



Planning Department <planning@amadorgov.org>

How one Amador County miner inspired world's first mountaintop observatory

Sherry Pease <sherry@foothillconservancy.org>
To: planning@amadorgov.org

Mon, Feb 3, 2020 at 10:17 AM

Hello friends,

Is it possible to add the attached article to the files for the Outdoor Lighting ordinance and include in the next planning commission packet on the ordinance?

Regards,

Sherry A Pease

Executive Director

Foothill Conservancy

209-223-3508

 **Madeira_Lick article Chronc 2-1-19.pdf**
751K

How one Amador County miner inspired world's first mountaintop observatory

By Valerie Stimac Feb. 1, 2019



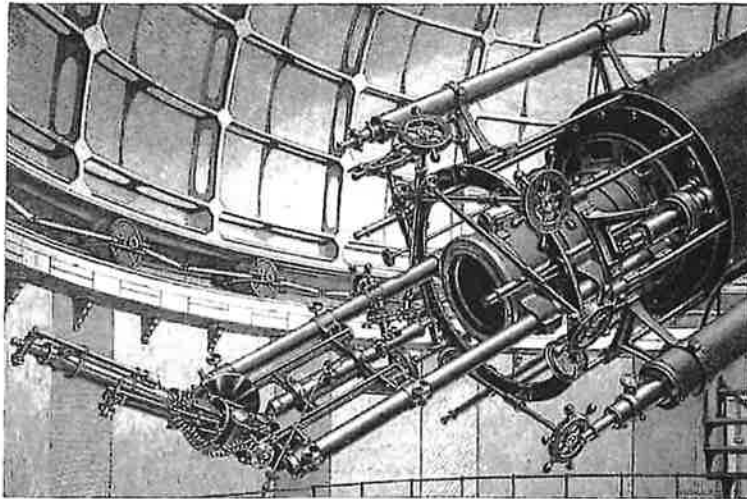
The evening sky at the top of Mount Hamilton at the Lick Observatory on Wednesday, August 4, 2010 in San Jose, Calif. Sixty specialized cameras that operate at UC's Lick Observatory, the Fremont Peak Observatory and a ground-based site, formerly in Mountain View but now in Lodi under a project called Cameras for Allsky Meteor Surveillance, Photo: John Sebastian Russo / The Chronicle 2010



A stone plaque honors amateur astronomer, George Madeira, who built California's first astronomical observatory in Volcano, in Amador County, Calif. Photo: Sarahbeth Maney / Special to The Chronicle



Amateur astronomer George Madeira, pictured, influenced land baron James Lick's decision to build an observatory in San Jose. Photo: California State Archives



"The Star-Spectroscope of the Lick Observatory. San Jose, CA. Photo: Courtesy Wikimedia

In the spring of 1843, George Madeira gazed up and saw the bright body and hazy tail of a comet streaking across the night sky. The sight sparked an interest in astronomy that would carry him throughout his life, and ultimately set in motion a chain of events that led to the construction of the world's largest telescope, atop Mount Hamilton in the Diablo Range just east of San Jose.

Madeira's adventure began in 1852 when, at the age of 15, he migrated west with his parents and siblings in an ox-drawn wagon, toward California in search of the gold that brought many others to the region. He brought his interest in astronomy, along with his collection of astronomy books and star charts. "Many times during the latter end of the trip ... when the load must be reduced, my books and charts were tossed out only to be returned by myself to the wagon," Madeira wrote in 1887.

Madeira and his family arrived in Amador County and settled in a town called Volcano, nestled in the foothills in the western Sierra, just one year after the town was formally established and the post office opened. The winding main street followed the curve of a small ravine, past a hotel, saloons and other businesses that served miners and prospectors searching for fortune.

In 1860, at age 23, Madeira set up an amateur observatory on a hillside close to main street in Volcano. Using only heavy canvas and oilcloth covering to protect the telescope from the weather, Madeira began to plot the stars and study the sun through a 3-inch telescope he had purchased and had delivered from San Francisco.

He had great timing: On a summer afternoon in 1861, he was observing sunspots and noticed the hazy tail of a comet near the horizon.

"I have discovered a huge comet!" he exclaimed upon arrival at the home of his mentor, a fellow astronomy enthusiast and mathematician who also lived in Volcano.

While Madeira was not the first to discover what would come to be called the Great Comet of 1861, it was still a historic sighting, especially for an amateur. Madeira is mentioned by name in W.W. Campbell's 1913 book "A Brief History of Astronomy in California": "Madeira has

recorded his discovery of the brilliant Comet 1861 II ... only a few hours following its discovery in Europe.”

After establishing his observatory, Madeira began touring Northern California, lecturing on objects in the night sky and demonstrating the use of his new portable telescope. Following a lecture in San Jose in 1860, Madeira wrote that he was approached by an older gentleman who inquired: “Will you accept an invitation to visit my place and remain a few days?” At the time, Madeira did not know the man but accepted his invitation and brought his traveling telescope.

Madeira’s host during the three-day stay was real estate tycoon James Lick. Lick is well known to contemporary Bay Area astronomers, largely because of the observatory near San Jose which bears his name.

Born in 1796 in Pennsylvania, Lick began building his fortune in South America and amassed his wealth through real estate as Gold Fever swept California. (He tried his hand in the gold fields before realizing that the money was in owning the land itself, not mining it.) He was a patron of social services and the sciences, donating to the Humane Society of the United States and supporting senior citizen care. He also helped establish the California Academy of Sciences in San Francisco. (The details of Lick’s life are best documented through his friends and benefactors. He was not a prolific writer, and there is no official biographical narrative of his life on record.)

When he met Madeira, the 64-year-old Lick was a well-connected, wealthy land baron with an estate near the Guadalupe River in Santa Clara County. He and Madeira spent the nights of Madeira’s visit stargazing and speaking about the planets and stars overhead. They discussed the value of larger telescopes and how glass technology was not yet able to build the kind of instruments that would unlock the deepest secrets of the heavens above.

In a bold move, Madeira said to Lick: “If I had your wealth, Mr. Lick, I would construct the largest telescope possible to construct,” according to a letter Madeira wrote in 1887 to Edward Holden, director of the Lick Observatory on Mount Hamilton in San Jose.

Those words apparently stayed with Lick through the remainder of his life. In 1874, at the age of 78, Lick suffered a stroke and began planning his legacy.

“He really wanted to be remembered. And so he was thinking of a grand monument to himself,” says Elinor Gates, staff astronomer at the Lick Observatory. “He wanted something that would be enduring.”

Lick considered several outrageous ideas: a pyramid to rival those in Egypt to be erected at the corner of Fourth and Market streets in the heart of downtown San Francisco; a huge statue of himself and his parents near the Golden Gate. Ultimately, Lick began to consider donating a large portion of his fortune to the sciences.

“Saner heads prevailed,” Gates says. “He recalled what George Madeira had said to him previously when he was down in his homestead in south San Jose.”

And so Lick wrote into his deed of trust, established in 1875, that his fortune would be used to build the world’s most magnificent lens through which to peer into the heavens — “a telescope

superior to and more powerful than any telescope yet made ... and also a suitable observatory connected therewith.”

Lens technology had improved since Lick’s conversation with the young Madeira, and Lick began to consider how to build the largest telescope possible. Encouraged by friend George Davidson, an astronomer and president of the Cal Academy, Lick organized a search for the perfect location for a year-round mountaintop observatory where his telescope could stand forever.

Lick set aside \$700,000, or over \$20 million in today’s money, to establish the Lick Observatory. At the time, it was the largest private donation to science in U.S. history.

In 1876, a location on San Jose’s Mount Hamilton was chosen, and construction began. Though other locations had been considered, it’s likely that Mount Hamilton was visible to Lick and Madeira on those fateful nights they spent stargazing together. “It may well have been the mountain that George Madeira might have pointed to, saying, ‘I would put a telescope there,’ just to make a point,” Gates says.

Unfortunately, James Lick did not live to see his observatory or telescope completed, in 1887 and 1888 respectively. Lick passed away at his home in San Francisco in 1876, at the age of 80.

For nine years, the 36-inch Lick Refractor was the largest telescope in the world, and Lick’s body was moved to a tomb under the telescope that bears his name. In 1892, astronomers used the Lick Refractor to discover Amalthea, one of Jupiter’s moons — the first one discovered since Galileo discovered the four largest in the 17th century, according to Holden’s “A Brief Account of the Lick Observatory” published in 1894.

Since the 1890s, the Lick Observatory has grown to house 10 refractor and reflector telescopes ranging in size from 20 to 120 inches in diameter. Over the decades, astronomers at the Lick Observatory have been credited with the discovery of several more moons of Jupiter, planets outside our solar system, and the gas and light emitted from several galaxies. Astronomers today use the imaging telescopes to search for more extrasolar planets, brown dwarf stars and even extraterrestrial life through the Optical Search for Extraterrestrial Intelligence program.

Though many of the original letters and records have been lost to time, astronomers at the Lick Observatory credit Madeira with his influence on Lick’s decision to bequest the largest portion of his fortune to build the observatory. The dreams and discussions Lick and Madeira shared of building larger telescopes materialized because Lick put his wealth behind the idea.

“For those of us that regularly give talks about James Lick’s life and the founding of the observatory, George Madeira is mentioned in every one of those lectures because he was so influential and for giving that spark,” Gates says.

Late in his life, Madeira corresponded regularly with staff members at the Lick Observatory, sharing his thoughts on the latest publications and discoveries they were making. In the years since his amateur observatory stood on the hillside in Volcano, massive developments in astronomical technology had unlocked great wonders of the night sky.

“All honor to the astroscientists who have accomplished so much in so short a time,” Madeira wrote.

Madeira continued lecturing and writing about astronomy until 1922, when at age 85 he fell ill on a trip from his home in Healdsburg to San Francisco and died.

In 1958, Victor Killick, vice president of the Sacramento Junior College Observatory, wrote of Madeira: “He engaged in astronomy strictly for the love of it — a true amateur in the exact meaning of the world.”

At the main intersection in Volcano, you’ll find California Historic Landmark #715, marking it as the “first amateur astronomical observatory of record” in the state, and the final public testament to Madeira’s work and influence on California’s astronomical history.



Krista Ruesel <kruesel@amadorgov.org>

Comments on Lighting Ordinance Draft 12191

Sherry Pease <sherry@foothillconservancy.org>

Thu, Jan 23, 2020 at 2:03 PM

To: pcrew@amadorgov.org

Cc: gspitzer@amadorgov.org, kruesel@amadorgov.org, katherine@mokeriver.com, Mara Feeney <marafeeney@gmail.com>

Dear Chairman Crew and Members of the Board,

Please find attached Foothill Conservancy's comments on Lighting Ordinance Draft 12191 that will be reviewed in the January 28, 2020 meeting.

Thank you again for the opportunity to comment.

Regards,

Sherry A Pease

Executive Director

Foothill Conservancy

209-223-3508



Lighting Ordinance Letter to Chairman Patrick Crew_012220.pdf

1876K



Chairman Patrick Crew
Amador County Board of Supervisors
810 Court St
Jackson CA 95642

Re: **Outdoor Lighting Ordinance on January 28 agenda**

January 22, 2020

Dear Chairman Crew and Members of the Board:

We would like to thank the county planning staff, county counsel's office and Amador County Planning Commission for their work in developing the Outdoor Lighting Ordinance you will review on Tuesday, January 28. We think they have done a good job of listening to the public's concerns and developing an ordinance that will enhance local public safety, save energy, and protect views of our dark, night skies, consistent with the intent of the County of Amador-Foothill Conservancy general plan litigation settlement agreement.

The ordinance strikes a good balance between protecting individual property rights and the broader public interest. It's also fitting to see our county, the site of California's first astronomical observatory, moving to take affirmative action to protect our dark sky views.

However, we believe the ordinance could still use a bit more clarity, and we would like to see it include certain additional provisions, as explained below. Our comments are based on the review of the draft labeled 12191.

19.50.064 Definitions

In subsection F, "Horizontal plane" is defined as "Surface parallel to the ground plane." We think this is self-contradictory ("horizontal" has a clear meaning -- that is, "level") and find it especially problematic in our hilly foothill and mountainous terrain. Allowing lights to be set at the same angle as steep ground slopes, rather than set horizontally, could result in the light trespass and light pollution the ordinance seeks to prevent.

19.50.067 Lighting Regulations

In subsection B.2 regarding residential uses, the level of initial lumen output is not included in the draft.

We believe it would be helpful to the public to change the term "commercial uses" in subsection C to "commercial, industrial and institutional uses."

19.50.068 Effective Date and Grandfathering ...

Subsection B states, regarding existing lighting:

“B. Maintenance and repair of legally nonconforming fixtures shall not affect their status as legally nonconforming. However, any structural change in the fixture shall subject the fixture to the requirements of this chapter. Legally nonconforming fixtures destroyed or damaged to an extent in excess of 50% of replacement value shall be replaced or repaired by conforming fixtures.”

We believe this would be nearly impossible for the county to enforce.

Instead, we recommend that the county require that commercial, industrial, and institutional luminaires to be brought into compliance within five years, and that residential luminaires be brought into compliance at the time a home is sold.

As noted in the attached article, upgrading the lighting on a home at the time of sale is considered a best “bang for your buck” upgrade for home sellers. Compliant exterior light fixtures can be purchased for as little as \$35 - \$50 each.

Lighting replacement-related costs would be recouped through savings on the property owner’s electric bill.

19.59.069 New construction

Consistent with our earlier recommendation, we ask that the county replace the word “commercial” in this section with the words “commercial, industrial, or institutional.” We would also recommend that the lighting plan requirement be broadened to include applications for residential or mixed-use development projects, including tentative subdivision maps.

Conclusion

In closing, we would like to again thank the county for developing this ordinance. We think its passage will help protect our rural environment and quality of life and ask for your support. We would also be happy to work with county staff to develop an informational handout for retailers, contractors and others to explain the requirements of the ordinance.

Thank you for this opportunity to comment.

Very truly yours,



Sherry A. Pease
Executive Director

Attachment

Cc: Amador County Planning Department, att: Ms. Krista Ruesel
Amador County Counsel’s Office, att: Mr. Glenn Spitzer



Fwd: For Dark Sky ordinance record

1 message

Krista Ruesel <kruesel@amadorgov.org>
To: Planning Department <planning@amadorgov.org>

Thu, Dec 12, 2019 at 11:10 AM

Krista Ruesel
Planner|Amador County Planning Department
(209)223-6803|kruesel@amadorgov.org

----- Forwarded message -----

From: <katherine@mokeriver.com>
Date: Thu, Dec 12, 2019 at 11:07 AM
Subject: For Dark Sky ordinance record
To: <kruesel@amadorgov.org>
Cc: Glenn Spitzer <gspitzer@amadorgov.org>, Mara Feeney <marafeeney@gmail.com>, Caryl Callsen <caryl@volcano.net>, Bragstad Susan <amadolorlive@twinwolf.net>, Sherry Pease <sherry@foothillconservancy.org>

Hi, folks: Thought y'all should see this article, which i just got in a newsletter from a realtor. It says exterior lighting upgrades are the number 1 thing to do when selling a house. That's a pretty good case for upgrading exterior lighting on homes at the time of sale.

Best,
Katherine

<https://dailyreckoning.com/10-upgrades-to-sell-your-home-or-flip-10x-faster/>

(<https://dailyreckoning.com/author/nmattive>)

BY NILUS MATTIVE ([HTTPS://DAILYRECKONING.COM/AUTHOR/NMATTIVE](https://dailyreckoning.com/author/nmattive))

POSTED

SEPTEMBER 7, 2019

10 Upgrades to Sell Your Home, or Flip 10x Faster

Yesterday, I talked about income properties and how you can get started with investing in real estate. If you are looking to start flipping houses, or if you are looking to sell your current home and downsize, it's important to know what will help get your house sold as quickly as possible, and get you the best price for your property.

Now, if you aren't flipping a house as an investment and you're just looking to downsize, you may be ask:

"Why would I renovate my house now if I'm going to sell in [*pick any short timeframe*]?"

It's a valid question for two reasons: First, if you make upgrades before you're about to sell, you won't get to enjoy the money you've invested. Second, a lot of upgrades don't necessarily deliver the return on investment you would imagine.

That goes for flipping homes as well. You need to be smart when picking the things that you choose to upgrade, so you don't spend more than you need to on your flip and still get the maximum profit potential from your property.

According to *Remodeling* magazine's 2019 Cost vs. Value report (<https://www.remodeling.hw.net/cost-vs-value/2019/>), most home remodeling efforts only increase a home's value by 50% – 80% of the average project's costs.

For example, the average remodel for a mid-range bathroom is \$20,420. According to the report, you'd make back only \$13,717 (67.2%) when you sell.

If you aren't flipping a house or looking to sell immediately, your best bet is to make small upgrades over a longer period of time. This way you can enjoy the upgrades while you're still living in the house and it's not one big expense or project you have to deal with when you eventually sell.

Of course, this is easier said than done. And if you're asking the question, I'll assume you don't have much time to waste and you are looking for your best options now.

So, what kind of upgrades deliver the best bang for your buck today and what kind of upgrades will get your home off the market fast?

Here are 10 upgrades to consider in 2019:

Upgrade #1 – Exterior Lighting

85% of buyers want this feature and the cost to install exterior lighting is relatively cheap. You're looking at around \$65 per fixture.

If your lawn is well kept, exterior lighting is a nice finishing touch that will grab a buyer's attention before they even walk through the front door.

In fact, exterior lighting is the second most-wanted outdoor feature, according to the National Association of Home Builders. Choose between spotlights, walkway lights and pendant lights.

Exterior lighting also signals safety. Even just having motion-sensor lights can be a big plus.

Upgrade #2 – Laundry Room

91% of buyers say they want a laundry room. The investment varies but you're looking in the neighborhood of \$1,000 to \$5,000 for a small-scale project.

If your guest bedroom looks anything like mine, you know why homeowners rate a laundry room as a must-have feature.

Homeowners want a separate room to fold and iron clothes, a place that keeps the mess out of the main living spaces.

If your house doesn't currently have a laundry room, the basement is typically the easiest (and cheapest) place to put one. Utility lines are already there, and most basements are unfinished so you don't have to demolish anything to start.

A basement laundry room will set you back \$1,000. If you want a laundry room or laundry closet close to your bedroom that fits just a washer and dryer, you're looking at \$5,000.

And if you want a full laundry room with sink and storage cabinets included, the price climbs to \$10,000 or more.

Upgrade #3 – Garage Storage Space

85% of buyers say they want garage storage space. Buyers with growing families especially need more storage space.

