Town of Matthews
Planning and Development

232 Matthews Station Street
Matthews, NC 28105
704.847.4411

Agenda Item: Zoning Motion 2020-1, UDO Text Amendment to Outdoor Illumination

TO: Mayor and Board of Commissioners

FROM: Mary Jo Gollnitz, Senior Planner

DATE: July 2, 2020

Background/Issue:

Matthews Planning staff is requesting a text change to amend § 155.609 Outdoor Illumination section of Matthews Unified Development Ordinance.

- During the Public Hearing, concern was noted regarding dark spots in non-residential properties and safety issues. Staff was asked to research neighboring communities to see what their ordinance states for levels of illumination at the property line. Mint Hill and Charlotte have no requirements, Huntersville has 1.0 footcandles (FC) and Indian Trail has 1.0 FC for residential and 2.0 fc for commercial.

- Planning Board discussed the proposed footcandles text request as presented at the Public Hearing and reverting the text back to 2.0 FC in Section 155.609.7.A. The suggested text as presented at the Public Hearing reads:

> All new lighting installations and renovations to existing lighting fixtures adjacent to a commercial property shall show the intent to limit footcandle (FC) levels at property lines to ~~two (2)~~ one (1) footcandle~~s~~ initial illumination.

Proposal/Solution

Planning Board voted unanimously to approve Outdoor Illumination Motion 2020-1 as presented at the Public Hearing.

Related Town Goal

<u>Quality of Life</u>

Recommended Action

Approved Motion 2020-1 Outdoor Illumination as presented at the Public Hearing.

DRAFT—FOR APPROVAL

STATEMENT OF CONSISTENCY WITH LOCAL ADOPTED GROWTH POLICIES
Final Decisions on Zoning-Related Issues

ZONING APPLICATION # _____
ZONING MOTION # _____2020-1_____
ADMINISTRATIVE AMENDMENT _____

Matthews Board of Commissioners adopts the checked statement below:

A) ___X__ The requested zoning action, as most currently amended, is **approved,** and has been found to be CONSISTENT with the Matthews Land Use Plan (or other documents), as follows:

It allows for the incorporation of text language to match current technology requirements. Additionally, it provides specific language for staff to enforce the Ordinance and assists developers in understanding the regulations.

The text amendment is reasonable because it promotes Public Safety through best practice standards.

OR

DRAFT—FOR DENIAL

B) _____ The requested zoning action, as most currently amended, is **not approved**, and has been found to be **INCONSISTENT** with the Matthews Land Use Plan (or other documents), as follows:

The text amendment encourages intrusion of light adjacent to residential properties and adversely affects the neighboring residential properties.

The text amendment is not reasonable because it would create an expansion of requirements for new development.

(In each case, the Statement must explain why the Board deems the action reasonable and in the public interest (more than one sentence). Reasons given for a zoning request being "consistent" or "not consistent" are not subject to judicial review.)

Date July 13, 2020

155.609. Outdoor Illumination

155.609.1. Purpose and Intent

It is the purpose and intent of this Outdoor Illumination Section to accomplish the following:

A. To encourage the use of lighting design practices and systems that will: *i*) minimize glare, light trespass and light pollution; *ii*) conserve energy and resources while maintaining nighttime safety, security and productivity; and *iii*) ~~to~~ curtail the degradation of the nighttime visual environment.

B. To establish clear and comprehensive outdoor lighting standards with an emphasis on reducing glare and light trespass by requiring, in most circumstances, full cut-off (preferred) lighting fixtures.

C. To allow for outdoor lighting that is appropriate for the task and to establish light fixture height, ~~wattage~~ lumen output, distribution and illumination limits that will help prevent light trespass to adjacent properties.

D. To establish specific standards for certain land uses that typically have unique lighting requirements, such as (but not limited to) automotive dealerships, service stations, and outdoor sporting facilities.

155.609.2. Applicability

This outdoor lighting standard applies to any development, expansion or improvement within non-residential districts and non-residential uses in residential districts, any multi-family housing or mixed development which incorporates residential units, athletic fields, and the construction of parking lots where such developments include the installation of new outdoor lighting fixtures or the replacement of existing lighting fixtures. It shall also apply to all proposed residential subdivisions and multi-family developments. All new construction projects shall have enough exterior lighting to meet the minimum safety and security requirements of the International Code Council (ICC), the National Electrical Code (NEC), Illuminating Engineering Society of North America (IESNA), and the North Carolina Building Code (NCBC) family of codes including the NC Energy Conservation Code. The replacement of an existing lighting fixture is defined as a change of the type of fixture; a change in the mounting height of a fixture on a pole, building, or other structure; or a change in the location of a lighting fixture. All of these applications require compliance with this section. Routine lighting fixture maintenance such as replacement of lamps, ballast, starter, photo control, or similar components will not constitute the need to comply with this ordinance, and is permitted provided such changes do not result in a ~~higher wattage or~~ higher lumen output.

155.609.3. Definitions

Direct Glare – The effect causing visual discomfort resulting from insufficiently shielded light sources in the field of view.

Direct Illumination – Center of a beam, or main beam angle of a lighting fixture.

Fixture – A gas-powered, battery-powered, solar-powered or electrically powered device that is secured to a wall, ceiling, pole, or post that is used to hold one or more lamps (or jets) and is intended to emit light.

Flood Light – Any light fixture or lamp that incorporates a reflector or a refractor to concentrate light output into a directed beam in a particular direction.

Footcandle (FC) – A quantitative unit measuring the amount of light cast onto a given point, measured as one lumen per square foot.

Full Cutoff Fixture – An outdoor light fixture shielded or constructed in such a manner that it emits no light above the horizontal plane of the fixture.

IESNA – The Illuminating Engineering Society of North America, a non-profit professional organization of lighting specialists that has established recommended design standards for various lighting applications. Unless otherwise specified in this ordinance, the IESNA RP-8 design criteria shall govern.

Illuminance– the areal density of the amount of visible light at a point on a surface; deprecated**: Illumination**

Initial (Burn-in) Illumination – The measured amount of illumination after approximately one hundred (100) hours of burn-in time.

Lamp – The component of a luminaire that produces the light.

Light Source – The element of a lighting fixture that is the point of origin of the lumens emitted by the fixture.

Light Trespass – Effects of light that strays from the intended purpose and becomes an annoyance, a nuisance, or a deterrent to visual performance. As such, light trespass should always be considered negative, unlike spill light, which can have positive or negative attributes. Light trespass is the encroachment of light causing annoyance, loss of privacy,

or other nuisance.

Lighting – see Street Lighting Unit

Lumen – A unit of ~~luminous flux.~~ visible light energy, emitted by a lamp. Electric lamps are typically rated for efficiency in terms of lumens emitted per watt of electrical energy consumed.

Luminaire – A complete lighting system including a lamp or lamps and a fixture.

Maintained Illumination – The amount of illumination below which the light level is not supposed to fall throughout system life measured at seventy percent (70%) of rated lamp life.

Mounted Fixture Height – The height of a complete fixture from the top point of any part of the fixture to the ground directly below where the supporting pole or wall or other support structure meets the ground surface.

Outdoor Lighting – The night-time illumination of an outside area or object by any man-made device located outdoors that produces light by any means.

