

Background – Motion re Light Pollution
(Recommended to the WRAC Board by the WRAC Land Use and Planning Committee)

Motion: The ____ NC/CC requests the City implement the Five Principles of Responsible Outdoor Lighting that minimize light pollution by following these guidelines for public facilities and private development (adopted by the Illuminating Engineering Society and the International Dark-Sky Association):

- All light should have a clear purpose.
- Light should be directed only where needed.
- Light should be no brighter than necessary.
- Light should be used only when it is useful.
- Use warmer color lights where possible.

The City shall enact/codify these principles through its departments and agencies for City facilities and properties such as buildings, parking lots and parks, the street light system, the airport and port, and for private development.

Community Plans and Specific Plans shall also enact similar dark sky practices, and include limitations on bright lights, light trespass and illumination of building facades.

Facts and background:

1. Light pollution is the release of unnecessary and wasted light into the atmosphere and is increasing 10% per year globally.
2. Light pollution and poor lighting design harm human health, public safety, wildlife, and cultural resources, including harm to sensitive and rare wildlife species in the City. It also harms low-income and underrepresented communities disproportionately, resulting in reduced sleep and increased health problems.
3. Direct glare and light trespass, as well as “skyglow”, degrades the night sky in the open spaces, parks, and astronomical observing locations, such as the Griffith Observatory, and beyond, including the Mt. Wilson Observatory.
 - a. According to the 2016 groundbreaking “[World Atlas of Artificial Night Sky Brightness](#),” 80% of the world’s population lives under skyglow. In the United States and Europe, 99% of the public can’t experience a natural night.
4. Light pollution and associated disruption of human daily rhythms likely contributes to cancer, metabolic disruption, obesity, diabetes, and other adverse health outcomes.
5. Current statutes, such as LAMC 93.0117, do not sufficiently control light pollution and are rarely enforced because of understaffed and untrained DBS inspectors.
6. Nearly all departments and agencies can reduce light pollution, including Streets LA, DBS, Planning, Port of Los Angeles, General Services, DWP, and Los Angeles World Airports.
7. Public safety and traffic safety are enhanced by well-designed, high-quality outdoor lighting that minimizes glare, eliminates wasted light, and avoids over-lighting.

8. Public health is benefitted by a nighttime environment that allows for restful sleep and lack of visual disturbance.
9. Citizens support and desire to coexist with wildlife in the City.
10. Many new buildings are installing lights that shine outward from their exteriors, mainly for marketing and to make them stand out (not for public safety). Lights also shine out from all-glass facades at night, and lights shine on reflective surfaces to illuminate buildings brightly at night.
 - a. These include neon lights on exteriors, shining lights on reflective glass facades, and large glass windows with interior lights that shine outward at night.
11. LAMC codes prohibit light trespass on neighboring properties.
 - a. LAMC: https://codelibrary.amlegal.com/codes/los_angeles/latest/lamc/0-0-0-183817
 - b. (b) No person shall construct, establish, create, or maintain any stationary exterior light source that may cause the following locations to be either illuminated by more than two footcandles (21.5 lx) of lighting intensity or receive direct glare from the light source. Direct glare, as used in this subsection is a glare resulting from high luminances or insufficiently shielded light sources that is in the field of view.

Findings and justification:

1. Both houses of the California State Legislature passed legislation to enact International Dark Skies Association best practices on State-owned properties, which demonstrates that high levels of government have vetted it.
 - a. Gov. Newsom vetoed it, however.
2. For 3,000,000,000 years, life on Earth existed in a rhythm of light and dark that was created solely by the illumination of the sun, moon and stars. Now, artificial lights overpower the darkness and our cities glow at night, disrupting the natural day-night pattern and shifting the delicate balance of our environment. A growing body of evidence links the brightening night sky directly to measurable harm:
 - a. [Increasing energy consumption](#)
 - b. [Disrupting the ecosystem and wildlife](#)
 - c. [Harming human health](#)
 - d. [Affecting crime and safety](#)
3. Bodies and brains require sleep in dark light to repair damage during the day, and lights that shine into residences disrupt sleep and the body's healing processes. Insufficient rest and healing increases agitation and reduces the ability to learn, which increases anger and psychological harm. That produces poor learning, poor health and increased crime.
4. Poor neighborhoods have more illumination than wealthier neighborhoods, due to extra security lighting and indifferent landlords who don't install hoods or dimmers.
5. 80% of birds migrate at night, preferring the cool of darkness, but lights from communication towers or skyscrapers attract and disorient birds. This causes them to land within the brightness, circle it in flight, or crash into structures, which

contributes to the death of millions of birds each year, according to conservationists behind World Migratory Bird Day. The initiative calls on cities to reduce light pollution during peak migration periods in May and October.