And unlike a backyard shed or the attic, garage storage is more easily accessible. For cost, you're looking at around \$2,025 – \$2,363 per 380 square feet.

Upgrade #4 – Energy Efficient Appliances and Windows

89% of buyers want energy efficient appliances, windows, and doors. The cost of owning a home is not cheap, so buyers are looking for anything to lower monthly utility bills.

Energy-efficient windows can trim heating and cooling costs by 12%, while Energy Star-rated appliances, like washing machines, can save homeowners around \$45 a year or more.

Dollar Collapse Preparation Plan

Jim Rickards says a the collapse of the dollar and international monetary system is imminent. Read this report immediately. He shows you concrete proof and gives you five actionable steps to protect and grow your wealth during the coming crash. Sign up for the Daily Reckoning today and receive your FREE report.

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By submitting your email address, you will receive a free subscription to *The Daily Reckoning* and carefully selected products and services that we think might interest you. You can unsubscribe at anytime. [Privacy Policy \(https://ads.agorafinancial.com/www/delivery/ck.php?noparams=2_bannerid=6234_zoneid=323_cb=c5be79f681_oadest=https%3A%2F%2Fdailyreckoning.com%2Fprivacy-p\)](https://ads.agorafinancial.com/www/delivery/ck.php?noparams=2_bannerid=6234_zoneid=323_cb=c5be79f681_oadest=https%3A%2F%2Fdailyreckoning.com%2Fprivacy-p)

Energy Star-qualified windows use an invisible glass coating, have vacuum-sealed spaces filled with inert gas between panes, sturdier weather stripping than regular windows.

And they use better framing materials to reduce heat gain and loss in the home.

Upgrade #5 – Patio

87% of buyers want a backyard patio. If you're thinking of installing a concrete patio, your cost is around \$963 per 120 square feet.

Only recently have outdoor living spaces gained in popularity. I blame the backyard makeover shows, but it's good news for sellers.

A nice patio will help sell your home faster because buyers can envision themselves sitting outdoors with friends having drinks or cooking meals.

Also, installing a patio is a lot cheaper than adding an addition to your home. So you get more living space for less.

Upgrade #6 – Ceiling Fans

85% of buyers say they want ceiling fans installed. Similar to the Energy Star-rated windows and appliances, homeowners these days want anything that will lower utility costs.

A ceiling fan with light kit and remote control will set you back \$466. Because ceiling fans create a wind-chill effect, a person sitting in a room will feel cooler when the fan is on.

According to Energy.gov, homeowners should be able to raise the thermostat level by four degrees without a reduction in comfort while the fan is in use.

Upgrade #7 – Walk-In Pantry

83% of home buyers want a walk-in pantry. Costs vary based on design but the reason why most home buyers today want a walk-in pantry is because kitchens get overcrowded when there's not enough space to store essentials.

Unlike reach-in closet pantries, walk-ins allow for more storage. Which is critical for larger families that buy in bulk.

Most walk-ins are about 5 x 5 feet and have open shelves. Just make sure your pantry is installed somewhere cool and dry.

Upgrade #8 – Hardwood Floors

83% of buyers say they want hardwood floors. For cost, you're looking at spending around \$999 per 120 square feet of red oak flooring.

Homeowners like hardwood floors because they're easy to clean, look nice, and are more durable than carpet. You can also refinish hardwood floors, extending their life even longer.

If you can't afford to install true hardwood, engineered wood flooring is another good option. The cost is typically a few hundred dollars less or about 15% cheaper than pure hardwood and you'll still get most of the benefits mentioned.

Upgrade #9 – Walk-In Closet

Walk-in closets are one of the most sought after features for first and second-time homebuyers.

They rank among the top five for must-have features. So if your current home has only a reach-in closet, you might want to consider revamping it.

Couples want a closet with more space, because they have to share. And singles like the flexibility of storing all their stuff in one organized space. Homes with walk-in closets in the master bedroom are a lot easier to sell than ones without.

Upgrade #10 – Eat-In Kitchen

Again, these are popular with first and second-time homebuyers. Eat-in kitchens are popular because they're great for families with small kids.

Everyone can meet in the kitchen for breakfast before work and school and in the evenings for dinner. Costs vary based on your space but it's not as expensive as you can imagine.

Removing a non-load-bearing wall to make room for a small table and some chairs will set you back about \$1,000. Of course this can be scaled up quickly but that's for you to decide.

To a richer life,



— Nilus Mattive

Editor, *The Rich Life Roadmap*

Dollar Collapse Preparation Plan

Jim Rickards says a the collapse of the dollar and international monetary system is imminent. Read this report immediately. He shows you concrete proof and gives you five actionable steps to protect and grow your wealth during the coming crash. Sign up for the Daily Reckoning today and receive your FREE report.

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[Privacy Statement \(https://ads.agorafinancial.com/www/delivery/ck.php?oasparams=2_bannerid=8211_zoneid=321_cb=2b0b729c5d_eadset=https%3A%2F%2Fdailyreckoning.com%2Fprivacy-policy-2%2F\)](https://ads.agorafinancial.com/www/delivery/ck.php?oasparams=2_bannerid=8211_zoneid=321_cb=2b0b729c5d_eadset=https%3A%2F%2Fdailyreckoning.com%2Fprivacy-policy-2%2F)

ABOUT NILUS MATTIVE:

From: <katherine@mokeriver.com>
Date: Thu, Dec 12, 2019 at 9:26 AM
Subject: RE: Dark sky ordinance
To: Glenn Spitzer <gspitzer@amadorgov.org>
Cc: Krista Ruesel <kruesel@amadorgov.org>

Dear Glenn and Krista:

Attached is the substantive portion of my comments. I also mentioned that the exemption for historic sites and structures, etc isn't clear because historic is not defined.

I'll talk to our land use team about the name of the ordinance. Personally, I think the IDSA suggestion re calling it a lighting ordinance may make more sense and be easier for the public to find in the code. I'll let you know what we think.

Thanks,
Katherine

1

Substantive comments on Dark Sky ordinance from PC hearing testimony 12-10-19

Katherine Evatt for Foothill Conservancy, 12-12-19

Still have some concerns

- We think the purpose language we submitted earlier is clearer and more helpful to the public regarding the reason for the ordinance. Important for purpose to be clear.
- Exemptions 19.50.065
A. - should say "state and *federal* government" to make clear that county facilities are not exempt.

Should 1. Re airports be a separate exemption that would apply to all airports? As written, looks limited to government airports?

- F: Public Gathering Lighting Fixtures -- What does this mean? Looks like it would apply to things like Helwig's amphitheater, wineries, and event centers. What's the rationale for exemption and to what does it apply? Needs to be clear.
- G: 40 acre exemption. For homes only? We don't support this. A house could be located near the edge of the property, not in the middle, and cause light trespass. And light pollution is a cumulative effect. Every source adds to it, even homes on large parcels.
- H. Nonconforming and temp lighting . What's the rationale for allowing nonconforming outdoor lighting to continue indefinitely? Also should separate temp residential uses out so that people's holiday decorations aren't subject to this -- or is that taken care of in the section on temporary lighting in the lighting regs? Hard to follow as written now and s/be clear for the public to follow.

19.50.067 prohibition

Exception in C is a problem b/c it would allow problematic lights approved in the past to exist indefinitely. Could fix by making it prospective, but as written, looks retrospective.

Lighting regulations sec 19.50.068

Why 3000K vs 2700K? Most newer ordinances using 2700K

Good to use 2200K for historic lighting, but how is "historic" defined? Not clear.

3. Commercial lighting -- should explicitly apply in R1A, AT, A and AG, too -- that's where we have big event centers operating at night - -wineries, etc

New construction

Recommend requiring lighting plans for all new commercial, industrial or institutional construction, not having it be optional. El Dorado County does this now.

Time limits for compliance

2

Substantive comments on Dark Sky ordinance from PC hearing testimony 12-10-19

Katherine Evatt for Foothill Conservancy, 12-12-19

Disappointed that the county is continuing to grandfather all existing lighting indefinitely. Guarantees that the light pollution we have today will just get worse -- and it's already a problem.

Suggestions:

Five year deadline for existing commercial, county, industrial and institutional buildings. Gives building owners time to change gradually or plan for it.

At time of sale for residences. It's when people are fixing up their homes anyway, cost could be negotiated as part of the transaction, easy to verify as part of recordation process, and cost is not that big an issue considering the value of homes. DNS compliant outdoor lights can be purchased for as little as \$30 - \$50 each. Out of pocket cost quickly recouped through savings on PG&E bills.



Fwd: Amador County: Planning Commission Meeting

1 message

Chuck Beatty <CBeatty@amadorgov.org>
To: Planning Department <planning@amadorgov.org>

Thu, Dec 5, 2019 at 8:28 AM

Please see below...

----- Forwarded message -----

From: Jeff White <jwhite@amadorgov.org>
Date: Thu, Dec 5, 2019, 8:16 AM
Subject: Fwd: Amador County: Planning Commission Meeting
To: Chuck Beatty <CBeatty@amadorgov.org>

Hello Chuck,

Please see the forwarded email which was received in the website feedback email inbox. Thank you.

----- Forwarded message -----

From: Catherine Nelson
Date: Wed, Dec 4, 2019 at 5:37 PM
Subject: Re: Amador County: Planning Commission Meeting
To: <website@amadorgov.org>

This is the dumbest ordinance that I have I have ever seen!

On Wed, Dec 4, 2019 at 5:01 PM Amador County Website <website@amadorgov.org> wrote:

Planning Commission Meeting

- **Date:** 12/10/2019 7:00 PM - 10:00 PM
- **Location:** Board of Supervisor's Chambers
810 Court St, 1st Floor, East Wing
Jackson, California 95642

PC Meeting Minutes 11-12-19.FINAL DRAFT.docx

Item 1- Dark Sky Ordinance

- **Agenda:** 12-10-19 PC Agenda.FINAL

To view this email, including any attached documents, click here.

Change your eNotification preference.

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--
Thank you,
Jeff White
Amador County Information Technology Director



Amador County Outdoor Lighting Ordinance, final comments and a request

2 messages

Jesales@surewest.net <jesales@surewest.net>

Mon, Dec 9, 2019 at 1:17 PM

To: Krista Ruesel <kruesel@amadorgov.org>, Amador Co Planning Dept <planning@amadorgov.org>

As I read through the latest version I feel some points may have been lost.

Outdoor Lighting Ordinances in the age of LEDs, the basics --

- 1. One must assume that all new lighting (indoor or outdoor) will be LED technology.
- 2. All LED outdoor lighting should be restricted to 3000K or less regardless of application with few exceptions.
- 3. Advancements in LED technology and product availability make 2700K equally viable and preferable to 3000K LEDs.
- 3. All outdoor lighting should be full cutoff with few exceptions.

Additional comments and a request follows.

Color Correlative Temperature, CCT --

- 1. You must assume that all new lighting (indoor or outdoor) will be LED technology.
- 2. All LED outdoor lighting should be restricted to 3000K regardless of application.
- 3. Because of advancements in efficiency vs CCT, it is not unreasonable to restrict CCT to 2700K.
- 4. Some applications should be 2700K for sure such as residential areas.
- 5. Some applications like historic fixtures should be 2200K, and never more than 2700K.
- 6. For some time incandescent lamps have had a CCT of around 2700K, historic lamps were more like 2200K.

LED retrofits and CCT --

- 1. It is not uncommon to see full cutoff fixtures that were once HPS with CCT somewhere around 2300K being retrofitted with LEDs that have a CCT well over 3000K such as 5000K or even 6000K.
- 2. It is important than any replacement or retrofit of a fixture, assuming it be LED be restricted to 3000K.
That is all outdoor LED lighting shall be 3000K or less.
Reference: 19.50.068 Lighting Regulations., A, Exterior Lighting-- Generally., c. All new lighting fixtures,....

Airports --

Consistent with Commissioner Dave Wardall concerns I agree that all airport lighting should be exempt.
Therefore I would move "1. Airports and other necessary airport lighting systems" to item B under Exemptions.
ie.
19.50.065 Exemptions.
B. Airports and other necessary airport lighting systems ...

I also look to the wording of the Mono County Dark Sky Ordinance that covers FAA airport lighting requirements.
23.040 Exemptions.

- 4. All lighting required by state or federal regulatory agencies.

Why 3000K --

- 1. High Kelvin lighting (greater than 3000K) create a harsh glare, making it difficult to see clearly at night.
- 2. Shielded 3000K or less LED lighting helps to reduce skyglow and improve nightscapes.
- 3. Skyglow and trespass into wildlife and their habitat is detrimental to wildlife.
- 4. Hi CCT lamps can also suppress melatonin production, leading to disrupted sleep and other health risks.
- 5. 3000K LED lighting is both economically viable and energy efficient.

Notes form this link <https://www.darksky.org/our-work/lighting/lighting-for-citizens/3k/>

Handout additions --

Please add IDA brochures on Crime and Energy to presented information as you have with Health and Wildlife.
<https://www.darksky.org/wp-content/uploads/bsk-pdf-manager/2019/05/Crime.pdf>
<https://www.darksky.org/wp-content/uploads/bsk-pdf-manager/2019/05/Energy.pdf>

Finally I would have preferred this ordinance be title Amador County Outdoor Lighting Ordinance and NOT Amador County Dark Sky Ordinance.

Regards
Jack Sales

Amador County Planning Department <planning@amadorgov.org>

Mon, Dec 9, 2019 at 2:41 PM

To: jesales@surewest.net, Krista Ruesel <kruesel@amadorgov.org>

Thank you for your comments, Jack! They will be shared with the Planning Commission. Krista is reviewing your comments.

[Quoted text hidden]

--

Amador County Planning Department
810 Court Street
Jackson, CA 95642
(209) 223-6380
planning@amadorgov.org



Questions/Comments on Current Draft Dark Sky Ordinance

Mara Feeney <marafeeney@gmail.com>

Tue, Dec 10, 2019 at 3:48 PM

To: Amador County Planning Department <planning@amadorgov.org>

For Planning Commission Consideration: Questions/Comments on Current Draft Dark Sky Ordinance

Dear Commissioners: As an Amador County resident, I value our rural scenic beauty very much. But I also value our dark night skies. We have many visitors come to the county from urban areas and even foreign countries. They comment on our lovely landscape by day, but it is at night that they are really blown away, because they can suddenly see more stars than they ever imagine existed. Please, let's preserve and treasure this resource. I urge you to craft an ordinance that will reduce existing light pollution and control its proliferation in future.

I spoke with Planning staff today to obtain clarification on a number of points in the revised draft ordinance. Here are my specific comments:

19.50.065 A - Change title from "State and Government Facilities" to "State and Federal Government Facilities" to make it clear that county facilities are not being exempted,

19.50.065 G - The rationale for exempting 40+ acre parcels is not well explained. Also, please make it clear that this text applies only to residential uses on 40+-acre properties, and not to commercial or industrial uses, including wineries and event centers.

19.50.067 C - complete the sentence that ends with "lights are prohibited unless"

19.50.067 F - since this is a section entitled "Prohibited," it seems the 'are permitted' should read 'are prohibited.'

19.50.070 - sorry to see the change pertaining to new construction that Applicant "may be required" vs the previous version which said "Applicant shall be required." Who will be responsible for determining which applicants will have to meet the suggested requirements, and which will not? What will be the criteria for this determination? It seems that, rather than burdening staff with discretionary decisions that may be seen as inconsistent, it would be better to have the requirement, but ask for less detail from Applicants whose project seems unlikely to cause light pollution, and more data and detailed plans or drawings from Applicants whose project does seem likely to increase light pollution or affect nearby residents or the public.

Finally, I encourage the Planning Commission to identify a reasonable grace period for complying with new light standards outlined in the ordinance. The home I built fifteen years ago has 19 outdoor light fixtures that would have to be replaced to meet new standards. As it is, I rarely use those lights, because they put out more light than is reasonable and I don't want to annoy my neighbors. I am more than willing to replace them all, and perhaps install motion detectors as well, to reduce light pollution and protect our unique night sky resources. Thanks for your consideration.

Mara Feeney
DAMAS Vineyards
21004 Ostrom Road
Fiddletown, CA



nighttime lighting ordinance

1 message

bchogan@volcano.net ·
Reply-To: bchogan@volcano.net
To: planning@amadorgov.org

Tue, Dec 10, 2019 at 2:32 PM

Dear Planning Commission,

I would like to submit the following comments on the proposed lighting ordinance that will be under consideration at tonight's planning commission meeting (as I cannot attend in person).

I was quite excited to see that Amador County was going to adopt a lighting ordinance because of all the ways that dark skies make rural living what it is and also can be leveraged to bring in tourists from places where light pollution makes it almost impossible to see good stars. In fact, the other night as I was driving home, I was appalled at how much light pollution has developed in the Martell area.

When I read the draft ordinance however, I was sorely disappointed in how ineffective it was. There are way to many exemptions (County buildings are exempt?! County buildings should lead the way by example! Outdoor venues seem to be exempt - again, those are often the most light polluting!) and no deadlines for retrofitting existing non-compliant lighting.

You don't seem to have read (or if you did read, followed) the recommendations of the International Dark Sky Association. You really should look into the success of other towns and locations where they have instituted those recommendations and have been able to capitalized on that by bringing in star-gazing tourism dollars.

Please consider revising the ordinance into something that will actually protect our dark skies before submitting it for board of supervisor approval.

thanks!
Bronwyn Hogan

Jackson CA 95642



Fwd: dark skies

1 message

Chuck Beatty <CBeatty@amadorgov.org>


Mon, Dec 9, 2019 at 10:38 AM

To: Planning Department <planning@amadorgov.org>, Glenn Spitzer <gspitzer@amadorgov.org>

----- Forwarded message -----
From: <K16BEC@volcano.net>
Date: Sun, Dec 8, 2019, 4:36 PM
Subject: dark skies
To: Chuck Beatty <CBeatty@amadorgov.org>
Cc: <JeffBrown@amadorgov.org>

Please see attached letter.

Earl Curtis

 **Chuck Beatty re darkskies.docx**
27K

Chuck Beatty, Planning Director
Amador County
810 Court Street
Jackson, CA 95666

8 Dec. 2019

Mr. Chuck Beatty

I have been thinking about this Dark Skies program for quite a while and gone over things proposed by the Department and the Foothill Conservancy and I have a very basic problem with this whole ordinance.

It seems to me that a small faction of the people of the County of Amador are trying to propose an ordinance that will affect all members of our community in an unnecessary way. Telling us what type of luminary to use at our private homes seems like the overreach of a very controlling society. The issue here has nothing to do with health and safety, but only an aesthetic opinion.

