



CITY OF WEST LAKE HILLS, TEXAS
NOTICE OF ZONING & PLANNING COMMISSION (ZAPCO) REGULAR MEETING
Wednesday, October 16, 2024 at 6:30 PM

Notice is hereby given that the Zoning and Planning Commission (ZAPCO) of the City of West Lake Hills, Texas, will hold a Regular Meeting on the 16th day of October 2024 at 6:30 p.m., in the Council Chamber, Municipal Building, 911 Westlake Drive, West Lake Hills, Texas, at which time the following items will be discussed, to-wit:

REMOTE ACCESS - Join Zoom Meeting at <https://us02web.zoom.us/j/3499549035>

Or via telephone: Dial (346) 248-7799

Meeting ID: 349 954 9035

If you wish to speak during the meeting or provide written comments, please email your name, phone number, comments, and the item number you wish to speak on to planner@westlakehills.gov by 1:00 P.M. on October 16, 2024

1. Call to Order. Chairman Robert Meisel.
2. Citizen Communications The Commission welcomes public comments at this point on any issue. If the issue is listed on the agenda, the speaker may choose to comment during the Public Comment period or when the specific agenda item is taken up by the Commission later in the meeting. The Commission cannot respond to or discuss matters not listed on the agenda. The Commission may provide factual information, refer the item to a staff member, or request the item be added to a future meeting agenda. Speakers shall limit their comments to five (5) minutes each.
3. Consent Agenda The following items are considered to be self-explanatory by the Commission and will be enacted with one motion. There will be no separate discussion of these items unless a Commission Member or citizen so requests.
 - a. Approval of the September 18, 2024 Zoning and Planning Commission Minutes
 - b. Report of previous ZAPCO cases acted on by the BOA/City Council
4. Public Hearing 3638 Bee Cave Rd Suite 104 – Discuss and make a recommendation on a variance request to:
 1. Section 24.03.006 (a) Maximum lumen limit – exceeding 6,000 lumen limit per luminaire; and

2. Section 22.03.006 (a) Maximum lumen limit – exceeding 2.5 lumens per square foot; and
3. Section 24.03.006 (b) General Parking and pedestrian areas – exceeding the limit of zero up-lighting for a non-shielded luminaire; and
4. Section 24.006 (d) Maximum Color Temperature – exceeding color temperature rating of 3500 K.
5. Section 24.03.004 (a) Shielding – not providing shielding of the luminaires.

for the installation of an Outdoor Digital Display. (West Lake Hills Code, Section 24.03.004 Standards for all districts and 24.03.006 Standards for O, GUI, B-1 and B-2 districts).

Applicant: AP ATX Restaurant Holding, LLC, (Austin’s Pizza Westlake)

5. Adjournment. Chairman Robert Meisel.

By Jennifer C. Bills, Director of Building &
Development Services

Certificate

I certify that the above Notice of the October 16, 2024 Zoning & Planning Commission Meeting was posted on the bulletin board at the Municipal Building, 911 Westlake Drive, West Lake Hills, Texas on Friday, October 11, 2024 at 5:00 p.m. and will remain posted continuously until said meeting is convened.

By Joel Sherrouse, Development Coordinator

The City of West Lake Hills is committed to compliance with the Americans with Disabilities Act. Reasonable accommodations and equal access to communications will be provided upon request.

All items on the agenda are for discussion and/or action. ZAPCO reserves the right to adjourn into executive session at any time during the course of this meeting to discuss any of the matters listed above, as authorized by Texas Government Code Sections 551.071 (Consultation with Attorney), 551.072 (Deliberations about Real Property), 551.073 (Deliberations about Gifts and Donations), 551.074 (Personnel Matters), 551.076 (Deliberations about Security Devices), and 551.086 (Economic Development).

City of West Lake Hills

MINUTES OF A ZONING & PLANNING COMMISSION (ZAPCO)

REGULAR MEETING

Wednesday, September 18, 2024 at 6:30 PM

1. **Call to Order: Chairman Robert Meisel**

- a. Meeting begins at 6:30pm
- b. Roll Call
 - o Chair Robert Meisel: Present
 - o Vice-Chair Jim Pledger: Present
 - o Commissioner Julia Webber: Absent (Excused)
 - o Commissioner Karen Bartoletti: Absent (Excused)
 - o Commissioner Patrick Stewart: Present
 - o Commissioner Laurie Maccini: Present

2. **Citizen Communications:**

- a. **None initially**
- b. **Re-opened at 6:39pm after item 4**
 - o **Deborah Humphrey:** Concerned about property near her home on Skyline removing trees and lack of response from inquiry regarding police incident in the area of her home
 - 1. Staff will follow up with Ms Humphrey

3. **Consent Agenda:** The following items are considered to be self-explanatory by the Commission and will be enacted with one motion. There will be no separate discussion of these items unless a Commission Member or citizen so requests.

- a. Approval of the August 21, 2024 Zoning and Planning Commission minutes
- b. Report of the Previous ZAPCO cases acted on by the BOA/City Council
- c. **Action:** Commissioner Pledger moves for approval of the Consent Agenda
 - i. Commissioner Stewart Seconds
 - ii. Motion carries unanimously 3:0

4. **Land Use:** Consider action to make a recommendation for the Replat of Lot 18, Stonehedge Estates, Block "P" and all of a called 0.64 acre tract of land situated in the A.D.L. Benham Survey No. 503, Abstract No. 75 (Section 36.01.018 of the West Lake Hills Code).

Applicant: Motoki Hiromatsu, Point B Design Group

a. Staff Report:

- i. Director Bills presents staff briefing on the proposed subdivision and remaining requirements for replat approval

b. Public Comments:

- i. **Deborah Humphrey** – has unrelated questions about development near her home
 - 1. Agenda item 2 to be re-opened following recommendation

c. Discussion: None

- a. **Action:** Commissioner Pledger moves that the variance request be forwarded to the City Council with a recommendation of Conditional approval per staff report
 - i. Commissioner Maccini Seconds
 - ii. Motion **carries** Unanimously (3-0)

Recommendation will be forwarded to City Council for consideration on October 9, 2024.

5. Administration Update from Mayor Vaughan regarding future amendments to the building and development codes.

- a. Mayor Vaughan outlined a 3-step process for council and ZAPCO to produce strategic plan, followed by public input.

b. Public Comments: None

c. Discussion:

- i. Regarding tree protections, the question of unlicensed tree companies arose.
 - 1. Staff explained that tree removal falls under general contractor requirements and that there is no license
 - 2. Most tree-trimming is for projects costing less than \$25,000, so contractor registration isn't required for most tree trimming companies

d. Action: None required

6. Public Hearing: Discuss and make recommendation on amendments to Section 22.03.276, Setbacks for accessory structures, related to allowed encroachments and

Section 1.01.003 Definitions and rules of construction - Impervious Cover, related to eaves and overhangs.

b. **Staff Report:**

- i. Director Bills delivers presentation on proposed code amendments

c. **Public Comment:**

- i. **None**

d. **Discussion:**

- i. **Commissioner Meisel:** Can we address propane tanks?

- 1. Propane tanks are regulated by the Texas Railroad Commission and municipalities are expressly prohibited from regulating their location and installation.

- ii. **Commissioner Maccini**

- 1. How are we defining appropriate noise screening for equipment?
 - a. Can we define a decibel level?

- iii. **Commissioner Stewart:** How soon will these items take effect?

- 1. As soon as ordinance read

- e. **Action:** Commissioner Maccini moves that the variance request be forwarded to the Board of Adjustment with a recommendation of **approval** for all code amendments

- i. Commissioner Pledger Seconds
- ii. Motion **carries** Unanimously (3-0)

Recommendation will be forwarded to the City Council for final consideration on October 9, 2024.

7. **Adjournment:**

- f. **Chair Meisel** adjourns the meeting at **7:17pm**

Respectfully submitted,

ROBERT MEISEL, CHAIRMAN

ATTEST:

Development Coordinator Joel Sherrouse

These minutes were approved on _____, 2024.

DRAFT



City of West Lake Hills Zoning & Planning Commission

AGENDA REPORT

Meeting Date:	September 18, 2024	Item Number:	3b
	Building & Development		
Department:	Services		
Prepared By:	Jennifer C. Bills	Cost / Budget:	None
Exhibits:	N/A	Source of Funds:	N/A

Subject

Report of Previous ZAPCO cases acted on by the BOA/City Council.

Discussion

Since the August 21, 2024 ZAPCO meeting the following cases forwarded by ZAPCO were considered at City Council/BOA.

Board of Adjustment

- a. No items forwarded from ZAPCO

City Council

- a. Replat of Lot 18, Stonehedge Estates, Block "P" and all of a called 0.64 acre tract of land situated in the A.D.L. Benham Survey No. 503, Abstract No. 75
 - a. Approved with Conditions – Applicant will need to resubmit plat for final review and consideration before Council
- b. Amendments to Sections 22.03.276 – setback for accessory structures related to allowed encroachments and 1.01.003 – Definitions and rules of construction – Impervious Cover, related to eaves and overhangs
 - a. Approved by Council



City of West Lake Hills Zoning & Planning Commission

AGENDA REPORT

Meeting Date:	October 16, 2024	Item Number:	4
	Building and Development		
Department:	Services		
Prepared By:	Jennifer C. Bills	Cost / Budget:	None
Exhibits:	See Attached	Source of Funds:	N/A

Subject

3638 Bee Cave Rd Suite 104 – Discuss and make a recommendation on a variance request to:

1. Section 24.03.006 (a) Maximum lumen limit – exceeding 6,000 lumen limit per luminaire; and
2. Section 22.03.006 (a) Maximum lumen limit – exceeding 2.5 lumens per square foot; and
3. Section 24.03.006 (b) General Parking and pedestrian areas – exceeding the limit of zero up-lighting for a non-shielded luminaire; and
4. Section 24.006 (d) Maximum Color Temperature – exceeding color temperature rating of 3500 K.
5. Section 24.03.004 (a) Shielding – not providing shielding of the luminaires.

for the installation of an Outdoor Digital Display. (West Lake Hills Code, Section 24.03.004 Standards for all districts and 24.03.006 Standards for O, GUI, B-1 and B-2 districts).

Applicant: AP ATX Restaurant Holding, LLC, (Austin's Pizza Westlake)

Recommendation

Staff recommend denial of all variances based on lack of hardship. If the ZAPCO and City Council would like to allow outdoor displays, adopting code changes and standards that are compliant with the International DarkSky Association (IDA) would be the appropriate avenue, not a variance. The variance will run with the property, so making a determination for this specific site without regard to the effect on the dark sky goals is counter to the intent to become a DarkSky Community. Additionally, if this restaurant changes ownership or uses, the next owner may use the screen for different purposes than the current business owner intends.

The ZAPCO recommendation for this item will be forwarded to the November 13, 2024 Board of Adjustment meeting for consideration.

Discussion

Property Information, Zoning & Site Characteristics:

Business Owner: Eddy Patterson, Austin's Pizza

Legal Description: Lot 1 Resubdivision of lot 19, Las Brisas Subdivision, and Block A, Westwood Section 1

Lot Size: 3.169 acres

Zoning: B-2 – Business 2

Hours of Operation: 10:00 am – 9:00 pm Monday through Sunday (per SUP application)

The properties surrounding the subject property are zoned B-2 Business 2, O-Office, and R-1 One Family.

Background & Analysis:

The business owners are requesting multiple variances for an outdoor display that they have already installed (Attachment 1). The structural frame for the display was installed prior to any applications being submitted to the city. The application for the display was submitted on June 10, 2024, and has not been approved. The owner continued the installation of the display once review comments were sent to the applicant, but no permit had been issued. Similarly, construction for the recently installed fence was started prior to submitting an application for a permit.

On June 27, 2023, the City Council adopted Resolution 2023-06-01 declaring the intent to seek certification from the International DarkSky Association (IDA). This is due to a house bill that was codified in the Texas Government Code Section 3000.02 in 2019 that specifies that municipalities can only regulate outdoor lighting if they are certified as a Dark Sky Community or have adopted a resolution stating the intent to become a DarkSky Community. If the city does not pursue becoming a certified DarkSky Community, outdoor lighting could not be regulated at all.

The city has current regulations that largely meet the intent of the dark sky goal, that restrict the total amount of light displayed by acreage, limit the color of the light (yellow vs blue/bright white) require shielding on fixtures to limit uplighting and restrict location/direction so they do not create spill over onto adjacent properties. The way the code is written, it does not allow outdoor displays. The most common use of this type of technology is for digital message boards/signs, which are explicitly prohibited in Section 23.01.016 Prohibited Signs.

As the outdoor display was installed without a permit, city staff and Andrew Oldner, the city consultant for outdoor lighting reviews, conducted a site visit on October 1st from 8:00 pm to 9:30 pm. Sunset on October 1st started at 7:16 pm and full darkness was reached at 8:35 pm. The display was set to 1%, 25% and 100% so staff could observe the impact both on the property and from vantage points on Westwood Terrace. Attachment 5 provides pictures depicting the relative contrast between existing site lighting and the new outdoor display.

Code Summary:

Variance 1 & 2

24.03.006 (a) Maximum lumen limit. Luminaires on properties in the O, GUI, B-1 and B-2 districts are limited to 6,000 lumens each and must be spaced so that the luminaire lumens per square foot of all existing and proposed lights in the illuminated area do not exceed 2.5.

Staff do not have enough information to evaluate that the number of lumens produced by the display is less than 6,000 lumens. Lumens can only be measured from a single light source (like a light bulb), and the display is comprised of thousands of tiny light sources. Additionally, Austin's Pizza is only one tenant on the site and has not been able to provide information on the existing lights for the total site lumen count.

While we cannot measure the lumens with the information provided, screen brightness output measured in nits (candelas per square meters) is provided. At maximum brightness, the screen displays 5,000 cd/sqm. Reduced to 1%, the output is 50 cd/sqm. Oldner Lighting provided information in their analysis that the IDA recommends a night range for LED displays of 20-40, which is exceeded at even a 1% setting.

Variance 3

Section 24.03.006 (b) General Parking and pedestrian areas

Within the parking and pedestrian areas, all pole mounted fixtures are supposed to be fully shielded to eliminate up-lighting, which causes light pollution that can cause a glare from the site and affect vegetation and birds at night. There is no shielding above the display that would deflect up-lighting from the surface of the screen.

Variance 4

Section 24.006 (d) Maximum Color Temperature – exceeding color temperature rating of 3500 K.

The color temperature refers to the perceived warmth or coolness of a light source. At 3500 Kelvin, a light source appears warmer and is more yellow in color. Above this limit, lights have a white or blue hue. The atmosphere absorbs light over distance in the order of the spectrum (ROYGBIV), blue light travels farther and appears brighter than yellow light. As the outdoor display is intended to show games and movies, the color temperature will constantly fluctuate, with the screen far exceeding this limit with the screen showing a scene with a lot of white or blue background.

Variance 5

Section 24.03.004 (a) Shielding – not providing shielding of the luminaires.

Shielding on luminaires is required to minimize glare and light trespass and to facilitate better vision at night. The screen does not provide any shielding for up-lighting or light trespass into the street/adjacent properties.

Outdoor Lighting Consultant Analysis:

Andrew Oldner with Oldner Lighting, LLC is the city's consultant for review applications that include outdoor lighting. He will also assist in the code updates required and the application for the International Dark Sky Association. He has provided an analysis of the outdoor display that has already been installed (Attachment 4) and recommends denial of variances 3-5 and made no recommendation 1 and 2 because he was unable to analyze based on the information provided. References for his report are included at Attachment 4.1 – 4.5

Public Comments:

As of the date of the staff report, one written response in opposition has been received (Attachment 6).