Outdoor Performance Area – A facility other than a sports field or stadium predominantly or completely without roofed structures intended for spectators to observe educational, recreational, or cultural programming, and where tickets may be sold or fees collected for the activity. This may include but is not limited to an outdoor amphitheater, an outdoor movie theater, or similar facility with seating around the perimeter.

Shielding – A design feature or a device that is applied to a luminaire to prevent its luminous output from being visible from selected locations or horizontal and/or vertical angles.

Sky Glow – The brightening of the night sky that results from the reflection of radiation (visible and non-visible) scattered from the constituents of the atmosphere (gaseous molecules, aerosols, and particulate matter), in the direction of the observer. It comprises two separate components:

Natural sky glow – that part of the sky glow, which is attributable to radiation from celestial sources and luminescent processes in the earth's upper atmosphere.

Artificial sky glow - that part of the sky glow which is attributable to man-made sources of radiation (e.g., outdoor electric lighting), including radiation that is emitted directly upwards and radiation that is reflected from the earth's surface.

Spill Light – Visible light (usually unwanted) which extends beyond the limit of the area which the light is intended to illuminate.

Street Lighting Unit – The assembly of a pole or lamp post with a bracket and a luminaire

Temporary Light – Any lighting fixture or instrument producing light that can be moved or relocated in a moment's notice.

Wall Pack – A type of light fixture typically surface-mounted on a vertical wall surface.

Watts – The measure of the amount of energy (electricity) an ~~incandescent fixture~~ electrical lamp uses~~. Lamps are typically rated for efficiency by noting lumens per watt.~~

155.609.4. General Exemptions

The following lighting applications are exempt from the requirements of this section:

A. Emergency Lighting: Lighting required for public safety, in the reasonable determination of the inspection official holding authority.

B. DOT Lighting: Department of Transportation highway signage luminaires, which must comply with federal DOT standards.

C. Decorative Lighting: Low ~~wattage~~ lumen fixtures (lamps capable of producing under ~~eight [8] watts or~~ one hundred twenty ~~[100]~~ [120] lumens) used for holiday decorations and annual civic events, or temporary or permanent building tubing fixtures which follow architectural features on buildings.

D. Individual residential lighting that is not reviewed as part of a development plan.

E. Illumination being installed for temporary usage only, refer to § 155.609.10.G.

F. ~~Municipal lighting installed within public rights of way, for the principal purpose of illuminating streets, sidewalks, bicycle facilities, or multi-modal pathways within or adjacent to a public street, refer to § 155.609.10.H. No exemption shall apply to any lighting fixture located within a public right of way when~~

~~its purpose is to illuminate areas within or outside the right of way not directly associated with providing safety for one or more modes of transportation by the general public.~~

155.609.5. Light Measurement Technique

Measurements shall be made at three feet (3') above finished grade, with the light registering portion of the meter held parallel to the ground, pointing up for horizontal readings (for spill light) and at the brightest light source for maximum vertical light readings (for glare). The meter shall have an accuracy tolerance of no greater than plus or minus five percent (5%). Measurements shall be taken with a light meter that has been calibrated within two (2) years. Light levels are specified, calculated and measured in footcandles (FC), and should be taken after a one hundred (100) hour burn-in time, which will more accurately register the lighting levels affecting the subject site and adjacent properties and public rights-of-way.

155.609.6. Outdoor Illumination Plan Required

Any development activity that proposes outdoor illumination shall include the preparation and submission of a detailed outdoor illumination plan. For developments requiring preparation of a Landscape Plan, it shall be submitted as part of the Landscape Plan submission. For residential developments requiring Subdivision approval, it shall be submitted as part of the preliminary plan submittal. When ~~no~~ neither a landscape plan nor subdivision review would be necessary, an outdoor ~~lighting~~ illumination plan shall be submitted and approved prior to any permit for lighting installation. This outdoor illumination plan shall at a minimum include:

A. Lighting fixture cut sheets for all exterior lighting fixtures such as: type of unit, color of unit, wattage of unit, lumen output of unit, and the cut-off classification of the unit. Any lighting fixture requiring a pole on which to be mounted shall include the pole specification, clearly stating the proposed pole height (including concrete base).

B. A photometric (ISO foot-candle) site plan that shows typical foot-candle contours within all property lines. The submitted ~~lighting~~ illumination plan shall be in accordance with IESNA standards for uniformity, and show all maximum/minimum and average/minimum light levels. Points of light shown on the plan shall be a maximum of ten feet (10') apart. The light grid diagram may show the locations a maximum of thirty feet (30') apart within that portion of a site which is designed for and utilized as an existing or proposed vehicle loading or maneuvering area, outdoor storage area not accessible to the general public, or outdoor sports fields, courts, pools, or similar facility, any of which covers three (3) acres or more in area. The scaled site plan drawing shall show locations of all existing and proposed exterior lighting in relation to all property lines, building outlines, parking and curbing, required preserved or new landscape areas, and above ground storm water detention areas. If any proposed lighting fixture is indicated as being within close proximity to an existing or proposed tree, or that an existing or proposed tree may partially or completely block light from the fixture onto the intended surface, now or in the future, then a written explanation for the lighting fixture location must be included.

C. When a phased plan is proposed such that one or more building sites may not be clearly determined or the architecture of a building may not be confirmed, but grading or other land disturbing activity is proposed, then a note on the ~~lighting~~ illumination plan must be included to state this plan is a partial compliance document, and must clearly indicate what is included here and what remains to be submitted at a future date.

D. When a single-family subdivision includes common areas such as common open space, pathways, parking lots, ~~and~~ clubhouses and postal central box units (CBU's), ~~a lighting~~ an illumination plan as defined here is required as part of the preliminary plan review process for any subdivision of land. See § 155.405.9.A. Proposed Conditions and § 155.609.10 Standards for Specific Uses.

E. Plan certification is required by a licensed illumination professional holding the PE, LC or CLEP certification, or similar certification that indicates proficiency in the design of outdoor illumination, a lighting manufacturer, or the local electric utility. The project applicant's lighting designer shall verify the illumination plans meet the Town's design requirements and illumination standards.

155.609.7. General Illumination Design Standards

A. All new lighting installations and renovations to existing lighting fixtures adjacent to a residentially zoned or used property shall show the intent to limit horizontal light levels at property lines to ~~one (1)~~ one-half (0.5) footcandle initial (burn-in) illumination. All new lighting installations and renovations to existing lighting fixtures adjacent to a commercial property shall show the intent to limit footcandle (FC) levels at property lines to ~~two (2)~~ one (1) footcandle~~s~~ initial illumination. ~~In addition, vertical light readings shall not exceed one and one half (1.5) FC at any point along the site perimeter.~~ When the horizontal initial illumination level

exceeds these standards at any given point, then the average illumination level at the property line within fifty feet (50') of that point shall not exceed ~~one (1)~~ one-half (0.5) FC for adjacent residential or ~~two (2)~~ one (1) FC for adjacent nonresidential. In this case, ~~and~~ a written explanation why the limit cannot be met shall be provided on the plan~~.~~ and ~~T~~the applicant shall incorporate ~~additional evergreen plant materials~~ mitigation at the place where the perimeter ~~lighting~~ illumination level exceeds the given standards. The Planning and Development Director in consultation with the Public Works Director shall review for approval.