It makes me feel as if I am going to live in a gated community that even tells me what color to paint my house and that I can't park my car in the driveway because it may offend someone's viewshed.

If the people of California or even the people of Amador had that chance to vote on this sort of thing it may be different in our democratic republic, but not when a small faction of the population tries to put this upon all the residents through the bureaucracy. It is also interesting that most government and commercial occupancies are exempt from this regulation, and that is where most of the offending light comes from.

I think that if the Foothill Conservancy wants everyone to do this sort of thing they could use the flyer that Wally Robertson, representing the Sacramento Valley Astronomical Society shared at the last meeting and mail it to all the residents of Amador County at their expense and people could comply voluntarily if they agreed.

I think this proposal will increase the cost of building new homes and just add to the responsibilities of current inspectors.

At this time, I find that I will have to vote against forwarding this to our Board of Supervisors.

Sincerely



Earl S. Curtis
Planning Commissioner
District 3, Amador County

Cc: Jeff Brown, Supervisor, district 3

Ps: I have not copied other commissioners, not wanting to be in violation of Brown Act



REVISED: comments on nighttime lighting ordinance

bchogan@volcano.net

Tue, Dec 10, 2019 at 3:43 PM

Reply-To: bchogan@volcano.net

To: Amador County Planning Department <planning@amadorgov.org>

Hello again,

If it is not too late, could you replace my previous comments with this version? (I was rushing before having to go to a meeting, didn't do a good job of editing and forgot to include a couple of links, before hitting "send")

Thanks again!
Bronwyn

Dear Planning Commission,

I would like to submit the following comments on the proposed lighting ordinance that will be under consideration at tonight's planning commission meeting (as I cannot attend in person).

I was quite excited to see that Amador County was going to adopt a lighting ordinance because of all the ways that dark skies make rural living what it is and also can be leveraged to bring in tourists from places where light pollution makes it almost impossible to see good stars.

I have been am increasingly concerned about Amador County losing its star views (not to mention all the other things light pollution affects). In fact the other night as I was driving home, I was appalled when I noticed how much light pollution has developed in the Martell area.

When I read the draft ordinance however, I was sorely disappointed in how ineffective it was. There are too many exemptions (County buildings are exempt, yet county buildings should lead the way by example! Outdoor venues seem to be exempt - again, those are often the most light polluting) and there seem to be no deadlines for retrofitting existing non-compliant lighting.

It doesn't appear that the commission has read (or if you did read, followed) the recommendations of the International Dark Sky Association. You really should look into the success of other towns and locations where they have instituted those recommendations and have been able to capitalize on that by bringing in star-gazing tourism dollars.

Please consider revising the ordinance into something that will actually protect our dark skies before submitting it for board of supervisor approval.

I have also included below, links to the International Dark Sky Recommendations and to recent research on the effect of badly planned outdoor lighting on our insect fauna (many of which pollinate our local crops and grassland plants that our farmers and ranchers rely on).

https://www.darksky.org/wp-content/uploads/2018/06/IDSC_Guidelines_Oct2015.pdf

<https://www.sciencedaily.com/releases/2018/06/180619122456.htm>

Thanks for your attention,
Bronwyn Hogan

Jackson CA 95642

Amador County Planning Department
810 Court Street
Jackson, CA 95642
(209) 223-6380
planning@amadorgov.org



Fwd: Amador County: Planning Commission Meeting

1 message

Chuck Beatty <CBeatty@amadorgov.org>
To: Planning Department <planning@amadorgov.org>

Thu, Dec 5, 2019 at 8:28 AM

Please see below...

----- Forwarded message -----

From: Jeff White <jwhite@amadorgov.org>
Date: Thu, Dec 5, 2019, 8:16 AM
Subject: Fwd: Amador County: Planning Commission Meeting
To: Chuck Beatty <CBeatty@amadorgov.org>

Hello Chuck,

Please see the forwarded email which was received in the website feedback email inbox. Thank you.

----- Forwarded message -----

From: Catherine Nelson
Date: Wed, Dec 4, 2019 at 5:37 PM
Subject: Re: Amador County: Planning Commission Meeting
To: <website@amadorgov.org>

This is the dumbest ordinance that I have I have ever seen!

On Wed, Dec 4, 2019 at 5:01 PM Amador County Website <website@amadorgov.org> wrote:

Planning Commission Meeting

- **Date:** 12/10/2019 7:00 PM - 10:00 PM
- **Location:** Board of Supervisor's Chambers
810 Court St, 1st Floor, East Wing
Jackson, California 95642

PC Meeting Minutes 11-12-19.FINAL DRAFT.docx

Item 1- Dark Sky Ordinance

- **Agenda:** 12-10-19 PC Agenda.FINAL

To view this email, including any attached documents, click here.

Change your eNotification preference.

Unsubscribe from all Amador County eNotifications.

--
Thank you,
Jeff White
Amador County Information Technology Director



Dark Sky Ordinance

1 message

David Wardall <

Wed, Dec 4, 2019 at 12:26 PM

To: Amador County Planning Department <planning@amadorgov.org>, "Byrne, Andy" <K...>, Keith DesVoignes <...>, "Ryan, Ray" <...>
Cc: Mary Ann Manges <mmanges@amadorgov.org>

, Earl Curtis

Good morning Staff and commissioners.

I studied the Draft Ordinance and sent the attached suggested comments to further define airport related lighting exclusions.

While comments were made at the last PC meeting that airport related lighting was exempt because of state and federal regulations pertaining to airport lighting precluded local ordinances from restricting airport lighting, the bottom line is there is nothing in writing protecting airports and airport lighting systems.

As an airport operator, I cannot take the risk of some future interpolation by a different Board of Supervisors or Planning Commission that would require modifications to airport lighting equipment.

I think that by amending the Draft Ordinance to include the prescribed exemptions, then airports have a clear included exemption that leaves little room for future interpolation.

Finally, our airport lighting system is dark until a local resident pilot uses a discrete radio frequency to turn the lights on about 20 miles out. The timer is set for 15 minutes after which the lights turn off. We use the lights one or two time per month.

I cannot attend the next PC meeting as I will be in Reno at a major aviation safety conference... I am the conference chair and have organize the conference.

Regards,

Dave Wardall



Comments on Draft Ordinance 19.50.060, Rev. 1.docx

16K



Planning Department <planning@amadorgov.org>

dark sky ordinance

Dale Hofstetter <dhofs1961@outlook.com>

Sat, Nov 30, 2019 at 11:00 AM

To: "planning@amadorgov.org" <planning@amadorgov.org>

Unable to find the proposed dark sky ordinance as directed by the notice of public hearing in Ledger Dispatch, Friday November 29, 2019.

Please add the following to the record of public hearing. We live in a free country bound by law. Another regulation by a government agency adds more cost to the taxpayer. People do not need to have lights regulated by ordinance. Hazards and glare created by intrusive lighting maybe corrected by discussion with the owner of the installation or by appeal to local authorities. Dale Hofstetter lone, ca

Sent from Mail for Windows 10



Dark Sky Ordinance

Ruslan Bratan <rbratan@amadorgov.org>
To: Planning Department <planning@amadorgov.org>

Tue, Nov 19, 2019 at 8:01 AM

Ruslan Bratan

Planner | Amador County Planning Department

810 Court Street, Jackson, CA 95642

rbratan@amadorgov.org | (209) 223-6332

----- Forwarded message -----

From: **Dave Sheppard** <dsheppard@amadorgov.org>

Date: Tue, Nov 19, 2019 at 7:42 AM

Subject: Re: Dark Sky Ordinance

To: Dave Wardall <davidwardall@gmail.com>, Ruslan Bratan <rbratan@amadorgov.org>

I would like to add that Dark Sky Certified Light fixtures may not comply with the requirements of the Airport Land Use Compatibility Plan (ALUP). We had this issue when the Placer Title center tried a Dark Sky Certified fixture that resembled runway lights when viewed from the above. In the bottom picture the runway lights are in the top right hand corner.

Dave





On Mon, Nov 18, 2019 at 8:51 PM <davidwardall@gmail.com> wrote:

Amador County has been under pressure to adopt a "Dark Sky Ordinance". This is being pushed by the Foothill Conservancy and other environmental cartels. This, ordinance will dictate and control all outdoor lighting fixtures.

I read the proposed ordinance and it had profound impacts on our airport. I had the matter tabled and advised that I would review and study the draft and submit edits to protect airports. The draft ordinance and my comments are attached; better take a look.

Dave

[Quoted text hidden]

David Sheppard
Amador County Airport
Manager
(209) 223-2376



Planning Department <planning@amadorgov.org>

Dark Sky Ordinance

8 messages

davidwardall@gmail.com <davidwardall@gmail.com>
To: Amador County Planning Department <planning@amadorgov.org>

Thu, Nov 14, 2019 at 7:06 AM

Please send me an electronic copy of the draft Ordinance.

Thanks!

Dave Wardall

Amador County Planning Department <planning@amadorgov.org>
To: "Wardall, Dave" <davidwardall@gmail.com>

Thu, Nov 14, 2019 at 8:46 AM

Good morning Dave!

This is the version that was uploaded and in your packet. No changes have been made as of the November 12th PC meeting.

Thank you!

Mary Ann

[Quoted text hidden]

--
Amador County Planning Department
810 Court Street
Jackson, CA 95642
(209) 223-6380
planning@amadorgov.org



Dark-Sky Ordinance Draft 9.30.19.pdf

107K

davidwardall@gmail.com <davidwardall@gmail.com>
To: Amador County Planning Department <planning@amadorgov.org>

Thu, Nov 14, 2019 at 9:05 AM

Thank you Mary Ann

[Quoted text hidden]

Amador County Planning Department <planning@amadorgov.org>
To: "Wardall, Dave" <davidwardall@gmail.com>

Thu, Nov 14, 2019 at 9:06 AM

You're welcome!

[Quoted text hidden]

davidwardall@gmail.com <davidwardall@gmail.com>
To: Amador County Planning Department <planning@amadorgov.org>

Fri, Nov 15, 2019 at 7:54 PM

Please find attached my comments, concerns and suggested wording for amending the draft Ordinance.

Please let me know that you received my comments.

Thanks!

Dave



Comments on Draft Ordinance 19.50.060.docx

16K

Amador County Planning Department <planning@amadorgov.org>
To: "Wardall, Dave" <davidwardall@gmail.com>

Mon, Nov 18, 2019 at 8:28 AM

Received, thank you Dave!

Ruslan

[Quoted text hidden]

[Quoted text hidden]

davidwardall@gmail.com <davidwardall@gmail.com>
To: Amador County Planning Department <planning@amadorgov.org>

Mon, Nov 18, 2019 at 9:32 AM

Ruslan:

The reason for the extensive revision is that: 1) I do not trust the Foothill Conservancy to be ethical in their pursuit to control this Ordinance; 2) as written, the Ordinance does not specifically exclude airport related lighting systems; 3) although this current County Planning Department and Board of Supervisors are fair and reasonable, politics and policies can "drift" over the years, so it is important to clearly include language that absolutely is clear and definite and will survive court challenges.

Thanks!

David Wardall

From: Amador County Planning Department <planning@amadorgov.org>
Sent: Monday, November 18, 2019 8:29 AM
To: Wardall, Dave <davidwardall@gmail.com>
Subject: Re: Dark Sky Ordinance

Received, thank you Dave!

Ruslan

[Quoted text hidden]

COMMENTS ON DRAFT ORDINANCE 19.50.060

DARK SKY ORDINANCE

Submitted by David Wardall

November 14, 2019

19.50.064 Definitions

E. "Horizontal Plane" This definition is confusing. Suggest: "Surface parallel with the ground plane"

19.50.065 Exemptions

B. Public Roadway Illumination The height limit of 20-feet may not work in all reasonable applications; at a minimum the property owner should have a provision to exceed the 20-foot limit as necessary for site conditions.

Add K. Airports are exempted from dark sky Ordinance 19.050.060. This exemption includes all airport lighting systems for runways, taxiways, obstruction lighting, lighted windsocks, approach and threshold light systems, termination lights, approach slope lights, runway end identification lights, rotating beacons, hangar ramp lights, road crossing warning lights and any other airport associated lighting systems.

Add L. Land parcels averaging 40 acres or greater are exempt from Section 19.50.068, Lighting Regulations, paragraph D. Permanent Residential Lighting.

19.50.067 Prohibited

F. Revise this section to read: "Light projectors directed above the horizontal plane in any airport zone or within three miles of any airport in Amador County with a State of California Airport permit licensed for night operations. Airport lighting may project above the horizontal plane for airfield lighting fixtures and equipment".

19.50.068 Lighting Regulations

Amend this paragraph as follows:

All new public and private outdoor lighting installed in the unincorporated County shall be in conformance with the requirements established by this Ordinance. All previous language in Amador County bylaws and ordinances regarding outdoor lighting will be subordinate to this ordinance for all new public and private outdoor lighting, **excluding airports**, unless otherwise specified by the Planning Commission and the Board of Supervisors.

Comment on paragraph B. follows:

B. Lamps Up To 800 Lumens. Any full cutoff luminaire, including flood or spot luminaires, with a lamp or lamps rated at a total of 800 lumens or less may be used without restriction to a light distributing or mounting height under 10 ft., except that the luminaire may not be aimed, directed, or focused so as to cause direct light from the luminaire on adjacent or nearby residential buildings, or to create glare perceptible to persons operating motor vehicles on public roadways. The luminaire shall be redirected or its light output controlled as necessary to eliminate such conditions.

The 10-ft height limit does not work for spot lights on large (40+ acre) parcels, With the abundance of trees on the airport properties, neighbors cannot see adjacent buildings or lights. Spot and flood lights have very limited use, but when needed do the job that no shielded light cannot perform.

C. Exterior Lighting.

Amend as follows:

All exterior lighting, except airports, including motion-sensitive or timed lighting, shall be provided by full cutoff fixtures installed per the manufacturer's specifications in order to limit glare. Fixtures that are shielded by a structural element so as to meet the intent of a full cutoff fixture shall be considered in compliance.



"To preserve and protect the nighttime environment and our heritage of dark skies through quality outdoor lighting."

Please join IDA, call or visit us
www.darksky.org
IDA Office 520-293-3198

International Dark-Sky Association

Jack Sales

5978 Woodbriar Way
Citrus Heights, CA 95621

jsales@surewest.net
www.skykeepers.org

Cell 1-916-747-7405
Direct 1-916-726-7405

Meteor Shower Calendar

Name of Shower	Dates	Maximum	Est. meteors/hr. at max
Quadrantids	Jan. 1-5	Jan. 3-4	20-80
Alpha Aurigids	Jan. 15-Feb. 20	Feb. 7-8	12
Lyrids (April)	Apr. 19-24	Apr. 22	12
Eta Aquarids	May 1-12	May 5	20
Lyrids (June)	Jun. 10-21	Jun. 15	15
Delta Aquarids	Jul. 15-Aug. 15	Jul. 28	35
Perseids	Aug. 1-18	Aug. 12	65
Orionids	Oct. 17-26	Oct. 20	35
Leonids	Nov. 14-20	Nov. 17	10-100
Geminids	Dec. 4-16	Dec. 13-14	50

Notes: Best Viewing after Midnight. — Look to the East
Dates will vary slightly (Calendar Good for any year)

California Sections, International Dark-Sky Association

It's a fact.

Poorly designed unshielded fixtures: blight our communities, cause glare and light trespass, waste energy up to 30%, impact vast areas, destroy the night sky and degrade terrestrial and aquatic ecosystems.

What is needed? Use the right amount of light for the task, not wasteful overlighting.

- Use only fixtures listed by the IDA's Fixture Seal of Approval program.
- Use only "warm" LED lamps — 3000k or lower color temperature.
- Use occupancy sensors or adaptive controls for all exterior lighting.

What are the benefits? Good lighting that is well directed:

- Is nearly invisible from a distance
- Reduces massive energy waste
- Improves visibility and safety by eliminating direct glare.
- Lessens urban sky glow and returns the natural nighttime environment.

International Dark-Sky Association

"Light Pollution", caused by poor outdoor lighting, greatly reduces what once could be seen in our night skies. Besides causing the bright urban sky glow, such wasted light produces glare, clutter, light trespass and a great deal of energy waste. Lack of awareness and apathy, rather than resistance, are the main problems. Dark skies need our help! What can you do?

- Reduce or eliminate your own unnecessary outside lighting.
- Ensure that all outside lights are well shielded; throwing their light only downwards, where it is needed.
- Educate everyone about good outdoor lighting.
- Join the International Dark-Sky Association, the group that is making a difference. Annual memberships begin at \$30.

IDA, Inc., 3225 N. First Ave., Tucson, AZ 85719-2103 USA
520-293-3198 (voice) • 520-293-3192 (fax)

IDA: www.darksky.org California Section: www.skykeepers.org

NIGHTSCAPE

FALL 2019 | ISSUE #101
2018 ANNUAL REPORT



INTERNATIONAL DARK-SKY ASSOCIATION

FROM THE EXECUTIVE DIRECTOR

Since joining the International Dark Sky Association in February of this year, I have come to appreciate the value of the night in our lives. The night is not just a time to rest and get ready for the coming day. Natural darkness is essential to all living things. The night sky, filled with stars, inspires our spirit and rejuvenates our souls.

I am blessed to spend many evenings immersed in the natural night outside with my family. From our home in Tucson, Arizona, we are often able to enjoy the Milky Way stretched over our heads, while bats flit around between us and the stars, and the coyotes howl in the distance. It's the perfect way for my family to unwind and reconnect with each other and the natural world around us.

This experience does not come about by accident. My enjoyment of the natural night from my home in Tucson is the result of thirty years of IDA's work to protect the night from light pollution.

I am in awe of our members and the work they are doing all around the world to protect the night in their communities. As you will read in this issue of *Nightscape*, despite the challenges and setbacks that we face, there are reasons to be hopeful.

I am especially encouraged that, together with our partners and advocates, we are introducing a new generation of night sky supporters.

In Alberta, Canada, the IDA chapter has offered educational programming to more than 6,000 school-aged students. The National Park Service's fastest-growing program is night sky interpretive outreach. Exposing people to the natural night is raising awareness about why urgent action is needed

to protect this resource - one that many young people today don't even know exists. But light pollution does not know boundaries, and it is no longer enough to protect dark places. Our challenge today is to bring light pollution solutions to the cities and communities where people live.

Bad lighting that wastes energy, disrupts wildlife, contributes to climate change, and interrupts our view of the universe is the norm in too many places. Fortunately, we are learning how new technology - such as the LED streetlight - does not automatically mean we lose our view of the stars. Outdoor lighting can be beautiful, healthy, and functional. As you will read, a groundbreaking LED retrofit in the city of Tucson demonstrates that lights can save energy and money, meet lighting safety standards, and actually reduce skyglow.