Variance Criteria Review:

No variance shall be granted unless the following conditions are fulfilled:

1. The strict or literal enforcement of the terms of this chapter, because of special conditions, will result in unnecessary hardship to the applicant.
2. There will not be unreasonable disruption of the natural terrain or unreasonable destruction of existing flora.
3. There is no reasonable alternative to the requisite variance that will alleviate the difficulty or hardship complained of.
4. The variance will not be greater than the minimum required to alleviate the difficulty or hardship complained of.
5. The variance does not violate the intent of the Zoning Ordinance or goals of the Comprehensive Plan.
6. The variance will not adversely affect neighboring properties or interfere with the enjoyment of these properties by their owners.

The findings of fact as alleged by the applicant and city staff are attached in the following exhibits.

- Exhibit A - From the applicant
- Exhibit B - Staff recommendation

Compliance with Code of Ordinances

The property and future construction will have to comply with all applicable City codes.

Subdivision

There is no change to the subdivision proposed with this application.

Comprehensive Planning Analysis

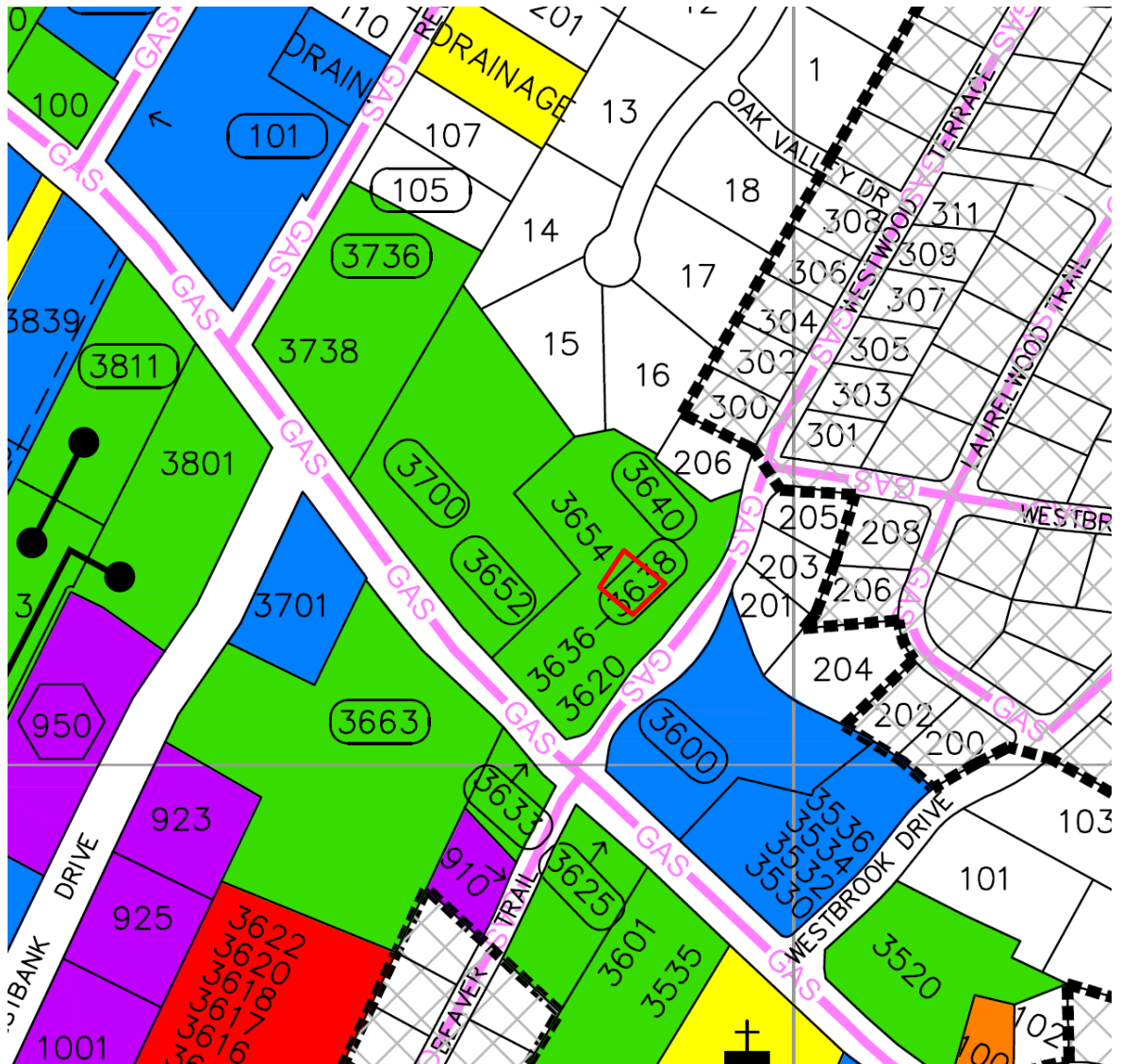
The existing and future land use is in conformance with the City of West Lake Hills Master Plan.

Links to Relevant Code:

[Article 24.03 Outdoor Lighting.](#)

[Section 32.01.016 Prohibited signs.](#)

Zoning:



Aerial:





September 5, 2024

Dear Honorable Meisel,

I hope this letter finds you well. I am writing to respectfully request approval for a variance concerning the operation of a television at Austin's Pizza, a cherished establishment in Westlake since 2008. Our goal is to enhance the experience for our patrons, particularly families and visitors of all ages, by providing free enjoyable and engaging content.

The television in question is strategically positioned within our property, facing away from any sightlines that could negatively impact surrounding businesses, traffic, or the neighborhood. The current ordinance allows for a maximum brightness of 6000 lumens, which we believe is more stringent than necessary for daytime use. Importantly, our television can be adjusted to comply with this limit in the evening, ensuring that its operation will not exceed the 6000-lumen threshold.

We have considered the broader context of our community. Nearby facilities, such as the Westlake High School Jumbotron, Hill Country Middle School, and Westbank Community Library, utilize lighting much larger structures and playing fields that far exceed the 6000-lumen maximum. Given this, we feel that our request for a variance is reasonable and equitable.

We sincerely believe that the addition of this television will provide significant value to our operations and enhance the overall experience for our patrons, without any adverse impact on the surrounding area. Your approval would greatly contribute to maintaining Austin's Pizza as a vibrant and family-friendly destination.

Thank you very much for considering our request. We would be grateful for the opportunity to provide any additional information and/or discussion at the upcoming ZAPCO meeting October 16th, 2024.

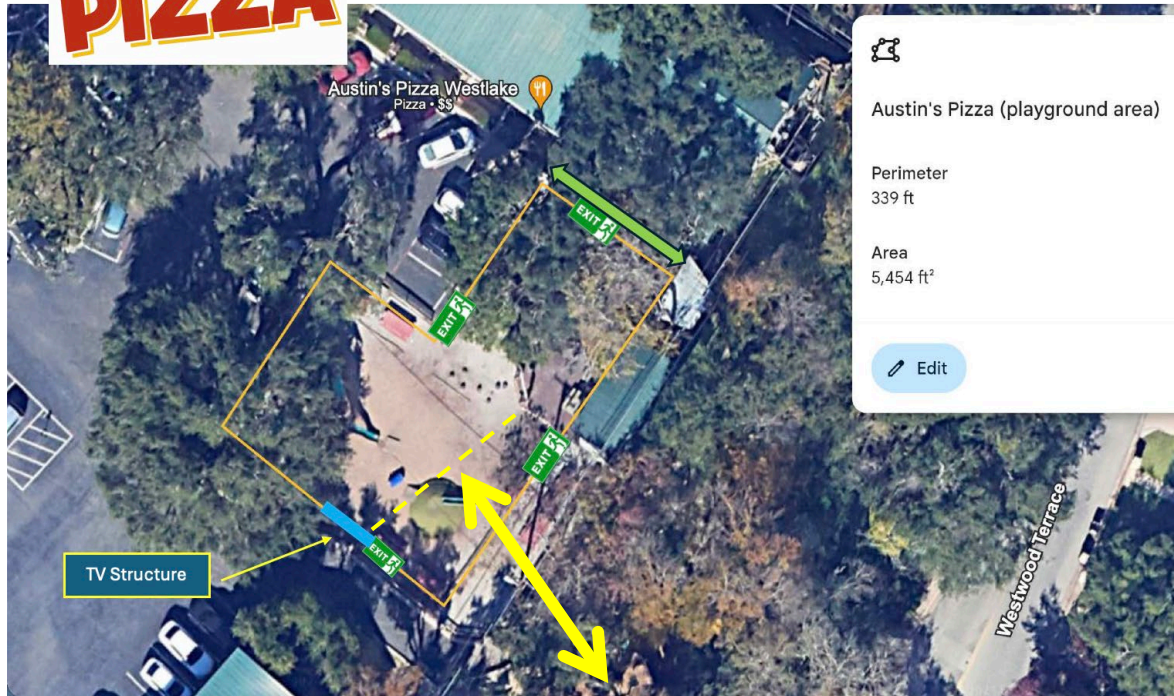
Sincerely,

A handwritten signature in blue ink that reads "Eddy A. Patterson". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

Eddy Patterson, Austin's Pizza



3636 Bee Caves Rd, Austin, Texas 78746



Austin's Pizza Playground area

5,454 sqft.

4 Exits (one exit will remain open with no fence/gate allowing access all the time. This open area is shown with arrows ↔

All EXITS will have double 5 ft doors that swing outward with weather-proof panic hardware. All EXITS will have emergency lights weatherproof light fixtures with battery back power.

We will place portable fire extinguishers outside within the enclosed area with weatherproof plastic extinguisher boxes for each.

Pro Outdoor 5.7mm

The Outdoor Pro is the right choice for your next event or permanent display. These features make it simple to configure and use right out of the box:



PRODUCT SPECIFICATIONS

Pixel Pitch:	5.7mm
Density (pixel/mm² / pixel/ft²):	30,625 / 2,845
Pixel Composition:	SMD
Viewing Angle:	H 160°, V 120°
Max Brightness (Nits):	6,000
Panel Size (mm / inches):	960x960x92 37.8x37.8x3.62
Refresh Rate:	3840Hz
Pixels per Panel:	28,224
Pixel Matrix:	168 x 168
Panel Weight:	63.94 lbs / 29kg
Operating Temp (C/F):	-20°C to 50°C / -4°F to 122°F
Operating Humidity:	10% - 95%
IP Rating:	IP66

ELECTRICAL SPECIFICATIONS

Max Power (per m²/ft²):	580W / 53.88W
Avg. Power (per m²/ft²):	150W / 13.94W
Voltage (VAC):	100-240V / 50-60Hz

(214)504-2404

sales@ultravisionledsolutions.com

www.ultravisionledsolutions.com



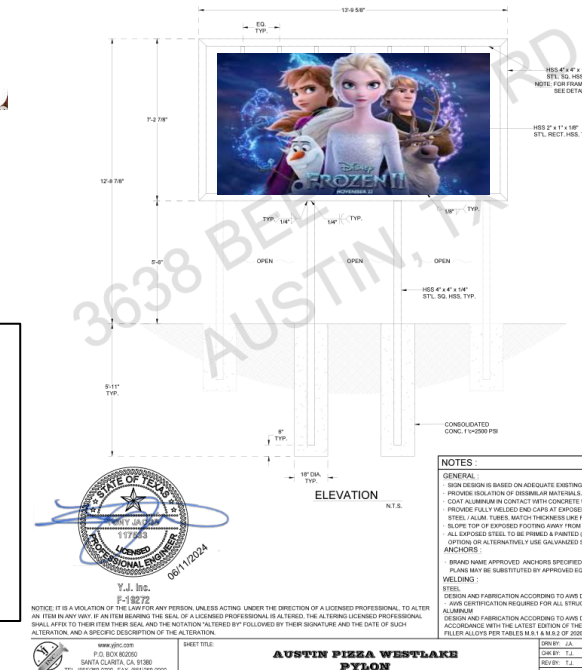
- Modular system for easy assembly and set up in fixed, stacking, or hanging configurations
- light-weight aluminum means a lower cost of installation
- 30% less power consumption, fan-less design means lower cost of operation
- Front or rear service
- Slim dimensions - less than 3.7"
- Display digital playback of recorded, live, or static images.
- ETL/CE/FCC Certified
- 5-Year Warranty



110v electric line from existing structure to TV was buried (shown with yellow dotted line on map)
"18 underground. No new or additional service/power required.
(shown in picture to left)

Response to Comments 7/15/24:

- Electricity has been extended to structure, but NO new service is required
- NO signage will be place on back of structure
- TV SPECS shown to right, TV can be dimmed to 1% as needed
- TV will be turned OFF before 11pm each night



TV SPECS



July 15, 2024

Dear Joel/Jennifer,

Please see our responses to your comments and review highlighted in yellow.

Thank you again for all your support.

RE: PROJECT TITLE: Project No.: 2024-11983

Planning Review - Jennifer Bills

Will there be electricity extended to the structure? **Yes, there is already electricity on-site no need for additional service.**

The backside of the structure cannot be used for signage. **Agreed, no signage on back of structure.**

Lighting Review - Andrew Gauld

1. Please provide the technical specification for the planned TV.

PRODUCT SPECIFICATIONS	
Pixel Pitch:	3.91mm
Density (pixel/mm ² / pixel/ft ²):	65,536 / 6,088
Pixel Composition:	SMD
Viewing Angle (H/V):	160°/120°
Max Brightness (Nits):	5,000
Panel Size (mm / inches):	500x500x74.5 19.68x19.68x2.93
Refresh Rate:	3840Hz
Pixels per Panel:	16,384
Pixel Matrix:	128 x 128
Panel Weight:	16.54lbs / 7.5kg
Operating Temp (C/F):	-30° to 55° / -22° to 131°
Operating Humidity:	10% - 95%
IP Rating:	IP65

100%: 5000 nits = 17,130 lumens

1%: 50 nits = 171 lumens

Please note that this can be dimmable to 1% as needed.

2. Please confirm the TV will be turned off every night the later of one hour after closing or 11:00 p.m (Section 24.03.006 (e)). **Yes, this TV will be turned off nightly at closing and/or before 11:00pm**

Respectfully,

Eddy Patterson, Austin's Pizza

Cc: Jennifer Bills, Joel Sherrouse, Jordan Word

Austin's Pizza

3638 Bee Caves Road, Austin Texas 78746

Yellow lines in pictures below shows existing Fence – asking for permit to replace aging fence with new fence – **NO** additional Square Footage will be added and/or increased | Approx. 325 ft.



Subject Property photo(s)
close & zoomed out







**Austin's Pizza Variance Request,
Application [2024-1229](#)**

On behalf of the City of West Lake Hills I have reviewed the variance request for Austin's Pizza outdoor TV ^[1].

Introduction

This review was performed in the context of the City of West Lake Hills Outdoor Lighting Ordinance ^[2] (OLO).

The OLO states "The city is a unique and pleasant place to live. Its very special quality is derived from its [...] dark night skies. The primary purpose of the outdoor lighting ordinance is to preserve and protect the safe and appropriate nighttime use and enjoyment of all properties in the community of West Lake Hills [...] by ensuring that outdoor lighting be designed, installed, and maintained to reduce glare and light trespass, thereby minimizing the adverse effects of artificial light on residents [...] and to prevent the degradation of the nighttime visual environment."

Summary

1. No exception is taken to the outdoor TV being operated during the hours of full daylight, i.e. 30 minutes after sunrise to 30 minutes before sunset.
2. The outdoor TV should only be operated during the hours of full daylight.
3. The outdoor TV should not be operated outwith the hours of full daylight.
4. The outdoor TV produces light pollution which is counter to the intent and requirements of the OLO and counter to the intent and recommendations of the International Dark Sky Association (IDA) and Illuminating Engineering Society of America (IES) ^[3].
5. The outdoor TV produces light pollution in the form of glare, uplight and light-trespass, the three main forms of light pollution that the OLO and the IDA recommendations are designed to prevent.