B. The maximum horizontal light level allowed at any point on a given parcel or property (with the exception of automobile dealerships, service stations and sporting facilities) shall not exceed twenty (20) footcandles initial. The minimum light level within any portion of a property, (other than single-family residential), which is intended to be utilized by residents, employees, customers or visitors shall be maintained at 0.50 footcandles. The maximum light level allowed at any point on an automobile dealership (display or parking area) shall not exceed fifty (50) footcandles initial. The maximum light level allowed under a canopy on a service station property shall not exceed thirty (30) footcandles initial. All outdoor sporting facilities shall be illuminated to IESNA standards, with great care taken to minimize spill light at the property lines. Refer to § 155.609.10.C for guidelines applying to outdoor sporting facilities.

C. All lighting fixtures ~~rated one hundred fifty (150) watts (incandescent lamp or appropriate~~ capable of producing 2,250 lumens ~~equivalent)~~ or less may be used without restriction to light distribution (non-cutoff classification) except when the luminaire creates direct glare perceptible to persons on a public right of way, or into the window openings of a residential dwelling unit. Care should be taken to minimize light trespass across property lines. Internal louvers or "glare shields" should be provided where the emitted light may become~~s~~ a hindrance. House side shields may also be effective in reducing light trespass.

D. All lighting fixtures ~~rated~~ capable of producing between 2,250 ~~one hundred seventy five (175) watts~~ and 6,000 ~~four hundred (400) watts (incandescent lamp or appropriate~~ lumens ~~equivalent)~~ shall be rated as a "full cutoff" type when placed in the aiming position for which they are designed.

E. All lighting fixtures capable of producing in excess of 6,000 ~~rated above four hundred (400) watts (incandescent lamp or appropriate~~ lumens ~~equivalent)~~ shall be listed as a "full cutoff" distribution only, and shall not emit any light above the horizontal plane of the fixture when placed in the aiming position for which they are designed. With exception of sporting facilities, the light source should not be visible (within reason) from adjacent properties, or the public street right-of-way (the exception being for public streetlights).

F. All building wall mounted lighting fixtures, or wall packs, shall be of the full cutoff type.

G. All lighting fixtures illuminating building facades, steeples, trees, billboards, signs, flags, etc. (vertical surfaces lighted from the bottom up) shall not emit in excess of 2,250 lumens ~~exceed one hundred fifty (150) watts (incandescent lamp or appropriate lumen equivalent),~~ with the exception of Department of Transportation highway signage luminaires, which must comply with federal DOT standards. Lighting fixtures shall be selected, located, aimed and shielded so that direct illumination is focused exclusively on the item being illuminated, and away from adjacent properties and the public street right-of-way. Only US, State or local Government flags may be lit with uplight.

H. All outdoor lighting fixtures placed on private property shall be located a minimum of ten feet (10') from a property or right-of-way line, and should be kept out of and at least two feet (2') away from any required perimeter or streetscape buffer, and tree save area. Where the required separation from a property or right-of-way line cannot be achieved due to on-site improvements, a written explanation of the alternative spacing shall be included on the plan drawing.

I. The layout of outdoor lighting fixtures shall be designed so that the poles do not interfere with other elements of the approved site plan such as trees, landscaping or parking. In general, poles shall be kept at least twenty feet (20') away from the trunk of any proposed large maturing tree and at least ten feet (10') away from any proposed small maturing tree. When a fixture is proposed near an existing preserved tree, the pole shall be no closer to the trunk than ten feet (10') from a small maturing tree or twenty feet (20') from a large maturing tree, or the tree's root protection zone, whichever is greater.

J. All floodlights shall include top and side shielding, and be aimed at least forty-five degrees (45°) below the horizontal.

K. To eliminate unneeded ~~lighting~~ illumination, exterior lighting systems are encouraged to include automatic timers, dimmers, sensors, or similar controls that will turn off lights during daylight hours and when the site is not occupied or open for business.

L. All fixtures and lamps shall be maintained in good working order, and replacement lamps and fixtures shall match approved plans. Landscaping shall be maintained in a manner that does not obstruct security lighting while not damaging or removing required landscape materials. Dark pockets on developed portions of any site other than single family residential should be corrected as part of the illumination plan. The property owner and occupant shall be jointly responsible for lighting system maintenance. The provisions of NCGS 136-32.2 shall also be the responsibility of the property owner and occupants.

155.609.8. Special Design Requirements

The following criteria shall be followed for all outdoor lighting designs. Submission of ~~lighting~~ illumination plans providing documentation that all of the following applicable criteria are met is necessary for approval. When any of these criteria cannot be met, or when sufficient documentation is not provided to clearly show compliance, then the Planning and Development Director may request further documentation prior to plan approval.

The maximum mounted fixture height (finished grade to top of fixture) for all ground mounted or building mounted lighting fixtures, ~~except those used for sporting facilities~~, shall be as follows:

A. Commercial and mixed use property – 32 feet

B. Residential property (single or multi-family) – including streetlighting – 20 feet

C. Pedestrian pathways or sidewalks separate from road rights-of-way – 16 feet

D. Public right-of-way for non-transportation-related lighting (i.e., signs) – 16 feet

E. Outdoor sports field and outdoor performance areas – 80 feet (unless approved prior to construction by the Board of Adjustment through a variance process)

155.609.9. Prohibited Uses of Lighting

A. Unshielded flood lights, except for residential floodlights capable of emitting 1,500 lumens ~~rated one hundred (100) watts (incandescent lamp or appropriate lumen equivalent)~~ or less, that are permitted but must be aimed towards the ground, and not towards adjacent properties.

B. Unshielded lamps or fixtures, except those used for private residential swimming pools, hot tubs, semi-enclosed decks or porches and similar accessory structures. See also §155.609.7.C and G for further standards.

C. Any flashing, moving, strobe effect, or twinkling within lighting fixtures. Changing of colors in architectural accent lighting only may occur when each hue displayed is constant for a minimum of eight (8) seconds and the change between colors is gradual, not immediate. Such fixtures shall be carefully aimed so as not to spill over onto ~~signs or other~~ site features or across property boundaries.

Note: The existing wattage levels contained within the UDO have been converted herein to the prescribed lumen levels above using the lumen/watt converter application found in www.interior-deluxe.com/lumens-to-watts-converter.html. The source cited on the site is the US Department of Energy.

155.609.10. Standards For Specific Uses

A. GAS AND SERVICE STATION CANOPIES

All lighting fixtures mounted on the underside of canopies must be "full-cutoff" classified, being either completely recessed/flush in the canopy, or having solid sides on a surface mounted fixture (canopy edges do not qualify as shielding).

The light source shall be metal halide, ceramic metal halide or light-emitting diode (LED).

Lighting levels under the canopy shall be no greater than thirty (30) footcandles. Areas outside the pump island canopy shall be illuminated as to provide proper safety to customers, but shall be limited and not exceed twenty (20) footcandles initial.

