



**FAIRFAX
COUNTY**

STAFF REPORT

V I R G I N I A

PROPOSED ZONING ORDINANCE AMENDMENT

Article 14 – Outdoor Lighting and Related Provisions

PUBLIC HEARING DATES

Planning Commission

January 8, 2020 at 7:30 p.m.

Board of Supervisors

February 11, 2020 at 4:00 p.m.

**PREPARED BY
ZONING ADMINISTRATION DIVISION
DEPARTMENT OF PLANNING AND DEVELOPMENT
703-324-1314**

November 19, 2019

CB



Americans With Disabilities Act (ADA): Reasonable accommodation is available upon 7 days advance notice. For additional information on ADA call 703-324-1334 or TTY 711 (Virginia Relay Center).

STAFF COMMENT

The proposed amendment addresses certain outdoor lighting topics identified on the 2019 Zoning Ordinance Amendment Work Program.

The Work Program calls for consideration of revisions to the lighting standards contained in Part 9 of Article 14 pertaining to:

- Single family residential exemptions
- Motion-activated security lighting exemptions
- Outdoor sports facilities
- Architectural Review Board (ARB) review of sports illumination plans

In addition to addressing these topics, staff recommends adding a maximum correlated color temperature, similar to that recently adopted in the Public Facilities Manual (PFM). Other than color temperature, the topics that appear on the Work Program are minor revisions initially identified by staff and the Environmental Quality Advisory Council (EQAC).

Current Zoning Ordinance Provisions

The current Zoning Ordinance performance standards for outdoor lighting were adopted in 2003 and represented a comprehensive update to the prior regulations that had been in effect since 1978. The 1978 regulations focused on light trespass by limiting illumination at a property line for a residential district to 0.5 footcandles; however, this standard was found to be inadequate in addressing glare. The 2003 rewrite deleted the light trespass standard and added the requirement for full cut-off fixtures that are mounted horizontal to the ground for most outdoor lighting, with certain exemptions. This was intended to establish a night-sky friendly ordinance and address the impacts of glare due to poorly designed lighting. The current standards also address height and location for lighting fixtures, dimming of nonresidential parking lot lights after the close of business, photometric plans for certain commercial uses, and sports illumination plans.

Proposed Amendment

Correlated Color Temperature:

Color temperature refers to the color characteristic of light, which for the purpose of outdoor lighting ranges from orange/yellow to blueish white, and is measured in kelvins (K). Lower color temperatures (e.g., 1,000 to 3,000K) are orange/yellowish and are referred to as “warm” while higher color temperatures (e.g., over 5,000K) are blueish white and are referred to as “cool.” A typical incandescent bulb has a color temperature of approximately 2,600K, but LED bulbs are available in a wide range of color temperatures. The higher color temperatures are associated with increased energy usage, glare, and impacts on human health and wildlife, as compared to lower color temperatures. Among other impacts, the “whiter” lighting can result in harsh glare, potentially damaging the eye and affecting safety, and can impact human circadian rhythm.

Consistent with the recently adopted amendment to the Public Facilities Manual for street lights and the recommendations of the American Medical Association and the International Dark Sky Association (IDA), staff recommends adding a maximum color temperature of 3,000K, which is

slightly higher than the color temperature of a typical incandescent bulb. This would apply to all light fixtures, including residential, with an exception of up to 5,700K for sports fields and courts that are subject to a sports illumination plan (SIP). The higher color temperature for the sports fields and courts is consistent with recent FCPA installations and IDA recommendations. It should be noted that fixtures and bulbs with 3,000K or less are readily available for purchase.

Exemptions for Single Family Dwellings:

On lots developed with single family dwellings, lighting that does not exceed 2,000 lumens (approximately equivalent to 133 watts with an incandescent bulb) is exempt from the requirements of Par. 2 of Sect. 14-902. This provision includes the requirements for fixtures to be full cut-off and mounted horizontal to the ground, for spotlighting of landscaping or other features to be shielded and aimed toward the object intended, and the locational or shielding requirements for lights abutting residential. There is no limit to the number, location, or orientation of lights that are under 2,000 lumens, sometimes resulting in unwanted glare and excessive lighting. It is appropriate to maintain an exemption for single family dwellings because limited styles of full cut-off fixtures are available. However, reducing the lumens for exempt fixtures would serve to reduce the unwanted impacts. For light fixtures to be exempt, it is recommended that the maximum initial light output be reduced to 1,500 lumens, similar to a 100-watt incandescent bulb. In addition, the exemption should be revised to only apply to Paragraphs 2A and 2E of Sect. 14-902, which include the requirement for lights to be full cut-off and mounted horizontal to the ground and the locational/shielding provisions. This change would require compliance with other provisions, such as the new color temperature standard and the requirement to direct spotlights toward the flag or landscaping intended to be illuminated.