- a. This article explains how bright lights disorient and harm migratory birds.
- b. <https://www.latimes.com/sports/dodgers/story/2022-10-13/what-happened-to-the-goose-at-dodger-stadium-experts-say-its-a-rare-species-from-alaska>
- c. The bird on Wednesday was probably following this migration pattern when it became distracted by the stadium lights that tower above Chavez Ravine, a common obstacle for migrating birds, said Longcore, whose research includes the effects of light pollution on migratory birds. Moments before the bird landed on the field, fans had spotted a flock of geese flying low near the stadium lights in a “V” formation.

Impact on region: All NCs are affected by facilities and areas that are brightly illuminated and shine into residential neighborhoods.

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Articles:

<https://www.npr.org/2022/03/29/1089533755/sleeping-in-a-room-even-a-little-bit-of-light-can-hurt-a-persons-health-study-sh>

<https://www.cnn.com/2020/07/08/health/night-light-pollution-disrupt-sleep-wellness/index.html>

<https://elemental.medium.com/the-very-real-ways-that-light-pollution-affects-your-sleep-and-mood-9c423aebc16d>

<https://sitn.hms.harvard.edu/flash/2020/i-cant-sleep-can-you-turn-off-the-lights/>

Examples:

1. Ensure that existing and new exterior fixtures are fully hooded to reduce light trespass.
 - a. Mono County: All new outdoor lighting shall use full cutoff luminaires with the light source downcast and fully shielded with no light emitted above the horizontal plane, with the following exceptions:
 - i. Fixtures that have a maximum output of 100 lumens (equivalent to one 10-watt incandescent bulb) or less, regardless of the number of bulbs, may be left unshielded provided the bulb surfaces are obscured from off-site visibility with a semi-translucent or frosted glass that has an opaque top to prevent the light from shining directly up. However,

- partial or full shielding is preferred to control light output in all situations.
- ii. Fixtures that have a maximum output of 600 lumens (equivalent to one 40-watt incandescent bulb) or less shall be partially or totally shielded using a solid or semi-translucent barrier, provided that the lamp is not visible from off site, no direct glare is produced, and the fixture has an opaque top to keep light from shining directly up; e.g., a low output-style wall pack.
 - iii. Floodlights that do not meet the definition of “full cutoff” may be used if permanently directed downward, if no light is projected above the horizontal plane, and if fitted with external shielding to prevent glare and off-site light trespass. Unshielded floodlights are prohibited.
2. Reduce the illumination of exteriors/facades (especially glass/reflective facades) that create glare and bright illumination from lights that shine on them.
 3. Establish Lighting Zones:
 - a. LZ-1: low ambient lighting levels – single-family and duplexes, business parks, and commercial or industrial/ storage areas typically with limited nighttime activity. Include the developed areas in parks and other natural settings.
 - i. Recommended for low-density residential areas. Includes residential; agricultural; business parks; and open space preserves.
 - b. LZ-2: moderate ambient lighting levels - multifamily residential, institutional, commercial and businesses areas with evening activities in residential areas, recreational and playing fields and/or mixed use. Can accommodate a district of outdoor sales or industry in an area otherwise zoned LZ-1.
 - i. Recommended for light commercial districts and high-density or mixed-use districts. Includes neighborhood business districts; churches, schools and neighborhood recreation facilities; and light-industrial.
 - c. LZ-3: moderately high lighting levels - commercial corridors, suburban commercial areas, town centers, mixed-use, industrial, shipping and rail yards, high-use recreational and playing fields, shopping malls, car dealerships, and other nighttime active exterior retail areas.
 - i. Recommended for large cities' business district. Includes business zone districts; commercial mixed-use; and heavy industrial and/or manufacturing.
 4. Enact the principals of responsible outdoor lighting, per the Illuminating Engineering Society and the International Dark Skies Association to reduce the intensity of nighttime lighting.
 - a. https://www.darksky.org/wp-content/uploads/bsk-pdf-manager/16_MLO_FINAL_JUNE2011.PDF
 - b. Areas without street lights or with very low ambient light levels should turn off all non-emergency lighting at curfew, while commercial areas or urban areas may reduce by at least 30%.

- c. Automatic Switching Requirements: Controls shall automatically extinguish outdoor lighting when sufficient daylight is available, using a control device or programmable lighting controller.
- d. In general, a higher BUG rating means more light is allowed in solid angles, and the rating increases with the lighting zone. 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:

- i. Zone 0 allows no light above 90 degrees.
- ii. 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).
- iii. Zone 2 allows only 50 lumens in the UH and UL zones, 100 lumens total (less than a 25W incandescent lamp).
- iv. Zone 3 allows only 500 lumens in the UH and UL zones, 1000 lumens total (about the output of a 75W incandescent bulb).
- v. Zone 4 allows only 1,000 lumens in the UH and UL zones, 2000 lumens total (about the output of a 100W incandescent bulb)

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

vi.