Review

On walking the site during the hours of darkness it was observed that the outdoor TV produces glare, light trespass and uplight.

- a) glare - lighting entering the eye directly that causes visual discomfort or reduced visibility
- b) light trespass - when a light source is visible from any other property, then the light is trespassing onto said property.
- c) uplight - lighting that is directed in such a manner as to shine light rays above the horizontal plane, contributing to skyglow.

Conclusions

Glare

The outdoor TV produces glare that is visible to neighboring properties and does not meet IDA recommendations^[4].

The IDA recommended brightness for outdoor LED displays at night ranges from 20-40 cd/sqm [the area is between Lighting Zones 1; low density residential and Lighting Zone 2; light commercial business districts].

The brightness of the outdoor TV ranges from 5,000 cd/sqm^[5] to 50 cd/sqm [when dimmed to lowest possible output of 1%].

i.e. Even at 1% output; the outdoor TV's 50 cd/sqm exceeds the highest recommended brightness of 40 cd/sqm.

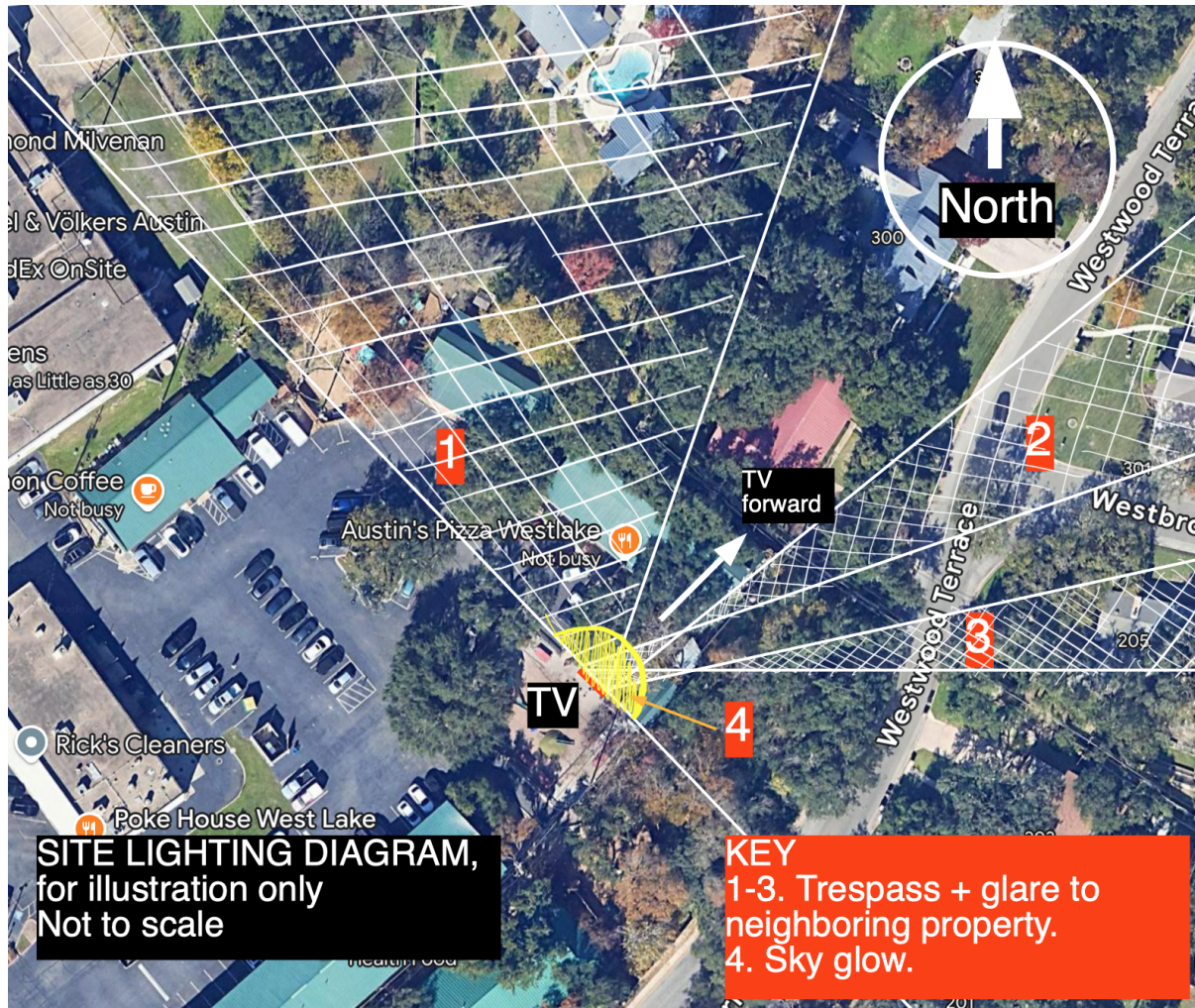
Up-lighting.

The outdoor TV produces uplight and does not meet OLO requirements, reference- Sec. 24.03.008 [b] Up-lighting. With certain exceptions, it is an offense to install or operate up-lighting.

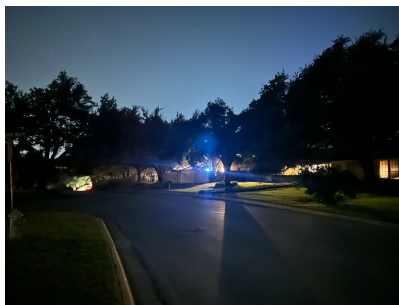
Light trespass

The outdoor TV produces light trespass that is visible to neighboring properties and does not meet OLO requirements, reference -

Sec. 24.03.008 [c] Light trespass. Outdoor lighting shall be designed to minimize light trespass to preserve the rural character of the city. Light trespass is a public nuisance. It is an offense for a person to knowingly install, maintain, or operate outdoor lights that shine directly into the eyes of any occupant of any vehicle on any public or private road, onto adjacent property, or where the illumination interferes with the visibility or readability of any traffic signs or devices.



1. Photo from parking lot to NW.



2. Photo from property to NE.



3. Photo from property to E.

Figure 1 – Site lighting diagram.



Figure 2 - Illustration of Glare, Light Trespass and Uplight.

This example uses a street ight but the principles are the same for all light sources, including outdoor TVs.

Appendice - Practical steps to reduce the light pollution of the outdoor TV.

Note: these actions would not negate the ordinance violations, only reduce the light pollution.

Uplight can be reduced by adding a canopy. Canopy to completely cover the TV. Canopy to protrude a distance equal to at least the height of the TV and a width of at least the width of the TV plus + 50%.

Light trespass and glare can be reduced by erecting structures that stop the light from outdoor TV reaching neighboring properties.

Glare can be reduced to the recommended brightness level by dimming the outdoor TV to the recommended 40cd/sqm during the hours of darkness.

References

1. 2024-1229-variance application - austin_s pizza outdoor tv
2. City of Westlake Hills, Title II Building and Development Regulations, Article 24.03 Outdoor Lighting.
3. Joint IDA-IES Model Lighting Ordinance, IES and IDA, 2011.
4. Guidance for Electronic Message Centers [EMCs], IDA, 2019
5. Pro Outdoor 3.9mm Spec Sheet

Thank you,

Andrew Gauld
Oldner Lighting Design LLC
10/7/24

VARIANCE APPLICATION



Date Received: _____	Received By: _____
Amount Due \$ _____	Date Payment Received: _____
Admin Complete Date: _____	Permit No: _____

All applications and supporting documents should be submitted electronically to
<https://www.mgoconnect.org/cp?JID=253>

APPLICANT & PROPERTY INFORMATION

The agent is the official contact person for this project and the single point of contact. All correspondence and communication will be conducted with the agent. If no agent is listed, the owner will be considered the agent.

Property Owner: Eric Johnson Phone: 512-797-9740

Email: _____

Address: 3638 Bee Caves Rd City: Austin State: Tx Zip: 78746

Agent*: Eddy Patterson Phone: 512-426-9993

Email: eddy@austinspizza.com

Address: 5423 Petticoat Ln City: Austin State: Texas Zip: 78746

Property Address: 3638 Bee Caves City: Austin State: Texas Zip: 78746

Property Information

Subdivision Name: Las Brisas Subdivision

Block: Block A Lot: 1 TCAD Tax Parcel ID: _____

Current Zoning Classification: _____ Total Lot Size (Acres): _____

**Please submit Power of Attorney form designating authorized agent.*

PROJECT INFORMATION

Please list all variances being applied for with this project and include Code Section references: (Please be detailed-for tree variances, must include tree #, size, species; setback variances-which setback and how far is requested encroachment; for height specify how much height being requested; etc.)

1. Requesting the use of an outdoor TV in the playground area at Austin's Pizza

2. _____



VARIANCE APPLICATION

3. _____

4. _____

5. _____

6. _____

CONDITIONS REQUIRED FOR GRANTING A VARIANCE (SECTION 38.05.32):

No variance shall be granted unless the following conditions are fulfilled as provided by the applicant's statements:

1. The strict or literal enforcement of the terms of this chapter, because of special conditions, will result in unnecessary hardship to the applicant. Describe in detail any special conditions you believe will result in unnecessary hardship to you if the terms of this ordinance are strictly or literally enforced.

We believe the current lumen ordinance does not properly reflect whether it is day-time or night-time use. We are asking for clarification to allow use our TV specifically during the day and then use at night to reflect under the 6000 Lumen limit

2. There will not be unreasonable disruption of the natural terrain or unreasonable destruction of existing flora. Why do you think the natural terrain and existing flora will not be unreasonably disrupted or destroyed if the variance you are requesting is granted?

There will be no disruption to the natural terrain. Nothing will be destroyed, changed or modified to the terrain

3. There is no reasonable alternative to the requisite variance that will alleviate the difficulty or hardship complained of. What other alternatives have you considered? Why won't those other options alleviate



VARIANCE APPLICATION

the difficulty or hardship that you think exists?

We submitted for our TV permit project #2024-11983 June of 2024 we provided a detailed plan with electric, location, type of use, engineer seal and all the application and permitting requirements.

4. The variance will not be greater than the minimum required to alleviate the difficulty or hardship complained of.

24.03.006(a) - Luminaires on properties in the O, GUI, B-1 and B-2 districts are limited to 6,000 lumens each and must be spaced so that the luminaire lumens per square foot of all existing.

5. *The current ordinance does not reflect the time of day use. Our intention is to operate the TV during the day and then at night operate the TV under the required 6,000 lumen limit, which our device is operationally capable of doing and will meet the ordinance spec of 6000 Lumen.* hy
We are NOT requesting any variations to the ordinance - just to modify to day-time / night-time usage + to be able to adjust the TV to operate under the 6000 lumens at night.

Given the size and location of the TV we determine there will be no adverse affect to neighbors, businesses, traffic or others in our general area of use. Our project plan #2024-11983 properly shows the impacted area and how this TV will only enhance the current and existing pizza operation located there since 2008 and

6. The variance may have an adverse effect on neighborhood properties or interfere with the respective owners' enjoyment thereof. Why do you believe your variance will not adversely affect or interfere with the enjoyment of neighboring properties?

The TV's orientation does not have any impact to the surrounding neighborhoods, businesses, or facilities. The screen faces away from any streets, parking, or other establishments. The property is businesses, or facilities. The screen faces away from any streets, parking, or other establishments. We will also only operate the TV on a limited amount of use is movies and sports and will be turned off by 10:30pm it will NOT be on 24hrs/7 days. The playground where the TV is located is also FREE to the public allowing everyone to enjoy the experience. We are prepared to add any exterior curtains to be used compliant if needed to create a positive experience for the community.

AUTHORIZATION & ACKNOWLEDGEMENT

The above information is true to the best of my knowledge. I attest that the real property described is owned by me and all others as signed below. If the below is signed by the authorized agent of said property, the signature of the property owner must be included below or consent must be attached (Power of Attorney Form).

Signature

Eddy A. Patterson

Date

September 5th, 2024

Printed Name

Eddy Patterson



VARIANCE APPLICATION

APPLICATION CHECKLIST

Variance Application Checklist

- ☐ Completed, signed application
- ☐ Power of Attorney form, if applicable
- ☐ Proof of ownership of subject property
- ☐ Completed Variance Hardship Questionnaire
- ☒ Letter addressed to ZAPCO Chairperson explaining reason for the request
- ☒ Property survey
- ☐ Proposed site plan with building setbacks clearly labeled
- ☐ Building elevations, if applicable
- ☐ Tree and topo survey, if applicable
- ☐ Preliminary plans for proposed project (pool plans, building plans, fence design, etc.)
- ☐ Photos of property showing existing conditions (for tree variances, include photos of proposed variance trees)
- ☐ Letters/emails of support from neighbors, if able to obtain
- ☐ Payment of application fees (*refer to Appendix A: Fee Schedule in the Code of Ordinances for current fees. Fees are due upfront with application.*)
- ☐ Other relevant information, as determined necessary by staff (for example, if variance is for cut/fill/retaining wall, you may be requested to provide a drainage report)

Variance Process and Information

- City staff will prepare public notification letters and will provide you a public notice sign to place on the property. You will be notified when the public notice sign is available to be picked-up.
- If you want to see example variance applications, please see the Agenda page on the City website at <https://www.westlakehills.org/> to view the latest ZAPCO, Council and BOA packets.
- All variance applications are first considered by the Zoning and Planning Commission (ZAPCO), which is an advisory commission only. Final action is then determined by either City Council or Board of Adjustment, depending on the type of variance being requested.
- Agenda packets are digital and posted on the website the Friday prior to the meeting by 5pm. Staff will send you a meeting reminder email after the agenda and packet are posted.
- **Applicants or a designated representative are required to attend/speak at each public hearing; otherwise you will risk postponement or denial for no-show. Applicants should keep remarks brief and the typical time allotment is 5 minutes for ZAPCO and 5 – 10 minutes for City Council/BOA.**
- Please note ZAPCO is an advisory commission only – final action must be taken by City Council or BOA, depending on the type of variance. If ZAPCO recommends denial, you can still move forward to City Council/BOA unless you decide to withdraw or postpone your variance request.
- If City Council/BOA denies your variance, you have to wait one year before you can reapply for the same variance.
- If approved by City Council/BOA, variances expire within one year of the approval date if a permit application has not been filed to perform the scope of work related to the variance.



VARIANCE APPLICATION

STAFF NOTES

For Completion by Staff Only

Date public notification letters mailed: _____

Date of ZAPCO Meeting: _____

ZAPCO Recommendation: _____

Date of City Council/BOA Meeting: _____

City Council/BOA

Action: _____

Notes:

Chapter 24. Environmental Protection

ARTICLE 24.03. OUTDOOR LIGHTING

§ 24.03.001. Purpose.

The city is a unique and pleasant place to live. Its very special quality is derived from its rugged terrain, beautiful views, dense foliage, unspoiled creeks, wildlife, large areas of relatively low population density, and dark night skies. The primary purpose of this article is to preserve and protect the safe and appropriate nighttime use and enjoyment of all properties in the community of West Lake Hills by establishing and enforcing reasonable and consistent outdoor lighting standards. This will be accomplished by ensuring that outdoor lighting be designed, installed, and maintained to reduce glare and light trespass, thereby minimizing the adverse effects of artificial light on residents, vehicle operators, and pedestrians; to conserve energy and resources; and to prevent the degradation of the nighttime visual environment. The standards of this article are intended to protect the general welfare by allowing sufficient (but not excessive) lighting for walkways, driveways, building entrances, loading areas, and common areas; to minimize the adverse effects of inappropriate lighting; and to provide for the safety and security of people and property in the city, particularly at points of ingress and egress.