Exemptions for Motion-activated Security Lights:

Currently, motion-activated lights on lots developed with single family dwellings are exempt from all requirements (except they may not cause disability glare) if: a) the fixtures are limited to 6,000 lumens, b) turn off within five minutes of the motion ceasing, and c) are aimed so that the bulb is not visible at five feet above the property line. Staff believes that 6,000 lumens, which is the average light output of a 400-watt incandescent bulb or a pair of 200-watt bulbs, is unnecessarily high and contributes to light pollution and unwanted glare onto neighboring properties. A more reasonable limit may be a maximum of 4,000 lumens per fixture, which is equivalent to a total of about 267 watts from incandescent bulbs.¹ This would provide adequate illumination for security lighting. Depending on topography, the mounting height of fixtures, and their angle, the standard that the bulb is not visible at five feet above the property line does not allow for security lighting in many circumstances and may still result in unwanted glare. The amendment proposes to replace this with a general standard that the light be aimed and directed within the property.

On lots developed with uses other than single family dwellings, the current standard for exemptions that the bulb is not visible at five feet above the property line is recommended to be replaced with the requirement for the illumination to be directed within the property.

Sports Illumination Plans:

The Zoning Ordinance requires approval of a SIP for all outdoor playing fields or courts that

¹ The amendment would be advertised with a range of 2,500 to 6,000 lumens.

exceed 10,000 square feet in area or have associated light poles that exceed 20 feet in height, including public, community, and private (e.g., associated with a single family dwelling) facilities.

Hours for Residential Outdoor Playing Field/Court Lighting:

Concerns have been raised that 11:00 p.m. may be too late to allow lighted outdoor playing fields or courts on single family residential properties. It is recommended that the hours be revised to 10:00 p.m. to better conform to the hours specified in the Noise Ordinance.² This revision would only apply to private outdoor facilities subject to a SIP on lots developed with a single family dwelling, and would not affect school or Park Authority fields or community fields sponsored by youth organizations such as the Southwestern Youth Association.

Perimeter Areas for SIPs:

The Zoning Ordinance requires a SIP to include the location and limits of the playing field or court and a perimeter area. The size of the perimeter area is based on the type of field. Revisions to the perimeter areas are proposed based on the recommendations of the FCPA, and to clarify that the perimeter area must be located on the subject property.

ARB Review of SIPs:

The ARB currently reviews SIPs as part of zoning applications and site plan submissions for properties located within a Historic Overlay District. However, in cases where a SIP is a stand-alone submission, the ARB is not given the opportunity for review. As lighting is an important component of review, staff recommends that all SIPs within a Historic Overlay District be referred to the ARB.

Definition of Lumen:

It is recommended that the definition of lumen be revised to clarify that when a light fixture contains two or more light bulbs (multiple heads), the lumen output measurement represents the cumulative total for the fixture.

Grandfathering:

The exemption provisions of Par. 1 of Sect. 14-902 are proposed to be extended to the new color temperature and lumen levels. The new standards would apply to the installation of new outdoor lighting fixtures or the replacement of existing fixtures. Routine fixture maintenance, such as changing light bulbs, does not constitute replacement if it does not result in a higher lumen output or a color temperature that exceeds the proposed standards.

Outreach

The proposed outdoor lighting amendment has been presented at numerous meetings, including five public zoning open houses (three in 2018 and two in 2019), the Northern Virginia Building Industry Association and National Association for Industrial and Office Parks (NVBIA/NAIOP), the zMOD Citizens Work Group, Land Use Attorneys Work Group, and Builders/Industry Work Group, the Engineers and Surveyors Institute, community groups (McLean Citizens Association, Great Falls Citizens Association), Planning Commission Land Use Process Review Committee,

² The amendment would be advertised with a turn-off time between 10:00 PM and 11:00 PM.

and the Board's Development Process Committee (September 10, 2019). Input was received from and draft text distributed to lighting work group members consisting of representatives from various agencies, including the Fairfax County Park Authority (FCPA) and Fairfax County Public Schools, the Environmental Quality Advisory Council (EQAC), engineers, and other stakeholder lighting groups.

