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March 4, 2021

Cupertino City Council
10300 Torre Avenue
Cupertino, California 95014

RE: Dark Sky Ordinance

Dear Councilmembers,

With this letter the Cupertino Chamber of Commerce wishes to express its continued concerns about the proposed Bird-safe and Dark Sky ordinance that has been considered by the Cupertino City Council.

Careful review of the previous versions of the ordinance available to the public have revealed contradictions and conflicts within the draft ordinance, conflicts with state law, and reliance on subjective standards.

Attached to this letter, please find specific problems and where they appear in the ordinance.

The Cupertino Chamber of Commerce strongly supports the intended outcome of the proposed ordinance. Our concerns are entirely regarding the significant negative unintended impact of the ordinance as currently designed.

The inconsistencies and subjective standards within the ordinance, as well as conflicts with state law will create many more problems than the ordinance is intended to solve.

Thank you for your most serious consideration of this issue.

Respectfully yours,

Shyam Panchal

Shyam Panchal
President, Board of Directors
Cupertino Chamber of Commerce

Attachment: Dark Sky Ordinance Comments, 24 Comments, 15 pages

DARK SKY ORDINANCE COMMENTS

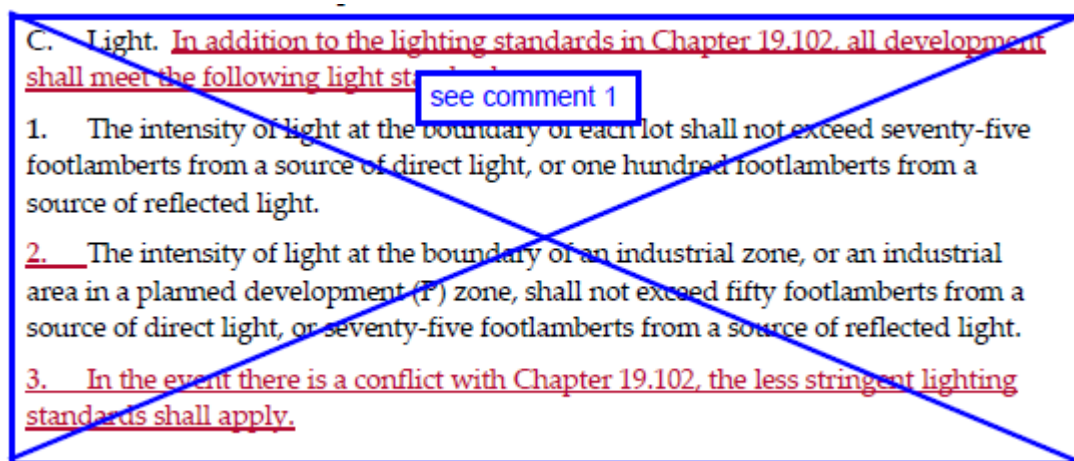
Comment 1

Footlambert is an outdated term that was expunged from Illuminating Engineering Society lighting standards about 30 years ago. To measure it, you would use an illuminance meter at the property line, with the conversion:

1 footlambert = 1 foot candle

Both have units of lumens per square foot, with one measuring the light falling on the imaginary plane at the boundary of the property, and the other measuring the light leaving the other side of this imaginary plane (and obviously the two are always equal).

Since the proposed limits in this section are 50-100 times higher than the 1 foot candle limit proposed in Section 19.102.040.B.2.a, this section has no effect and should be eliminated.



Comment 2

Regulations need to allow for like-kind replacement of both lighting and windows for routine maintenance. If someone breaks a window which is identical to 20 other windows in a building, it should be possible to replace that window with a glass that matches the other 19 windows. If a car knocks down a light pole in a parking lot, it should be possible to replace that light pole with a pole that has similar performance to avoid dark spots in the parking lot.

19.102.020 Applicability of regulations

see comment 2

Whenever an applicant is required to obtain a building permit or a Permit pursuant to Title 19, or whenever exterior lighting is added, ~~or replaced, or altered~~ (whether temporary or permanent), the ~~project~~ shall meet the requirements of this Chapter. The following table indicates the applicability of regulations by type of project in which exterior glazing or interior or exterior lighting is added, replaced, or altered:

see comment 3

newly installed lighting

Type of Development	Applicable Sections
A. New primary or accessory building, structure, or site construction	Sections 19.102.030 <u>and 19.102.040</u>
B. Complete or Partial Remodel of primary or accessory building, structure, or site	Sections 19.102.030 <u>and 19.102.040</u> apply to remodeled portions
C. Parking lot upgrade or redesign, excluding maintenance or repair activities (i.e., restriping, resealing, or repaving)	Section 19.102. 030 (D) 040 see comment 2
D. New or replacement exterior glass windows, doors, or features	Section 19.102.030 (A), (B), and (D <u>E</u>) apply only to the new exterior glass windows, doors, or features
E. New or replacement exterior lighting	Section 19.102. 030 (D) 040
F. Exemptions	See Sections 19.102.030 (B)(4), <u>C(2)</u> and (D <u>(14)</u>) <u>19.102.040 (D)</u>