B. MOTOR VEHICLE DEALERSHIP STANDARDS

~~All lighting within a dealership display area shall be automatically reduced in light level by twenty five percent (25%) after 11:00 PM or within one (1) hour after close of daily business, whichever is earlier, and shall not return to full intensity before 8:00 AM.~~

Outdoor display areas where nighttime motor vehicle sales activity takes place and where accurate color perception of the vehicles by customers is required are allowed specific lighting level provisions. The display areas for new and used vehicles available for sale which are accessible to the general public during business operating hours shall not exceed fifty (50) foot candles. Other areas of the dealership property, such as inventory storage or repair vehicle storage, which are not intended for vehicle display, shall be designed to not exceed twenty (20) foot candles, although some portions within the site may slightly exceed this limit due to close proximity to a display area.

All exterior lighting within dealership display areas shall be automatically reduced in light level by twenty five percent (25%) after 11:00 PM or within one (1) hour after close of daily business, whichever is earlier, and shall not return to full intensity before 8:00 AM.

C. GENERAL OUTDOOR SPORTING FACILITY/PERFORMANCE AREA ~~LIGHTING~~ STANDARDS

The mounting height of outdoor sports field and outdoor performance area lighting fixtures shall not exceed eighty feet (80') from finished grade unless approved prior to construction by the Board of Adjustment through a variance process.

All outdoor sports field and outdoor performance area lighting fixtures shall be equipped with the manufacturer's maximum glare control package (louvers, shields, visors or similar devices). The fixtures must be aimed so that their beams are directed and fall within the primary playing field or performance area. Other on-site improvements, such as parking lots and concession or restroom facilities, should not rely on ~~lighting~~ illumination from the playing fields or performance area, but shall have separate lighting designed not to exceed twenty (20) foot candles initial ~~lighting~~ illumination levels when combined with any spill light from the fields, and not create any areas of public access and use which are void of a minimum of 0.5 FC maintained while the facility is open to the public.

The hours of operation for the sports field lighting system for any game or event shall not exceed 8:00AM to 11:00PM. An exception to this time limit may be granted for tournament play which has been weather-delayed, or when a tournament or production is scheduled in advance with a final game or program to occur beyond 11:00 PM. The facility's property owner and management/production authority for the tournament or event are jointly responsible for providing notice of potential time extension to the Town Manager and adjacent property owners/occupants. Written notice may be distributed to adjacent property owners/occupants by first class mail postmarked forty eight (48) hours in advance or door hang tags at least twenty four (24) hours in advance of the event. Written notice shall be provided to the Town Manager by e-mail and first class mail postmarked forty eight (48) hours in advance of the event.

Lighting of playing fields or performance areas shall only be turned on when activity is scheduled and occurring. When scheduled activities are completed prior to 11:00 PM, the field or performance area lights shall be turned off (when egress lighting is separate) or reduced in light level by at least fifty percent (50%) within one (1) hour after conclusion of play or other activity. When there are no scheduled activities at a sports field or performance area, then the lighting of them shall not be turned on.

The security and egress illumination lighting systems may remain turned on for any amount of time deemed necessary to remove people safely.

Light levels for sports field illumination shall comply with, but not exceed IESNA standards. Where new sporting facility lighting is installed adjacent to an existing residential property, the intent shall be made for all installations to limit property line light levels to a maximum horizontal level of three (3) foot candles initial, and a maximum vertical level of one and one-half (1.5) foot candles at the property line of any developed residential parcel. When not installed adjacent to a residential property, light levels at the property line shall not exceed a maximum horizontal level of four (4) foot candles initial and a maximum vertical level of two (2) foot candles at the property line of any developed parcel or right-of-way. All possible means of shielding must be applied if this level has not been met. Owner must prove to the appropriate permitting authority that these means have been exhausted, and the intent has been made to meet these goals.

Additional landscape screening may be necessary at select locations in order to reduce spill light on adjacent property. The ~~lighting~~ illumination plan shall include a notation that the owner shall be responsible for providing additional landscaping or other visual screening within nine (9) months of the verified light readings at identified points along the property line which are in excess of intended limits. This additional screening shall be approved as an amended landscape plan prior to installation.

D. STANDARDS FOR MIXED USE DEVELOPMENTS WITH MULTIPLE PARCELS

When a mixed use development exists or is proposed which would include two or more parcels sharing infrastructure improvements such as driveway curb cuts, parking lots, dumpster enclosures, and internal private drives, then the light level limits at interior perimeter property lines between non-residentially used parcels do not apply. All lots within the mixed use development which are not designed for exclusive residential use and not bisected by a public street shall be treated as a single tract for purposes of perimeter light levels. The light levels listed at § 155.609.7.A will apply to any property line within the mixed use development adjacent to a public right-of-way or adjacent to any parcel zone or used exclusively for residential purposes.

E. SECURITY LIGHTING

Outdoor security lighting should be designed to provide safety to a building occupant, while effectively allowing proper surveillance, though not to exceed lighting levels described in § 155.609.7.A and B.

The use of motion sensors, timers, photocells or other means to activate lighting during nighttime hours is required to conserve energy, provide safety, and promote compatibility between different land uses.

In order to direct light downward and minimize the amount of spill light, all security lighting fixtures shall be shielded and aimed so that the main beam is directed toward the ground or designated area where security lighting is needed.

F. ARCHITECTURAL ACCENT LIGHTING

Lighting fixtures used to accent architectural features, materials, colors, style of buildings, landscaping or art shall be located, aimed and shielded so that light is directed only on those features. Such fixtures shall be aimed or shielded to minimize light spill from the source in conformance with the luminaire standards. Accent lighting shall not generate excessive light levels, cause glare, or direct light beyond the façade onto neighboring properties, streets or night sky.

US, State or Government flags may be illuminated from below provided such lighting is focused primarily on the individual flag or flags, and to limit light spill into the night sky. These fixtures must conform with § 155.609.7.G.

G. TEMPORARY OUTDOOR LIGHTING

Any temporary outdoor lighting that conforms to the requirements of this section shall be allowed. Any temporary lighting that does not conform to these outdoor lighting standards may be permitted after considering: i) the public and/or private benefits that will arise from the temporary lighting; ii) any annoyance or safety problems that may result from the use of the temporary lighting, and iii) the duration of the temporary nonconforming lighting. The applicant shall provide a detailed description of the proposed temporary outdoor lighting (including the intended duration of its operation) to the Planning and Development Director for review and approval.

H. PUBLIC AND PRIVATE ROADWAYS

~~Where l~~Lighting ~~is~~ shall be provided~~,~~ on all streets, sidewalks, bicycle facilities, public gathering places, and multi-modal pathways in order to ~~should be sufficiently illuminated to~~ ensure the safety and security of ~~the street right-of-way and safety of~~ motorists, bicyclists and pedestrians present in those areas.

Street lighting must be included on all new residential (both public and private) and commercial streets. In addition, street lighting must be installed on the perimeter of ~~the~~ new development along a thoroughfare, arterial, or boulevard, as well as any collector road in locations where it does not currently exist.

