall include:

a. Administration

b. Collection

c. Pro-ration of non payables

d. Actual utility electrical charges

e. Maintenance and maintenance contracts for maintenance of fixtures and associated equipment.