(Ordinance 295 adopted 5/28/14)

§ 24.03.002. Definitions.

Words and phrases used in this article shall have the meanings set forth in this section. Terms that are not defined below, but are defined elsewhere in this code or in state law, shall be given the meanings set forth in this code or state law. Words and phrases not defined in this code shall be given their common, ordinary meaning unless the context clearly requires otherwise. When not inconsistent with the context, words used in the present tense shall include the future tense; words in the plural number shall include the singular number (and vice versa); and words in the masculine gender shall include the feminine gender (and vice versa). The words “shall” and “must” [are] always mandatory, while the word “may” is merely directory. Headings and captions are for reference purposes only.

B-U-G ratings. A luminaire classification system with ratings for backlight (B), up-light (U), and glare (G). The backlight component of the rating system takes into account the amount of light in the BL, BM, BH and BVH zones. The up-light component takes into account the amount of light in the UH and UL zones. The glare component takes into account the amount of light in the FH, FVH, BH and BVH zones.

Backlight. For an exterior luminaire, light emitted in the quarter sphere below horizontal and in the opposite direction of the intended orientation of the luminaire. For luminaires with symmetric distribution, backlight will be the same as front light.

Fixture. The assembly that holds the lamp in a lighting system. It includes the elements designed to give light output control, such as a reflector (mirror) or refractor (lens), the ballast, housing, and the attachment parts.

Fully shielded luminaire. A luminaire constructed and installed in such a manner that all light emitted by the luminaire, either directly from the lamp or a diffusing element, or indirectly by reflection or refraction from any part of the luminaire, is projected below the horizontal plane through the luminaire's lowest light-emitting part.

Glare. Lighting entering the eye directly from luminaires or indirectly from reflective surfaces that causes visual discomfort or reduced visibility.

Landscape lighting. Outdoor lighting of trees, shrubs, or other plant material as well as ponds and other landscape features.

Light trespass. Light emitted from luminaires designed or installed in a manner that causes light to fall on a property other than the one where the light is installed, in a motor vehicle drivers' eyes, or upwards toward the sky. If light directly from the bulb is visible from any other property then the light is trespassing onto said property.

Lumen. The unit of measurement used to quantify the amount of light produced by a bulb or emitted from a fixture (as distinct from "watt," a measure of power consumption). For the purposes of this article, the lumen output values shall be the initial lumen output ratings of a lamp. The lumen rating associated with a given lamp is generally indicated on its packaging or may be obtained from the manufacturer. (Abbreviated lm.)

Luminaire. The complete lighting unit, i.e. the fixture.

Luminaire lumens. For luminaires with relative photometry per Illuminating Engineering Society of North America (IES), it is calculated as the sum of the Luminaire Lumens for all lamps within an individual luminaire, multiplied by the luminaire efficiency. If the efficiency is not known for a residential luminaire, assume 70%. For luminaires with absolute photometry per IES LM-79, it is the total luminaire lumens. The lumen rating of a luminaire assumes the lamp or luminaire is new and has not depreciated in light output.

New construction. Site preparation for, and construction of, entirely new structures or buildings, and/or significant extensions to existing structures or buildings, whether or not the site was previously occupied.

Outdoor lighting. Lighting that is installed, located or used in such a manner to cause light rays to shine outdoors. Residential luminaires installed indoors that cause light to shine outside are not considered outdoor lighting. Nonresidential luminaires installed indoors that cause light to shine outside are considered outdoor lighting.

Person. A human individual, corporation, agency, unincorporated association, partnership, or sole proprietorship.

Up-lighting. Lighting that is directed in such a manner as to shine light rays above the horizontal plane.

(Ordinance 295 adopted 5/28/14)

§ 24.03.003. Outdoor lighting permits.

- (a) An outdoor lighting permit is required for:
 - (1) Luminaires installed as part of new construction; or
 - (2) New sport court lighting.
- (b) Building permits and site plans for new construction can only be issued concurrently with or subsequent to the issuance of an outdoor lighting permit.
- (c) Outdoor lighting permits for new construction will be issued upon the city's approval of an outdoor lighting plan: (i) that conforms to the standards established by this article; or (ii) for which a variance was approved by the board of adjustment.
 - (1) Nonresidential lighting plans require city council approval.
 - (2) Residential lighting plans for new construction require approval of the city administrator or city inspector.
- (d) Applications: All outdoor lighting permit applications relating to new construction shall include an outdoor lighting plan to be reviewed for compliance with this article. To be deemed administratively complete, outdoor lighting plans must include the following:
 - (1) A layout of the property with the location and mounting height of each proposed and/or existing luminaire.
 - (A) Nonresidential properties must also include the square footage of the area to be illuminated, and the square footage of each permanent structure within or adjacent to the illuminated area.
 - (B) Residential properties must also include the square footage of the property, the perimeter of each permanent structure on the property, and the number of exterior doors on each permanent structure.
 - (2) For each type of proposed or existing luminaire provide:
 - (A) The manufacturer's specification sheet or, for an existing fixture, a daytime photograph and a nighttime photograph with the fixture illuminated.
 - (B) Fixture description or catalog number, including the lamp type.
 - (C) Initial lumens produced by the luminaire.
 - (D) Quantity of fixtures with the specific catalog description.
 - (E) Luminaire efficiency rating or 'LLF' for the specific luminaire. If the efficiency is not known for a residential luminaire, assume 70%.
 - (F) Total luminaire lumens for the fixtures with the specific catalog description type.
 - (3) Total luminaire lumens for all outdoor lights, both existing and proposed. As a guideline for calculating luminaire lumens for existing lights, see exhibit 2's wattage-to-lumens conversion chart.
- (e) Where a permit is required by this article, it is an offense for a person to install luminaires after May 28, 2014 without having applied for and received an outdoor lighting permit from the city.
- (f) All luminaires must comply with this article without regard to whether a permit is required for installation.

(Ordinance 295 adopted 5/28/14)

§ 24.03.004. Standards for all districts.

- (a) Shielding. All outdoor luminaires in all districts shall be shielded, hooded, or diffused so that it is a fully shielded luminaire. Illustrations of unshielded and fully shielded luminaires are provided in exhibit 3.

The city may require additional shielding, hooding, or diffusing even for a fully shielded luminaire if, due to the mounting height, topography, or proximity to other properties, additional shielding, hooding, or diffusing is needed to prevent the source of the light from being visible from any other property.

- (b) Parking or loading areas. All luminaires used to illuminate off-street parking or loading areas shall be designed and installed so as to be confined within and directed only onto the parking or loading area.
- (c) Holiday lighting.
- (1) Luminaires intended as holiday decorations are exempt from the restrictions of this article between Thanksgiving Day and January 8, unless in response to a resident complaint the city inspector deems that such lights constitute light trespass or interfere with the reasonable use and enjoyment of any other property.
 - (2) Ground-mounted floodlights used for holiday lighting are permitted if they are shielded to prevent the light source from being directly visible from any other property or public streets and light output does not exceed 1,260 lumens.
- (d) ATMs and fuel dispensing pumps. The luminaire lumens per square foot of all existing and proposed luminaires in the area regulated by the state or the federal government surrounding an automated teller machine (ATM) or fuel dispensing pumps shall comply with this article, except to the extent necessary to comply with requirements promulgated by the state or the federal government.

(Ordinance 295 adopted 5/28/14)

§ 24.03.005. Standards for R-1, R-2, and R-3 residential districts.

- (a) Maximum lumen limit. Total outdoor light output (excluding government-owned street lights used for illumination of public rights-of-way, sport courts and outdoor recreation facilities) of any residential property shall not exceed a capped amount to be calculated as follows:
- (1) A base allowance of 10,000 lumens for lots with an area of less than one acre or 12,000 lumens for lots with an area of one acre or greater, plus.
 - (2) 800 lumens for each door on each permanent structure, plus.
 - (3) 10 lumens for each foot of perimeter around each permanent structure.
- (b) Height limit. Luminaires attached to structures in residential districts shall not be placed higher than the roofline of that structure. Luminaires not attached to structures in residential districts shall not exceed 28 feet in height, measured from the ground/pavement to the top of the pole or the bottom (base) of the fixture as shown in exhibit 1.

- (c) Perimeter lighting. Luminaires at the perimeter of a property are limited to two fixtures at the driveway entrance(s), a mailbox fixture, and one additional luminaire for a footpath entry. These fixtures should be limited to 385 lumens each. No other perimeter lighting is permitted.
- (d) Private walkway lighting. Private walkway lights are not to exceed 385 lumens each.
- (e) Setback lighting. No luminaires shall be installed in any setbacks except for lighting installed in accordance with subsection (c) or (d).
- (f) Security and safety lighting.
 - (1) Standard security and safety lighting. Luminaires installed to illuminate points of ingress and egress (e.g., garage doors, windows, and front and back doors, but not landscape or accent lighting) is standard security and safety lighting. Such luminaires must be fully shielded and hooded and can be operated without curfew.
 - (2) Manually operated security and safety lighting. Resident-operated security luminaires, such as floodlights, installed to illuminate specific areas around a residence in response to a perceived security threat are manually operated security and safety lighting. Such luminaires do not need to be fully shielded luminaires, but, if they are not fully shielded luminaires, they must be turned off as soon as the perceived security threat has been resolved or within 1 hour, whichever is sooner.
 - (3) Motion sensing security and safety lighting. Luminaires installed to illuminate points around a residence automatically upon detecting motion is motion sensing security and safety lighting. Such luminaires do not need to be fully shielded luminaires, but, if they are not fully shielded luminaires, they must be operated with a timer set to stay on for no longer than 10 minutes.
- (g) Sport court lighting. Sport court luminaires must not emit more than 30 luminaire lumens per square foot of playing surface. The luminaires must be turned off no later than 11:00 p.m. The installation of sport court luminaires requires a permit in advance of construction. Sport court luminaires are exempt from maximum lumen limit for the premises. Sport court luminaires shall only be on when sport court is actively in use.
- (h) Landscape/yard lighting. Luminaires used for illuminating landscape features shall not be used after 11:00 p.m. Individual fixtures shall not exceed 800 lumens.
- (i) Residential lighting curfew. Luminaires in full compliance with this article are not subject to a residential lighting curfew. As explained in section **24.03.011**, outdoor lighting installed on or before May 28, 2014, must be brought into conformance within ten (10) years. All nonconforming outdoor residential lighting that continues to be operated during that ten (10) year period shall be turned off between 11:00 p.m. and 1 hour before sunrise, with the exception of nonconforming security and safety lighting used to illuminate points of ingress and egress (e.g., garage doors, windows, and front and back doors, but not landscape or accent lighting).

(Ordinance 295 adopted 5/28/14)

§ 24.03.006. Standards for O, GUI, B-1 and B-2 districts.

- (a) Maximum lumen limit. Luminaires on properties in the O, GUI, B-1 and B-2 districts are limited to 6,000 lumens each and must be spaced so that the luminaire lumens per square foot of all existing and proposed lights in the illuminated area do not exceed 2.5.
- (b) General parking and pedestrian areas. Luminaires for parking and pedestrian areas in these

districts shall conform to the following:

- (1) Luminaires attached to structures shall not exceed the height of the roofline of that structure. Luminaires not attached to structures shall not exceed 28 feet in height, measured from the ground/pavement to the bottom (base) of the fixture as shown in exhibit 1.
 - (2) Luminaires shall be limited to two per pole and shall have a zero up-light rating and either a zero or one glare rating within the BUG rating system or, if not rated, shall be a fully shielded luminaire.
 - (3) Building-mounted wall packs shall have a zero up-light rating and a zero glare rating within the BUG rating system, or if not rated, shall be a fully shielded luminaire.
 - (4) Luminaire Lumens per square foot of illuminated area for covered parking facilities shall not exceed 5.0.
- (c) Landscape/yard lighting. The luminaires used for illuminating landscape features must be fully shielded luminaires and shall not be illuminated after 11:00 p.m. Individual fixtures shall not exceed 1,050 lumens and shall be spaced so that the luminaire lumens per square foot of all existing and proposed lights in the illuminated area does not exceed 1.25.
- (d) Luminaires shall utilize lamps with a color temperature rating of 3,500K or below. This is not a design goal but a maximum allowable color temperature rating.
- (e) Lighting must be turned off or the lumen output must be reduced to half of normal by the later of one hour after closing or 11:00 p.m. The lighting may be turned back on or returned to full power 1 hour before sunrise.

(Ordinance 295 adopted 5/28/14)

§ 24.03.007. Standards for the B-3 district.

- (a) Maximum lumen limit. Luminaires on properties in B-3 districts shall not exceed 6,000 lumens each and must be spaced so that the luminaire lumens per square foot of all existing and proposed lights in the illuminated area shall not exceed 2.5.
- (b) General parking and pedestrian areas. Luminaires for parking and pedestrian areas in this district shall conform to the following:
- (1) Luminaires attached to structures shall not exceed the height of the roofline of that structure. Luminaires not attached to structures in residential districts shall not exceed 28 feet in height, measured from the ground/pavement to the bottom (base) of the fixture as shown in exhibit 1.
 - (2) Fixtures shall be limited to four per pole and shall have a zero up-light rating and either a zero or one glare rating within the BUG rating system or, if not rated, must be a fully shielded luminaire.
 - (3) Building-mounted wall packs shall have a zero up-light rating and a zero glare rating within the BUG rating system, or if not rated, must be a fully shielded luminaire.
 - (4) Luminaire lumens per square foot of illuminated area for covered parking facilities shall not exceed 5.0.
- (c) Landscape lighting.

- (1) Landscape lights shall be spaced so that luminaire lumens per square foot of all existing and proposed lights in the illuminated area does not exceed 1.25.
 - (A) Landscape lighting fixtures for features such as tree lighting shall not have initial lumens rating more than 385 lumens and shall be achieved by placing the light source above the area to be illuminated and not on the ground.
 - (B) Light sources for illuminating landscape features shall not be visible from any other property nor be illuminated after 11:00 p.m.
 - (C) Individual landscape lighting fixtures that do not allow light to escape above a horizontal line through the lowest part of the fixture shall not exceed 1,650 lumens.
 - (D) Individual landscape lighting fixtures that allow light to escape above a horizontal line through the lowest part of the fixture shall not exceed a rating of 385 lumens and shall be hooded, diffused or otherwise designed and installed so that the source of the light is not visible from any other property.
- (d) Luminaires must utilize lamps with a color temperature rating of 4,000K or below. This is not a design goal but a maximum allowable color temperature rating.
- (e) Lighting must be turned off or the lumen output must be reduced to half of normal by the later of one hour after closing or 11:00 p.m. The lighting may be turned back on or returned to full power 1 hour before sunrise.

(Ordinance 295 adopted 5/28/14)

§ 24.03.008. Prohibitions.

- (a) It is an offense for a person to perform any of the following:
 - (1) Install street lighting. Perimeter lighting as defined at section **24.03.005(c)** is not street lighting.
 - (2) Install or operate searchlights or lasers.
- (b) Up-lighting. With certain exceptions, it is an offense to install or operate up-lighting. The following exceptions are allowed provided the lighting fixtures are fully shielded luminaires:
 - (1) Ground-level or low-level landscape lighting where each fixture does not exceed 385 lumens, provided that the luminaire lumens of all the existing and proposed fixtures is limited to the lumens per square foot cap defined for that particular district.
 - (2) Illumination of governmental flags is required to be from above. However, flagpoles for governmental flags shorter than 22 feet tall may be illuminated by up-lighting with up to two spot type fixtures whose total luminaire lumens is no more than 75 lumens per linear foot, measured from the bulb to the top of the flagpole. The fixture is to be mounted with the lens perpendicular to the flagpole and the illumination pointing straight up at the flag.
- (c) Light trespass. Outdoor lighting shall be designed to minimize light trespass to preserve the rural character of the city. Light trespass is a public nuisance. It is an offense for a person to knowingly install, maintain, or operate outdoor lights that shine directly into the eyes of any occupant of any vehicle on any public or private road, onto adjacent property, or where the illumination interferes with the visibility or readability of any traffic signs or devices.