My work at IDA is only just beginning. My commitment is to work with all of you IDA's members and supporters - to ensure that more people around the world will come to know the natural darkness of the night from their home and community.

Thank you for your encouragement and support as, together, we work toward a world where the night sky filled with stars, is celebrated and protected around the world as a shared heritage benefitting all living things.



Never stop looking up.

Ruskin K. Hartley
Executive Director

CONTENTS

NATIONAL PARK SERVICE: NIGHT SKY ACADEMY

NIGHTS OVER TUCSON: HOW THE TUCSON, ARIZONA, LED CONVERSION IMPROVED THE QUALITY OF THE NIGHT

ESTRELLAS ANCESTRALES – GUATEMALA'S HERITAGE OF DARK SKIES

2018 ANNUAL REPORT: IMPACT REPORT AND FINANCIALS

RECOGNITION

Cover Image: Stars over Mount Lemmon, Arizona, U.S. Photo by Bettyrupal Faelt
Image Right: A wispy long nose hawk near the Milky Way. Tachibana, Austria. Photo by Stefan Labeemann

*"I often think that the night
is more alive and more richly
colored than the day."
—Vincent Van Gogh*

The stars above VERTAS gamma-ray instrument at the Fred Lawrence Whipple Observatory in southern Arizona, U.S.
Photo by Bettymary Froth



The Milky Way over Shenandoah National Park. Photo by William McIntosh

INTERNATIONAL DARK-SKY PLACES

National Park Service: Night Sky Academy

Each year, millions of visitors to one of the seventy-six International Dark Sky Parks around the world experience the sense of wonder found when they see a truly dark sky for the first time. For many people, a visit to an International Dark Sky Place is the first time they have seen more than a handful of stars, let alone the rings of Saturn, the moons of Jupiter, the arc of our own galaxy, or a distant deep space object at an unfathomable distance.

Demand for night sky activities is growing rapidly around the world. For the United States National Park Service (NPS), demand for night sky programs is growing faster than any other interpretive program. In response, the Park Service is training a new cadre of night sky rangers to help share the wonder of a dark, star-studded sky with their visitors.

"IDA's recognition program helps bring international awareness to the National Park Service's important work in protecting special, dark places. After all, half the park is after dark," said Karen Trevino, chief of the Natural Sounds and Nightscapes division for the National Park Service.

International Dark Sky Places offer their visitors nighttime programs to celebrate the benefits of the natural night and raise awareness about the urgent need to protect it.

Yeongyang Firefly Eco Park International Dark Sky Park, South Korea

Hosts annual events to celebrate the region's fireflies and promote the preservation of their natural, dark habitat.

Cedar Breaks International Dark Sky Park, Cedar Breaks, Utah, U.S.

Leads an annual Master Astronomer Program, a 40-hour workshop to train local residents as stewards of the dark night sky.

Thunder Mountain Pootseev Nightsky International Dark Sky Community, Kaibab Paiute Indian Reservation, U.S.

Holds star parties that include traditional Southern Paiute songs, dances, and storytelling related to the night sky.

Snowdonia National Park, International Dark Sky Reserve, Wales

Organizes "Starry Night Swim" events within the Reserve to connect attendees with the beauty of the night sky in a unique way.

Thank you to The Fred Maytag Family Foundation for their generous support of the Dark Sky Places Program in 2019.

"IDA's recognition program helps bring international awareness to the National Park Service's important work in protecting special, dark places. After all, half the park is after dark."

—Karen Trevino, chief of the Natural Sounds and Nightscapes division for the National Park Service

Earlier this summer, IDA's Executive Director, Ruskin Hartley, joined a group of twenty-five National Park Service rangers and employees for a Night Sky Academy at Shenandoah National Park in Virginia, U.S. The workshop was the result of a collaborative partnership between the NPS Natural Sounds and Night Skies Division and the McDonald Observatory in Texas. For three days, attendees were immersed in the wonders of the night as birds return to roost and the night chorus of frogs and insects and resources to lead night sky interpretive programs. Presenters talked about hosting star parties (even when it is cloudy), navigating the stars, setting up a telescope, telling the stories mapped in the constellations, and listening to the sounds of the night as birds return to roost and the night chorus of frogs and insects starts up. They even spent an evening touring lighting in the park to appreciate the difference between responsible, useful light and wasted light.

In fact, the night sky program at Shenandoah National Park started in 1999, when former IDA Board President, Bob Gent, volunteered to bring a few telescopes up to the park in return for a free room and dinner in the lodge. The program has gone on to thrive, and this summer 650 people lined up to look at the moon through the eyepiece of a telescope during the annual Shenandoah Night Sky Festival.

Shenandoah National Park is located two hours from Washington, D.C. Light pollution from the greater D.C. metro area means it lacks the pristine skies of a remote site like Dark Sky Places on the Colorado Plateau. But what it lacks in pristine skies, it makes up in easy access to the beautiful night sky for millions of visitors.

"On our final morning, two children visiting from Japan stopped by our table to say thank you," Hartley said. "The previous night they had peered through a telescope and seen the rings of Saturn with their own eyes. You could still see the sense of wonder in their faces."

You can help protect the night sky where you live by visiting our website. Learn more at www.darksky.org/get-involved/.

THE TUCSON RETROFIT AT A GLANCE:

- 19,561 lights retrofit to 3,000K LED lighting with adaptive controls
- Lights operate at 90% power until midnight
- Lights are further dimmed to 60% between midnight and sunrise

The Tucson city council in February 2016 and completed in 2018. In total, 19,561 fixtures were replaced with 3,000K LED lights. To prolong the life of the lights and reduce lumen output, the lights are operated at ninety percent capacity from the hours of sunset until midnight. After midnight, most of the lights are further reduced to sixty percent of capacity until they are extinguished thirty minutes after sunrise.

"The cost savings and the dimming capability – which also saves money on electrical usage – should be enough for any jurisdiction to consider LED conversion with dimming." –Jessie Sanders, city of Tucson

light emissions from the city of Tucson have been reduced by seven percent. Best of all, the benefits realized by Tucson's lighting retrofit can be applied anywhere in the world. Tucson's project manager, Jessie Sanders, told IDA, "The cost savings and the dimming capability – which also saves money on electrical usage – should be enough for any jurisdiction to consider LED conversion with dimming."

Has your city recently undergone or considered a street lighting retrofit? We'd love to hear about your experience. Contact IDA at contact@darksky.org with the subject line: Lighting Where We Live.



High-pressure sodium lights on the right were replaced with 3,000 Kelvin LED lights, shown on the left. Image by John Eurenline.

The results of the conversion are encouraging. The city of Tucson is saving millions of dollars in annual energy costs. The total lumen output from street lighting was reduced from ~481 million to ~181 million lumens during the early nighttime hours. When the streetlights are dimmed to sixty percent after midnight, the total lumen output is further reduced to ~134 million, a seventy-two percent reduction.

City officials tell IDA that they have received few comments about the change in lighting. But the differences are meaningful to wildlife, the environment, and for night sky protection. The lower lumen output results in a reduction of blue light emissions of approximately thirty-four percent, which is an important factor in making the city safer for nocturnal wildlife. Recent measurements made by IDA indicate that total measured

THE RESULTS

- ~\$2.16M in annual energy savings
- Expected lifetime of luminaires extended from 8 to 25 years*
- 63% reduction of total lumens emitted by street lights
- Blue light emissions were reduced by ~34%
- 7% reduction in total light emissions from the Tucson metro area

*High-pressure sodium luminaire lifetime is approximately eight years. LEDs with the adaptive control measures implemented by the city of Tucson have an expected lifetime of twenty-five years.



Tucson, Arizona, is lit by environmentally friendly lighting that saves energy. Photo by Bethymaya Focht

LIGHTING

Can a lighting retrofit in a growing metropolitan city save energy, maintain safety standards, and protect the starry night sky?

NIGHTS OVER TUCSON: How the Tucson, Arizona, LED Conversion Improved the Quality of the Night

Tucson, Arizona, is a major metropolitan city in the southwest United States. The city has a long-standing commitment to best lighting practices that protect the night. In fact, people who move to the area often remark on how bright the stars appear to shine. But as the city has grown, so has its light pollution. With major astronomical observatories within close range, city leaders enacted an outdoor lighting ordinance in 2012 that requires fully shielded lighting and sets limits on the total light produced at night, especially in natural areas and areas close to astronomy sites.

In 2016, Daryl Cole, the Director of Transportation for the city of Tucson, in consultation with IDA member Christian Monrad, of Monrad Engineering, and Ameresco, a global energy management firm, developed a plan to convert nearly 20,000 street lights from high-pressure sodium to energy-efficient LEDs with adaptive controls. The plan projected savings of \$180,000 per month in energy consumption and a sixty percent reduction in lumen output from street lighting.

The conversion plan was approved by

IDA CHAPTERS

Dark sky advocates are working in more than twenty countries around the world to protect the night from light pollution.

UNITED STATES

Dark Skies Northwest • Flagstaff Dark Skies Coalition • Geneva Lake Dark Sky • IDA Berrien County • IDA California • IDA Central Illinois • IDA Central Tennessee • IDA Chicago • IDA Colorado • IDA Connecticut • IDA Dark Sky Lake Worth • IDA Duluth, Minnesota • IDA Erie and Crawford County • IDA Florida • IDA Hawaii • IDA Massachusetts • IDA Memphis • IDA Missouri • IDA Montana • IDA New York • IDA North Carolina • IDA Ohio • IDA Oregon • IDA Pennsylvania • IDA Phoenix • IDA Pinal County, Arizona • IDA Rapid City • IDA San Bernardino County • California - High Deserts Region • IDA San Diego • IDA Santa Barbara County, California • IDA Santa Cruz • IDA South Central Kentucky • IDA South Florida • IDA Southern Arizona • IDA Texas • IDA Utah • IDA Virginia • IDA Washington, D.C. • IDA Westchester County • Northwest Illinois • Pennsylvania Outdoor Lighting Council

INTERNATIONAL

Dark Sky Cyprus • Dark Sky Greece • Dark Sky Ireland • Dark Sky Switzerland • IDA Austria • IDA Beijing, China • IDA Czech Republic • IDA Daegu Gyeongbuk, Korea, IDA Guangdong Province, China • IDA Hungary • IDA India • IDA Israel • IDA Italy • IDA Mayo, Ireland • IDA Mexico • IDA Punjab • IDA Quebec, Canada • IDA Shanghai, China • IDA Southern Alberta, Canada • IDA Tasmania • IDA Tokyo, Japan • IDA Victoria, Australia • Light Pollution Awareness Group, Malia • The Royal Astronomical Society of Canada

CHAPTER HIGHLIGHTS

IDA SOUTHERN ALBERTA

IDA Southern Alberta educates 6,000 schoolchildren about the value of dark skies each year, and has communicated with over 400 teachers on light pollution abatement programs. They also worked with the transportation department to install "Dark Sky Country" signage across roadways in Canada.

Dark Sky Country

View the S.A.R.C.

IDA MEXICO

IDA Mexico was instrumental in modifying federal environmental law to include light pollution protections. It was approved unanimously in the deputy chamber of congress and is now in the final stages of ratification by the Senate.

IDA MASSACHUSETTS

IDA Massachusetts wrote and supported a bill, currently in the Massachusetts Legislature, that will protect dark skies across the state.

Omega Centauri & The Great Jaguar, Photo by Sergio Emilio Montúfar Codófer

"I am a living witness of the stars disappearing," says Guatemala-based delegate for IDA, Sergio Emilio Montúfar Codófer. At a young age, Sergio started to notice that stars were disappearing, but didn't realize it was because of light pollution until he got older.

In 2012, Montúfar was selected to participate in a special meeting of the Congress for Archeoastronomy in Guatemala, where he was first exposed to the archeoastronomy of the Maya. Montúfar met with leaders of the Maya community where he connected to their worldview and culture. He learned that in their spiritual ceremonies, Maya timekeepers often invoked the stars. With this fresh inspiration, Montúfar began working to preserve the night sky and restore its disappearing stars through photography and storytelling.

Montúfar traveled around Guatemala to document Mayan archeological sites and sacred places under the dark, starry sky, and ultimately produced a photography exhibit titled "Estrellas Ancestrales" (Ancestral Stars). The twenty-two images in the show align the sacred sites to the stars, introducing people to astronomy and Maya culture. According to

INSPIRATION

ESTRELLAS ANCESTRALES Guatemala's Heritage of Dark Skies



IDA delegate Sergio Montúfar has made it his mission to connect Guatemalans with their heritage through the stars.

2018 IMPACT REPORT

- 1 Provided training to our network of advocates, and dispatched grassroots volunteers in twenty-four U.S. states and nineteen countries to fight for better nights in their communities.
- 2 Designated the 100th International Dark Sky Place. More people than ever before – from all over the world – can now be inspired by a naturally dark night.
- 3 Launched the Community Friendly Outdoor Sports Lighting Program to protect the night and improve outdoor sports lighting design.
- 4 Established a Public Policy program to support responsible outdoor lighting policies in cities and communities around the globe.
- 5 Distributed more than 42,000 light pollution education brochures to people in the U.S., Canada, Ireland, Japan, Kenya, Malaysia, and New Zealand.

Great Barrier Island, New Zealand. Photo by Carol Comer

FROM THE PRESIDENT

In the words of IDA member Janet Muir, "IDA is a sane voice in a world of rapidly increasing light pollution."

Globally, light pollution is growing at twice the rate of the world's population growth, making our efforts to protect the night more urgent than ever before. In 2018, the IDA board and staff asked ourselves, "How can we leverage our 30 years of knowledge and pragmatic solutions to better protect and restore dark skies around the world?"

The answer is *you*.

We have made a commitment to you – our members, supporters, partners, and advocates – to provide more resources, tools, and information to advance the fight to protect the night.

With your support and passion for the night sky, IDA will continue to build on our work as a sane and reliable voice, bringing solutions to the urgent issue of light pollution. Thank you for your continued support.



Ken Kattner
IDA President

STATEMENT OF FINANCIAL ACTIVITY FOR THE FISCAL YEAR ENDING DECEMBER 31, 2018



This information is based on Reviewed Consolidated Financial Statements for the year ended December 31, 2018. For more detailed financial information, please visit darksky.org/about/funding

SPECIAL THANKS

The International Dark-Sky Association's Brand Partners are dedicated members of the dark sky protection community from the corporate and business sectors. They support programs, outreach, education, and night sky conservation efforts. We are grateful to our Brand Partners for their support in 2018.

LEADING PARTNERS

Lumican • Musco Lighting

GUIDING PARTNERS

Grand Canyon National Park Lodges • The Home Depot • GreaterSKies

SUSTAINING PARTNERS

Your True Nature • Earth Sun Moon Trading Company

ALLY PARTNERS

C&W Energy Solutions • Fairmont Jasper Park Lodge • Hipcamp • Holiday River Expeditions • Selux Corp • VOLT • Sunday Afternoons

MEMBER MENTIONS

Thank you to our members and supporters for your generous financial support. We couldn't protect the night from light pollution without you!

Recconnecting with our night sky heritage is so important. Every time I experience a dark sky I feel reset, energized, and reminded of how small we are in this vast universe. It's essential that every person on Earth has the opportunity to experience this firsthand. I'm often invited to give talks about light pollution and prevention to local communities and conservation groups, and I'm so proud to be working with such a great organization helping to bring awareness to this issue. Thanks to IDA, there's an ongoing effort to educate the public to reduce and prevent light pollution.

- Jeremy Evans, California, U.S.
IDA Member since 2017



I support IDA because my membership funds are used to provide the reliable scientific information and policy tools needed to empower an army of volunteers within their own communities. I see IDA's model being akin to the old saying, "Give a man a fish, and you'll feed him for a day. Teach a man to fish, and you've fed him for a lifetime." I plan to do "free commercials" on behalf of IDA until light pollution becomes as archaic as poisonous smokestacks. Join IDA and help us teach more people to fish.

- Dawn Nilson, Oregon, U.S.
IDA Member since 2009

DARK SKY DEFENDERS SOCIETY

The Dark Sky Defenders Society recognizes those who have arranged for planned gifts to IDA. Twelve individuals and families have made a commitment to a legacy that will protect the night long into the future. Some of the Dark Sky Defenders Society members wish to remain anonymous.

If you would like to receive information about how to join the Dark Sky Defenders Society, please contact IDA's Executive Director, Ruskin Hartley, at ruskin@darksky.org.

DARK SKY DEFENDERS SOCIETY MEMBERS

Tom Buchanan
Jim Altenstader
Thomas and Brenda Corbin
J. Ryan Currans
Susan Harder
Tim and Carol Hunter
Ruth Karl
Heidi Massa
Leo and Judy Smith
Anonymous (3)

IDA BOARD OF DIRECTORS:

Ken Kattner, President, USA • Kellie Pendoley, Vice President, Australia • Kim Patten, Treasurer, USA • Jessica Cleaves, Secretary, USA • Laurel Alyn-Forest, USA • Diane Knutson, USA • Alejandro Sanchez Miguel, Spain • Diana Umpierre, USA

COMMITTEE CHAIRS:

Chad Moore, Technical Committee • Mike Weasner, International Dark Sky Places Committee • Corrie Walker, Education Committee

FUNDING SPOTLIGHT

Located in Los Angeles, California, U.S., Metabolic Studio recently made a significant grant to support IDA's work. One of their team members, Dani Lunn, recommended the grant. Dani lives in the city, yet her biggest love is the stars. "Wasted energy from light pollution is a symptom of the crisis our cities face," says Lunn. "The

global dark sky movement gives me hope that we can reverse this and find new ways of making our cities livable, thriving places that respect the environment."

Metabolic Studio supports living systems. Learn more at metabolic.org.

METABOLIC STUDIO

International Dark-Sky Association
3223 N First Ave.
Tucson, AZ 85719



NON-PROFIT ORG
US POSTAGE
PAID
TUCSON, AZ
PERMIT #1902

The starry night sky over Flagstaff, Arizona, U.S.
Photo by SKYGLOW Project

LIGHT TO PROTECT THE NIGHT

IDA's Five Lighting Principles for Responsible Outdoor Lighting

1. USE LIGHT ONLY IF IT IS NEEDED

All light should have a clear purpose. Consider how the use of light will impact the area, including wildlife and their habitat.

2. DIRECT LIGHT SO IT FALLS ONLY WHERE IT IS NEEDED

Use shielding and shaping methods to target the direction of the light beam so that it does not spill beyond where it is needed.

3. USE LIGHT ONLY WHEN IT IS NEEDED

Use active controls such as timers or motion-detectors to ensure that light is available when it is needed and turned off or dimmed when it is not needed.