Conclusion

In order to address the impacts of glare and light pollution and encourage safety and energy conservation, the amendment proposes to add a maximum correlated color temperature standard, reduce the lumens for certain exempt fixtures, and other revisions. Therefore, staff recommends approval of the proposed amendment. Although the advertising will include a wider range, staff recommends a turn-off time of 10:00 PM for the lighting of sports fields or courts approved with a SIP only on properties that are both zoned to a residential district and developed with a single family residential use and a maximum of 4,000 lumens for exempt motion activated lighting on lots developed with single family dwellings. The amendment, if adopted, would have an effective date of 12:01 a.m. on the day following adoption.

PROPOSED AMENDMENT

This proposed Zoning Ordinance amendment is based on the Zoning Ordinance in effect as of November 19, 2019, and there may be other proposed amendments that could affect some of the numbering, order or text arrangement of the paragraphs or sections set forth in this amendment. Any necessary renumbering or editorial revisions will be administratively incorporated by the Clerk in the printed version of this amendment following Board adoption.

1 **Amend Article 7, Overlay and Commercial Revitalization District Regulations, Part 2, Historic**
 2 **Overlay Districts, Sect. 7-204, Administration of Historic Overlay District Regulations, by**
 3 **revising Paragraphs 1 and 2 to read as follows:**
 4

- 5 1. All applications for rezoning, special exception, special permit, variance, sign permits,
 6 building permits, as qualified below, and all site plans, sports illumination plans,
 7 subdivision plats, grading plans, and applications for any new utility distribution or
 8 transmission poles 50-feet or lower in height (“new utility or transmission poles”) and
 9 their associated facilities, as qualified below, must be referred to the ARB for its review
 10 and recommendation or decision in accordance with the provisions of this Part.
 11
- 12 2. The ARB review and recommendation on applications for a rezoning, special exception,
 13 special permit, variance and for site plans, sports illumination plans, subdivision plats
 14 and grading plans ~~shall~~ must include consideration of the potential impact of the proposal
 15 on the historical, architectural, or archaeological significance of the district and, but not
 16 limited to, the following:
 17

18 **Amend Article 14, Performance Standards, Part 9, Outdoor Lighting Standards as follows:**

19 - **Amend Sect. 14-902, Applicability and General Provisions, as follows:**

20 - **Amend the first two paragraphs of Par. 1 to read as follows:**

- 21
- 22 1. Except as provided in Sect. 905, Exemptions, below, ~~theis~~ Part ~~shall~~ applies to the
 23 installation of new outdoor lighting fixtures or the replacement of existing outdoor
 24 fixtures. Replacement of a fixture ~~shall~~ means a change of fixture type or change to the
 25 mounting height or location of the fixture. Routine lighting fixture maintenance, such as
 26 changing lamps or light bulbs, ballast, starter, photo control, housing, lenses and other
 27 similar components, ~~shall~~ does not constitute replacement and ~~shall~~ will be permitted
 28 provided such changes do not result in a higher lumen output or a color temperature that
 29 exceeds the provisions of Par. 4 below.
 30

31 Outdoor lighting fixtures lawfully existing prior to June 17, 2003, that do not conform
 32 to the provisions of this Part ~~shall be~~ are deemed to be a lawful nonconforming use and
 33 may remain. For the purpose of the provisions in Par. 4 of Sect. 14-902 (correlated color
 34 temperature), Par. 5 of Sect. 14-905 (exemptions for motion activated light fixtures), and
 35 Par. 6 of Sect. 14-905 (exemptions for lots developed with single family dwellings),
 36 outdoor lighting fixtures lawfully existing prior to *[insert effective date of this*
 37

1 amendment] are deemed to be a lawful nonconforming use and may remain. A
 2 nonconforming lighting fixture that is changed to or replaced by a conforming lighting
 3 fixture ~~shall~~ is no longer be deemed nonconforming, and ~~thereafter such lighting fixture~~
 4 ~~shall~~ must be in accordance with the provisions of this Part.