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, excluding "like kind" replacements

Comment 3

The scope of regulations needs to be limited to the scope of the proposed alterations. If a restaurant decides to install a light by their trash bin to make it easier to take out the trash after closing, the entire mall should not be required to upgrade their lighting to comply with current regulations.

temporary or permanent), the ~~project~~ shall meet the requirements of this Chapter. The following table indicates the applicability of regulations by type of project in which exterior glazing or interior or exterior lighting is added, replaced, or altered:

see comment 3

newly installed lighting

Comment 4

This section has no effect and should be eliminated. These regulations are not applicable to existing installations which are not altered, and any new installations are already required to comply with the California Building Energy Efficiency Standards (Title 24), which are more stringent.

C. Non-residential Indoor Lighting Requirements:

1. Install time switch control devices or automatic occupancy sensors on non-emergency interior lights that are programmed to turn off at eleven p.m. or within two hours after the business is closed.

see comment 4

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Comment 5

“Low voltage lighting” is not a defined term and has no clear meaning. All new lighting being installed today is LED (light emitting diode) and all LED’s operate at “low” voltages (i.e. <48V, and usually 3V or 6V). This phrase would most likely be interpreted as meaning that lighting has to have a remote driver, but this has absolutely no bearing on the light output – it will just increase the installation costs for some projects where fixtures with integral drivers would be less expensive to install.

2. Businesses that involve the direct retailing of goods to the general public may have downward directed, low voltage, and fully shielded lighting for window displays at any time when there is a display of such goods.

~~D. Outdoor Lighting Requirements:~~

see comment 5

Comment 6

Certification by any design professional (as defined by California Civil Code) should be accepted. There are many architects and landscape architects who are knowledgeable about lighting, and many electrical engineers who are not.

~~3. Photometric plans, prepared, stamped and signed by a licensed electrical engineer, depicting the location of all outdoor lighting fixtures and building-mounted lighting fixtures and a maximum ten-foot by ten-foot grid of both~~

see comment 6

Comment 7

Preparation and certification of photometric plans represents a significant cost for smaller commercial projects, as well as homeowners. It is also not clear how these plans could be prepared for projects

involving the alteration of small amounts of lighting on a larger site. Some limits need to be placed on this requirement to avoid ensnaring small property owners in unnecessary cost and complexity. Some suggestions for how to limit this:

1. Limited to projects required to involve a design professional; or
2. Limited to projects installing more than 1,000 watts of exterior lighting; or
3. Limited to projects involving the construction of a new structure.

see comment 7

19.102.040 Outdoor Lighting Requirements

A. Submittal Requirements: Projects **subject to outdoor lighting regulations** must submit the following information:

1. A site plan indicating the location of all outdoor lighting fixtures.

Comment 8

It is not necessary to submit both initial and maintained values, and this doubles the number of drawings that need to be produced, submitted, and reviewed with no discernable benefit. There is also no consensus in the lighting industry about how to approach maintenance factors with the transition to LED sources, which have extremely long life, no scheduled maintenance, and minimal lamp lumen degradation in the early years of an installation, meaning that any maintenance value could be assumed and would not be wrong.

illuminance

see comment 8

the ground. The grid shall be extended beyond the property line to show any light levels greater than 0.1 fc (1 lux) falling on adjacent property.

the initial ~~and maintained~~ lighting levels on the site, including any impact on adjacent property.

4. The project lighting plan shall indicate how lighting has been coordinated

Comment 9

All filing requirements need to be explicitly stated in the regulations.

4. The project lighting plan shall indicate how lighting has been coordinated with any associated landscaping plan to prevent site planning conflicts.

5. Any other information the Director may determine is necessary to ensure that the proposed lighting is in compliance with the provisions of this Chapter.

6. Any of the above requirements may be waived by the Director of Community Development when determined to be unnecessary for determining compliance with the provisions of this Chapter.