4. LIGHT ONLY TO THE BRIGHTNESS NEEDED

Use the least amount of light needed.

5. MINIMIZE BLUE LIGHT TO THE AMOUNT NEEDED

Whenever possible, use warm color lights at night.

Exposure to artificial light at night is unnatural



In less than 100 years, humans have radically altered our nighttime environment, putting our health at risk. Due to the rapid growth of artificial light at night, most of us spend our nights bathed in light. But basking in all this light at night is not natural and it may be taking a serious toll on our health.

We are only just beginning to understand the potential negative consequences of this swift change in our environment. A growing body of scientific research suggests that artificial light at night can have lasting adverse effects on human health.



“The power to artificially override the natural cycle of light and dark is a recent event and represents a man-made self-experiment.”

—The American Medical Association

Not All Artificial Light Is Created Equally

Warm White 2700K-3500k	Natural White 4000K-4500K	Day White 5000K-5500K	Cool White 6000K-7000K
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Exposure to blue light at night is especially harmful because it is particularly disruptive to circadian rhythms and melatonin production. Unfortunately, most LEDs used for outdoor lighting — as well as computer screens, TVs and other electronic displays — create abundant blue light. We recommend using light bulbs that emit warm white light with a color temperature of 3000K or lower.

About IDA

The International Dark Sky Association, a 501(c)(3) nonprofit organization based in Tucson, Ariz., is dedicated to preserving the natural nighttime environment by educating policymakers and the public about night sky conservation and promoting eco-friendly outdoor lighting.

Our Mission

To preserve and protect the nighttime environment and our heritage of dark skies through environmentally responsible outdoor lighting.

Our Goals

- Advocate for the protection of the night sky
- Educate the public and policymakers about night sky conservation
- Promote environmentally responsible outdoor lighting
- Empower the public with tools and resources to help bring back the night



International Dark-Sky Association
3223 N. First Avenue
Tucson, AZ 85719 USA
darksky.org +1-520-293-3198

Artificial Light at Night Can Put Your Health at Risk



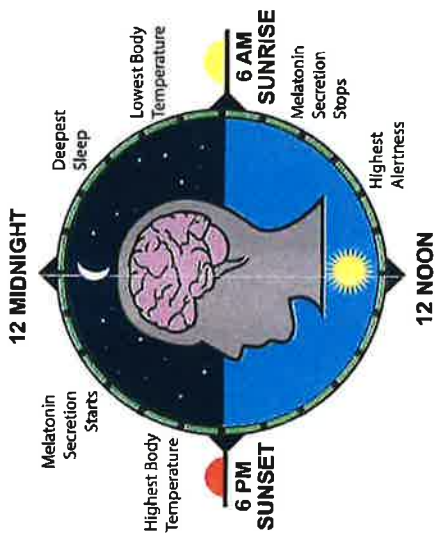
Humans need the natural day/night cycle

Our Biological Clocks Help Keep Us Healthy

What is Circadian Rhythm?

Humans evolved with the rhythms of the natural light-dark cycle of bright days and dark nights. Before the advent of artificial lighting, we spent our evenings in relative darkness.

Like most life on Earth, humans adhere to a circadian rhythm — our master clock, which is crucial for our overall health. It interacts with our body systems, changes our hormone levels and even modifies our genetic code. Natural light helps keep our clock in tune with Earth's 24-hour cycle.



Effects of Circadian Disruption

Circadian disruption may increase our risk of obesity, diabetes, mood disorders, reproductive problems and cancers.

Numerous studies have linked working the night shift and exposure to light at night to increased risks for breast and prostate cancers and other health problems.

Circadian disruption can affect our natural sleep patterns, too. A good night's sleep helps reduce weight gain, stress, depression and the onset of diabetes.

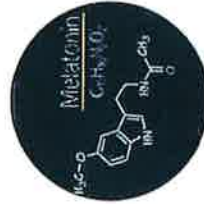
What is Circadian Disruption?

When our master clock is out of sync with the day-night cycle, it's called circadian disruption. Altering or interrupting our normal circadian rhythm can put us at risk for physiological and behavioral impacts. Shift work almost always causes circadian disruption because it puts the internal body clock at odds with the shift schedule.



What is Melatonin?

We don't know why light at night appears to be so bad for us. But we do know that exposure to light at night — even if it's dim — can suppress the body's natural production of melatonin, a hormone that is important for our health including regulating our sleep-wake cycle, metabolism and immune system.



Solutions

- Use only fully shielded, dark sky friendly fixtures for all outdoor lighting, so lights shine down, not up.
- Use only the right amount of light needed. Too much light is wasteful, creating glare and harsh shadows that impair vision.
- Keep the blues away. Two to three hours before bed avoid devices with screens that emit blue light such as tablets, smartphones, computers and televisions.
- If you must use devices at night, install a color temperature app that automatically limits blue light at night based on your time zone.
- Keep your bedroom dark by using blackout curtains and cover or remove light sources such as clock radios and charging stations.
- If you need a nightlight, use one with dim red or amber light. Red light is least likely to be disruptive.
- Use indoor light bulbs that emit warm white light with a color temperature of 3000K or lower. All packaging for new CFL & LED light bulbs provide this information.
- Work with your neighbors and local government to keep light on the ground and the night skies natural.

Visit darksky.org and

join IDA for resources and more information.

Glare Impairs Our Vision

Artificial light at night can also create blinding glare from overly bright and poorly shielded outdoor lighting. Aging eyes are especially at risk. The effects of glare are cumulative, meaning that every light source in view impacts our vision. Blue light, like that in many newer LED streetlights, is more likely than conventional light sources to impair our vision.



Life on Earth Needs the Natural Rhythm of Light and Dark



For billions of years, life has evolved with Earth's predictable rhythm of light and dark controlled by the length of the day. In fact, it's encoded in the DNA of all plants and animals. Unfortunately, humans have radically disrupted this cycle by lighting up the night.

It used to be that when the sun went down, celestial sources like the moon, stars, planets and Milky Way lit the sky. Life learned to operate under the glow of the night sky. For many animals, a natural night sky signals when to eat, sleep, hunt, migrate and even when to reproduce. It is estimated that half of all life on earth start their "daily" activities at sundown.

"Near cities, cloudy skies are now hundreds, or even thousands of times brighter than they were 200 years ago. We are only beginning to learn what a drastic effect this has had on nocturnal ecology."

— Christopher Kyba, light pollution research scientist

Ecosystems: Everything is Connected

Light pollution can affect entire ecosystems. For example, many insects are naturally drawn to light, but artificial light can create a fatal attraction. Declining insect populations negatively impact all species that rely on insects for food or pollination. Some predators exploit this attraction to their advantage, affecting food webs in unanticipated ways.



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 3223 N. First Avenue
 Tucson, AZ 85719 USA
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Light Pollution Can Harm Wildlife





 INTERNATIONAL DARK-SKY ASSOCIATION
www.darksky.org

Artificial Lights Disrupt the World's Ecosystems

Plants and animals depend on Earth's daily cycle of light and dark to govern life-sustaining behaviors such as reproduction, nourishment, sleep and protection from predators. Scientific evidence suggests that artificial light at night has negative and deadly effects on many creatures, including amphibians, birds, mammals, invertebrates and plants.

Coral

More than 130 different species of coral on the Great Barrier Reef spawn new life by moonlight. Bright urban lights can mask the moon's phases, throwing the corals' biological clocks out of sync.



Sea Turtles

Sea turtles live in the ocean but hatch at night on the beach. Hatchlings find the sea by detecting the bright horizon over the ocean. Artificial lights draw them away from the ocean. In Florida alone, millions of hatchlings die this way every year.



Frogs and Toads

Glare from artificial lights can impact wetland habitats that are home to amphibians, such as frogs and toads, whose nighttime croaking is part of the breeding ritual. Artificial lights disrupt this nocturnal activity, interfering with reproduction, which reduces populations.



Birds

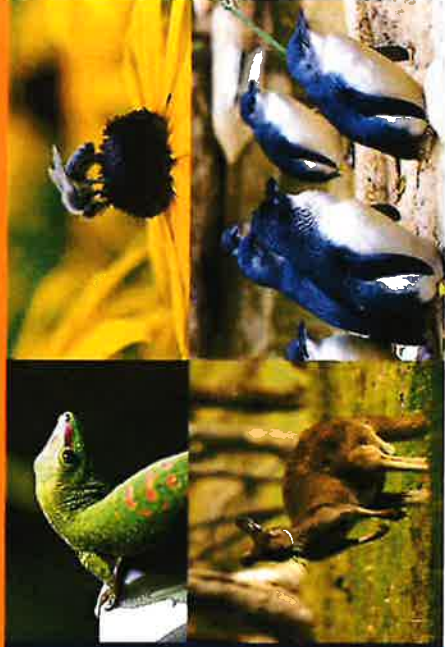
Birds that migrate or hunt at night navigate by moonlight and starlight. Artificial lights can cause them to wander off course towards dangerous nighttime landscapes of cities. Every year millions of birds die colliding with needlessly illuminated buildings and towers.



Other Wildlife Harmed by Light Pollution

We are only just beginning to understand the negative effects of artificial light at night on wildlife. Every year new research adds even more wildlife to the list of animals affected by too much light, including:

- Hummingbirds
- Wallabies
- "Little" penguins
- Zebrafish
- Sweat bees
- Seabirds
- Monarch butterflies
- Atlantic salmon
- "Little" penguins
- European perch
- Songbirds
- Peahens
- Bats
- Owls
- Mice
- Insects
- Geckos
- Fireflies



Solutions

- Use only fully shielded, dark sky friendly fixtures for all outdoor lighting, so lights shine down, not up.
- Use only the right amount of light needed. Too much light is wasteful, harms wildlife and creates glare.
- Install timers and dimmer switches and turn off lights when not in use. If you must have security lighting, use motion sensors.
- Turn off lights in office buildings and homes when not in use.
- Use only lighting with a color temperature of 3000K and below. This means that there is less blue (cool) light that is more harmful to many animal species.
- Work with your neighbors and local governments to ensure outdoor lighting isn't harming the wildlife in your area.

Visit darksky.org and join IDA for resources and more information.



Please support a strong dark night sky ordinance

Susan Edwards
To: planning@amadorgov.org

Thu, Nov 7, 2019 at 5:29 PM

I am definitely in favor of this ordinance!

I go up to the high country to photograph the Milky Way and when I arrive home I can see it behind my house. We are so lucky! I have family in the UK who have only been able to see the Milky Way maybe once. I really value our dark skies and have particularly admired Flagstaff for introducing special street lights that maintain the dark skies. It would be wonderful if we could do the same in our community and be a leader for surrounding communities Please consider the recommendations of the International Dark Sky Association.

Sincerely,

Susan Edwards



Planning Department <planning@amadorgov.org>

Additional attachment to Foothill Conservancy comments on Dark Sky Ordinance

1 message

katherine@mokeriver.com <katherine@mokeriver.com>

Fri, Nov 8, 2019 at 4:39 PM

To: Andy Byrne <andyerupts@volcano.net>

Cc: Mara Feeney <marafeeney@gmail.com>, Chuck Beatty <cbeatty@amadorgov.org>, Lynn Morgan <ladairmorgan@gmail.com>, kruesel@amadorgov.org, Planning Department <planning@amadorgov.org>, Terry Watt <terryjwatt@gmail.com>, Caryl Callsen <caryl@volcano.net>, Gary Reinoehl <digshistory@volcano.net>, Sherry Pease <sherry@foothillconservancy.org>

Dear Chairman Byrne and Amador County Planning Staff:

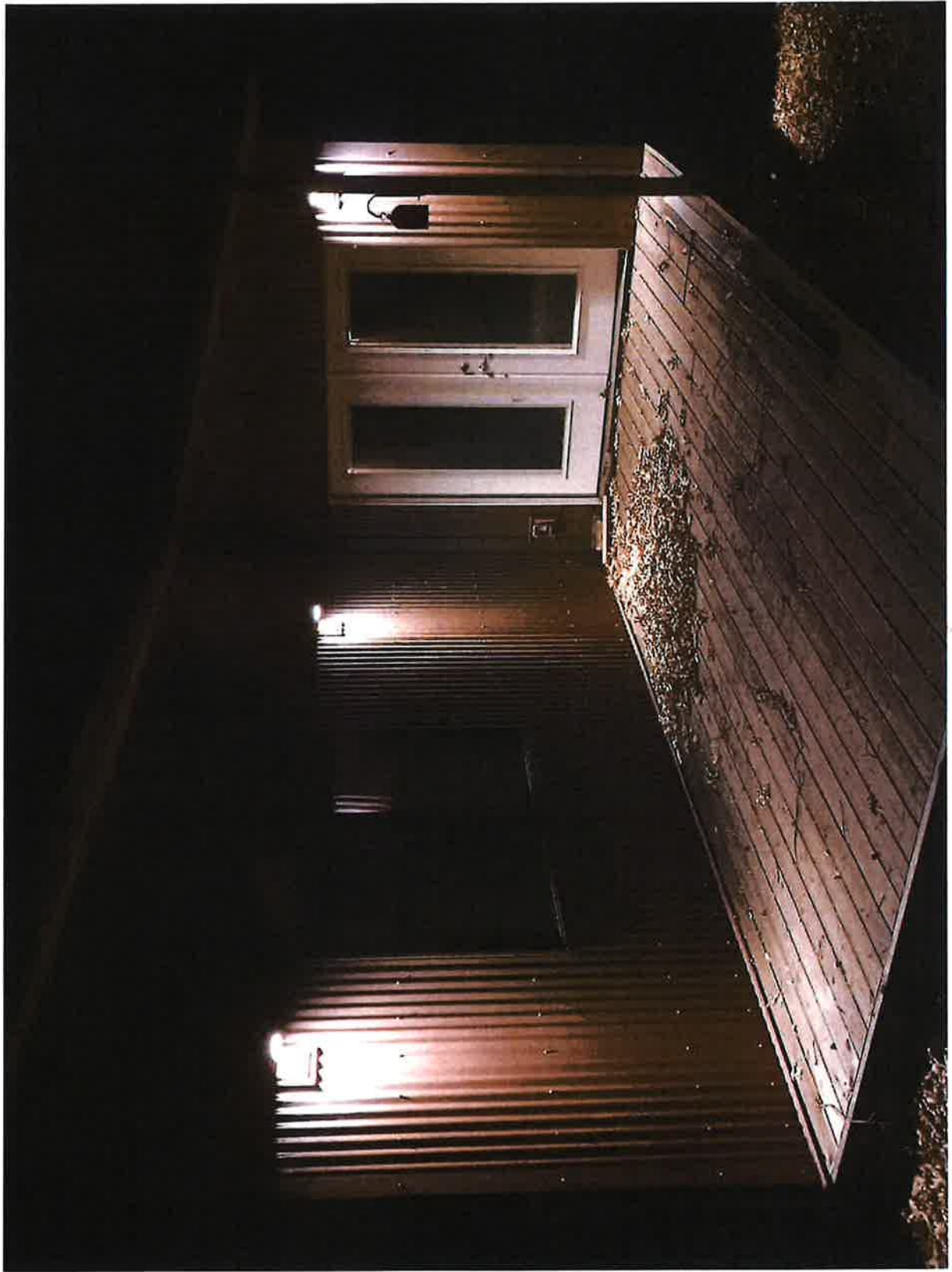
Please add this illustrative PDF to the Foothill Conservancy comments on the draft Dark Sky Ordinance for Tuesday's Planning Commission meeting.

Thanks,

Katherine Evatt
Foothill Conservancy

 **DNS deck pic attach.pdf**
1543K

Amador County residence with dark-sky-friendly lighting fixtures. Please note that while the lighting is directed down from horizontal plane, the deck is well lit for visibility and safety.



ATTACHMENT A



City of Malibu

23825 Stuart Ranch Road · Malibu, California · 90265-4861
Phone (310) 456-2489 · www.malibucity.org

OUTDOOR LIGHTING BASICS

The City of Malibu Dark Sky Ordinance is effective October 15, 2018, so what does that mean for the residents of Malibu? There are requirements of the ordinance that are applicable immediately upon the effective date and other requirements that will need to be addressed prior to the designated compliance periods.

For Existing Lighting (Applicable upon the effective date):

1. Outdoor light fixtures that have the ability to be redirected, shall be directed downward so as to minimize sky glow, glare and light trespass onto adjacent properties.
2. Outdoor light fixtures that have adjustable dimmers with color temperature that exceeds 3000 Kelvin shall be dimmed to comply with MMC Section 17.41.050(G) to minimize glare and light trespass onto adjacent properties.
3. String lights may be allowed in occupied dining and entertainment areas only and must not exceed 3000 Kelvin. String lights shall not be used as landscape lights. This does not apply to seasonal lighting.

For New Lighting: (Basic Residential Requirements):

Lighting Facts <small>Per Bulb</small>	
Brightness	820 lumens
Estimated Yearly Energy Cost	\$7.23
<small>Based on 3 hrs/day, 11¢/kWh Cost depends on rates and use</small>	
Life	1.4 years
<small>Based on 3 hrs/day</small>	
Light Appearance	
Energy Used	60 watts

Manufacturer labels include lumen and Kelvin counts.

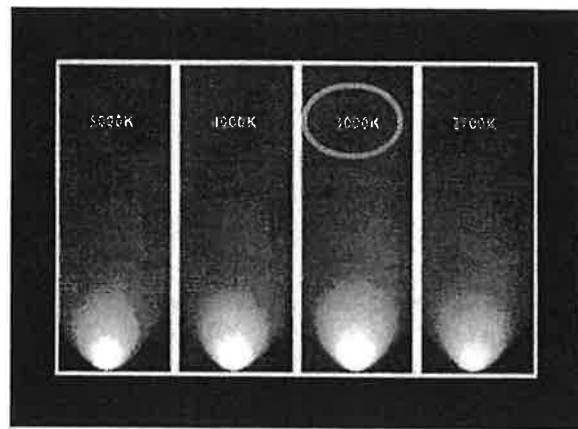
1. Lighting shall be fully shielded and directed downward.
2. Lumen count shall not exceed 850 lumens.
3. Security lighting shall be attached to buildings and controlled by motion sensors which extinguish no later than 10 minutes after activation.
4. Color temperature shall not exceed 3000 Kelvin.
5. Curfew: Unless controlled by motion sensors, outdoor Lighting shall be extinguished by 11:00 pm or when people are no longer present in exterior areas.
6. Outdoor lighting shall only be used within 50 feet of a residentially habitable building or pool with the exception of security, driveway and walkway lighting.