For ~~a~~ new subdivisions, an illumination ~~lighting~~ plan (layout and overall streetlight design) is required in the subdivision design submittal documents as a part of the preliminary plan review process. The conditions contained within 155.609.6 (Outdoor Illumination Plan Required) shall be complied with. ~~Lighting~~ Illumination plan submittals shall include a scaled drawing showing the proposed placement and spacing of the fixtures, as well as the fixture specifications, ~~lamp,~~ pole types and heights and the methods of shielding being ~~used~~ proposed. See also § 155.609.6 Outdoor Illumination Plan Required.

The following are requirements as part of a residential Illumination Plan:

- Residential streetlight fixtures shall be of the LED type.
- Fixtures shall be full cutoff type.
- Maximum mounted outdoor fixture height for residential streetlights shall be 20 feet.
- Fixtures shall be installed on steel, fiberglass, aluminum, or wood poles.

While residential illuminating plan design should remain somewhat flexible in order to accommodate the unique environmental conditions (topography, building setbacks, tree canopy, roadway configuration, etc.) of each individual subdivision, the following guiding principles should be adhered to, to the extent practicable in developing lighting plans:

- Residential streetlights should be spaced at 150 to 200-foot intervals for single family detached developments and at 80 to 120-foot intervals for townhome and multi-family developments.
- Residential streetlight fixtures should be a single consistent style throughout the subdivision.
- A minimum of one streetlight should be placed at three-leg residential intersections and a minimum of two streetlights should be placed at four leg intersections.
- One streetlight should be placed at the end of each residential cul-de-sac and stub street.
- A streetlight should be placed on the outside of residential road curves.
- Specific attention should be paid to the lighting at locations of public assembly, such as at amenity areas (open spaces and playgrounds), at community clubhouses, trail heads, and at postal CBU's.
- Maximum lumens per fixture shall be 9500 lumens or 70W LED**.**
- Illumination plan should be designed so that average footcandle values on residential streets will be 0.4 or above.
- In areas of high pedestrian activity (multifamily or commercial) the minimum footcandle value on the public sidewalk shall be 0.5 to 2.0.

As part of the subdivision review process, developers are required to have the ~~roadway lighting~~ illumination plan ~~design~~ approved by the Public Works Department with design assistance provided by ~~from~~ the appropriate power company. The developers will then be required to~~, and shall then~~ submit the Town-approved design to the power company for its final approval prior to installation. ~~ing the assemblies. An accurate scale reference must be included on all layout drawings.~~

~~When lighting is provided, private roads and drives, and public or private off road pathways and greenways shall be sufficiently illuminated to ensure users' safety and security.~~

~~All new lighting fixtures must be installed on new steel, fiberglass, aluminum, wood or concrete poles.~~

ORDINANCE NO. _____ AMENDING CHAPTER 155.609

AN ORDINANCE AMENDING THE TOWN CODE WITH RESPECT TO THE UNIFIED DEVELOPMENT ORDINANCE REGARDING OUTDOOR ILLUMINATION.

BE IT ORDAINED, by the Town Board of Commissioners of the Town of Matthews, North Carolina:

SECTION 1. That Chapter 155, Section 609, is hereby amended as follows:

See Exhibit A attached hereto and incorporated herein for a more specific description of the amendment showing the changes, including additions and deletions.

SECTION 2. That this Ordinance shall become effective upon adoption.

This the _____ day of _____ 2020.

APPROVED AS TO FORM:

_____

Charles R. Buckley, III
Town Attorney

155.609. Outdoor Illumination

155.609.1. Purpose and Intent

It is the purpose and intent of this Outdoor Illumination Section to accomplish the following:

A. To encourage the use of lighting design practices and systems that will: *i*) minimize glare, light trespass and light pollution; *ii*) conserve energy and resources while maintaining nighttime safety, security and productivity; and *iii*) curtail the degradation of the nighttime visual environment.

B. To establish clear and comprehensive outdoor lighting standards with an emphasis on reducing glare and light trespass by requiring, in most circumstances, full cut-off (preferred) lighting fixtures.

C. To allow for outdoor lighting that is appropriate for the task and to establish light fixture height, lumen output, distribution and illumination limits that will help prevent light trespass to adjacent properties.

D. To establish specific standards for certain land uses that typically have unique lighting requirements, such as (but not limited to) automotive dealerships, service stations, and outdoor sporting facilities.

155.609.2. Applicability

This outdoor lighting standard applies to any development, expansion or improvement within non-residential districts and non-residential uses in residential districts, any multi-family housing or mixed development which incorporates residential units, athletic fields, and the construction of parking lots where such developments include the installation of new outdoor lighting fixtures or the replacement of existing lighting fixtures. It shall also apply to all proposed residential subdivisions and multi-family developments. All new construction projects shall have enough exterior lighting to meet the minimum safety and security requirements of the International Code Council (ICC), the National Electrical Code (NEC), Illuminating Engineering Society of North America (IESNA), and the North Carolina Building Code (NCBC) family of codes including the NC Energy Conservation Code. The replacement of an existing lighting fixture is defined as a change of the type of fixture; a change in the mounting height of a fixture on a pole, building, or other structure; or a change in the location of a lighting fixture. All of these applications require compliance with this section. Routine lighting fixture maintenance such as replacement of lamps, ballast, starter, photo control, or similar components will not constitute the need to comply with this ordinance, and is permitted provided such changes do not result in a higher lumen output.

155.609.3. Definitions

Direct Glare – The effect causing visual discomfort resulting from insufficiently shielded light sources in the field of view.

Direct Illumination – Center of a beam, or main beam angle of a lighting fixture.

Fixture – A gas-powered, battery-powered, solar-powered or electrically powered device that is secured to a wall, ceiling, pole, or post that is used to hold one or more lamps (or jets) and is intended to emit light.

Flood Light – Any light fixture or lamp that incorporates a reflector or a refractor to concentrate light output into a directed beam in a particular direction.

Footcandle (FC) – A quantitative unit measuring the amount of light cast onto a given point, measured as one lumen per square foot.

Full Cutoff Fixture – An outdoor light fixture shielded or constructed in such a manner that it emits no light above the horizontal plane of the fixture.

IESNA – The Illuminating Engineering Society of North America, a non-profit professional organization of lighting specialists that has established recommended design standards for various lighting applications. Unless otherwise specified in this ordinance, the IESNA RP-8 design criteria shall govern.

Illuminance– the areal density of the amount of visible light at a point on a surface; deprecated**: Illumination**

Initial (Burn-in) Illumination – The measured amount of illumination after approximately one hundred (100) hours of burn-in time.

Lamp – The component of a luminaire that produces the light.

Light Source – The element of a lighting fixture that is the point of origin of the lumens emitted by the fixture.

Light Trespass – Effects of light that strays from the intended purpose and becomes an annoyance, a nuisance, or a deterrent to visual performance. As such, light trespass should always be considered negative, unlike spill light, which can have positive or negative attributes. Light trespass is the encroachment of light causing annoyance, loss of privacy,

or other nuisance.

Lighting – see Street Lighting Unit

Lumen – A unit of visible light energy, emitted by a lamp. Electric lamps are typically rated for efficiency in terms of lumens emitted per watt of electrical energy consumed.

Luminaire – A complete lighting system including a lamp or lamps and a fixture.

Maintained Illumination – The amount of illumination below which the light level is not supposed to fall throughout system life measured at seventy percent (70%) of rated lamp life.