Kern County:

Direct upward lighting and lighting aimed at structures is prohibited except as follows:

- Accent lighting of architectural features: provided that no glare or off-site light spillover is produced. Lamps for this type of accent lighting must be low-intensity and utilize less than 100 watts and emit less than 1,600 lumens

- Accent lighting of other features, such as statues, public art, or other objects of interest that cannot be illuminated with down lighting, may use narrow-cone spotlights that use less than 100 watts and emit less than 1,600 lumens.
- All other lighting aimed against structures can be aimed against structures if (1) the light is contained by the structure, (2) no glare is visible off site and (3) the fixture is fully shielded so none of the light emitted above the horizontal plan crosses over the property line.
- Low voltage landscape light (such as lighting used to illuminate fountains, shrubbery, trees, and walkways etc.) shall be permitted provided that the lighting is not mounted on a pole or building, it is shielded to eliminate glare and light spillover and each fixture uses only a maximum of 60 watts or emits a maximum of 750 lumens (whichever is less).

SHIELDING

- All lighting fixtures (utilizing 100+ watts and emitting 1,600+ lumens per fixture) must be fully shielded per the definition listed in the chapter.
- Floodlights which use less than 100 watts must be at least partially shielded to reduce light spillover onto nearby properties.
- The light bulb within the lighting fixture should be pointed downward.

OFF-SITE AND ON-SITE OUTDOOR ADVERTISING SIGNS

- New off-site outdoor advertising signs (with externally mounted light fixtures utilizing 100+ watts and emitting 1,600+ lumens per fixture) must:
 1. Mount the fixtures on the top of the advertising structure
 2. Orient the fixtures downward
 3. Fully shield the lighting fixtures
 4. Any externally mounted light bulb or lighting tubes (not filled with neon, argon, or krypton) shall not be visible from the adjacent public right-of-way or adjoining property.

HOURS OF OPERATION (CURFEW)

Outdoor lighting fixture located in or within 25 ft. of a residential (E, R-1, R-2, and R-3) zone district:

- Will not be subject to curfew if the light fixture uses less than 100 watts, emits under 1,600 lumens, and does not project light above the horizontal plane
- Security lighting fixtures that utilize 100+ watts or emit 1,600+ watts will be controlled by a motion-sensor device, if used after 11 PM. The motion-sensor device should be programmed to illuminate the fixture for no more than 10 minutes activation. The fixture shall conform to all other provisions of the “Dark Skies Ordinance”.
- All non-exempt outdoor lighting fixtures should be turned off between 9:00 pm and sunrise.

Malibu:

Driveways. The minimum necessary for safe vehicular use of the driveway, utilizing fixtures shall not exceed 850 lumens.

An outdoor light fixture shall not to exceed 850 lumens, at the entrance of buildings.

Projects in West L.A. with bright illumination:

1. West Edge project (Bundy & Olympic – old Martin Cadillac): Horizontal decorative lights on each level that face the south residences.
2. Olympic & Butler project: Neon light on side that faces west residences.
3. Lumen (Olympic and Corinth - old Manatt building): Bright, colored, changing lights on the roof pavilion that shine down into the north residences.
4. Apartment (Barry & Ayers): Brightly lighted “L’Ovest” sign.
5. Westside Media Center (Bundy & Olympic): Bright “Kilroy” sign that shines into south neighborhood.
6. Wilshire Blvd. tower (old Pavillions site): Building is illuminated brightly at night.



WestEdge project (Olympic Blvd., old Martin Cadillac site): Horizontal light bands that shine into houses to the south.



Lumen project (Olympic Blvd.): LED lights (colors, flashing) on bottom side of pavilion on roof that shine onto Olympic and houses to the north.



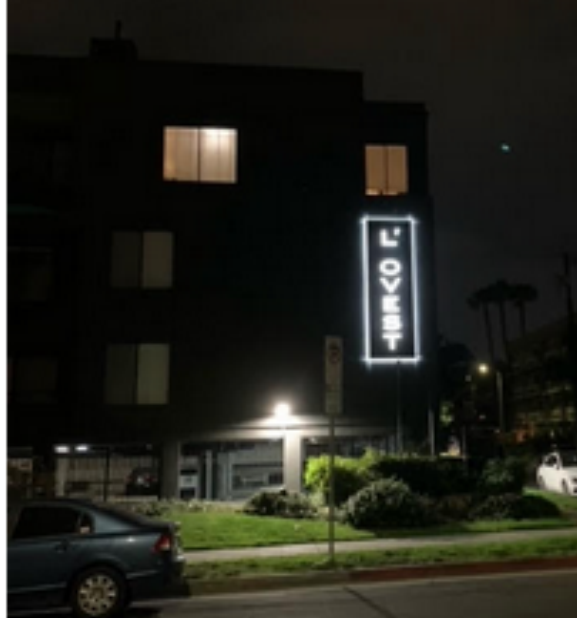
Olympic / Butler project: Neon on side of building that shines into houses to the west.



Westside Media Center (Olympic / Bundy): Kilroy sign facing south and shining into residential neighborhood.



West Edge project (Olympic / Bundy): Construction crane facing south and shining into residential neighborhood (O'Neill Construction).



Apartments on Ayers and Barry: Lighted sign

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