see comment 9

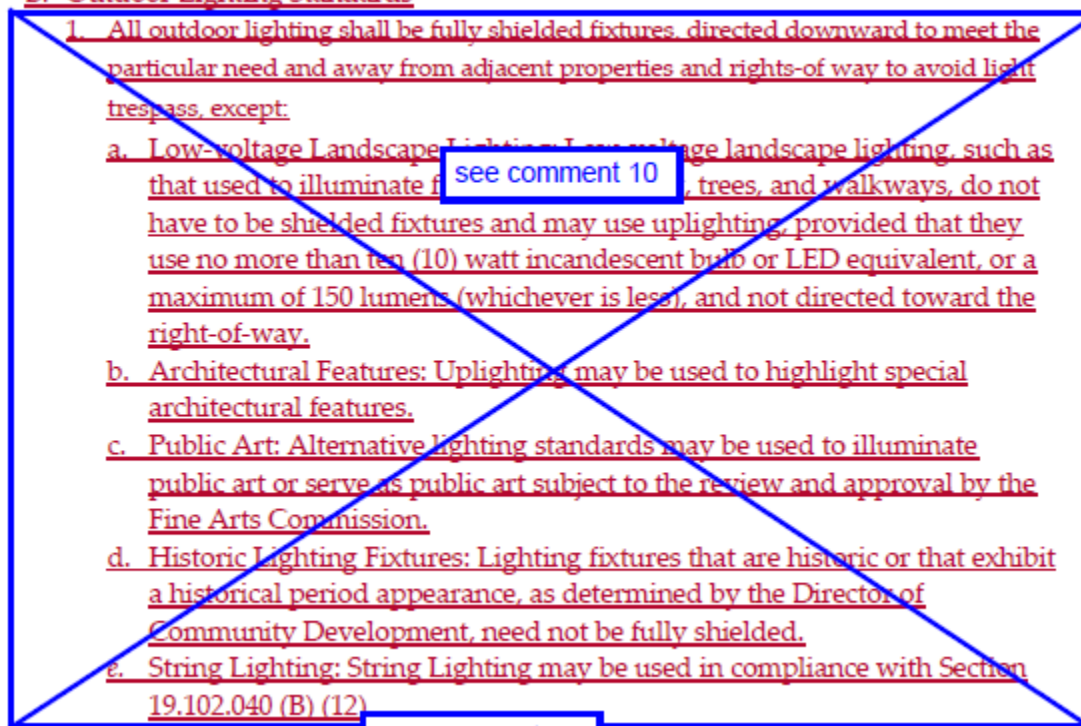
Comment 10

Uplight and glare from luminaires is already regulated by the California Green Building Standards Code (CalGreen). The requirements in CalGreen are expressed as a BUG rating (Backlight-Uplight-Glare). This was derived from the Model Lighting Ordinance (MLO), which was jointly developed by the International Dark-Sky Association (IDA) and the Illuminating Engineering Society (IES) over a number of years in a public process with input from numerous stakeholders. CalGreen and the MLO are technically validated, well-understood in the lighting industry, and enforceable.

There are two reasons why 19.102.040.B should be eliminated:

1. It is in conflict with the provisions of CalGreen, meaning that the same project must be evaluated under two different standards, with two different results. This adds significant additional complexity and cost, both for property owners and for building code and zoning officials.
2. The language of the proposed regulation is not enforceable. "Fully shielded fixture" is not a defined term, nor does it have a readily understood meaning. "Low voltage lighting" is similarly problematic (see comment 5). What types of architectural features are "special" enough that uplighting should be allowed?

B. Outdoor Lighting Standards

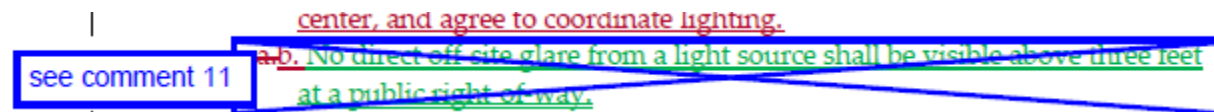


Comment 11

Glare is entirely subjective. Glare metrics which attempt to determine whether viewers will experience glare in a certain set of conditions always refer to the “probability” that there will be glare. Another way of looking at this is that under most lighting conditions, in a random sample of 100 viewers, some will describe the environment as being glaring, and some will not.

This raises the important question: whose opinion will determine if “glare” is present?

CalGreen and the Model Lighting Ordinance avoided this problem by regulating the photometric characteristics of lights near the property line, and this is the correct way of approaching this in a clear and enforceable manner. Regulations should not be based on subjective evaluations.



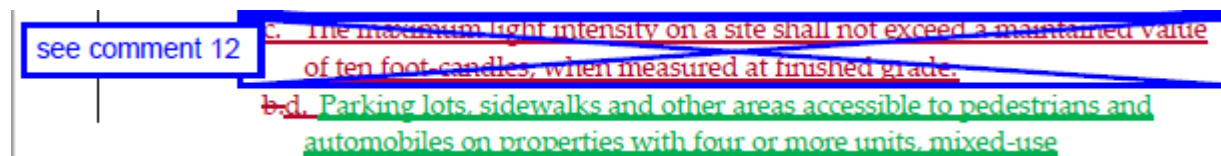
Comment 12

There are several problems with this item:

First, keep in mind that this is setting a maximum value. A max:avg uniformity ratio of 2 or 3 to 1 is quite common in exterior applications. Therefore, a maximum of 10 footcandles results from an average of 4 footcandles in many installations, which is not that high.