(Ordinance 295 adopted 5/28/14)

§ 24.03.009. Exemptions from regulation.

The following forms of lighting are exempt from compliance with this article:

- (1) Lighting produced directly by the combustion of fossil fuels.
- (2) Lighting used by law enforcement, fire and other emergency services.
- (3) Lighting employed during emergency repairs of roads and utilities provided the lights are positioned so they do not shine in the eyes of passing drivers.
- (4) Lighting required by law to be installed on motor vehicles.
- (5) Lighting required for the safe operation of aircrafts.

(Ordinance 295 adopted 5/28/14)

§ 24.03.010. Conformance with applicable codes.

- (a) All artificial outdoor lighting fixtures shall be installed and operated in conformance with the provisions of this article, chapter **32** (signs), chapter **38** (zoning), and all other code provisions.
- (b) All outdoor lighting fixtures shall be installed and operated in conformance with the building code and electrical code of the city, chapter **22**.
- (c) The replacement, enlargement, alteration, repair or improvement of any existing outdoor lighting equipment that becomes damaged or inoperable with equipment that does not conform to this article is prohibited. This prohibition applies to all fixtures exempted in section **24.03.011**.

(Ordinance 295 adopted 5/28/14)

§ 24.03.011. Grandfathering.

All outdoor lighting lawfully installed on or before May 28, 2014, must be brought into conformance within ten (10) years. This section shall not be construed to authorize light trespass or to exempt a luminaire from the section **24.03.005(i)** curfew.

(Ordinance 295 adopted 5/28/14)

§ 24.03.012. Variances.

The board of adjustment is authorized to approve variances and alternate design standards for outdoor lighting. The process and standards for consideration and determinations upon variance requests are established in article **38.02**.

(Ordinance 295 adopted 5/28/14)

§ 24.03.013. Public nuisance.

- (a) Any lighting fixture erected, constructed, enlarged, altered, repaired, moved, improved, or

converted contrary to the provisions of this article shall be unlawful and a public nuisance.

- (b) The city council or its appointed authority shall, as appropriate, upon order of the city council or its appointed authority, commence necessary proceedings for the abatement, removal and/or enjoinder of any such public nuisance in the manner provided by law. Any failure, refusal or neglect to obtain a permit as required by this article shall be prima facie evidence of the fact that a public nuisance has been committed in connection with the erection, construction, enlargement, alteration, repair, movement, improvement or conversion of an outdoor lighting structure.

(Ordinance 295 adopted 5/28/14)

§ 24.03.014. Conflicts.

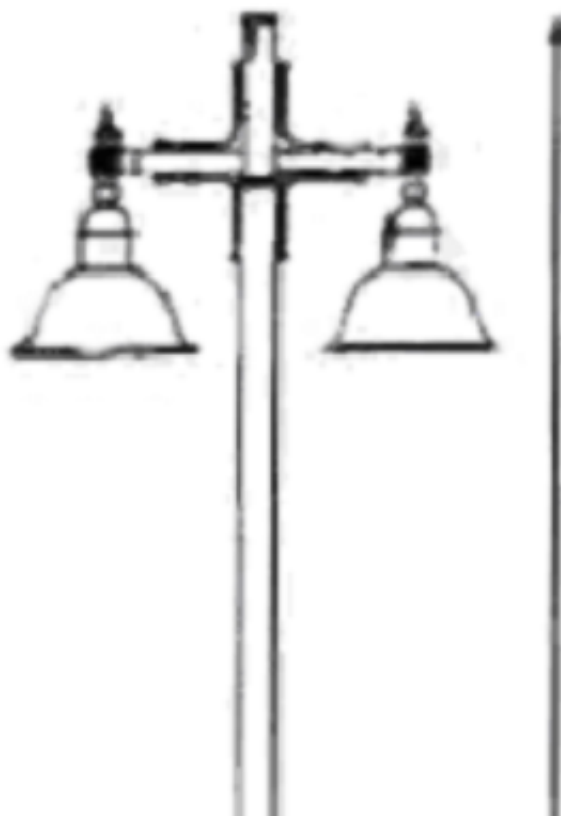
Where any provision of this article conflicts with the statutes, codes or laws of the United States of America or the state, the most restrictive shall apply unless otherwise required by law.

(Ordinance 295 adopted 5/28/14)

§ 24.03.015. Violations and penalties.

- (a) It shall be unlawful for any person to erect, install, construct, enlarge, alter, repair, move, improve or convert any outdoor lighting of any type, or cause the same to be done, contrary to or in violation of any provision of this article.
- (b) Any person convicted of a violation of this article shall be punished by a fine of not more than \$500.00 per violation.

EXHIBIT 1



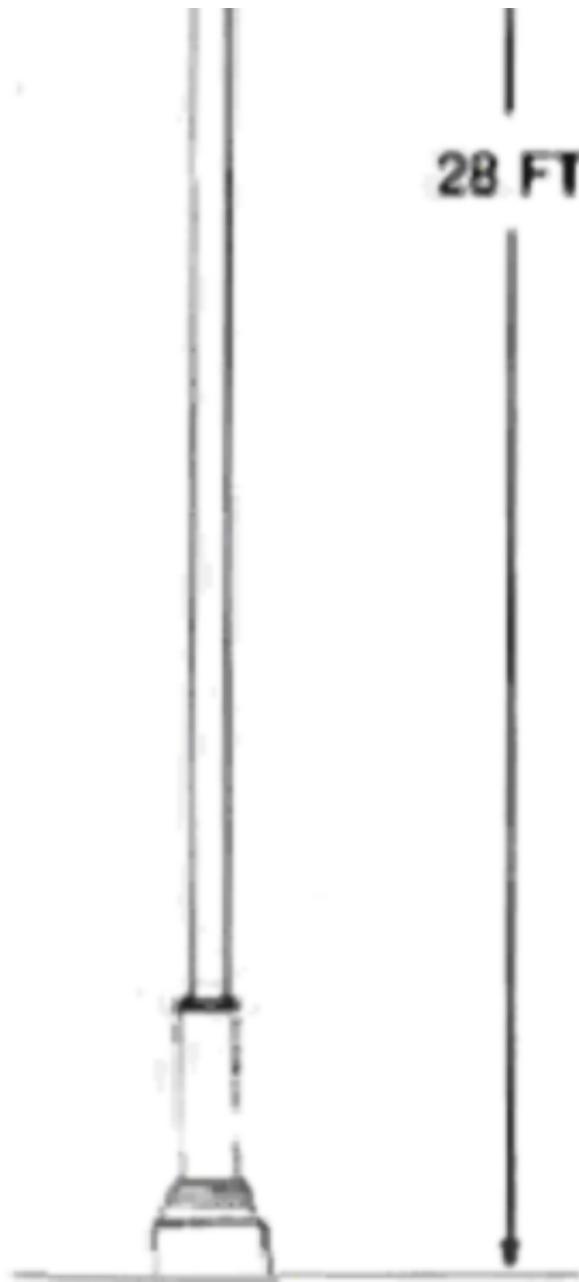


EXHIBIT 2

Lumen Conversion Chart

The outdoor lighting plan referenced in section **24.03.003** requires that the luminaire lumens for each fixture (existing and proposed) be noted on the plan and included in the calculations. For new fixtures, the luminaire lumens can easily be obtained from the documentation that is included with the fixture. If such data is not available for existing fixtures, the chart below should be used as guidance when estimating the luminaire lumens. The chart was created for the sole purpose of providing an easy method of estimating the lumens produced by existing lighting products installed on a particular property in cases where documentation providing such data is not available.

Light Output in Lumens (Lumens calculated using an average luminous efficacy. En-			LED Watts (Lumen efficacy	
---	--	--	---------------------------	--

energy saving lamps may generate more lumens per watt.)	Incandescent Watts	CFL Watts	varies greatly with color)	High Efficiency LED Watts
200	25	6 to 8	2 to 3	2 or less
450	40	9 to 13	4 to 5	3 to 4
800	60	13 to 15	6 to 8	4 to 5
1100	75	18 to 25	9 to 13	6 to 7
1500	100	23 to 30	16 to 20	7 to 9
2000	150	30 to 35	25 to 28	10 to 13
2800	200	45 to 50	35 to 40	14 to 15
5000		100	65 to 133	25 to 50

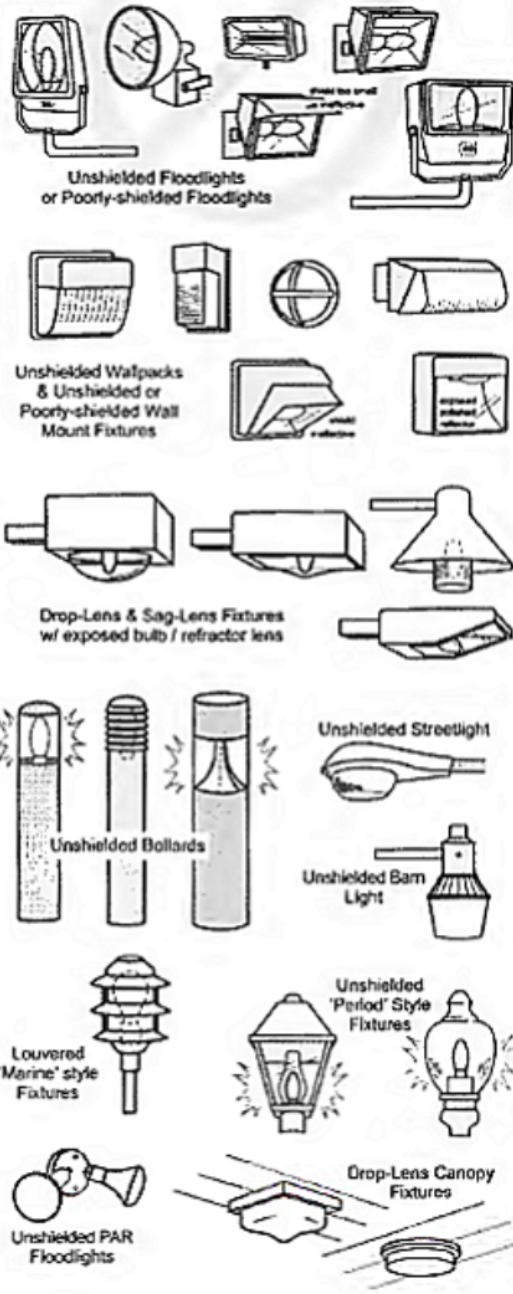
EXHIBIT 3

Better Lights for Better Nights

Help eliminate light pollution. Select the best fixture for your application using this guide. Use the lowest wattage bulb appropriate for the task and turn off the light when it's not being used.

Unacceptable / Discouraged

Fixtures that produce glare and light trespass



Acceptable

Fixtures that shield the light source to minimize glare and light trespass and to facilitate better vision at night



Rendered for the Town of East Hampton, NY by Bob Crelin ©2005

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(Ordinance 295 adopted 5/28/14)



Illuminating
ENGINEERING SOCIETY



JOINT IDA - IES

**MODEL
LIGHTING
ORDINANCE
(MLO)**

with USER'S GUIDE

June 15, 2011

The User Notes

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

Background

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

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

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

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

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

Joint IDA-IESNA
Model Outdoor Lighting
Ordinance (MLO)

June 15, 2011

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General Notes in Adopting this Model Ordinance

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

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

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

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

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

MLO Development and Task Force Members

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

The Joint Task Force responsible for developing the MLO include

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

I. PREAMBLE - User's Guide

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

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

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

II. LIGHTING ZONES - User's Guide

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

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

I. PREAMBLE - Ordinance Text

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

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

II. LIGHTING ZONES - Ordinance Text

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

LZ0: No ambient lighting

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

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

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

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

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

II. LIGHTING ZONES (cont.) - Ordinance Text

LZ1: Low ambient lighting

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

LZ2: Moderate ambient lighting

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

LZ3: Moderately high ambient lighting

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

LZ4: High ambient lighting

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

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

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

III. GENERAL REQUIREMENTS - User's Guide

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

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

EXEMPTIONS - User's Guide

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

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

SIGN LIGHTING - User's Guide

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

III. GENERAL REQUIREMENTS - Ordinance Text

A. *Conformance with All Applicable Codes*

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

B. *Applicability*

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

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

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

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

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

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

III. GENERAL REQUIREMENTS (cont.) - Ordinance Text

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

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

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

C. *Lighting Control Requirements*

1. Automatic Switching Requirements

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

LIGHTING CONTROLS - User's Guide

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

CURFEW REQUIREMENTS - User's Guide

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

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

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

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

III. GENERAL REQUIREMENTS (cont.) - Ordinance Text

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

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

2. Automatic Lighting Reduction Requirements

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

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

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

IV. NON-RESIDENTIAL LIGHTING - User's Guide

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

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

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

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

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

IV. NON-RESIDENTIAL LIGHTING - Ordinance Text

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

PRESCRIPTIVE METHOD - User's Guide

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

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

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

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

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

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

1. Total Site Lumen Limit

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

3. Light Shielding for Parking Lot Illumination

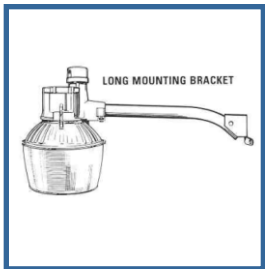
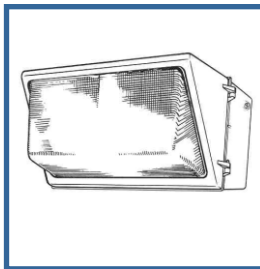
All parking lot lighting shall have no light emitted above 90 degrees.

Exception:

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

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

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

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

PERFORMANCE METHOD - User's Guide

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

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

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

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

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

Table E allows additional lumens for unique site conditions.

Examples of allowances include:

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

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

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

B. Performance Method

1. Total Site Lumen Limit

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

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

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

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

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

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

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

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

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

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

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

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

The design complies if:

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

DESIGN COMPLIANCE - User's Guide

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

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

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

V. RESIDENTIAL LIGHTING - User's Guide

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

RESIDENTIAL LIGHTING EXCEPTIONS

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

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

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

RESIDENTIAL LIGHTING EXAMPLE

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

Comparison of efficacy by power
(120 Volt Incandescent lamps)

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

V. RESIDENTIAL LIGHTING - Ordinance Text

A. General Requirements

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

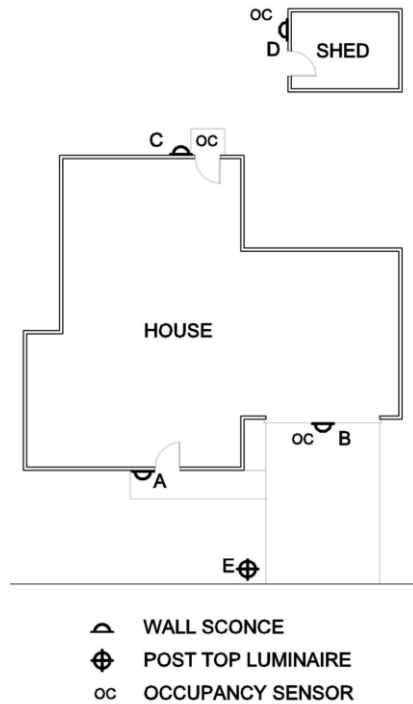
Exceptions

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

B. Requirements for Residential Landscape Lighting

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

V. RESIDENTIAL LIGHTING - User's Guide



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

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

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

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

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

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

SPORTS FIELD LIGHTING

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

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

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

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

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

VI. LIGHTING BY SPECIAL PERMIT ONLY - Ordinance Text

A. High Intensity and Special Purpose Lighting

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

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

B. Complex and Non-Conforming Uses

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

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

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

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

SPORTS FIELD LIGHTING

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

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

VII. EXISTING LIGHTING - User's Guide

Adoption of this section on existing lighting is strongly encouraged.