What Does 3000 Kelvin Look Like?

A Kelvin is a measure of color temperature. Color temperatures reaching 5000 Kelvin (K) appear blueish in tone and are typically referred to as "cooler" colors.

Kelvins between 2700-3000 (K) are yellowish and are referred to as "warm" colors.

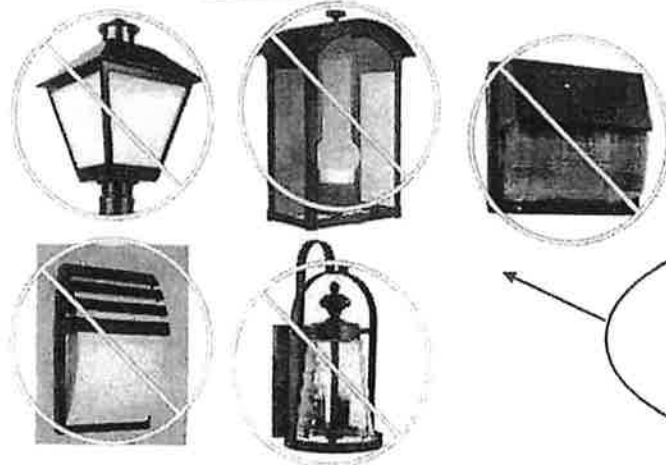
The Dark Sky Ordinance allows for a maximum of 3000 Kelvin.



What Does "Fully Shielded" Mean?

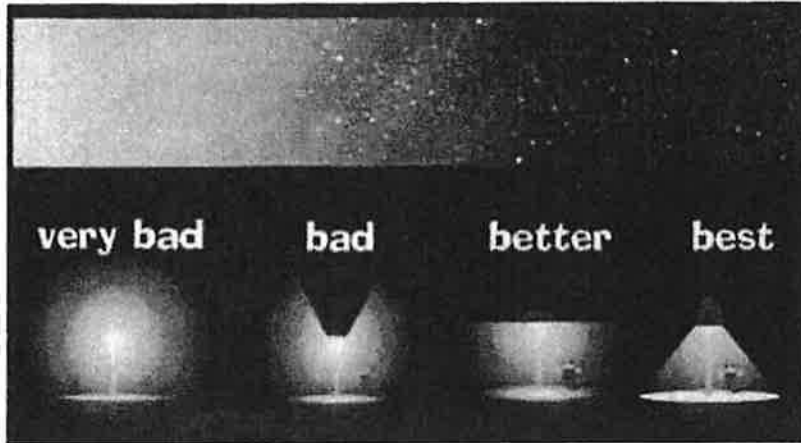
"Fully shielded" means a light fixture constructed and installed in such a manner that all light emitted, either directly from the lamp or a diffusing element, or indirectly by reflection or refraction from any part of the fixture, is projected below the horizontal plane through the fixture's lowest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

The images to the right are examples of "fully shielded," Dark Sky-Compliant outdoor light fixtures. The bulb or lamp is not visible below the fixture.



The images to the left are examples of outdoor light fixtures that are NOT "fully shielded" and Dark Sky-Compliant. The lamp, or diffusing element, is visible through the glass or plastic cover.

What Does "Directed Downward" Mean?



The Dark Sky Ordinance includes a requirement to direct the light "downward" or towards the ground. This is done to concentrate the light in a fixed area, thereby improving the visibility within that area and reducing light pollution, light trespass and sky glow.

Definitions of light pollution, light trespass and sky glow can be found in Section 17.41.030 of the Dark Sky Ordinance.

Compliance Periods for Existing Non-Conforming Outdoor Lighting

Compliance periods for existing non-conforming lighting are established by zoning district. Notwithstanding the provisions in MMC Chapter 17.60 (Non-conforming Structures and Uses) and MMC Section 17.04.070, a property owner shall comply with the requirements of this chapter by the following compliance deadlines. Any non-compliant lighting still in place after the compliance deadline shall remain extinguished at all times.

1. Gas Stations: Outdoor lighting at gas station properties shall comply by October 15, 2019 (1 Year from the effective date).
2. Commercial and Recreations Zones: Outdoor lighting in commercial zones, including but not limited to CN, CC, CV, CG, RVP, and RD zoning districts shall comply by October 15, 2020 (2 Years from the effective date).
3. Residential and Institutional Zones: Outdoor lighting in all remaining zones, including but not limited to SF, MF, MFBF, RR, PD, MH, and I zoning districts shall comply by October 15, 2021 (3 Years from the effective date).

ORDINANCE NO. 434

AN ORDINANCE OF THE CITY OF MALIBU DETERMINING THE PROJECT IS CATEGORICALLY EXEMPT FROM THE CALIFORNIA ENVIRONMENTAL QUALITY ACT AND AMENDING MALIBU MUNICIPAL CODE TITLE 17 (ZONING) TO REGULATE OUTDOOR LIGHTING CITYWIDE

The City Council of the City of Malibu does ordain as follows:

SECTION 1. Recitals.

A. On April 8, 2013, the City Council directed staff to prepare a Zone Text Amendment (ZTA) to establish a citywide outdoor lighting standards ordinance, later referred to as Dark Sky Ordinance. The purpose of the ordinance is to reduce light pollution to preserve enjoyment of the night time sky and the City's rural environment, reduce impacts on wildlife and natural habitats, and promote the City's goal of conserving energy and natural resources.

B. On April 30, 2013, the Zoning Ordinance Revisions and Code Enforcement Subcommittee (ZORACES) provided recommendations on key elements to include in a Request for Proposal (RFP) for the preparation of a comprehensive citywide lighting ordinance (ZTA No. 13-001).

C. On April 16, 2014, the City Council authorized an agreement with the International Dark Sky Association (IDA) to assist staff with the preparation of the citywide lighting ordinance for integration into City codes. The City Council further directed staff, in close coordination with IDA, to prepare a modified version of the MLO, as this model lighting code was determined to be more appropriate overall than previously considered alternative ordinances.

F. On September 8, 2014, the City Council directed staff and IDA to prepare a citywide lighting ordinance based on the MLO that incorporated standards such as light spectrum controls to aid in protecting the City's rural nature.

G. On May 9, 2016, August 23, 2016, and February 28, 2017, staff presented a draft ordinance to ZORACES for recommendations.

J. On June 6, 2017, a duly noticed Special Joint meeting of City Council and Planning Commission was held in order for staff and IDA to conduct a guided nighttime tour of seven locations throughout the City exhibiting a variety of lighting schemes. Approximately 15 members of the public attended.

K. On June 7, 2017, a duly noticed Special Joint meeting of City Council and Planning Commission was held which included a public workshop on the results of tour surveys, an overview of the draft ordinance, known as the Dark Sky Ordinance, and a discussion about community concerns, enforcement and compliance. At the conclusion of the meeting, staff received comments from the public, Councilmembers and Commissioners.

L. On July 17, 2017, the Planning Commission held a duly noticed public hearing on a progress draft of the proposed Dark Sky Ordinance, received public comment and provided recommendations to staff.

M. On February 15, 2018, a Notice of Planning Commission Public Hearing was published in a newspaper of general circulation within the City of Malibu and was mailed to all interested parties.

N. On March 19, 2018, the Planning Commission held a duly noticed public hearing on the draft ordinance, at which time the Planning Commission reviewed and considered the agenda report, reviewed and considered written reports, public testimony, and other information in the record.

O. On March 29, 2018, a Notice of City Council Public Hearing was published in a newspaper of general circulation within the City and was mailed to all interested parties; regional, state and federal agencies affected by the amendments; local libraries and media; and the CCC.

P. On April 23, 2018, the City Council held a duly noticed public hearing on the proposed ordinance, reviewed and considered the staff report, reviewed and considered written reports, public testimony, and other information in the record.

SECTION 2. Environmental Review.

The City Council has analyzed the project proposal described herein and has determined that the project is covered by the general rule that the California Environmental Quality Act (CEQA) applies only to projects which have the potential for causing a significant effect on the environment. Pursuant to CEQA Guidelines Section 15061(b)(3), where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, the activity is not subject to CEQA. The City Council has determined that there is no possibility the proposed amendment may have a significant effect on the environment and accordingly, the exemption set forth in Section 15061(b)(3) applies.

SECTION 3. Findings for Zoning Text Amendment No. 13-001.

The City Council hereby finds that ZTA No. 13-001 is consistent with the General Plan and is designed to protect and promote public health, safety, welfare, quality of life and the ability to view the night sky. The ordinance further strives to reduce light pollution, protect the City's rural environment, reduce impacts on wildlife and natural habitats, and promote the City's goal of conserving energy and natural resources. The ordinance will also ensure compatibility between land uses by reducing negative effects of light pollution which conflict with the City's goals of maintaining its unique rural character.

The ZTA further advances the General Plan Vision Statement which reads, "Malibu is a unique land and marine environment and residential community whose citizens have historically evidenced a commitment to sacrifice urban and suburban conveniences in order to protect that

environment and lifestyle, and to preserve unaltered natural resources and rural characteristics. The people of Malibu are a responsible custodian of the area's natural resources for present and future generations." The City is committed to "manage growth to preserve a rural community character" [General Plan LU Element, Section 1.4.2]. The overriding goals of the City are to: "(a) Protect, maintain, and where feasible, enhance and restore the overall quality of the coastal zone environment and its natural and artificial resources; and (b) Assure orderly, balanced utilization and conservation of coastal zone resources taking into account the social and economic needs of the people of the state."

The proposed ordinance does not authorize a use other than that already designated in the MMC as a permitted or conditionally permitted use in the zone. The proposed ordinance is consistent with the Coastal Act and the MMC because it protects, maintains and enhances the overall quality of the coastal zone environment. The proposed ordinance will not alter the utilization or conservation of coastal zone resources, impede public access to and along the coastal zone, or interfere with the priorities established for coastal-dependent or coastal-related development.

SECTION 4. Zoning Text Amendments.

Chapter 17.41 (Malibu Dark Sky) is hereby added to Title 17 of the MMC to read as follows:

17.41.010 Title.

This chapter shall be known as the "Malibu Dark Sky Ordinance."

17.41.020 Purpose.

The purpose of this chapter is to implement the goals of the General Plan and protect and promote public health, safety, welfare, quality of life and the ability to view the night sky, by establishing regulations and a process for review of outdoor lighting in order to accomplish the following:

- A. Minimize direct glare and prevent excessive lighting, thereby minimizing light pollution caused by inappropriate or misaligned light fixtures, and promoting common courtesy among neighbors;
- B. Reclaim the ability to view the night sky and thereby help preserve Malibu's rural quality of life and the scenic value of this desirable visual resource;
- C. Promote wildlife habitation and migration by minimizing light pollution into and adjacent to habitat areas;
- D. Prevent light pollution wherever possible in all areas of the city;
- E. Provide sufficient lighting where it is needed to promote safety and security on public and private property;

- F. Allow flexibility in the style of outdoor lighting;
- G. Provide standards for efficient and moderate use of lighting which balance energy use and economic impact;
- H. Provide lighting standards that can evolve according to advancements in technology and
- I. Promote lighting practices and systems which conserve energy, decrease dependence on fossil fuels and limit greenhouse gas emissions consistent with the California Global Warming Solutions Act and other applicable state and federal law.

17.41.030 Definitions.

Notwithstanding the provisions of Section 17.02.060, for the purposes of this chapter only, the following words and phrases are defined as follows:

“Curfew” means the time of day when lighting restrictions, based on zoning district, are in effect.

“Directional lighting” means methods of directing light downward, rather than upward or outward, with the intention of directing light where it is needed.

“Environmentally Sensitive Habitat Area (ESHA),” for purposes of this chapter, shall be defined as in the MMC except in the Point Dume area, where it shall refer only to any slopes of 25 percent or steeper.

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

“Glare” means light entering the eye directly from a light fixture or indirectly from reflective surfaces that causes visual discomfort or reduced visibility to a reasonable person.

“Kelvin” means the measure of the color temperature of a light source. Warmer temperatures are a lower number, and cooler temperatures are a higher number.

“Lamp” means, in generic terms, 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.

“Light pollution” means the material 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, including light sources that are left on when they no longer serve a useful function.

“Light trespass” means light that falls beyond the property it is located on.

“Lumen” means the unit of measure used to quantify the amount of visible light produced by a lamp or emitted from a light fixture (as distinct from “watt,” a measure of power consumption).

“Navigation lights” means a set of lights shown for an aircraft at night to indicate obstacles and hazards such as towers and tall buildings.

“Outdoor light fixtures” means outdoor electrically powered illuminating devices, lamps and similar devices, including solar powered lights, and all parts used to distribute the light and/or protect the lamp, permanently installed or portable; synonymous with “luminaires.”

“Public viewing area” shall be defined as in Local Coastal Program Local Implementation Plan Section 2.1.

“Seasonal lighting” means lighting installed and operated in connection with holidays or traditions.

“Sky glow” means the brightening of the nighttime sky that results from scattering and reflection of artificial light by air molecules, moisture and dust particles in the atmosphere. Sky glow is caused by light directed or reflected upwards or sideways and reduces one's ability to view the night sky.

“String lights” means light sources connected by free-strung wires or inside of tubing resulting in several or many points of light that are unshielded or partly shielded light sources.

17.41.040 Applicability.

A. All outdoor light fixtures installed prior to the effective date of this ordinance are subject to the compliance period of Section 17.41.100(A), however the following requirements must be complied with immediately:

1. Outdoor light fixtures that have the ability to be redirected, shall be directed downward so as to minimize sky glow, glare and light trespass onto adjacent properties.
2. Outdoor light fixtures that have adjustable dimmers with color temperature that exceeds 3000 Kelvin shall be dimmed to comply with

Section 17.41.050(G) to minimize glare and light trespass onto adjacent properties.

3. String lights may be allowed in occupied dining and entertainment areas only and must not exceed 3000 Kelvin. String lights shall not be used as landscape lights. This does not apply to seasonal lighting.

B. All outdoor light fixtures installed after the effective date of this ordinance shall comply with this chapter.

C. For any property subject to this chapter and also regulated by permit conditions pertaining to outdoor lighting, the more restrictive provisions in terms of minimizing light pollution shall apply.

D. Nothing in this chapter shall prohibit a declaration of covenants, conditions and restrictions for private enforcement from further restricting lighting so long as it meets the minimum standards detailed in this chapter.

E. The following lighting and activities are not regulated by this chapter:

1. Indoor lighting
2. Lighting within the public right-of-way for the principal purpose of illuminating public streets or traffic control
3. Lighting solely used to illuminate signs for which a permit has been received
4. Lighting solely used to illuminate address signs
5. Construction or emergency lighting provided such lighting is temporary, necessary, and is discontinued immediately upon completion of the construction work or termination of the emergency
6. Aircraft navigation lights such as those attached to radio/television towers
7. Short-term lighting associated with activities authorized by a valid temporary use permit, special event permit or film permit during the duration of the permit
8. Malibu High School field and parking lot lights

17.41.050 Citywide Requirements.

A. All outdoor light fixtures shall be fully shielded and installed and maintained in such a manner that the shielding does not permit light trespass in excess of those amounts set forth in subsection G below. Lighting shall be directed away from ESHA, ESHA buffer, Pacific Ocean, beaches, and public viewing areas in a manner to ensure no lamp is directly visible from public viewing areas.

B. Lighting around the perimeter of the site, except as required for security lighting purposes and where it is controlled by motion sensor which extinguishes the light no later than 10 minutes after activation, and lighting for aesthetic purposes on any parcel of land that is located along, within, provides views to or is visible from any scenic area, scenic road, public viewing area, ESHA or ESHA buffer is prohibited.

C. Light pollution shall be minimized through the use of directional lighting, fixture location, height, the use of shielding and/or motion sensors and timers.

D. Automated control systems, such as motion sensors and timers, shall be used to meet the curfew requirements of 17.41.060. Photocells or photocontrols shall be used to extinguish all outdoor lighting automatically when sufficient daylight is available. Automated controls should be fully programmable and supported by battery or similar backup.

E. Lighting Color (Chromaticity). The correlated color temperature of all outdoor lighting shall be 3000 Kelvin or less except:

1. Amber colored sources of a lower temperature necessary to protect beach and ESHA, as determined by the planning director

2. Seasonal lighting

F. Seasonal lighting shall be allowed from November 15 to January 15 only.

G. Allowable light trespass. Outdoor lighting shall not cause light trespass exceeding the following amounts, measured with a light meter oriented vertically or horizontally at the property line of the property on which the light is trespassing:

1. From any property onto a residential property, ESHA, ESHA buffer, Pacific Ocean, beaches, and public viewing areas, the maximum allowable light trespass shall be 0.1 foot-candles

2. From any property onto a non-residential property other than ESHA, ESHA buffer, Pacific Ocean, beaches, and public viewing areas, the maximum allowable light trespass shall be 0.25 foot-candles

H. Permanently installed lighting that blinks, flashes or is of unusually high intensity or brightness is prohibited.

I. Lighting of the shore is prohibited, except as required for security lighting purposes and where it is controlled by motion sensor which extinguishes the light no later than 10 minutes after activation.

17.41.060 Additional Lighting Requirements by Zoning District.

A. Public Open Space (OS) zoning district

1. The lighting curfew for all outdoor lighting, other than security lighting as detailed in Section (2)(b) below, shall be one hour after sunset.

2. Lighting shall be minimized, restricted to outdoor light fixtures meeting the following standards:

a. Walkways: The minimum necessary to light walkways used for entry to and exit from structures and parking areas, utilizing fixtures that are shielded, directed downward, and do not exceed two feet in height and 850 lumens.

b. Security lighting shall be attached to buildings and controlled by motion sensors which extinguish no later than 10 minutes after activation, with fixtures that do not exceed 850 lumens.

c. Driveways: The minimum necessary for safe vehicular use of the driveway, utilizing fixtures that do not exceed 850 lumens.

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

B. Residential zoning districts, including SF, MF, MFBF, RR, PD, and MH

1. Curfew: All outdoor lighting shall be extinguished by 11:00 p.m. or when people are no longer present in exterior areas, whichever is later, except for lighting activated by motion sensor which extinguishes 10 minutes after activation and lighting at building entrances, parking areas and driveways.

2. Each outdoor light fixture shall be fully shielded, directed downward and shall not exceed 850 lumens. Outdoor light fixtures shall not be mounted higher than 18 feet above ground level. For the portion(s) of a property containing ESHA or ESHA buffer or located in or adjacent to ESHA or ESHA buffer or visible from public viewing areas, lighting shall comply with the OS zone standards detailed in subsection (A)(2) above instead of this subsection (B)(2).