Second, any lighting installation that is close to the ground, including step lights and under-bench lights, will exceed a 10 footcandle maximum immediately adjacent to the fixture, so this would effectively ban some of the low-level lighting applications that other parts of the regulations are trying to encourage.

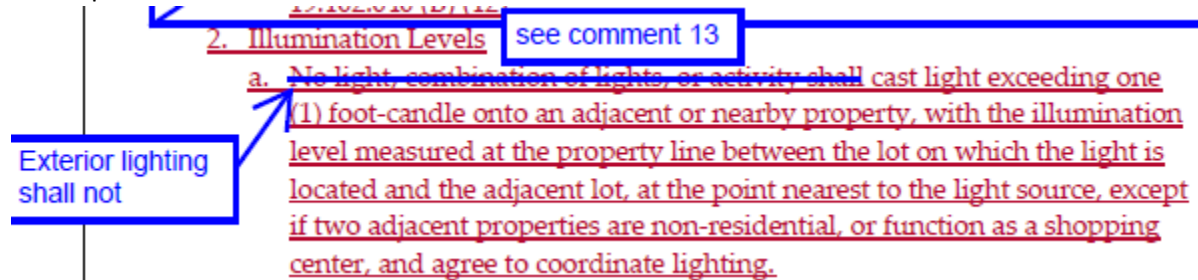
Third, while the vast majority of exterior lighting applications do not require 10 footcandles of illumination, some do. In practice, a 10 footcandle maximum will be problematic at some ATM machines, fuel service stations, drive-through windows (all of which require reading of receipts and visibility of keypads), vehicle inspection locations at secure facilities, and some security checkpoints with high resolution cameras. Higher illuminance levels are particularly important for the elderly, who typically require twice as much illumination as young people for similar visibility. This is not a comprehensive list of problematic applications.



Comment 13

This section is too broad. As written it would include interior lighting within buildings, exterior lighting, signage, temporary / holiday lighting, etc. which seems to be in direct conflict with the scoping provisions in 19.102.020 and the exemptions in Paragraph D. Furthermore, for signage and holiday lights, there is no way to calculate the light level at the property line before these are installed, putting

property owners at risk that an installation which is permitted to be installed would be found to not be in compliance after installation.



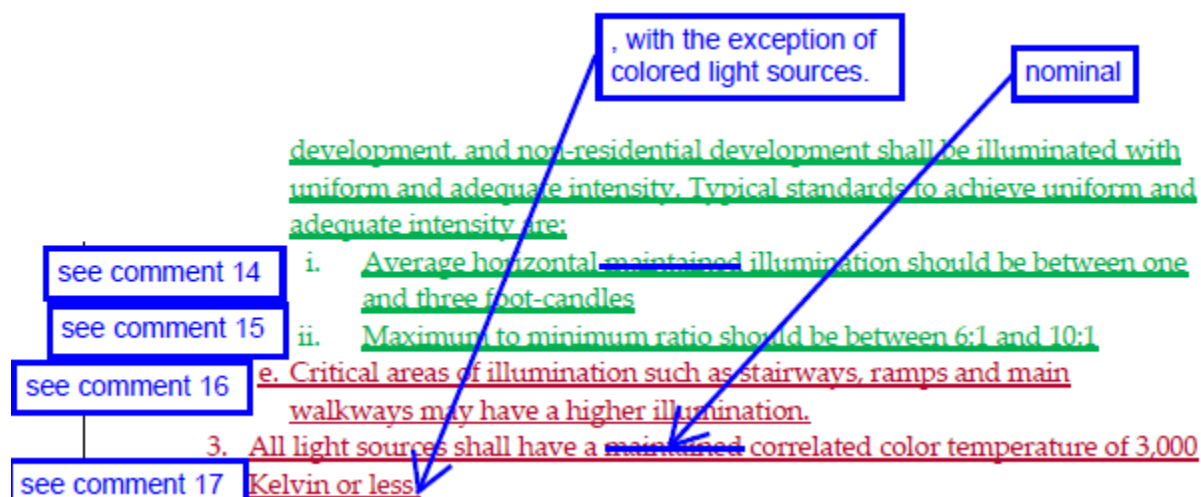
Comment 14

First, the use of permissive language (“should”) should be avoided in regulations. Will a permit application showing less than 1 footcandle average be approved? If yes, then this section should be eliminated. If not, then the word “should” needs to be replaced with “shall”, and the 3 footcandle number eliminated (because it is too low for some applications).

Second, it is surprising to see a “minimum” illuminance requirement included in a regulation whose stated intent is to reduce light pollution. The best way to reduce light pollution is to reduce the amount of light being provided.