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

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

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

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

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

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

VII. EXISTING LIGHTING - Ordinance Text

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

A. Amortization

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

B. New Uses or Structures, or Change of Use

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

C. Additions or Alterations***1. Major Additions.***

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

VII. EXISTING LIGHTING (cont.) - Ordinance Text

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

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

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

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

Any new lighting shall meet the requirements of this Ordinance.

3. Resumption of Use after Abandonment

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

VIII. ENFORCEMENT & PENALTIES - Ordinance Text

(Reserved)

VIII. ENFORCEMENT AND PENALTIES - User's Guide

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

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

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

IX. TABLES - User's Guide

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

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

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

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

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

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

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

IX. TABLES - Ordinance Text

Table B - Lumen Allowances, in Addition to Base Allowance

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

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

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

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

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

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

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

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

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

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

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

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

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

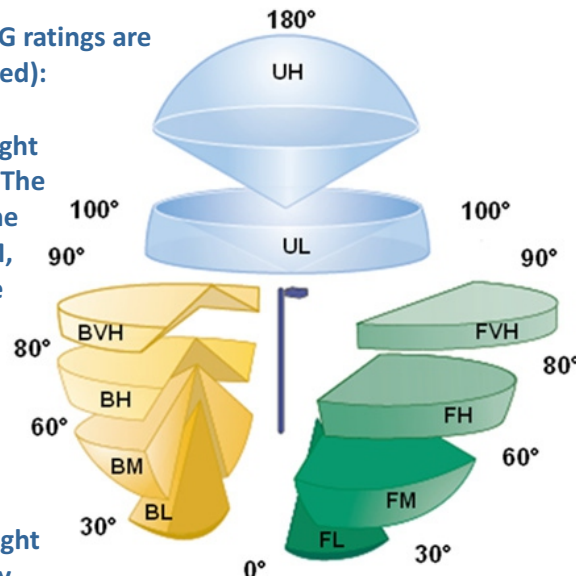
The three components of BUG ratings are based on IES TM-15-07 (revised):

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

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

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

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



IX. TABLES (cont.) - Ordinance Text

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

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

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

At the 90-180 degree ranges:

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

IX. TABLES (cont.) - Ordinance Text

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

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

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

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

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

TABLE D EXAMPLE - PERFORMANCE METHOD - User's Guide

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

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

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

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

May be used on any project.

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

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

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

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

TABLE E PERFORMANCE METHOD - User's Guide

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

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

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

IX. TABLES (cont.) - Ordinance Text

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

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

IX. TABLES (cont.) - Ordinance Text

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

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

IX. TABLES (cont.) - Ordinance Text

Table G - Residential Lighting Limits

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

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

TABLE G RESIDENTIAL LIGHTING - User's Guide

Residential Light Levels

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

X. DEFINITIONS - User's Guide

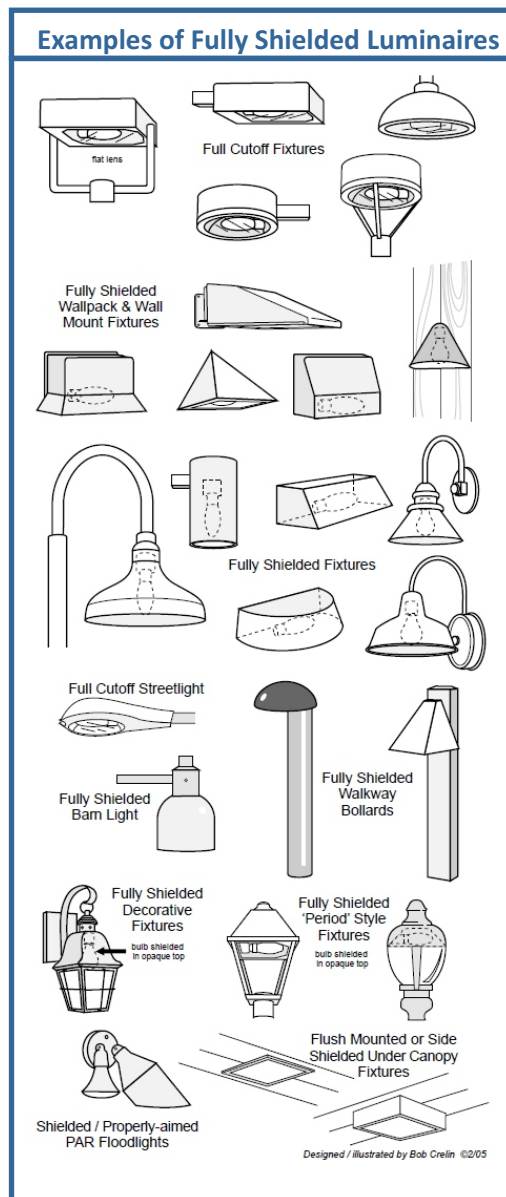
Definitions are typically generally added to any code when new code sections are added. The definitions are legally required and play a significant role in the interpretation of the ordinance and code.

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

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

X. DEFINITIONS - Ordinance Text

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

**X. DEFINITIONS - Ordinance Text**

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

X. DEFINITIONS - Ordinance Text

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

X. DEFINITIONS - Ordinance Text

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

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

X. DEFINITIONS - Ordinance Text

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

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

X. DEFINITIONS - Ordinance Text

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

X. DEFINITIONS - Ordinance Text

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

XI. OPTIONAL STREETLIGHT ORDINANCE - User's Guide

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

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

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

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

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

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

XI. OPTIONAL STREETLIGHT ORDINANCE - Ordinance Text

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

A. Preamble

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

B. Definitions

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

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

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

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

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

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

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

D. Master Lighting Plan

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

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

E. Warranting

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

XI. OPTIONAL STREETLIGHT ORDINANCE - Ordinance Text

F. Light Shielding and Distribution

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

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

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

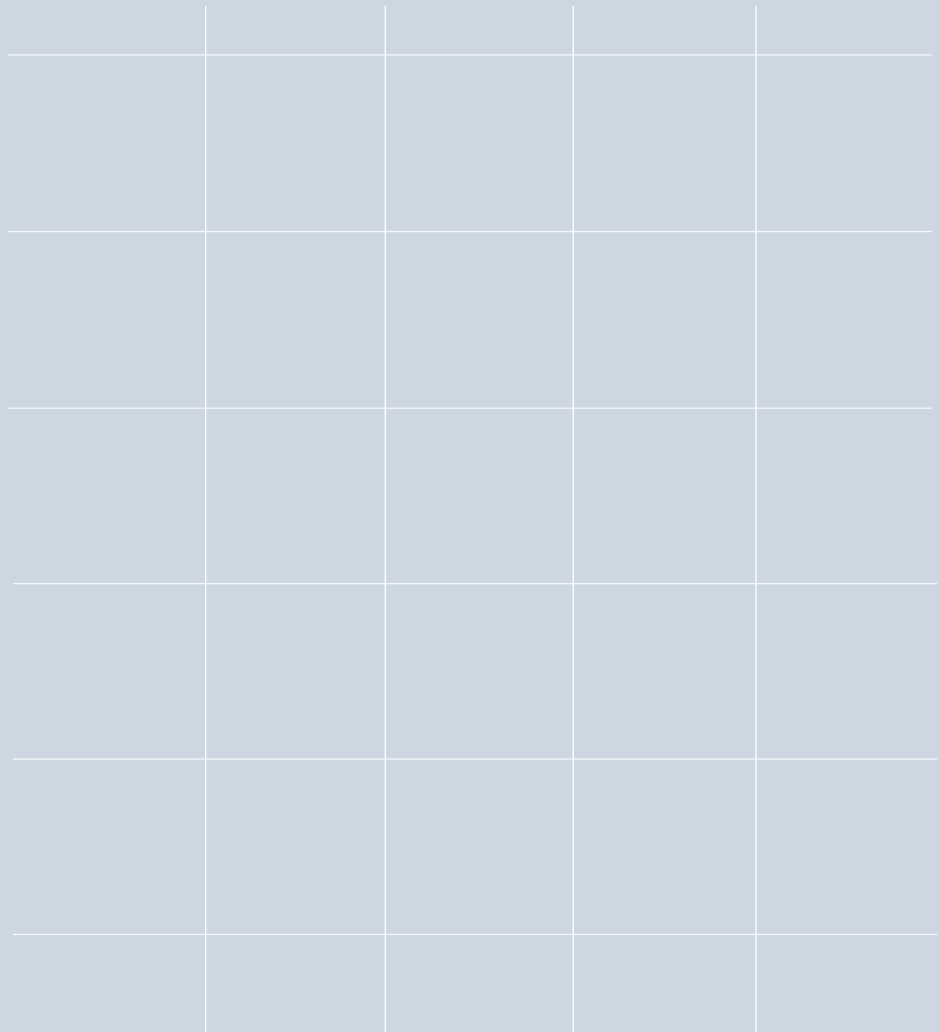
Lighting Zone	Maximum Uplight Rating
LZ-0	U-0
LZ-1	U-1
LZ-2	U-2
LZ-3	U-3
LZ-4	U-4



INTERNATIONAL DARK-SKY ASSOCIATION

INTERNATIONAL DARK-SKY ASSOCIATION

Guidance for Electronic Message Centers (EMCs)



ABOUT IDA

The need to protect and restore the natural nighttime environment is more urgent than ever. Light pollution, defined as light where it is not wanted or needed, affects our health, the environment, wildlife, and our ability to find awe in the natural night. Research indicates that light pollution is increasing at a global rate of five percent per year.

The International Dark-Sky Association, a 501(c)(3) nonprofit organization based in Tucson, Arizona is dedicated to preserving and protecting the natural nighttime environment.



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The IDA Guide for Electronic Messaging Centers (EMCs) was prepared for the International Dark-Sky Association (IDA) by the IDA Technical Committee and approved by the IDA Board of Directors.

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IDA Guidance for Electronic Message Centers (EMCs)

Purpose

Electronic Message Centers (EMCs) are also known as “LED signs,” “LED displays,” “solid-state lighting signs,” “digital billboards,” “mobile digital billboards,” “changeable message signs,” “media facades,” “media towers,” “architectural lighting facades,” or “electronic signs.”¹ This guidance addresses outdoor installations as well as indoor installations that are intended to be viewed from outdoors, such as through store windows. This guidance addresses all EMC installations no matter where situated, whether off or on a public right of way, and whether on- or off-premise.

EMCs have directly-viewed arrays of LED light sources (and potentially fiber optic or backlit display light source) that are electronically controlled to display fixed or dynamic messages. Each LED in the array can be of a different color and brightness and is dynamically controlled. EMCs have been rapidly adopted for commercial sites and advertising. The nature of EMCs makes them a significant impact to the natural and built environment, often producing glare, light trespass, skyglow, and substantially changing the nightscape.

To address deficiencies in many sign codes that only address legacy sign installations, IDA has developed minimum requirements and a set of best practices for EMCs in order to minimize the environmental hazard that often results from carelessly installed and operated signs. These recommendations are intended to be integrated by planners into existing sign ordinances and zoning codes and adopted by lighting practitioners. While IDA does not endorse the use of EMCs at night, it recognizes that these installations will continue to be developed and installed widely. IDA therefore presents the following guidance from a technical and scientific stand-point.

IDA Guidance for Electronic Message Centers (EMCs)

Background

The light-emitting diode (LED) is transforming the way we light our cities and towns. LEDs have now come to dominate the outdoor advertising industry, replacing legacy signs such as conventional flood-lighted billboards, exposed lamp and internally-illuminated (i.e. backlit) translucent signs, as well as ushering in new communication media. EMCs, are appearing with increasing frequency along roadsides and on urban buildings worldwide.

EMCs consist of arrays of many thousands of programmable LED light sources which, when viewed from a distance, make up a composite picture. Multiple advertisements can be displayed in one space, and can also be altered remotely. EMCs can be adjusted by time of day to changing traffic and ambient light conditions, and may require less electricity than legacy installations given the high efficiency of LEDs. However, EMCs are often being applied in novel ways that expand their application and may not be replacing a traditional sign or façade light on a one for one basis; thus may not represent any energy use reduction over past practices.

EMCs can be harmful to the nighttime environment. Much of the implementation of this medium to date has been uncontrolled, has been especially harmful to the environment, and has garnered much public attention. Unlike luminaires (i.e. light fixtures), EMC light emissions cannot be shielded, and the horizontal arrangement of their LEDs – typically aimed outward toward traffic and viewers – means that some of their light is necessarily emitted laterally into adjacent environments and upward into the night sky. Light that is emitted laterally can be a substantial source of

IDA Guidance for Electronic Message Centers (EMCs)

Background, continued

glare, temporarily limiting visual function for passing observers. Animated and/or rapidly cycling messages can be distracting to drivers, cyclists, and pedestrians and are suspected as being a potential traffic safety risk.² The light emission of EMCs can generate more lateral and upward light emission than conventional billboard lighting and thus can be visible to wildlife over long distances,³ affecting breeding, foraging and orientation behaviors in individuals, potentially leading to population level impacts. EMCs may contribute substantially to light trespass⁴ into residences and may thus have an impact upon human health. The primary method of mitigation is through luminance control, limiting hours of operation, and avoiding locating signs adjacent to sensitive areas or residential areas.

Measurement of EMC is different than most other outdoor lighting. The important metric for EMCs is their luminance – the light intensity of the light leaving the sign surface in a given direction, as opposed to most other lighting, which is often quantified by its illuminance – the light falling upon a surface, such as the billboard face or the ground. Proper installation, regulation and monitoring of EMCs requires the proper use of a luminance meter, and may require new measurement tools and procedures. Measurement of EMCs is discussed later in this guidance.⁵

IDA has developed this document to provide planners, lighting designers, architects, biologists, government officials, and the general public with a basic understanding of the environmental hazards and potential solutions to making EMCs less obtrusive and more sustainable. This guidance is particularly

IDA Guidance for Electronic Message Centers (EMCs)

Background, continued

well suited for municipal planning, regional planning, transportation planning, law enforcement, code enforcement, and conservation efforts where a lighting specialist may not be available. For those lighting professionals seeking additional guidance, technical standards from organizations like the International Commission on Illumination (CIE) and Illuminating Engineering Society (IES) can be layered atop this guidance.