3. Outdoor lighting shall only be used within 50 feet of a residentially habitable building or swimming pool except that security lighting, driveways and walkways may include outdoor lighting which complies with Section 17.41.060(A)(2).

C. All other zoning districts including, but not limited to Commercial and Institutional zoning districts (CN, CC, CV, CG, I, RVP, and RD)

1. All outdoor lighting shall comply with California Building Code Title 24 Lighting Zone One (LZ1).

2. Curfew: All outdoor lighting shall be extinguished by 11:00 p.m. or close of business, whichever is later, except for lighting activated by motion sensor which extinguishes 10 minutes after activation and lighting at the building entrances and driveway egress points.

3. Lighting for ATMs and exterior accessways to hotel/motel rooms are not subject to the curfew.

4. For the portions of a property containing ESHA or ESHA buffer or located in or adjacent to ESHA or ESHA buffer, on any parcel of land that is located along, within, provides views to or is visible from any scenic area, scenic road, public viewing area, lighting shall comply with the standards of subsection (A)(2) under the OS zone standards instead of this subsection (C)(4).

17.41.070 Deviation.

A. Deviations from the lighting standards provided in this chapter may be approved pursuant to an application processed according to the same procedures as a site plan review under this Title. The application shall be made on a form provided by the Planning Department, and shall be accompanied by accurate plans, a legal description of the subject property and the following information:

1. Plans depicting the proposed lighting;

2. Detailed description of the circumstances which necessitate the deviation;

3. Details on the use of the proposed light fixtures for which the deviation is requested, including the type of outdoor light fixtures to be used, the light output and character of the shielding, if any; and

4. Such other data and information as may be required by the planning director.

B. The deviation may be granted by the planning director (for all residential zoning districts) and by the planning commission (for all other zoning districts or if an application is referred to the planning commission by the planning director) if the City makes the following four findings, based on substantial evidence.

1. There are unique circumstances affecting the subject property that make it infeasible or impractical to comply with strict application of the lighting standards detailed in this chapter.
2. The proposed deviation will achieve the purpose and intent of this chapter.
3. The levels of light pollution will not exceed the level anticipated to be produced by a project compliant with this chapter.
4. The proposed project will not be contrary to or in conflict with the general plan.

17.41.080 Street Lighting. (RESERVED)

17.41.090 Conflicts with other Laws.

In the event the provisions in this chapter conflict with federal or state law, this section shall be applied in a manner intended to carry out all provisions of law to the maximum extent feasible. When there is an irreconcilable conflict between the provisions of this chapter and the requirements of federal or state law, the provisions of federal or state law shall prevail over the provisions contained in this section only to the extent necessary to avoid a violation of those laws.

17.41.100 Application of Ordinance to Legal Non-conforming Lighting.

- A. Effective Date. The effective date of this chapter shall be October 15, 2018.
- B. Compliance Period. Notwithstanding the provisions in Chapter 17.60 (Non-conforming Structures and Uses) and Section 17.04.070, a property owner shall comply with the requirements of this chapter by the following compliance deadlines. Any non-compliant lighting still in place after the compliance deadline shall remain extinguished at all times.
 1. Outdoor lighting at gas station properties shall comply by October 15, 2019.
 2. Outdoor lighting in commercial zones, including but not limited to CN, CC, CV, CG, RVP, and RD zoning districts shall comply by October 15, 2020.
 3. Outdoor lighting in all remaining zones, including but not limited to

SF, MF, MFBF, RR, PD, MH, and I zoning districts shall comply by October 15, 2021.

C. Extension. A property owner may apply for an extension of this deadline by submitting a request to the planning director thirty days before the compliance deadline detailing why an extension is needed. With the exception of lighting provided for security purposes, any non-compliant lighting shall remain extinguished while the request is pending. Upon demonstration of good cause for providing a property owner additional time to comply with the requirements of this section, the planning director may extend the property owner's time to comply and/or may require a plan for compliance that requires partial compliance in advance of full compliance. For purposes of this section, the term "good cause" shall mean a significant financial or other hardship which warrants an extension or conditional extension of the time limit for compliance established herein. In no instance shall the planning director issue an extension of the compliance period in excess of one year's time. The planning director's decision shall be appealable pursuant to the provisions of Section 17.04.220.

D. Change of Use. If a property with non-compliant lighting changes use after the effective date, then all outdoor lighting shall be brought into compliance with this chapter, either by the property owner or tenant, before the new use begins.

17.41.110 Enforcement and Penalties.

Any violation of the provisions of this chapter by any person shall be subject to the administrative penalty provisions of Title 1 chapter 1.10 of this Code.

SECTION 5. Certification.


The City Clerk shall certify the adoption of this Ordinance.

PASSED, APPROVED AND ADOPTED this 29th day of May, 2018.



RICK MULLEN, Mayor

ATTEST:



HEATHER GLASER, City Clerk
(seal)

Date: May 29, 2018


APPROVED AS TO FORM:


CHRISTI HOGIN, City Attorney

Any action challenging the final decision of the City made as a result of the public hearing on this application must be filed within the time limits set forth in Section 1.12.010 of the Malibu Municipal Code and Code of Civil Procedure.

I CERTIFY THAT THE FOREGOING ORDINANCE NO. 434 was passed and adopted at the Regular City Council meeting of May 29, 2018, by the following vote:

AYES:	5	Councilmembers:	La Monte, Peak, Rosenthal, Wagner, Mullen
NOES:	0		
ABSTAIN:	0		
ABSENT:	0		


HEATHER GLASER, City Clerk
(seal)



Planning Department <planning@amadorgov.org>

Foothill Conservancy Comments on Proposed Draft Dark Sky Ordinance Attached

Terry Watt <terryjwatt@gmail.com>

Fri, Nov 8, 2019 at 4:15 PM

To: andyrupts@volcano.net, planning@amadorgov.org

Cc: kruesel@amadorgov.org, cbeatty@amadorgov.org, katherine@mokeriver.com, terryjwatt@gmail.com, Mara Feeney <marafeeney@gmail.com>

Chairman Byrne,

RE: Comments on Proposed Draft Dark Sky Ordinance

Please accept these Comments on the Proposed Draft Dark Sky Ordinance prepared on behalf of the Foothill Conservancy. We appreciate the County's work to draft this Ordinance and engage the public in a timely review so it can be improved as warranted and enacted.

Please do not hesitate to contact me with any questions you may have about the Comment Letter or attachment.

Terry Watt, AICP

(415) 377-6280

TerryJWatt@gmail.com

Please update your contacts

2 attachments

 **Comments on Dark Sky Ord final.pdf**
233K

 **attachment A.pdf**
6483K

Terrell Watt Planning Consultants
1937 Filbert Street
San Francisco, CA 94123
terryjwatt@gmail.com
415-377-6280
November 8, 2019

Chairman Andy Byrne
Amador County Planning Commission
810 Court Street
Jackson, CA 95642
Via Email Transmittal

RE: Comments on Proposed Dark Sky Ordinance

Dear Chairman Byrne and Members of the Planning Commission:

These comments on the County of Amador's Proposed Dark Sky Ordinance have been prepared on behalf of the Foothill Conservancy. As a Planning Consultant and planning policy expert I have been asked to participate in drafting and reviewing similar ordinances as well as recommending best practices and mitigation measures to address nighttime lighting impacts for project compliance with requirements of the California Environmental Quality Act. In addition to Dark Sky policies and ordinances, I have also advised on closely related Bird Safe lighting policies and ordinances which borrow from similar policy and regulatory standards to protect birds and other wildlife.

The Foothill Conservancy appreciates the County's accelerated work to draft this Dark Sky Ordinance and engage the public in a timely review so that it can be improved as warranted and enacted. In addition to considering our comments below, we urge the County to consider modifying the Proposed Ordinance to reflect the recommendations of Jack Sale's of the International Dark Sky Association (submitted to the County under separate cover). We also urge the County to review a number of other sources of information cited in our letter and in Jack Sale's letter, including the City of Malibu's Outdoor Lighting Ordinance and Outdoor Lighting Basics brochure, both copied for ease of reference in Attachment A to this letter.

Essential Modifications for Consideration

The draft warrants enactment with modifications to address the General Plan settlement language including LEDs and compliance for existing structures. Specifically, we recommend the following be included in the Ordinance:

- LED with Color Temperature of 2700 Kelvin or less spectrum shall apply to all outdoor lighting.
- LED retrofit of all existing outdoor lighting compliant with the 2700K or less color temperature of the light source and fully shielded, with reasonable exceptions and subject to compliance periods.
- Clear language requiring that the Ordinance applies to lighting at wineries and other venues that host weddings, concerts, performances, and other events. These venues should not be exempt from the Ordinance as section 19.50.064 suggests.
- Compliance periods for all structures and facilities that are not exempt to comply with the Ordinance should be described in lieu of the blanket grandfathering provision in Section 19.50.069, specifying reasonable timeframes for compliance and provisions for extension. The following compliance periods should be added to the Ordinance for outdoor lighting:
 - Non-residential properties: Within 1 year from enactment.
 - County facilities: Within 1 year from enactment.
 - Residential properties: Upon resale. The added benefit of such a resale approach is the disclosure, and therefore, enforcement is addressed as a recorded real estate transfer matter.
 - Change of use: If a property with non-compliant lighting changes use, then all outdoor lighting shall be brought into compliance with this chapter, either by the property owner or tenant, before the new use begins.
 - Extension: A property owner may apply for an extension of this deadline by submitting a request to the planning director thirty days before the compliance deadline detailing why an extension is needed. Upon demonstration of “good cause,” the planning director may extend the property owner’s time for up to one year to comply and/or may require a plan for compliance that requires partial compliance in advance of full compliance. “Good cause” shall mean a significant financial or other hardship. The planning director’s decision shall be appealable.

Definitions should be included for Kelvin¹ and Fully Shielded².

¹ “Kelvin” means the measure of the color temperature of a light source. Warmer temperatures are a lower number, and cooler temperatures are a higher number. Kelvin is important because at the same wattage output, a white LED light will put out more than *eight times* more brightness (and thus, light pollution) than a warmer-looking counterpart. The side effects of this are an increase in overall light pollution (even if pointed down), adverse effects to human and wildlife health, and a huge jump in light trespass.

² “Fully shielded” means a light fixture constructed and installed in such a manner that all light emitted, either directly from the fixture, or indirectly by reflection or refraction from any part of the fixture, is projected below the horizontal plane through the fixture’s lowest light emitting part.

Additional Recommendations for Consideration

In addition to the above, we recommend the County consider the following modifications to clarify the purposes and benefits of the Ordinance.

1. Purpose and intent (19.50.063): The County should consider including language in this section that explicitly invokes the County's police powers and more clearly sets forth the benefits. Language in the Malibu Ordinance is instructive (see section 17.41.020). We suggest revising the section as follows:

The purpose of this chapter is to protect and promote public health, safety, welfare, quality of life and the ability to view the night sky by providing regulations for installation, establishing safety and installation guidelines for safe and compliant lighting, and a process for review of outdoor lighting to accomplish the following:

- A. Protect public safety and security, night-time character and quality of life by preventing light pollution and trespass.
- B. Improve the County's energy independence.
- C. Allow flexibility in style of outdoor lighting with ability to evolve according to advancement in technology.
- D. Maintain natural cycles protective of the County's night-sky and other natural resources.

2. County Outdoor Lighting: Clarify that Section 19.50.065 A does not include County facilities and include a compliance period for all County facilities.

Concluding Comments

We appreciate the County's work to draft the Proposed Dark Sky Ordinance and open up the public discussion. The Foothills Conservancy offers its support to:

- Work with the County on timely modifications proposed above as well as to identify funding sources to accelerate and incentivize public and private retrofits;
- Develop web-based and printed information once the Ordinance has been enacted to provide helpful information to the public, lighting retailers, builders, architects, realtors and other building owners. (see e.g., Malibu Outdoor Lighting Basics); and
- Assist in widely distributing information about the Ordinance and sharing it as a model with the County's incorporated cities.

Please feel free to reach out to me to discuss these comments and follow-up as helpful.

Sincerely,

Terry Watt

Terry Watt, AICP

TO: Krista Ruesel, Planner, & Amador County Planning Commission

Subject: Comments regarding proposed Amador County Dark Skies Protection Ordinance

From:

Jack Sales

5978 Woodbriar Way

Citrus Heights, California 95621-1616

INTRODUCTION --

While a member of the International Dark-Sky Association (IDA) and the Illuminating Engineering Society North America (IESNA) my comments are my own and are based on knowledge gained through over 20 years of association with the lighting industry.

Preserving and restoring the dark night skies of Amador County is a quality of life issue that is a win win for all.

I fully support enacting the Amador County Dark Skies Protection Ordinance.

It is fitting and long over due that Amador County adopt an Outdoor Lighting Ordinance as the first recognized Amateur Astronomical Observatory was located in Volcano. George Madeiros operated the observatory from 1860 to 1862. It is commemorated by California Historical Landmark No. 715 that plaque was first placed near Volcano in 1968. In 2004 it was revised and relocated in Volcano by the State Department of Parks and Recreation in cooperation with the Stockton Astronomical Society and the Sacramento Astronomical Society.

According to Anyplace America, there are 58 streams and 18 reservoirs in Amador County. Artificial lighting at night (ALAN) alters aquatic-riparian invertebrate food webs and alters the prey predator relationship of fishes. By enacting this ordinance these important ecological resources will be protected from ALAN.

With over 30 years of advocating for Dark Skies, the International Dark-Sky Association (IDA) established a Fixture Seal of Approval Program. The program certifies outdoor lighting fixtures as being Dark Sky Friendly, meaning that they minimize glare while reducing light trespass, skyglow and requires and in 2014 requiring lighting that has a "correlated color temperature" (CCT) of 3,000K and lower. The program provides a convenient source for selecting fixtures compliant with the Amador County Dark Skies Protection Ordinance.

Concerns about blue light rich LED Lighting are well known, increased glare and compromise human vision, increased skyglow and Light Pollution and more. Previously these blue rich LEDs were considered more efficient, that is on longer the case in fact over all LEDs of 3000K and lower are now preferred. Currently under Title 24 CalGreen Program established Lighting Color Temperature

Restrictions of 3000K CCT is the recommended lighting standards for all outdoor lighting in California.

While a CCT of 3000K is required by these programs technology advances have made it appropriate to now consider CCT of 2700K the appropriate standard. By way of reference 2600-2700K is considered the CCT of incandescent lamps we have had for over 100 year. As a minimum 2700K outdoor lighting should be used in residential areas and natural habitat..

GENERAL COMMENTS --

Additional Illustrations, Attachments and Handouts ---

Illustrations should be added to the Ordinance and can be found in many existing Outdoor Lighting Ordinances.

Better Lights for Better Nights also titled Good Lights for Good Night, by Bob Crelin, can and has been used with full permission. This handout has been used by a number of Municipalities as part of Outdoor Lighting Ordinances and Building Department Handouts.

Examples are -

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Lakewood Village, Texas, <http://www.lakewoodvillagetx.us/docman-documents/town-ordinances/dark-skies/983-lighting-ordinance>

City of Concord, CA, <https://www.cityofconcord.org/DocumentCenter/View/178/Outdoor-Lighting-PDF>

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Adaptive Lighting - Title 24 requires Adaptive Lighting however the requirement should extend to all applications as much as possible. Adaptive Lighting goes beyond simple motion sensitive OFF-ON but includes controlled dimming from 90% down to 10% when. Because of LEDs can be controlled, dimming of 50% until motion is detected can save significant energy and reduce light pollution as well.

Adaptive Lighting and Light Trespass - Adaptive Lighting or Motion Sensitive Lighting should not be used as an excuse to enable light trespass. Light Trespass is pronounced in rural areas and it's abatement should apply to motion controlled lighting as well. Shielding of motion sensor activated lighting is essential.

Glare - It is easy to understand the shielding can reduce glare, however glare can be reduced by reducing the color temperature CCT as well, therefore preference should be given to 2200K and 2700K in all cases.

Digital Billboards, Electronic Messaging - Digital Billboards should be prohibited.

In May 2019 the IDA Announces Lighting Guidelines for Electronic Messaging Centers please refer to the following link.
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Item by Item Response

19.50.064. Definitions: For the purpose of this ordinance, terms shall be defined as follows:

G. "Light Bulb, bulb." The...

COMMENT - Replace with G. "Light Bulb, bulb, and Lamp." The... (add Lamp to the list).
The lighting industry uses the proper term "Lamp" for the colloquial term bulb.

I. "Light trespass." Shining of light produced by a luminaire...

COMMENT - The Bold Font extends to the "S" in Shining. The term often takes the form of "Light Trespass".

Light trespass is often more objectionable in dark surroundings.

Addressing the impacts of Light trespass should be more prominent in this document.

19.50.065 Exemptions.

Recommended Changes and comments.

B. Public Roadway Illumination,

COMMENT - Remove and include all Public Roadway Illumination be included in the ordinance.

C. Official Traffic Control Devices or Fixtures,

COMMENT - Recommend removal as not necessary.

E. Vehicular Luminaires,

COMMENT - Recommend removal as not necessary.

G. Illumination of the United States Flag,

COMMENT - Modify as in The Town of Lakewood Village, Texas

H. Historic Light Fixtures,

COMMENT - This should be a stand alone paragraph and include requirement of low CCT 2200K.

J4. Maintenance and Repairs of Nonconforming Fixtures,

COMMENT - This should be a stand alone paragraph and include CCT =<3000K.

EXAMPLES, ADDITIONAL COMMENTS - Flags and Historic Fixtures

Illumination of the United States Flag, some important points from the The Town of Lakewood Village, include from page 7

Flagpoles illuminated from below... The maximum output shall be 1,300 lumens and 3,000 kelvins.

The fixture shall be mounted perpendicular to the flag pole and the light outputs shall point straight up at the flag.

Flagpoles illuminated from above shall utilize a single light fixture, not to exceed 800 initial lamp lumens and 3,000 kelvins, attached to the top of the flagpole.

Flags should be illuminated first from the top, and second directly from below.

Historic Light Fixtures or new "Historic" stile, "period" stile fixtures, such as acorns should be restricted to 2200K CCT.

Maintenance and Repairs of Nonconforming Fixtures and LED retrofit of existing fixtures, shall comply with the 3000K or less CCT and Shielding requirements of this ordinance.

19.50.067 Prohibited.

B. Bottom-mounted outdoor advertising-sign lighting fixtures are prohibited.

COMMENT - Excellent statement.

19.50.068 Lighting Regulations.

c. On-site and Off-sight lighting shall be designed, controlled, and maintained so minimal light source is visible from outside the property...

COMMENT - This describes Light Trespass.