Mounted Fixture Height – The height of a complete fixture from the top point of any part of the fixture to the ground directly below where the supporting pole or wall or other support structure meets the ground surface.

Outdoor Lighting – The night-time illumination of an outside area or object by any man-made device located outdoors that produces light by any means.

Outdoor Performance Area – A facility other than a sports field or stadium predominantly or completely without roofed structures intended for spectators to observe educational, recreational, or cultural programming, and where tickets may be sold or fees collected for the activity. This may include but is not limited to an outdoor amphitheater, an outdoor movie theater, or similar facility with seating around the perimeter.

Shielding – A design feature or a device that is applied to a luminaire to prevent its luminous output from being visible from selected locations or horizontal and/or vertical angles.

Sky Glow – The brightening of the night sky that results from the reflection of radiation (visible and non-visible) scattered from the constituents of the atmosphere (gaseous molecules, aerosols, and particulate matter), in the direction of the observer. It comprises two separate components:

Natural sky glow – that part of the sky glow, which is attributable to radiation from celestial sources and luminescent processes in the earth's upper atmosphere.

Artificial sky glow - that part of the sky glow which is attributable to man-made sources of radiation (e.g., outdoor electric lighting), including radiation that is emitted directly upwards and radiation that is reflected from the earth's surface.

Spill Light – Visible light (usually unwanted) which extends beyond the limit of the area which the light is intended to illuminate.

Street Lighting Unit – The assembly of a pole or lamp post with a bracket and a luminaire

Temporary Light – Any lighting fixture or instrument producing light that can be moved or relocated in a moment's notice.

Wall Pack – A type of light fixture typically surface-mounted on a vertical wall surface.

Watts – The measure of the amount of energy (electricity) an electrical lamp uses.

155.609.4. General Exemptions

The following lighting applications are exempt from the requirements of this section:

A. Emergency Lighting: Lighting required for public safety, in the reasonable determination of the inspection official holding authority.

B. DOT Lighting: Department of Transportation highway signage luminaires, which must comply with federal DOT standards.

C. Decorative Lighting: Low lumen fixtures (lamps capable of producing under one hundred twenty [120] lumens) used for holiday decorations and annual civic events, or temporary or permanent building tubing fixtures which follow architectural features on buildings.

D. Individual residential lighting that is not reviewed as part of a development plan.

E. Illumination being installed for temporary usage only, refer to § 155.609.10.G.

155.609.5. Light Measurement Technique

Measurements shall be made at three feet (3') above finished grade, with the light registering portion of the meter held parallel to the ground, pointing up for horizontal readings (for spill light) and at the brightest light source for maximum vertical light readings (for glare). The meter shall have an accuracy tolerance of no greater than plus or minus five percent (5%). Measurements shall be taken with a light meter that has been calibrated within two (2) years. Light

levels are specified, calculated and measured in footcandles (FC), and should be taken after a one hundred (100) hour burn-in time, which will more accurately register the lighting levels affecting the subject site and adjacent properties and public rights-of-way.

155.609.6. Outdoor Illumination Plan Required

Any development activity that proposes outdoor illumination shall include the preparation and submission of a detailed outdoor illumination plan. For developments requiring preparation of a Landscape Plan, it shall be submitted as part of the Landscape Plan submission. For residential developments requiring Subdivision approval, it shall be submitted as part of the preliminary plan submittal. When neither a landscape plan nor subdivision review would be necessary, an outdoor illumination plan shall be submitted and approved prior to any permit for lighting installation. This outdoor illumination plan shall at a minimum include:

A. Lighting fixture cut sheets for all exterior lighting fixtures such as: type of unit, color of unit, wattage of unit, lumen output of unit, and the cut-off classification of the unit. Any lighting fixture requiring a pole on which to be mounted shall include the pole specification, clearly stating the proposed pole height (including concrete base).

B. A photometric (ISO foot-candle) site plan that shows typical foot-candle contours within all property lines. The submitted illumination plan shall be in accordance with IESNA standards for uniformity, and show all maximum/minimum and average/minimum light levels. Points of light shown on the plan shall be a maximum of ten feet (10') apart. The light grid diagram may show the locations a maximum of thirty feet (30') apart within that portion of a site which is designed for and utilized as an existing or proposed vehicle loading or maneuvering area, outdoor storage area not accessible to the general public, or outdoor sports fields, courts, pools, or similar facility, any of which covers three (3) acres or more in area. The scaled site plan drawing shall show locations of all existing and proposed exterior lighting in relation to all property lines, building outlines, parking and curbing, required preserved or new landscape areas, and above ground storm water detention areas. If any proposed lighting fixture is indicated as being within close proximity to an existing or proposed tree, or that an existing or proposed tree may partially or completely block light from the fixture onto the intended surface, now or in the future, then a written explanation for the lighting fixture location must be included.

C. When a phased plan is proposed such that one or more building sites may not be clearly determined or the architecture of a building may not be confirmed, but grading or other land disturbing activity is proposed, then a note on the illumination plan must be included to state this plan is a partial compliance document, and must clearly indicate what is included here and what remains to be submitted at a future date.

D. When a single-family subdivision includes common areas such as common open space, pathways, parking lots, clubhouses and postal central box units (CBU's), an illumination plan as defined here is required as part of the preliminary plan review process for any subdivision of land. See § 155.405.9.A. Proposed Conditions and § 155.609.10 Standards for Specific Uses.

E. Plan certification is required by a licensed illumination professional holding the PE, LC or CLEP certification**,** or similar certification that indicates proficiency in the design of outdoor illumination, a lighting manufacturer, or the local electric utility. The project applicant's lighting designer shall verify the illumination plans meet the Town's design requirements and illumination standards.

155.609.7. General Illumination Design Standards

A. All new lighting installations and renovations to existing lighting fixtures adjacent to a residentially zoned or used property shall show the intent to limit horizontal light levels at property lines to one-half (0.5) footcandle initial (burn-in) illumination. All new lighting installations and renovations to existing lighting fixtures adjacent to a commercial property shall show the intent to limit footcandle (FC) levels at property lines to one (1) footcandle~~s~~ initial illumination. When the horizontal initial illumination level exceeds these standards at any given point, then the average illumination level at the property line within fifty feet (50') of that point shall not exceed one-half (0.5) FC for adjacent residential or one (1) FC for adjacent nonresidential. In this case, a written explanation why the limit cannot be met shall be provided on the plan and the applicant shall incorporate mitigation at the place where the perimeter illumination level exceeds the given standards. The Planning and Development Director in consultation with the Public Works Director shall review for approval.

B. The maximum horizontal light level allowed at any point on a given parcel or property (with the exception of automobile dealerships, service stations and sporting facilities) shall not exceed twenty (20) footcandles initial. The minimum light level within any portion of a property, (other than single-family residential), which is intended to be utilized by residents, employees, customers or visitors shall be maintained at 0.50

footcandles. The maximum light level allowed at any point on an automobile dealership (display or parking area) shall not exceed fifty (50) footcandles initial. The maximum light level allowed under a canopy on a service station property shall not exceed thirty (30) footcandles initial. All outdoor sporting facilities shall be illuminated to IESNA standards, with great care taken to minimize spill light at the property lines. Refer to § 155.609.10.C for guidelines applying to outdoor sporting facilities.