Guidance for Electronic Message Centers (EMCs)

Lighting Zones

The following overlay lighting zones (LZs) are referred to in this document:⁶

LZ0: No ambient lighting. Areas where the natural environment will be seriously and adversely affected by lighting, and in which human activity is subordinate in importance to nature. This is the recommended default zone for undeveloped rural areas, including wilderness areas, parks and preserves. (Equivalent to CIE Environmental Zone E1)

LZ1: Low ambient lighting. Areas where lighting might adversely affect flora and fauna or disturb the character of the area. This is the recommended default zone for rural and low-density residential areas. (Equivalent to CIE Environmental Zone E2)

LZ2: Moderate ambient lighting. Areas of human activity where the vision of human residents and users is adapted to moder-

ate light levels. This is the recommended default zone for light-commercial business districts and high-density or mixed-use residential districts. (Equivalent to CIE Environmental Zone E3)

LZ3: Moderately high ambient lighting. Areas of human activity where the vision of human residents and users is adapted to moderately high light levels. This is the recommended default zones for business districts in large cities. (Equivalent to CIE Environmental Zone E4)

LZ4: High ambient lighting. Areas of human activity where the vision of human residents and users is adapted to high light levels. Most cities do not have areas that meet this criterion. This is not a default zone. (Equivalent to CIE Environmental Zone E4)

Minimum Requirements

It is impractical to shield light from EMCs due to its orientation, so many of the traditional approaches to reducing the impacts of artificial light at night do not translate to EMCs. As a result, the potential harm of EMCs cannot be completely mitigated by design alone. Rather, minimizing the harmful effects of EMCs is best accomplished through careful operation, programming, and location of this technology to the greatest extent practical. As of 2019, it is common for EMCs to operate in daytime at luminances in excess of 5000 candelas per square meter (cd/m2), also be known as “nits.” Such high luminances are necessary for visibility due to the high ambient illumination during the day. Achieving proper lighting control at night requires dimming of the LEDs to match the lower ambient illumination and thus render more appropriate visibility. However, sufficient dimming at night is infrequently implemented, resulting in over-lighting, decreased sustainability, and attendant environmental impacts.

These Minimum Requirements for urban, suburban, rural, and natural environments have been developed by practicing scientists and lighting engineers to provide a minimum level of protection to the nighttime environment, while meeting the needs of advertisers. However, IDA strongly recommends also applying the Best Management Practices described

herein, in addition to these Minimum Requirements, to provide greater protection of the nighttime environment and to meet the currently accepted standards of sustainability.

1. Luminance level - During the night hours, which commence no later than one hour after sunset, luminance levels shall not exceed the maximum values provided in Table 1 as measured:⁷

Lighting Zone	Nighttime Maximum Luminance (cd/m2)
LZ0	0
LZ1	20
LZ2	40
LZ3	80
LZ4	160

2. Curfew - EMCs shall be switched off completely after 2300h/11pm (or 30 minutes after the close of business for on-premises signs, whichever is later), and remain off until one hour before sunrise. EMC applications for traffic and safety information shall be exempt from curfew.

Best Management Practices

A number of best management practices are recommended for EMCs which can further decrease the negative impacts to the environment, reduce visual clutter, and improve the safety of drivers and pedestrians. The combination of adoption of these Minimum Requirements and Best Management Practices has the potential to result in no net increase or even a net reduction in light pollution caused by signage while simultaneously meeting the needs for commerce. Thus, the IDA strongly supports the incorporation of the following Best Management Practices into the relevant codes and regulations covering signs and/or outdoor lighting.

BMP 1. Monitoring – EMC device owner or the permit holder should continuously monitor signs twenty-four (24) hours per day, including monitoring of the reliability of hardware, software, network and other support infrastructure. Should a problem occur, the EMC shall remain unlit.⁸

BMP 2. Sensitive Area Setback – EMCs should not be placed within or adjacent to sensitive areas. These may include, but are not limited to: natural areas, beaches, wetlands, state and national parks, wildlife refuges, residential areas, observatories, and military training grounds. Setbacks in excess of 1 mile (1600 meters) from sensitive areas may be warranted.⁹ Distance setbacks should be assessed on a case-by-case basis, considering the cumulative effect of multiple EMCs, and set forth by the appropriate authority in each community. Mobile EMCs should be addressed as well.

BMP 3. Distraction Limitation – Messages

appearing on EMCs should minimize distraction to vehicle operators and pedestrian by setting a minimum message duration, setting a maximum transition time between messages, and by maintaining adequate spacing between EMCs along thoroughfares.¹⁰

BMP 4. Gradual Brightness Reduction – It is recommended that EMC luminance levels gradually dim between day and night modes (from sunset to 1-hour after sunset) to provide the proper contrast ratio with the ambient illumination level, and similarly before sunrise.

BMP 5. Size Limits – Larger EMCs have a proportionally greater impact upon the nighttime environment. While IDA does not commend a maximum size due to the diversity of EMC uses, it may be appropriate for planners to carefully assess the maximum area of illuminated area in the relevant code or regulation.

BMP 6. Density Limits – Because of the rapid adoption of EMCs, the cumulative impact to the environment of multiple installations should be addressed. The total light emissions from EMCs can be controlled through limiting the number or combined size of signs that are permitted for a given length of roadway or a given area of land.

Measurement

The ideal opportunity to measure luminance from an EMC is at the point of installation. Verification from the

manufacturer of meeting Minimum Requirements is strongly encouraged, in combination with “as installed” measurements. Luminance measures should be of a white screen at the programmed nighttime intensity level. Once installed and operating normally, it is substantially more difficult to obtain accurate luminance measures.

Luminance measures require care in collecting accurate data, and are more exacting to obtain than the use of the more common illuminance meter or “light meter.” Proper setting of luminance meter, a perpendicular viewing angle, and control of stray light from other sources are critical considerations. A good primer on this topic is Alex Ryer’s “Light Measurement Handbook,” which is widely available online.

Guidance on collecting luminance measurements:

- Measure between 1 hour after the sunset and 1 hour before sunrise (use the official daily sunset and sunrise time).
- Take measurements in dry, cloudless weather conditions. Rainy, foggy, snowy conditions will result in erroneous measures.
- The luminance meter should view the EMC perpendicular to the surface and should be aimed at the center of the EMC.
- The luminance meter should be carefully aimed or mounted on a tripod; at least five replicate measurements should be taken and the median (e.g. middle) value utilized.

Once installed and operating, the non-static images and different color composition on EMCs will dramatically complicate measurement. Therefore, every attempt

should be made to verify compliance with IDA Minimum Requirements using the night-mode white screen setting, and to do so before normal EMC operations.

Should there be a need to evaluate existing installation or reevaluate an installation, there are some tools that can be used to provide an approximate measure of luminance. A standard luminance meter used on moving color images will likely produce a measurement that is lower than the actual luminance due to shifting images and non-white colors (even when the luminance meter set to peak luminance mode). Smartphone applications have the potential to aid in this regard, yet there are no ideal solutions as of 2018.¹¹ Illuminance meters, also known as foot-candle or lux meters, can also be used to derive an approximate measurement of luminance, yet are prone to bias from other sources of light and distance from the EMC must be precisely known.¹² Such alternative measures may indicate whether the EMC is grossly out of compliance or not, but will subsequently require that the EMC owner/vendor be contacted to set a pure white screen for proper measurement using a luminance meter and measurements coordinated with the appropriate code enforcement office.

Revisions

Due to the rapidly evolving technology and implementation of EMCs, these Minimum Requirements, Best Management Practices, and in particular measurement guidance in this document may be periodically updated and improved. For the latest information on EMCs, or to learn more about outdoor lighting and dark skies, see the IDA website at www.darksky.org.

Endnotes

1. IDA uses an expansive definition for EMCs, and does not differentiate between signs used for advertising vs. other uses, nor does IDA differentiate between on-premise signs and off-premise signs.
2. Dukic, T; Ahlstrom C; Patten C; Kettwich C; Kircher K. Effects of Electronic Billboards on Driver Distraction. *Traffic Injury Prevention*. 2003;14(5):469-476, doi:10.1080/15389588.2012.731546; Belyusar D; Reimer B. Mehler B; Coughlin J. A Field Study on the Effects of Digital Billboards on Glance Behavior during Highway Driving. *Accident Analysis & Prevention*. 2016 (March) Vol 88: 88-96, doi:10.1016/j.aap.2015.12.014.
3. Luginbuhl, C; Boley, P; Davis, D. The impact of light source spectral power distribution on sky glow. *Journal of Quantitative Spectroscopy and Radiative Transfer*. 2014;139:21-26. doi:10.1016/j.jqsrt.2013.12.004.
4. Ho, C; Lin, H; Huang, K. A Study on Energy Saving and Light Pollution of LED Advertising Signs. *Applied Mechanics and Materials*, 2011;121-126:2979–2984, doi:10.4028/www.scientific.net/AMM.121-126.2979
5. e.g., IES Recommended Practice for Off-Roadway Sign Luminance (RP-39-19).
6. IES/IDA Model Lighting Ordinance (2011); CIE 150:2017 Standard Guide on the limitation of the effects of obtrusive light from outdoor lighting installations, Second Edition.
7. As a point of comparison, conventionally lit signs are typically illuminated to surface brightnesses of between 60 and 100 cd/m². See C.B. Luginbuhl, H. Israel, P. Scowen, J. Polakis, T. Polakis, “Digital LED Billboard Luminance Recommendations How Bright Is Bright Enough?” (white paper, 2010).
8. A typical Best Management Practice is for EMCs to default to an unlit black screen when more than 50% of the LED emitters have failed or are otherwise not displaying properly.
9. A full-size electronic billboard at 50 cd/m² as seen from 1 mile (1600 meters) away illuminates the landscape nearly three times greater than the planet Venus (the “evening star”), and is capable of casting a visible shadow and causing glare for an otherwise dark-adapted human observer. Since EMCs generally produce a range of colors, a broad range of wildlife may be impacted, giving further credence to substantial setbacks from sensitive areas.
10. IES Recommended Practice for Off-Roadway Sign Luminance (RP-39) recommends a minimum duration of at least 20 seconds. Other best practices to reduce distraction include transitions from one message to another in less than 0.5 seconds, and to require a minimum of 1200 feet (366 meters) between installations on roadways.
11. For example, the Candela App is no longer available.
12. IDA disagrees with the 2016 recommendation by the International Sign Association that EMC compliance measurements should use illuminance (foot-candles or lux) instead of luminance (candela per square meter). With EMCs becoming increasingly popular, enforcement efforts should use the proper tool, and the growing market for luminance meters is bringing down the cost of these more accurate tools.

Pro Outdoor 3.9mm

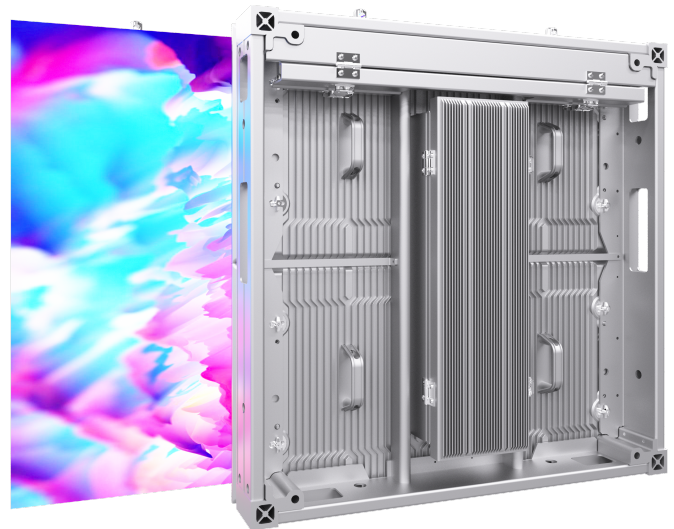
The Outdoor Pro is the right choice for your next event or permanent display. These features make it simple to configure and use right out of the box.

PRODUCT SPECIFICATIONS

Pixel Pitch:	3.91mm
Density (pixel/m ² / pixel/ft ²):	65,536 / 6,088
Pixel Composition:	SMD
Viewing Angle:	H 160°, V 90°
Max Brightness (Nits):	5,000
Panel Size (mm / inches):	500x500/750/1000 19.7x19.7/29.51/39.37
Refresh Rate:	3840Hz
Pixels per Panel:	16,384 / 24,576 / 32,768
Pixel Matrix:	128x128/192/256
Panel Weight:	19.85 / 29.77 / 36.38 lbs
Operating Temp (C/F):	-30°C to 55°C / -22°F to 131°F
Operating Humidity:	10% - 90%
IP Rating:	IP66

ELECTRICAL SPECIFICATIONS

Max Power (per m ² /ft ²):	700W / 65.03W
Avg. Power (per m ² /ft ²):	210W / 19.51W
Voltage (VAC):	110-220V / 50-60Hz



- Modular system for easy assembly and set up in many different configurations
- light-weight aluminum means a lower cost of installation
- 30% less power consumption, fan-less design means lower cost of operation
- Front or rear service
- Slim dimensions - less than 3.3"
- Display digital playback of recorded, live, or static images.
- ETL/CE/FCC Certified
- Industry standard 5-year warranty, with optional 10-year extended warranty

(214)504-2404

sales@uvledsol.com

www.ultravisionledsolutions.com

Display Power

25%

Shutter Speed:1/30
Aperture:3.5
ISO:20000

Shutter Speed:1/30
Aperture:3.5
ISO:20000

Camera setting on left is identical to camera settings on right



Display Power

25%

Shutter Speed:1/30
Aperture:3.5
ISO:20000

Shutter Speed:1/30
Aperture:22
ISO:12800

Camera setting on left captures approximately 10.2 times as much light as image on right.



Display Power

25%

Shutter Speed:1/40
Aperture:11
ISO:12800

Shutter Speed:1/40
Aperture:11
ISO:12800

Camera setting on left is identical to camera settings on right



Display Power

1%

Shutter Speed:1/40

Aperture:11

ISO:12800

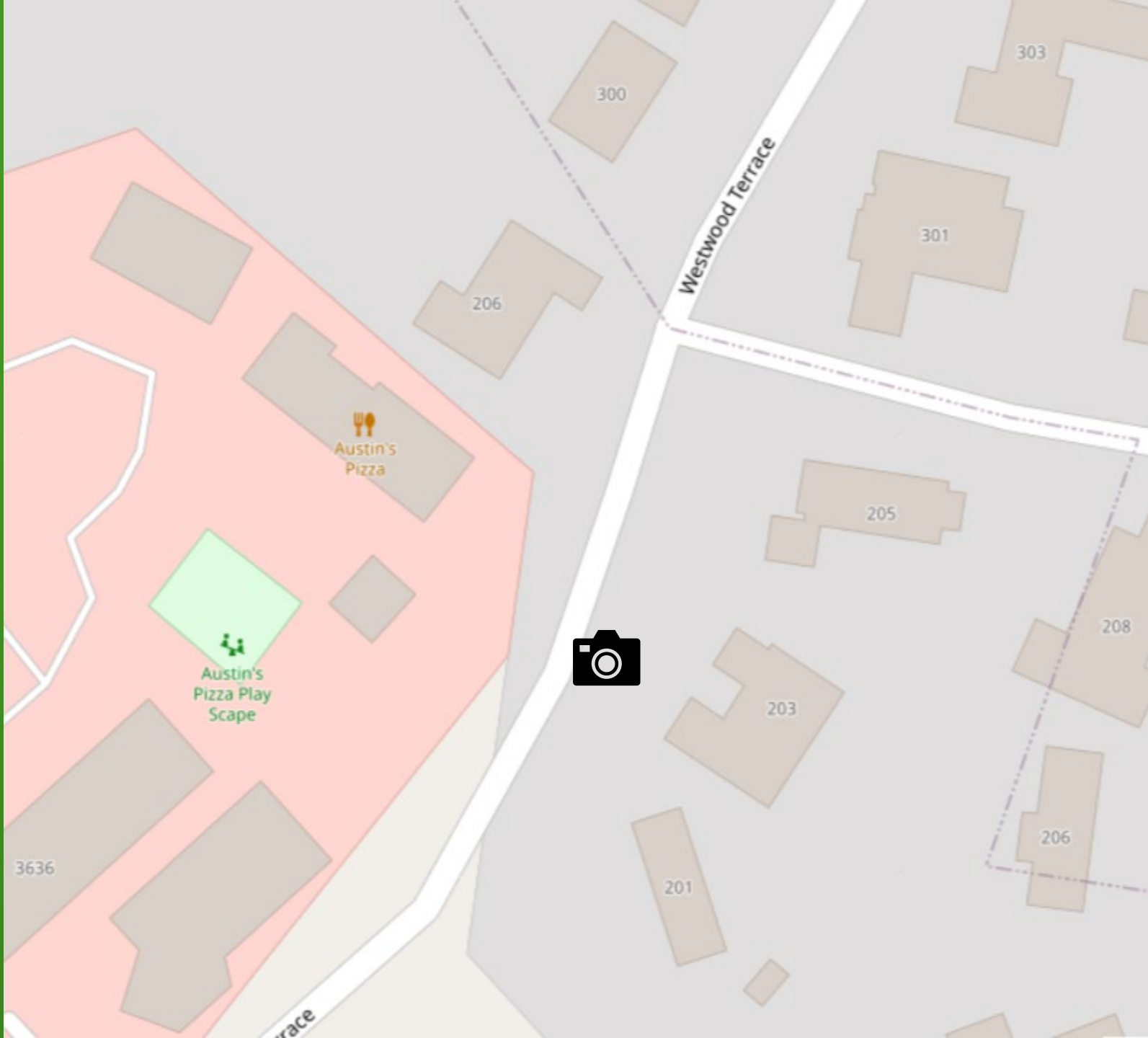
Shutter Speed:1/40

Aperture:11

ISO:12800

Camera setting on left is identical to camera settings on right





Display Power

1%

Shutter Speed:1/8
Aperture: 8
ISO:12800

Shutter Speed:1/8
Aperture: 8
ISO:12800

Camera setting on left is identical to camera settings on right



Display Power

1% - 25%

Shutter Speed: 1/8

Aperture: 8

ISO: 12800

Shutter Speed: 1/8

Aperture: 8

ISO: 12800

Camera setting on left is identical to camera settings on right



Display Power

1% - 100%

Shutter Speed: 1/8

Aperture: 8

ISO: 12800

Shutter Speed: 1/125

Aperture: 13

ISO: 12800

Camera setting on left captures approximately 25.4 times as much light as image on right.