Third, there is no consensus on appropriate maintenance factors for LED lighting, so it would be best to use initial values for clarity (and to be consistent with Comment 8).

Finally, and most importantly, there are many exterior lighting applications where an average illuminance of less than 1 footcandle is appropriate. Consider that the Illuminating Engineering Society recommends 0.5 footcandles average for surface parking lots. The proposed “light pollution” regulations should not be requiring that exterior environments be over-lighted.

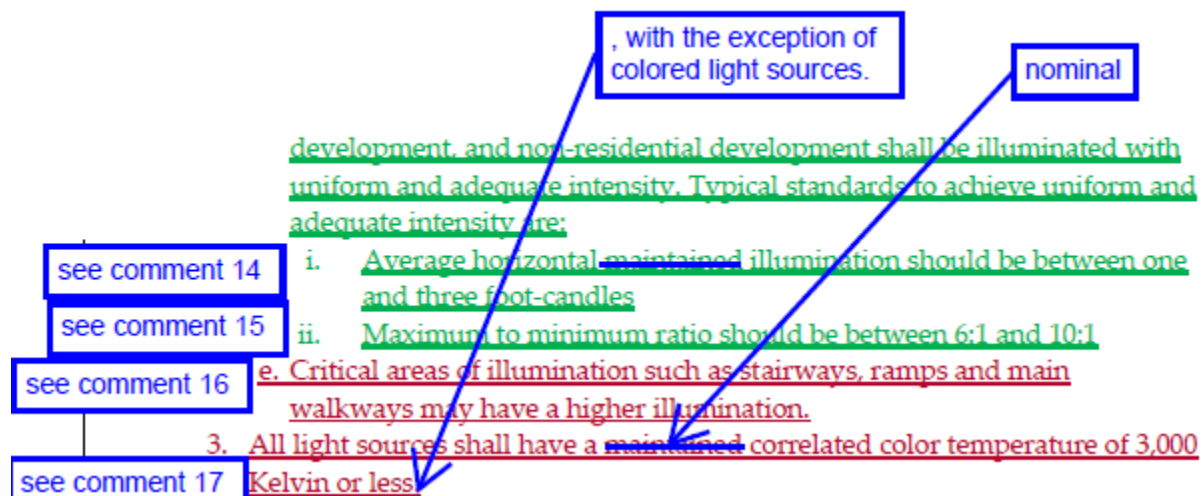


Comment 15

First, the use of permissive language (“should”) should be avoided in regulations. Will a permit application showing greater than 10:1 uniformity ratio be approved? If yes, then this section should be deleted. If not, then the word “should” needs to be replaced with “shall”, and the 6:1 ratio needs to be deleted (a lower uniformity ratio is always better in these applications – it makes no sense to limit this ratio to 6:1).

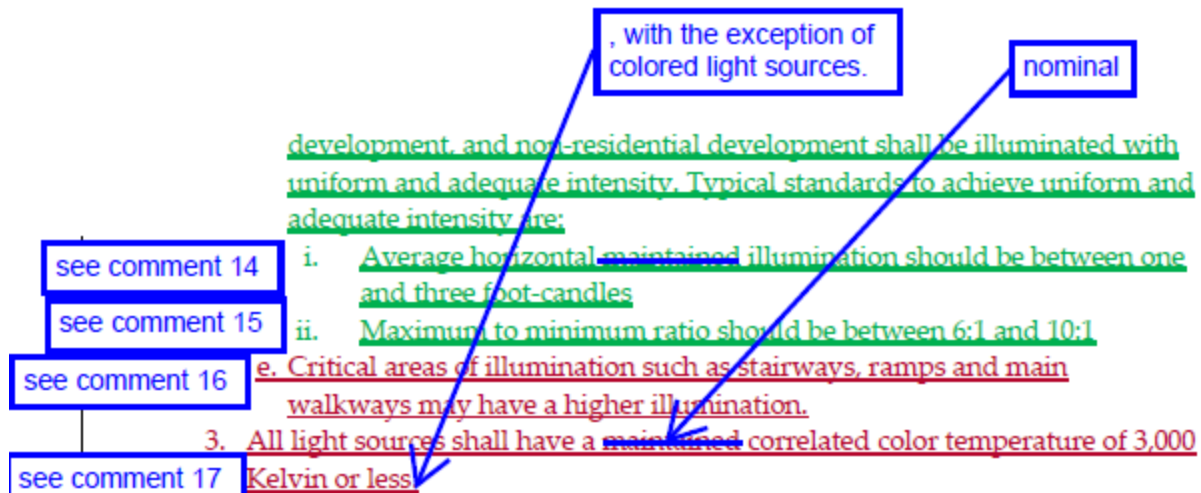
Please keep in mind that a lower uniformity ratio results from more lights. The proposed regulation will mean that additional lights need to be installed in many applications. For reference, the Illuminating Engineering Society recommends that a ratio of 15:1 not be exceeded in surface parking lots. It is not at all uncommon to have light levels between lights along a walkway drop to zero, or for light levels at the front bumper of a car in a parking lot to drop to zero. Providing additional lighting in these areas to meet a uniformity requirement is contrary to the intent of the regulation, which is to reduce light trespass.