5
 6 - **Add new Par. 4, as follows:**

- 7
 8 4. All light sources may not exceed a maximum Correlated Color Temperature (CCT) of
 9 3,000K unless otherwise approved by the Director. However, sports fields or courts that
 10 are subject to a sports illumination plan may have a maximum CCT of up to 5,700K.

11
 12 - **Amend Sect. 14-904, Outdoor Recreation/Sports Facility Lighting Requirements, as**
 13 **follows:**

14
 15 - **Amend Par. 2B to read as follows:**

- 16
 17 2. A sports illumination plan ~~shall~~ must be prepared by a lighting professional that is
 18 certified by the National Council on Qualifications for the Lighting Professions
 19 (NCQLP) or a State licensed professional engineer, architect, landscape architect, or land
 20 surveyor and ~~shall~~ must contain the following information:

21 ...

- 22
 23 B. Location and limits of playing fields/courts, to include a perimeter area which must
 24 be located entirely on the same lot. For baseball/softball fields, the perimeter area
 25 ~~shall~~ extends ~~thirty (30)~~ 40 feet in a direction perpendicular to the foul lines and
 26 away from the field. The perimeter area for rectangular playing fields, such as soccer,
 27 football, lacrosse, and field hockey, ~~shall~~ extends ~~twenty (20)~~ feet from the side lines
 28 and ~~thirty (30)~~ feet from the end lines. The perimeter area for tee boxes on golf
 29 courses and golf driving ranges is 30 feet. The perimeter area for all other playing
 30 fields/courts ~~shall~~ extends ~~ten (10)~~ feet beyond the playing field/court boundary.

31
 32 - **Amend Par. 5 by deleting the current text and replacing it with the following:**

- 33
 34 5. Time limits for lighting of outdoor playing fields or courts that are subject to a sports
 35 illumination plan, unless other hours are specifically approved by the BZA in
 36 conjunction with the approval of a special permit, or by the Board in conjunction with
 37 the approval of a special exception, development plan, or proffered rezoning:

- 38
 39 1. For properties that are both zoned to a residential district and developed with a single
 40 family residential use, lighting is not allowed between the hours of 10:00 PM and
 41 7:00 AM [Advertised to permit the Board to consider hours beginning between
 42 10:00 PM and 11:00 PM]; and
 43 2. For all other properties including but not limited to public athletic field sites, lighting
 44 is not allowed between the hours of 11:00 PM and 7:00 AM.

45
 46 - **Amend Sect. 14-905, Exemptions, as follows:**

47
 48 - **Amend Par. 5 to read as follows:**

49

14-905 Exemptions

The following ~~shall be~~ are exempt from the provisions of this Part, provided that such fixtures, except for those set forth in Paragraphs 1 and 2 below, do not cause disability glare:

...

5. Motion activated light fixtures located as follows:

A. On lots developed with single family dwellings, when such lighting fixtures: (1) emit initial lighting levels of ~~6000~~ 4000 lumens or less [*Advertised to permit the Board to consider a range of 2,500 to 6000 lumens*]; (2) are extinguished within five (~~5~~) minutes upon cessation of motion; and (3) are aimed such that the illumination is directed within lamp or light bulb portion of the lighting fixture is not visible at five (5) feet above the property boundary.

B. On all other lots when such lighting fixtures are aimed such that the illumination is directed within lamp or light bulb portion of the lighting fixture is not directly visible at five (5) feet above the property boundary.

- **Amend Par. 6 to read as follows:**

6. On lots developed with single family dwellings, outdoor lighting fixtures with initial light outputs of ~~2000~~ 1,500 lumens or less ~~shall~~ are not be subject to the provisions of Paragraphs: 2A and 2E of Sect. 902 above.

Amend Article 20, Ordinance Structure, Interpretations and Definitions, Part 3, Definitions, as follows:

- **Amend the definition of Lumen, as follows:**

LUMEN: A quantitative unit measuring the amount of light emitted from a light source. When a light fixture contains two or more light bulbs, the lumen output measurement represents the cumulative total of all light emitted from the fixture.