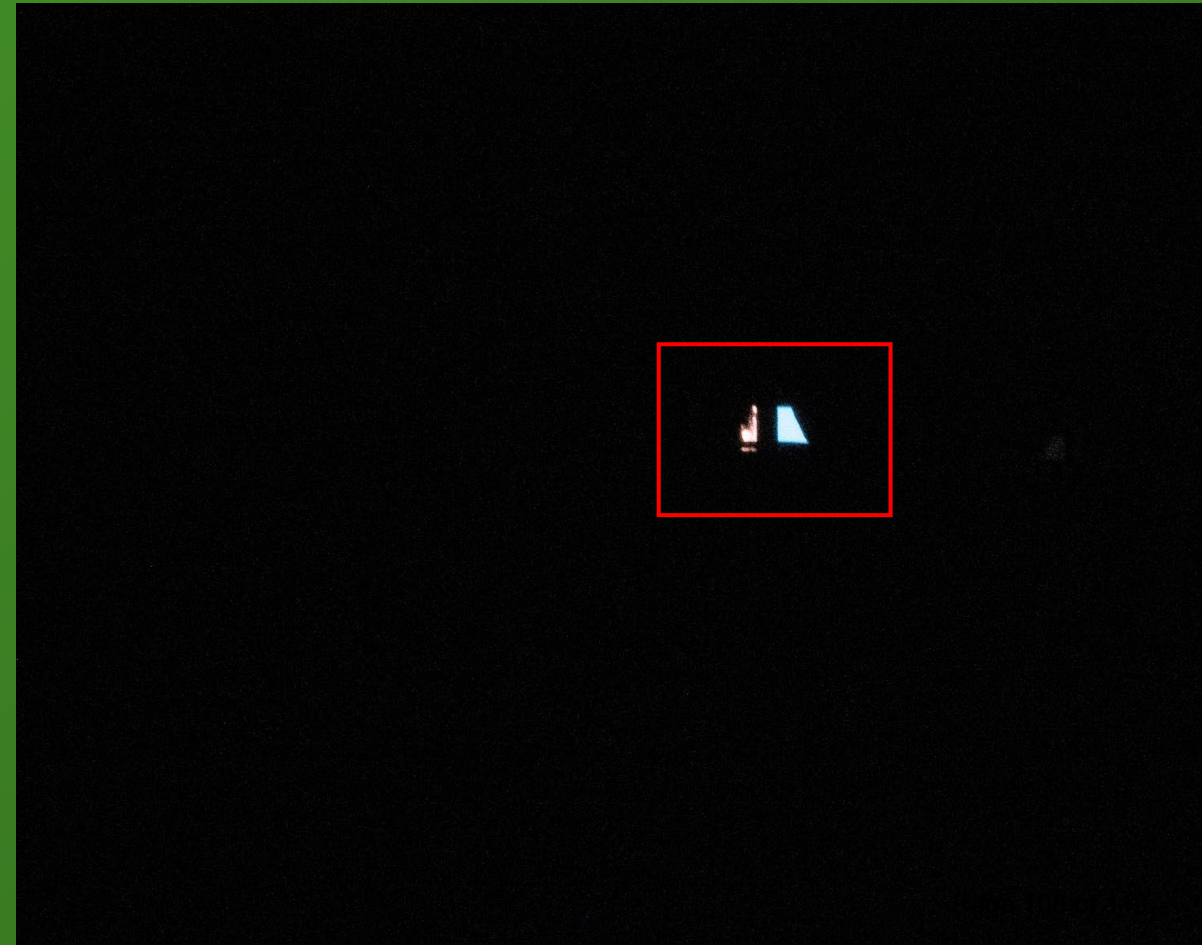
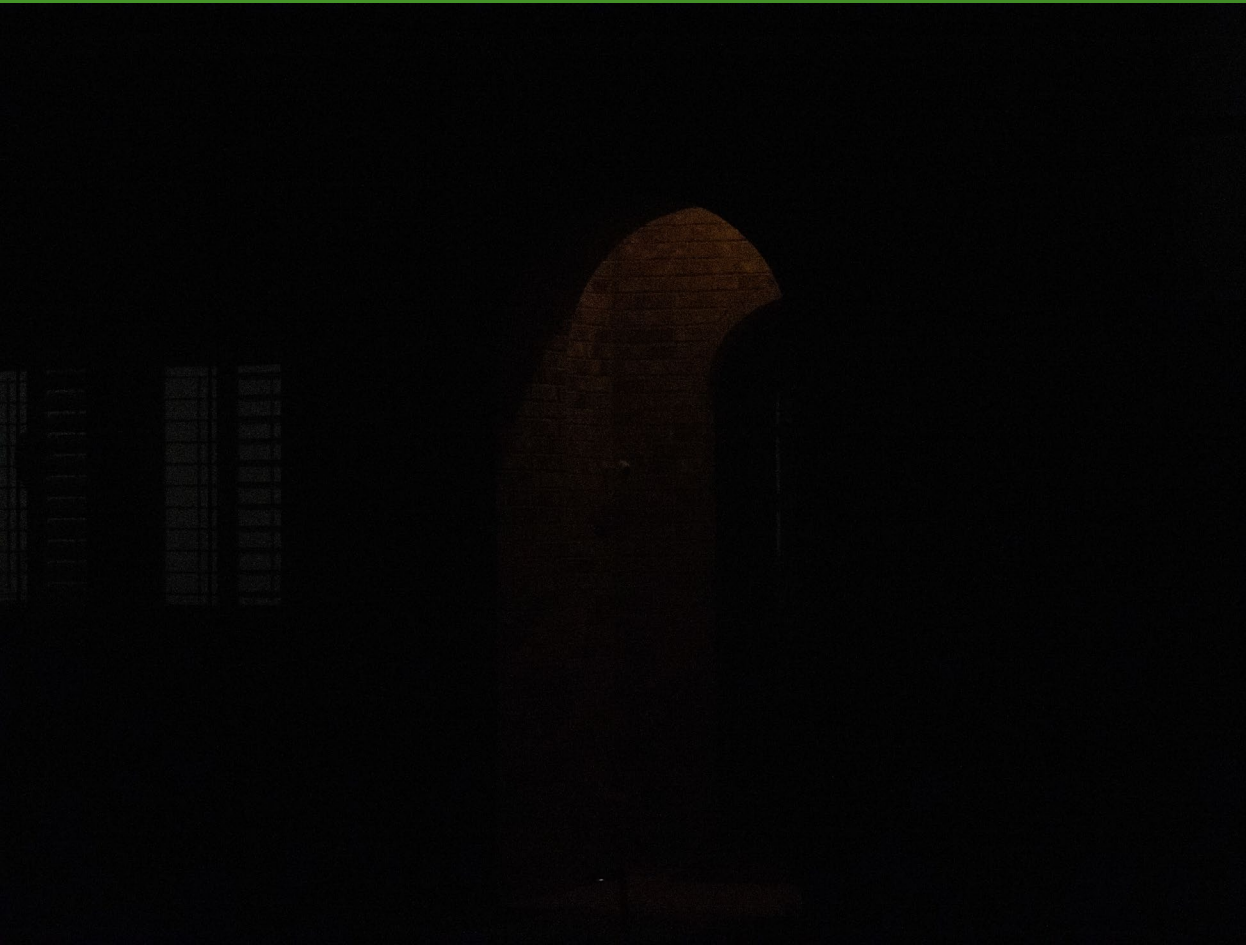


Display Power 100%

Shutter Speed:1/8
Aperture: 8
ISO:12800

Shutter Speed:1/8
Aperture: 8
ISO:12800

Camera setting on left is identical to camera settings on right



From: [Charlie Scott](#)
To: [Planner](#)
Subject: Variance Request = 3638 Bee Cave Road
Date: Friday, September 20, 2024 12:00:42 PM

Hi,

I live at 204 Laurelwood Trl, 78746, within 300 feet of 3638 Bee Cave Road. I understand that the owners of that property have requested variances to allow brighter lighting, higher quantities of light, with a brighter temperature, and without uplighting and other shielding.

I am writing to oppose that variance request.

Most importantly to me, my bedroom windows face in the direction of that property, and more light will negatively impact my sleep by making my bedroom brighter at night. There is already too much light for me coming from that direction.

In addition, I am opposed to light pollution in general and appreciate the fine efforts many areas of Austin have done to keep it low and even reduce it. I would like West Lake Hills to continue its respect for the environment and community by not increasing light pollution.

Please confirm you will represent my opposition to these code variances.

Thank you,
Charles Scott
204 Laurelwood Trl
Austin, TX 78746
512-306-1450

Exhibit A

3638 Bee Cave Road – Multiple Variances

Staff Findings of Fact

1. The strict or literal enforcement of the terms of this chapter, because of special conditions, will result in unnecessary hardship to the applicant.

We submitted for our TV permit project #2024-11983 June of 2024 we provided a detailed plan with electric, location, type of use, engineer seal and all the application and permitting requirements.

We were given the following review comments to include:

- 1)Will there be electricity to the structure
- 2)the backside can not be used for signage
- 3)provide technical specs,
- 4)confirm TV will be turned off every night one hour after closing or 11:00pm (Section 24.03.006(e).

All of these comments were responded and agreed upon

We then commenced on the TV as we understood this to be an internal process supported by our recent fence permit to construct. We recently learned of the lumens ordinance which have been described below but was suggested we take the variance route to ensure proper alignment ensures for the project.

2. There will not be unreasonable disruption of the natural terrain or unreasonable destruction of existing flora.

Nothing will be destroyed, changed, or modified in the terrain.

3. There is no reasonable alternative to the requisite variance that will alleviate the difficulty or hardship complained of.

24.03.006(a) - Luminaires on properties in the O, GUI, B-1 and B-2 districts are limited to 6,000 lumens each and must be spaced so that the luminaire lumens per square foot of all existing.

*The current ordinance does not reflect the time of day use. Our intention is to operate the TV during the day and then at night operate the TV under the required 6,000 lumen limit, which our device is operationally capable of doing and will meet the ordinance spec of 6000 Lumen.

We are NOT requesting any variations to the ordinance - just to modify to day-time / night-time usage + to be able to adjust the TV to operate under the 6000 lumens at night.

4. The variance will not be greater than the minimum required to alleviate the difficulty or hardship complained of.

24.03.006(b)(2) - Luminaires shall be limited to two per pole and shall have a zero up-light rating and either a zero or one glare rating within the BUG rating system or, if not rated, shall be a fully shielded luminaire.

*We have ZERO up-light rating impact

24.03.006(d) - Luminaires shall utilize lamps with a color temperature rating of 3,500K or below. This is not a design goal but a maximum allowable color temperature rating.

*We will operate under the required color temperature of 3,500K.

5. The variance does not violate the intent of the Zoning Ordinance or goals of the Comprehensive Plan.

Given the size and location of the TV we determine there will be no adverse affect to neighbors, businesses, traffic or others in our general area of use. Our project plan #2024-11983 properly shows the impacted area and how this TV will only enhance the current and existing pizza operation located there since 2008 and provide enjoyment to families and the community. This TV will be FREE to all in the community and promises to be a positive experience for all.

We also believe this will have MUCH less impact pertaining to Lumens than many other establishments which have a much larger impact in our immediate area ie. Westlake Jumbotron, Westlake Athletic fields High School, Middle and Elementary schools, HEB and other larger businesses.

6. The variance will not adversely affect neighboring properties or interfere with the enjoyment of these properties by their owners.

The TV's orientation does not have any impact to the surrounding neighborhoods, businesses, or facilities. The screen faces away from any streets, parking, or other establishments. The property is also tucked in the back of the property far removed to avoid any disturbances and/or nuisances to aforementioned. We will also only operate the TV on a limited amount of use ie. movies and sports and will be turned off by 10:30pm it will NOT be on 24hrs/7days. The playground where the TV is located is also FREE to the public allowing everyone to enjoy the experience. We are prepared to add

any exterior curtains to be used compliant if needed to create a positive experience for the community.

Exhibit B

3638 Bee Cave Road – Multiple Variance

Staff Findings of Fact

1. The strict or literal enforcement of the terms of this chapter, because of special conditions, will result in unnecessary hardship to the applicant.

There is no unnecessary hardship. The code does not have standards by which to evaluate an outdoor display screen because they are not intended to be allowed. This is not a special condition to the site or applicant, as no other site would be able to have a similar display.

2. There will not be unreasonable disruption of the natural terrain or unreasonable destruction of existing flora.

There would not be a disruption to the natural terrain, but there may be an impact on the existing trees and avian wildlife due to greater nighttime light.

3. There is no reasonable alternative to the requisite variance that will alleviate the difficulty or hardship complained of.

There is no reasonable alternative as the outdoor display is not allowed by code.

4. The variance will not be greater than the minimum required to alleviate the difficulty or hardship complained of.

This cannot be determined as the maximum lumen output of the screen has not been provided. Additionally, as the minimum screen brightness at 1% is over recommended levels by the International DarkSky Association and the screen brightness can be easily reset, there is no assurance that the screen brightness will remain at 1% at night.

5. The variance does not violate the intent of the Zoning Ordinance or goals of the Comprehensive Plan.

The Zoning Ordinance seeks to promote the health, safety, property and general welfare of the residents of the city. The Outdoor Lighting Ordinance specifically states “Its very special quality is derived from its rugged terrain, beautiful views, dense foliage, unspoiled creeks, wildlife, large areas of relatively low population density, and **dark night skies.**” The brightness of an outdoor display is not in keeping with the intent of the code.

6. The variance will not adversely affect neighboring properties or interfere with the enjoyment of these properties by their owners.

The outdoor display is visible from Westwood Terrace, which is residential on the east side of the street and to the northeast of the subject site.