Finally, lights that are close to the ground have high uniformity ratios. Some types of low level light sources like step lights and underbench lights will be effectively banned by this requirement, even though these types of light sources are encouraged in other parts of the regulation, and generally helpful in reducing light trespass.



Comment 16

It is not clear what item (e) means. It sounds like an exception, but it is an exception from what requirement(s) exactly? If Part (a)? Part (c)? All requirements in this section? Please clarify.

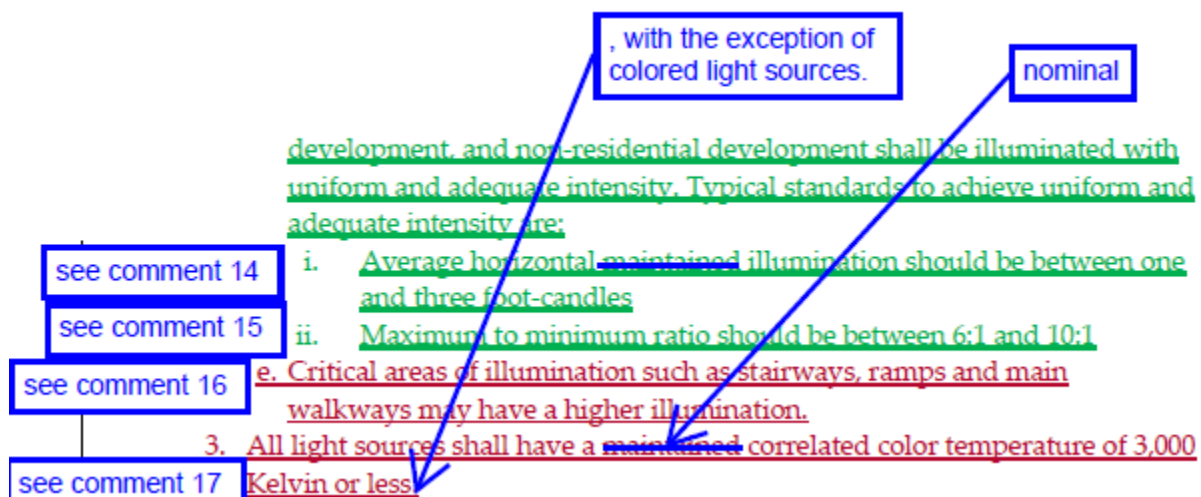


Comment 17

The phrase “maintained correlated color temperature” is problematic. There is no data from most luminaires on how the color temperature shifts over time, so this is not predictable. In a random sample of fixtures with nominal 3000K correlated color temperature, about half will be slightly higher than 3000K, and about half will be slightly lower than 3000K. Hence the word “nominal” is appropriate.

If an absolute limit is desired, then “less than” 3100K or 3200K would be better, as there are very few exterior light sources with a rated color temperature between 3000K and 3500K.

The current language also has the (perhaps) unintended effect of banning colored light sources (red, green, blue, etc.) which are sometimes used for corporate colors, holiday celebrations, etc. and are appropriate in some applications. An exception for colored lighting is proposed.



Comment 18

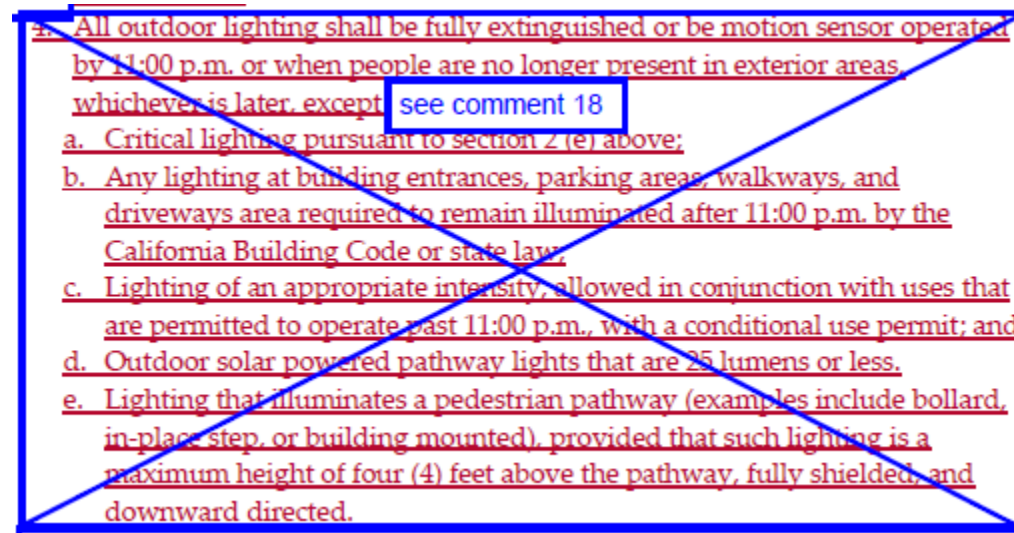
This section is not safe.