C. All lighting fixtures capable of producing 2,250 lumens or less may be used without restriction to light distribution (non-cutoff classification) except when the luminaire creates direct glare perceptible to persons on a public right of way, or into the window openings of a residential dwelling unit. Care should be taken to minimize light trespass across property lines. Internal louvers or "glare shields" should be provided where the emitted light may become a hindrance. House side shields may also be effective in reducing light trespass.

D. All lighting fixtures capable of producing between 2,250 and 6,000 lumens shall be rated as a "full cutoff" type when placed in the aiming position for which they are designed.

E. All lighting fixtures capable of producing in excess of 6,000 lumens shall be listed as a "full cutoff" distribution only, and shall not emit any light above the horizontal plane of the fixture when placed in the aiming position for which they are designed. With exception of sporting facilities, the light source should not be visible (within reason) from adjacent properties, or the public street right-of-way (the exception being for public streetlights).

F. All building wall mounted lighting fixtures, or wall packs, shall be of the full cutoff type.

G. All lighting fixtures illuminating building facades, steeples, trees, billboards, signs, flags, etc. (vertical surfaces lighted from the bottom up) shall not emit in excess of 2,250 lumens with the exception of Department of Transportation highway signage luminaires, which must comply with federal DOT standards. Lighting fixtures shall be selected, located, aimed and shielded so that direct illumination is focused exclusively on the item being illuminated, and away from adjacent properties and the public street right-of-way. Only US, State or local Government flags may be lit with uplight.

H. All outdoor lighting fixtures placed on private property shall be located a minimum of ten feet (10') from a property or right-of-way line, and should be kept out of and at least two feet (2') away from any required perimeter or streetscape buffer, and tree save area. Where the required separation from a property or right-of-way line cannot be achieved due to on-site improvements, a written explanation of the alternative spacing shall be included on the plan drawing.

I. The layout of outdoor lighting fixtures shall be designed so that the poles do not interfere with other elements of the approved site plan such as trees, landscaping or parking. In general, poles shall be kept at least twenty feet (20') away from the trunk of any proposed large maturing tree and at least ten feet (10') away from any proposed small maturing tree. When a fixture is proposed near an existing preserved tree, the pole shall be no closer to the trunk than ten feet (10') from a small maturing tree or twenty feet (20') from a large maturing tree, or the tree's root protection zone, whichever is greater.

J. All floodlights shall include top and side shielding, and be aimed at least forty-five degrees (45°) below the horizontal.

K. To eliminate unneeded illumination, exterior lighting systems are encouraged to include automatic timers, dimmers, sensors, or similar controls that will turn off lights during daylight hours and when the site is not occupied or open for business.

L. All fixtures and lamps shall be maintained in good working order, and replacement lamps and fixtures shall match approved plans. Landscaping shall be maintained in a manner that does not obstruct security lighting while not damaging or removing required landscape materials. Dark pockets on developed portions of any site other than single family residential should be corrected as part of the illumination plan. The property owner and occupant shall be jointly responsible for lighting system maintenance. The provisions of NCGS 136-32.2 shall also be the responsibility of the property owner and occupants.

155.609.8. Special Design Requirements

The following criteria shall be followed for all outdoor lighting designs. Submission of illumination plans providing documentation that all of the following applicable criteria are met is necessary for approval. When any of these criteria cannot be met, or when sufficient documentation is not provided to clearly show compliance, then the Planning and Development Director may request further documentation prior to plan approval.

The maximum mounted fixture height (finished grade to top of fixture) for all ground mounted or building mounted lighting fixtures, shall be as follows:

A. Commercial and mixed use property – 32 feet

B. Residential property (single or multi-family) – including streetlighting – 20 feet

C. Pedestrian pathways or sidewalks separate from road rights-of-way – 16 feet

D. Public right-of-way for non-transportation-related lighting (i.e., signs) – 16 feet

E. Outdoor sports field and outdoor performance areas – 80 feet (unless approved prior to construction by the Board of Adjustment through a variance process)

155.609.9. Prohibited Uses of Lighting

A. Unshielded flood lights, except for residential floodlights capable of emitting 1,500 lumens or less, that are permitted but must be aimed towards the ground, and not towards adjacent properties.

B. Unshielded lamps or fixtures, except those used for private residential swimming pools, hot tubs, semi-enclosed decks or porches and similar accessory structures. See also §155.609.7.C and G for further standards.

C. Any flashing, moving, strobe effect, or twinkling within lighting fixtures. Changing of colors in architectural accent lighting only may occur when each hue displayed is constant for a minimum of eight (8) seconds and the change between colors is gradual, not immediate. Such fixtures shall be carefully aimed so as not to spill over onto site features or across property boundaries.

Note: The existing wattage levels contained within the UDO have been converted herein to the prescribed lumen levels above using the lumen/watt converter application found in www.interior-deluxe.com/lumens-to-watts-converter.html. The source cited on the site is the US Department of Energy.

155.609.10. Standards For Specific Uses

A. GAS AND SERVICE STATION CANOPIES

All lighting fixtures mounted on the underside of canopies must be "full-cutoff" classified, being either completely recessed/flush in the canopy, or having solid sides on a surface mounted fixture (canopy edges do not qualify as shielding).

The light source shall be metal halide, ceramic metal halide or light-emitting diode (LED).

Lighting levels under the canopy shall be no greater than thirty (30) footcandles. Areas outside the pump island canopy shall be illuminated as to provide proper safety to customers, but shall be limited and not exceed twenty (20) footcandles initial.

B. MOTOR VEHICLE DEALERSHIP STANDARDS

Outdoor display areas where nighttime motor vehicle sales activity takes place and where accurate color perception of the vehicles by customers is required are allowed specific lighting level provisions. The display areas for new and used vehicles available for sale which are accessible to the general public during business operating hours shall not exceed fifty (50) foot candles. Other areas of the dealership property, such as inventory storage or repair vehicle storage, which are not intended for vehicle display, shall be designed to not exceed twenty (20) foot candles, although some portions within the site may slightly exceed this limit due to close proximity to a display area.

All exterior lighting within dealership display areas shall be automatically reduced in light level by twenty five percent (25%) after 11:00 PM or within one (1) hour after close of daily business, whichever is earlier, and shall not return to full intensity before 8:00 AM.

C. GENERAL OUTDOOR SPORTING FACILITY/PERFORMANCE AREA STANDARDS

The mounting height of outdoor sports field and outdoor performance area lighting fixtures shall not exceed eighty feet (80') from finished grade unless approved prior to construction by the Board of Adjustment through a variance process.

All outdoor sports field and outdoor performance area lighting fixtures shall be equipped with the manufacturer's maximum glare control package (louvers, shields, visors or similar devices). The fixtures must be aimed so that their beams are directed and fall within the primary playing field or performance area. Other on-site improvements, such

as parking lots and concession or restroom facilities, should not rely on illumination from the playing fields or performance area, but shall have separate lighting designed not to exceed twenty (20) foot candles initial illumination levels when combined with any spill light from the fields, and not create any areas of public access and use which are void of a minimum of 0.5 FC maintained while the facility is open to the public.