California Building Energy Efficiency Standards (Title 24) do not require occupancy sensors for luminaires mounted over 24 feet, because there are no occupancy sensors that work at higher elevations. Title 24 also does not require occupancy sensors for luminaires under 40 watts, because low level step lights, handrail lights, under bench lights, bollards, etc. are almost never available with occupancy sensors. So occupancy sensors are not be available for the vast majority of outdoor lighting installations, which is why time scheduling is used to control these lights. And time scheduling can never determine whether or not people are present.

This presents the very real likelihood that this regulation would require time scheduling to shut the lights off unexpectedly in outdoor public areas when people are present, with all of the attendant safety concerns.

California Building Energy Efficiency Standards Section 130.2(c)(2)(A) states that, “Automatic scheduling controls shall be capable of reducing the outdoor lighting power by at least 50 percent and no more than 90 percent, and separately capable of turning the lighting OFF, during scheduled unoccupied periods.” It would be better to build on this and require a scheduled power reduction “At 11:00 PM or two hours after business closing, whichever is later”. The amount of this reduction should be no more than 50%, in conformance with national codes that include a similar requirement. This would prevent lights from being turned completely off in occupied outdoor spaces.

It should also be noted that these regulations are applicable to residential properties. Is it right to require homeowners to install and maintain timeswitches and occupancy sensors for their exterior lights, and to require that they be programmed to shut lights off in the middle of the night?



Comment 19

This section has no effect on commercial properties, as these requirements are already included in California Building Energy Efficiency Standards (Title 24). The only impact would be on residential

properties. Is it right to require homeowners be required to install and maintain photosensors for their exterior lights?

5. Automated control systems, such as motion sensors and timers, shall be used to meet the outdoor lighting requirements.
- a. Photocells or photocontrols shall be used to extinguish all outdoor lighting automatically when sunlight is available. see comment 19
 - b. All lighting activated by motion sensors shall extinguish no more than 10 minutes after activation.
 - c. Automated controls shall be full programmable and supported by battery or similar backup.

Comment 20

Security lighting is not excepted or excluded from any of the other requirements in this proposed regulation. The requirements outlined here are “in addition to other applicable standards”. If no exceptions are granted for security lighting, then there is no reason for any lights to ever be classified as “security” lighting, meaning that this section has no effect.

- ~~b. Security lighting may be provided when necessary to protect persons and property. When security lighting is provided, the following standards shall apply, in addition to other applicable standards:~~ see comment 20
- ~~a. Security lighting shall be controlled by a programmable motion-sensor device, except where continuous lighting is required by the California Building Code.~~
 - ~~b. Floodlights shall not be permitted.~~
 - ~~c. Security lights intended to illuminate a perimeter, such as a fence line, are permitted only if such lights do not result in light trespass.~~

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see comment 20

- ~~d. Motion-activated security lights shall not use lamps that exceed 100 watt incandescent bulb or LED equivalent, or a maximum of 1,600 lumens (whichever is less).~~

Comment 21

Subjective standards of beauty are not enforceable and do not belong in a regulation.

see comment 21	7. <u>Lighting design standards:</u>
	a. <u>Lighting fixtures must be of a design that complements building and landscaping design.</u> b. <u>Lighting fixtures shall be appropriate in height, intensity, and scale to the use they are serving. Parking lot lights in non-residential zones shall not exceed a height of 21 feet, and any wall-mounted lights shall not exceed a height of 12 feet, measured from the adjacent grade to the bottom of the fixture.</u>

Comment 22

Item (2) would prohibit building façade lighting and landscape accent lighting, which were explicitly allowed in previous portions of the proposed regulation.

Item (4) is unclear. A spotlight is a floodlight with a narrower beam distribution, though there is no universally agreed upon standard for this. Spotlights have more controlled beams than floodlights, with less spill light, and because of this are better at limiting light pollution / light trespass. It is not clear why these would not be allowed.

see comment 22	A.C. Prohibited Lighting: The following types of lighting are prohibited:
	1. Outdoor lighting that blinks, flashes, or rotates except those that may be permitted pursuant to Chapter 10.26.
	2. Outdoor flood lights that project above the horizontal plane.
	3. Lighting that unnecessarily illuminates any other lot or substantially interferes with use or enjoyment of that lot.
	4. High-intensity discharge lighting for recreation courts on private property.
	5. Spotlights.