The hours of operation for the sports field lighting system for any game or event shall not exceed 8:00AM to 11:00PM. An exception to this time limit may be granted for tournament play which has been weather-delayed, or when a tournament or production is scheduled in advance with a final game or program to occur beyond 11:00 PM. The facility's property owner and management/production authority for the tournament or event are jointly responsible for providing notice of potential time extension to the Town Manager and adjacent property owners/occupants. Written notice may be distributed to adjacent property owners/occupants by first class mail postmarked forty-eight (48) hours in advance or door hang tags at least twenty-four (24) hours in advance of the event. Written notice shall be provided to the Town Manager by e-mail and first class mail postmarked forty-eight (48) hours in advance of the event.

Lighting of playing fields or performance areas shall only be turned on when activity is scheduled and occurring. When scheduled activities are completed prior to 11:00 PM, the field or performance area lights shall be turned off (when egress lighting is separate) or reduced in light level by at least fifty percent (50%) within one (1) hour after conclusion of play or other activity. When there are no scheduled activities at a sports field or performance area, then the lighting of them shall not be turned on.

The security and egress illumination lighting systems may remain turned on for any amount of time deemed necessary to remove people safely.

Light levels for sports field illumination shall comply with, but not exceed IESNA standards. Where new sporting facility lighting is installed adjacent to an existing residential property, the intent shall be made for all installations to limit property line light levels to a maximum horizontal level of three (3) foot candles initial, and a maximum vertical level of one and one-half (1.5) foot candles at the property line of any developed residential parcel. When not installed adjacent to a residential property, light levels at the property line shall not exceed a maximum horizontal level of four (4) foot candles initial and a maximum vertical level of two (2) foot candles at the property line of any developed parcel or right-of-way. All possible means of shielding must be applied if this level has not been met. Owner must prove to the appropriate permitting authority that these means have been exhausted, and the intent has been made to meet these goals.

Additional landscape screening may be necessary at select locations in order to reduce spill light on adjacent property. The illumination plan shall include a notation that the owner shall be responsible for providing additional landscaping or other visual screening within nine (9) months of the verified light readings at identified points along the property line which are in excess of intended limits. This additional screening shall be approved as an amended landscape plan prior to installation.

D. STANDARDS FOR MIXED USE DEVELOPMENTS WITH MULTIPLE PARCELS

When a mixed use development exists or is proposed which would include two or more parcels sharing infrastructure improvements such as driveway curb cuts, parking lots, dumpster enclosures, and internal private drives, then the light level limits at interior perimeter property lines between non-residentially used parcels do not apply. All lots within the mixed use development which are not designed for exclusive residential use and not bisected by a public street shall be treated as a single tract for purposes of perimeter light levels. The light levels listed at § 155.609.7.A will apply to any property line within the mixed use development adjacent to a public right-of-way or adjacent to any parcel zone or used exclusively for residential purposes.

E. SECURITY LIGHTING

Outdoor security lighting should be designed to provide safety to a building occupant, while effectively allowing proper surveillance, though not to exceed lighting levels described in § 155.609.7.A and B.

The use of motion sensors, timers, photocells or other means to activate lighting during nighttime hours is required to conserve energy, provide safety, and promote compatibility between different land uses.

In order to direct light downward and minimize the amount of spill light, all security lighting fixtures shall be shielded and aimed so that the main beam is directed toward the ground or designated area where security lighting is needed.

F. ARCHITECTURAL ACCENT LIGHTING

Lighting fixtures used to accent architectural features, materials, colors, style of buildings, landscaping or art shall be located, aimed and shielded so that light is directed only on those features. Such fixtures shall be aimed or shielded to minimize light spill from the source in conformance with the luminaire standards. Accent lighting shall not generate excessive light levels, cause glare, or direct light beyond the façade onto neighboring properties, streets or night sky.

US, State or Government flags may be illuminated from below provided such lighting is focused primarily on the individual flag or flags, and to limit light spill into the night sky. These fixtures must conform with § 155.609.7.G.

G. TEMPORARY OUTDOOR LIGHTING

Any temporary outdoor lighting that conforms to the requirements of this section shall be allowed. Any temporary lighting that does not conform to these outdoor lighting standards may be permitted after considering: i) the public and/or private benefits that will arise from the temporary lighting; ii) any annoyance or safety problems that may result from the use of the temporary lighting, and iii) the duration of the temporary nonconforming lighting. The applicant shall provide a detailed description of the proposed temporary outdoor lighting (including the intended duration of its operation) to the Planning and Development Director for review and approval.

H. PUBLIC AND PRIVATE ROADWAYS

Lighting ~~is~~ shall be provided~~,~~ on all streets, sidewalks, bicycle facilities, public gathering places, and multi-modal pathways in order ensure the safety and security of motorists, bicyclists and pedestrians present in those areas.

Street lighting must be included on all new residential (both public and private) and commercial streets. In addition, street lighting must be installed on the perimeter of new development along a thoroughfare, arterial, or boulevard, as well as any collector road in locations where it does not currently exist.

For new subdivisions, an illumination plan (layout and overall streetlight design) is required in the subdivision design submittal documents as a part of the preliminary plan review process. The conditions contained within 155.609.6 (Outdoor Illumination Plan Required) shall be complied with. Illumination plan submittals shall include a scaled drawing showing the proposed placement and spacing of the fixtures, as well as the fixture specifications, pole types and heights and the methods of shielding being proposed. See also § 155.609.6 Outdoor Illumination Plan Required.

The following are requirements as part of a residential Illumination Plan:

- Residential streetlight fixtures shall be of the LED type.
- Fixtures shall be full cutoff type.
- Maximum mounted outdoor fixture height for residential streetlights shall be 20 feet.
- Fixtures shall be installed on steel, fiberglass, aluminum, or wood poles.

While residential illuminating plan design should remain somewhat flexible in order to accommodate the unique environmental conditions (topography, building setbacks, tree canopy, roadway configuration, etc.) of each individual subdivision, the following guiding principles should be adhered to, to the extent practicable in developing lighting plans:

- Residential streetlights should be spaced at 150 to 200-foot intervals for single family detached developments and at 80 to 120-foot intervals for townhome and multi-family developments.
- Residential streetlight fixtures should be a single consistent style throughout the subdivision.
- A minimum of one streetlight should be placed at three-leg residential intersections and a minimum of two streetlights should be placed at four leg intersections.
- One streetlight should be placed at the end of each residential cul-de-sac and stub street.
- A streetlight should be placed on the outside of residential road curves.
- Specific attention should be paid to the lighting at locations of public assembly, such as at amenity areas (open spaces and playgrounds), at community clubhouses, trail heads, and at postal CBU's.
- Maximum lumens per fixture shall be 9500 lumens or 70W LED**.**
- Illumination plan should be designed so that average footcandle values on residential streets will be 0.4 or above.

- In areas of high pedestrian activity (multifamily or commercial) the minimum footcandle value on the public sidewalk shall be 0.5 to 2.0.

As part of the subdivision review process, developers are required to have the illumination plan ~~design~~ approved by the Public Works Department with design assistance provided by the appropriate power company. The developers will then be required to submit the Town-approved design to the power company for its final approval prior to installation.