Comment 23

Subjective language does not belong in a regulation.

1. Light Color	All lighting shall be a white type light either metal halide or a comparable color corrected light unless otherwise approved as part of a development plan for uniformity, <u>not allowing any dark areas in the parking lot.</u>
see comment 23	

3.	see comment 23 Lighting Intensity	Parking lots, sidewalks and other areas accessible to pedestrians and automobiles shall be illuminated with a uniform and adequate intensity. Typical standards to
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as follows:

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Comment 24

Glare is entirely subjective. Glare metrics which attempt to determine whether viewers will experience glare in a certain set of conditions always refer to the “probability” that there will be glare. Another way of looking at this is that under most lighting conditions, in a random sample of 100 viewers, some will describe the environment as being glaring, and some will not.

This raises the important question: whose opinion will determine if “glare” is present?

CalGreen and the Model Lighting Ordinance avoided this problem by regulating the photometric characteristics of lights near the property line, and this is the correct way of approaching this in a clear and enforceable manner. Regulations should not be based on subjective evaluations.

2.	see comment 24 Lighting Glare	i. The light fixtures shall be oriented and designed to preclude any light and direct glare to adjacent residential properties. ii. No direct off-site glare from a light source shall be visible above three feet at a public right-of-way.
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Comment 25

The recommended light level for surface parking in the Illuminating Engineering Society Recommended Practice 20-14 is 0.5 footcandles. Requiring a higher average illuminance will result in additional light pollution and may conflict with the energy restrictions in California Building Energy Efficiency Standards (Title 24).

Table 19.124.040 - Regulations for Off-Street Parking	
	achieve uniform and adequate intensity are:
a. Average Horizontal Maintained Illumination	Between one and three foot-candles
b. Average Maximum to Minimum Ratio	Should be generally between six and ten to one

Not greater than 15:1

see comment 25

An average illuminance on the ground plane of not less than 0.5 footcandles.

see comment 25

Comment 26

This item needs to be deleted and should not be a part of the regulation.

First, the recommendation in the Illuminating Engineering Society Recommended Practice 20-14 is for 0.25 footcandles. The proposed regulation would require that parking lots be 12 times brighter than recommended by the IES, which will result in additional light pollution and will certainly conflict with the energy restrictions in California Building Energy Efficiency Standards (Title 24).

Second, vertical illuminance calculations are much more complicated than horizontal illuminance calculations. There is a much smaller pool of specialists who are capable of performing the calculations, evaluating the calculations, and verifying compliance through on-site measurements, meaning that this provision is much more expensive to comply with than horizontal illuminance requirements.

Third, the requirement that 3 footcandles vertical illuminance be provided in parking lots is in direct conflict with the 1 footcandle limit at the property line proposed in 19.102.040. The only way to resolve this conflict would be to create a wall, or a large empty space as a barrier between the edge of the parking lot and the property line.

c. Minimum Intensity above Parking Lot Surface	Minimum Intensity above the parking lot surface shall be maintained.
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see comment 26

Comment 27

This has no effect and so should be deleted.

Vandal-resistant lighting is already required by item 5 (shatter-resistant lenses - if there is a difference intended, then it would be good to have elaboration on this). As a general rule, though, it should be left to property owners to decide how durable they want their lights to be. They bear the cost of repairing vandalized lighting, and thus have an incentive to minimize this cost by whatever means is most cost-

effective for them (for example enhanced security). In a controlled environment like a corporate campus, for example, vandalism may be non-existent, with no reason to spend extra money on vandal-resistant lights.

5 lux = 0.5 footcandles, which is the value recommended for surface parking. A higher level of 1.0 footcandles is required by California Building Code in structured parking and is also the recommendation of the Illuminating Engineering Society, so including a less stringent 0.5 footcandle requirement here has no effect.

6.	see comment 27 Underground and Structured Parking Lighting	i. Lighting shall utilize vandal-resistant fixtures and ii. Maintain a minimum five lux level of color-corrected lighting for maximum efficiency.
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Comment 28

First, the use of permissive language (“should”) should be avoided in regulations.

Second, what is meant by “portal lighting”? Is this just lighting located in the “portal” (i.e. any lighting will comply) or is specific lighting intended?

7.	Parking Garage Entrances	Portal lighting should be provided inside all parking garages entrances see comment 28
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Comment 29

We assume exemption D.2, “Permitted lighting for signs”, applies to all sign types and therefore no types of signage are regulated by this ordinance. If all signs types are not exempt, this item needs to be clarified. If this regulation applies to signage, there will be substantially more comments on this ordinance.

B.D. Exemptions: The following types of lighting are exempt from the lighting requirements of the Chapter:

1. Lighting within the public right-of-way and public parks
2. Permitted lighting for signs