Light Trespass should be more prominent as in the Malibu OLO on Page 7

G. Allowable light trespass...residential property,...maximum allowable light trespass shall be 0.1 foot-candles

H. From any property onto a non-residential property... (open areas, natural areas) maximum allowable... 0.25 foot-candles

d. Any luminaire and all flood or spot luminaires shall not emit any direct light above a horizontal plane between the hours of 11:00 p.m. and sunrise.

COMMENT - Remove "between the hours of 11:00 p.m. and sunrise". This should be a strict requirement regardless of time of use.

B. Lamps Up To 800 Lumens.

COMMENT - "adjacent or nearby residential buildings," should be "adjacent or nearby residential property".

This is a statement that should also include reference to CCT, recommend the CCT shall not exceed 2700K.

D. Permanent Residential Lighting.

COMMENT - Because a point is made regarding Zoning the Title 24, IDA Model OLO and the City of Malibu OLO should be referenced.

The R1, R2, R3, R1A, R2A, or RE zones should be assigned LZ1 and restricted to a CCT of 2700K.

E. Commercial Lighting Regulations.

COMMENT - Because a point is made regarding Zoning the Title 24, IDA Model OLO and the City of Malibu OLO should be referenced.

The C1, C2, LM, MM, M, MRZ, or H zones should be assigned LZ1 or LZ2 and restricted to a CCT of 3000K or less.

F. Recreational Facilities.

COMMENT - Today LED sports lighting can direct light with pinpoint precision, with no off site light.

Today LED sports lighting can be neighbor friendly with 0.0 foot candle light trespass.
This item should also require a maximum allowable light trespass of 0.1 foot-candles or less.

Recently IDA Announces Criteria for Community-Friendly Outdoor Sports Lighting
<https://www.darksky.org/ida-announces-criteria-for-community-friendly-outdoor-sports-lighting/>

H. Temporary Outdoor Lighting.

COMMENT - Even temporary outdoor lighting shall have a CCT of 3000K or less.

19.50.069 Effective Date and Grandfathering of Nonconforming Luminaires:

COMMENT - The Ordinance should not allow a grandfather clause or be extremely restrictive and require 2700K/3000K compliance.

EXAMPLES AND REFERENTS - Time limitations for compliance

The City of Concord provides a good example in 17.41.100 Application of Ordinance to Legal Non-conforming Lighting, and is noted on the last page of the Malibu Outdoor Lighting Basics Handout.
REF-URL = <https://www.cityofconcord.org/DocumentCenter/View/178/Outdoor-Lighting-PDF> (Page 10)

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The City of Haley Idaho Outdoor Lighting Ordinance is another example,

"8B.2.2 Existing Lighting. All existing exterior lighting installed before the effective date of this Article shall be brought into conformance with this Article, except Section 8B.4.3, within the following time periods:"... "maximum of thirty (30) days"

REF-URL = https://www.haileycityhall.org/Codes_Plans/documents/Article8BOutdoorLighting-1068_002.pdf (Page 1)

Non-Conforming Outdoor Lighting should also include Correlated Color Temperature (CCT) requirement of less than 3000K CCT.

The Butte County Outdoor Lighting Ordinance is a further example,
"24-65 - Time limitations for compliance.

A.

Outdoor lighting existing at the time of the effective date of the Zoning Ordinance that does not meet the requirements of this article shall be brought into compliance or removed as follows:

1. Within three (3) months of the effective date of the Zoning Ordinance, where re-direction of the light fixture is feasible and will bring the light fixture into compliance; or
2. Within six (6) months of the effective date of the Zoning Ordinance, in all other cases."

In closing please consider contents of the following Outdoor Lighting Ordinances.

The IDA/IES Model Lighting Ordinance

<https://www.darksky.org/our-work/lighting/public-policy/mlo/>

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Regards

Jack Sales, California Chapter IDA, IESNA, SVAS, SAS, AAS



Krista Ruesel <kruesel@amadorgov.org>

Comments regarding proposed Amador County Dark Skies Protection Ordinance

3 messages

jesales@surewest.net <jesales@surewest.net>

Mon, Nov 4, 2019 at 10:52 PM

To: Krista Ruesel <kruesel@amadorgov.org>

TO: Krista Ruesel, Planner, & Amador County Planning Commission

Subject: Comments regarding proposed Amador County Dark Skies Protection Ordinance

From:

Jack Sales

[5978 Woodbriar Way](#)

[Citrus Heights, California 95621-1616](#)

INTRODUCTION --

While a member of the International Dark-Sky Association (IDA) and the Illuminating Engineering Society North America (IESNA) my comments are my own and are based on knowledge gained through over 20 years of association with the lighting industry.

Preserving and restoring the dark night skies of Amador County is a quality of life issue that is a win win for all.

I fully support enacting the Amador County Dark Skies Protection Ordinance.

It is fitting and long over due that Amador County adopt an Outdoor Lighting Ordinance as the first recognized Amateur Astronomical Observatory was located in Volcano. George Madeiros operated the observatory from 1860 to 1862. It is commemorated by California Historical Landmark No. 715 that plaque was first placed near Volcano in 1968. In 2004 it was revised and relocated in Volcano by the State Department of Parks and Recreation in cooperation with the Stockton Astronomical Society and the Sacramento Astronomical Society.

According to Anyplace America, there are 58 streams and 18 reservoirs in Amador County.

Artificial lighting at night (ALAN) alters aquatic-riparian invertebrate food webs and alters the pray predator relationship of fishes. By enacting this ordinance these important ecological resources will be protected from ALAN.

With over 30 years of advocating for Dark Skies, the International Dark-Sky Association (IDA) established a Fixture Seal of Approval Program. The program certifies outdoor lighting fixtures as being Dark Sky Friendly, meaning that they minimize glare while reducing light trespass, skyglow and requires and in 2014 requiring lighting that has a "correlated color temperature" (CCT) of 3,000K and lower. The program provides a convenient source for selecting fixtures complaint with the Amador County Dark Skies Protection Ordinance.

Concerns about blue light rich LED Lighting are well known, increased glare and compromise human vision, increased skyglow and Light Pollution and more. Previously these blue rich LEDs were considered more efficient, that is on longer the case in fact over all LEDs of 3000K and lower are now preferred. Currently under Title 24 CalGreen Program established Lighting Color Temperature Restrictions of 3000K CCT is the recommended lighting standards for all outdoor lighting in California.

While a CCT of 3000K is required by these programs technology advances have made it appropriate to now consider CCT of 2700K the appropriate standard. By way of reference 2600-2700K is considered the CCT of incandescent lamps we have had for over 100 year. As a minimum 2700K outdoor lighting should be used in residential areas and natural habitat..

GENERAL COMMENTS --

Additional Illustrations, Attachments and Handouts ---

Illustrations should be added to the Ordinance and can be found in many existing Outdoor Lighting Ordinances.

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Adaptive Lighting - Title 24 requires Adaptive Lighting however the requirement should extend to all applications as much as possible. Adaptive Lighting goes beyond simple motion sensitive OFF-ON but includes controlled dimming from 90% down to 10% when. Because of LEDs can be controlled, dimming of 50% until motion is detected can save significant energy and reduce light pollution as well.

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Recommended Changes and comments.

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COMMENT - Remove and include all Public Roadway Illumination be included in the ordinance.

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COMMENT - Recommend removal as not necessary.

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"24-65 - Time limitations for compliance.

A.

Outdoor lighting existing at the time of the effective date of the Zoning Ordinance that does not meet

the requirements of this article shall be brought into compliance or removed as follows:

1. Within three (3) months of the effective date of the Zoning Ordinance, where re-direction of the light fixture is feasible and will bring the light fixture into compliance; or
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Regards

Jack Sales, California Chapter IDA, IESNA, SVAS, SAS, AAS

Att: PDF

 **AmadorCo-OLO-Response.pdf**
38K

Krista Ruesel <kruesel@amadorgov.org>
To: Planning Department <planning@amadorgov.org>

Tue, Nov 5, 2019 at 8:49 AM

Krista Ruesel
Planner|Amador County Planning Department
(209)223-6803|kruesel@amadorgov.org
[Quoted text hidden]

 **AmadorCo-OLO-Response.pdf**

Krista Ruesel <kruesel@amadorgov.org>
To: Planning Department <planning@amadorgov.org>

Tue, Nov 5, 2019 at 8:59 AM

Hello,

Thank you Mr. Sales! I have forwarded your comments in this email as well as the past email to the planning department email and your correspondence will be included in the packet presented to the Planning Commission next Tuesday. In the meantime, the planning department is still in the progress of editing the draft ordinance and I expect further edits will be necessary after the meeting as well.

Thank you,

Krista Ruesel
Planner|Amador County Planning Department
(209)223-6803|kruesel@amadorgov.org

[Quoted text hidden]



Mr. Andy Byrne, Chairman
Amador County Planning Commission
810 Court St
Jackson, CA 95642

October 3, 2019

Re: Draft Dark Sky Ordinance Public Hearing Continuance Request

By e-mail transmittal to planning@amadorgov.org

Dear Chairman Byrne and Members of the Commission:

We are glad to see that the County has drafted a Dark Sky Ordinance and is ready to circulate it for public review and comment. As you know, this ordinance is of great interest to the Foothill Conservancy, as well as to many residents of Amador County. Drafting and considering the ordinance is part of the County of Amador-Foothill Conservancy general plan litigation settlement. The deadline for hearings and consideration of ordinance adoption is April 2020.

We feel that the county has not provided sufficient time for review of this important change to the zoning code. We learned about the availability of the ordinance through a legal notice buried in the *Ledger Dispatch* notices section, and subsequently requested a copy. The ordinance contains a great deal of technical language and deserves proper review. At this time, many of our members who are most interested in this topic are traveling, ill, or busy harvesting. We need additional time to confer with technical experts and to compare this draft ordinance with various model dark sky ordinances that exist, including the one available from the International Dark Sky Association.

We respectfully request that you continue the public hearing on this matter to the November commission meeting. That would give us and other members of the interested public adequate time to fully review the ordinance and ensure that it will in fact protect our county's beautiful dark night skies.

I hope you will grant this request. Thanks for your consideration.

Respectfully,

Mara Feeney

Mara Feeney
Director



Planning Department <planning@amadorgov.org>

Fwd: Draft Amador County Outdoor Lighting Ordinance

1 message

Krista Ruesel <kruesel@amadorgov.org>
To: Planning Department <planning@amadorgov.org>

Fri, Oct 25, 2019 at 11:12 AM

Received October 25, 2019

Krista Ruesel
Planner|Amador County Planning Department
(209)223-6803|kruesel@amadorgov.org

----- Forwarded message -----

From: <jesales@surewest.net>
Date: Fri, Oct 25, 2019 at 9:42 AM
Subject: Draft Amador County Outdoor Lighting Ordinance
To: Krista Ruesel <kruesel@amadorgov.org>
Cc: Mara Feeney <marafeeney@gmail.com>

Hi Krista

This is a follow up on our conversation about a week ago.

I have not had time to fully review and make notes however I want to get this information to you.

As the draft stands now I fully support it's enactment, however it needs to full address LEDs.
Additional provisions should not slow the process however.

So here are some notes and recommendations for your consideration.

Other Ordinances to consider ---

Please make extensive use of the recently enacted City of Malibu Outdoor Lighting Ordinance.

References below and attached.

Include the Malibu Ordinance in the supporting documents and most important model a web page after the Malibu Dark-Sky-Ordinance page.

Include the Outdoor-Lighting-Basics handout in the supporting documents and publish a similar handout.

More Ordinances to consider -

El Dorado County Outdoor Lighting Ordinance
San Benito County Development Lighting ("DarkSkies") Ordinance.
Butte County Outdoor Lighting Ordinance.
El Dorado County Outdoor Lighting Ordinance

Spectrum and CCT-

Spectrum of Light Sources noted in D. Dark Skies Ordinance, 6. Yellow spectrum light sources....

LED with 3000K or less spectrum in all cases.

Preference or requirement of 2700K for all lighting in residential areas.

Requirement for 3000K or less in all applications

CalGreen regarding CCT ---

In October 2018 the California Energy Commission convened a meeting to regarding CalGreen (24 CCR Part 11) and 3000K lighting standards for outdoor lighting in California.

Here are a few notes which support the requirements for 3000K or less in fact I, James Benya, Michael Siminovitch and others supported the statewide maximum of 3000K under CalGreen (24 CCR Part 11). In addition I, James Benya, Michael Siminovitch and others support and advocate 2700K as the max CCT for all outdoor lighting.

Docket 17-BSTD-03 CalGreen Lighting Color Temperature Restrictions
<https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=17-BSTD-03>

Comments by
James Benya regarding 3000K/2700K outdoor lighting --
James Benya Comments Letter including planned remarks to be made 10-3-18
<https://efiling.energy.ca.gov/GetDocument.aspx?tn=224851&DocumentContentId=55438>

Comments by
UC Davis California Lighting Technology Center/Michael Siminovitch --
UC Davis Calif. Lighting Technology Center Comments on 15-Day Express Terms 2019 CALGREEN Voluntary Provisions
<https://efiling.energy.ca.gov/GetDocument.aspx?tn=224886&DocumentContentId=55478>

Note that ALL outdoor lighting in California is governed under Title 24 with further restriction enacted by City and County Ordinances.

LED Retrofit ---
LED retrofit of all existing lighting shall comply with the 3000K or less CCT and Shielding requirements of this ordinance.

Examples-
<https://www.venturelighting.com/led-lighting/led-lamps/led-retrofit-lamps/3000k-retrofit/lp16735.html>
<https://www.inductionlightingfixtures.com/product-catalog/led-light-fixtures-bulbs-and-accessories/led-outdoor-light-fixtures-led-bulbs-and-accessories/led-fixtures-led-retrofit-lamp-kits-led-strip-kits-and-led-pcb-kits/led-outdoor-irkm-light-fixture-led-retrofit-kits-for-metal-hali-759.html>

Dimming and Motion Activation ---
A dimming requirement should be included in this ordinance. As a minimum reference to Title 24 dimming requirements should be referenced and included in the staff report.
Requirement for shielding of motion activated lighting should also note include a requirement of NO light trespass.

Municipal Lighting
Public outdoor lighting, including street lighting should be included in this ordinance.
The County should comply with its own ordinance.

Some Additional Web Page Links ---

City of Malibu Dark Sky Ordinance
<https://www.malibucity.org/705/Dark-Sky-Ordinance>
<https://www.malibucity.org/DocumentCenter/View/22947/Outdoor-Lighting-Basics>
<https://www.malibucity.org/DocumentCenter/View/22417/Dark-Sky-Ordinance-Ordinance-No-434>
<https://www.malibucity.org/DocumentCenter/View/25085/Dark-Skies-Gas-Station---Submittal-Packet>
<https://www.malibucity.org/DocumentCenter/View/14301>
<https://www.malibucity.org/DocumentCenter/View/14303>
<https://www.malibucity.org/DocumentCenter/View/14304>

[Dark-Skies-Gas-Station-Submittal-Packet_201910151222275801.pdf](#)

Butte County Outdoor Lighting Ordinance
<https://www.buttecounty.net/Portals/10/CodeEnforcement/Lighting/Outdoor Lighting 12-29-15.pdf>
El Dorado County Outdoor Lighting Ordinance
https://www.edcgov.us/government/planning/pcagendas/2006/documents/pcagn102606_LightingOrdinanceAttachments.pdf

International Dark Sky Associations (IDA) Links of Note
Home Page, <http://darksky.org/>
Lighting for Policy Makers, <https://www.darksky.org/our-work/lighting/public-policy/policy-makers/>
Lighting Ordinance, <https://www.darksky.org/our-work/lighting/public-policy/lighting-ordinances/>

10/25/2019

County of Amador Mail - Fwd: Draft Amador County Outdoor Lighting Ordinance

IDA Blog on LEDs, <https://www.darksky.org/category/leds/>

Blue Rich LEDs, https://www.darksky.org/wp-content/uploads/bsk-pdf-manager/8_IDA-BLUE-RICH-LIGHT-WHITE-PAPER.PDF

Model Lighting Ordinance , https://www.darksky.org/wp-content/uploads/bsk-pdf-manager/16_MLO_FINAL_JUNE2011.PDF

Fixture Seal of Approval, <https://www.darksky.org/our-work/lighting/lighting-for-industry/fsa/>

FSA Products, <https://www.darksky.org/our-work/lighting/lighting-for-industry/fsa/fsa-products/>

Regards

Jack Sales

5978 Woodbriar Way

Citrus Heights, California 95621-1616

Home Phone: 916-726-7405

Mobile phone: 916-747-7405

eMail: jesales@surewest.net

jesalesgm@gmail.com



Support outdoor lighting ordinance

Diane Christensen <dkmchristensen@gmail.com>
To: planning@amadorgov.org

Tue, Feb 11, 2020 at 11:50 AM

Dear Members of the Amador County Planning Commission:

As a resident of the county's unincorporated area for over 35 years, I would strongly urge the members of the Planning Commission to keep the latest outdoor lighting ordinance on track. I'm referring, of course, to the draft of an outdoor lighting ordinance developed by the Foothill Conservancy with assistance provided by the International Dark-Sky Association, Amador Astronomical Society, and members of the public along with the support of the Tri-County Wildlife Care.

Many years ago my family and I moved from Los Angeles County to Amador County; we chose this beautiful place for many reasons-small town neighborliness, extraordinary outdoor rural beauty, amazing Native American and Old West history, great small schools for our children, and multiple opportunities for volunteering in many organizations for the betterment of our community.

I
What really stunned us, though, when we moved to Amador County, was the magnificent night sky. Except for special trips to the Griffiths Park Observatory when we were children growing up in LA, my husband and I and then later our own children never really saw the extraordinary night sky of stars, planets, Milky Way Galaxy, satellites, and meteor showers until we moved to where we live today in Amador County.

Please keep this outdoor lighting ordinance on track so that we and our children and our children's children can continue to live in a place that values the extraordinary beauty all around and above us.

Sincerely,

Diane Christensen



I support the outdoor lighting ordinance

1 message

dtrranch@volcano.net <dtrranch@volcano.net>
Reply-To: William Easton <dtrranch@volcano.net>
To: planning@amadorgov.org

Mon, Feb 10, 2020 at 3:48 PM

Dear Amador County Planning Department:

I support the outdoor lighting ordinance. Actually, I don't think it goes far enough, as I think it should cover all municipal jurisdictions in the complete County and not just the county's unincorporated areas. One of the things that makes living in Amador County special is its natural, rural atmosphere. Light pollution destroys that experience in the evening hours and obscures the night sky unnecessarily. As our population grows it will only get worse. There are plenty of night-sky lighting options available now for individuals to safely light their property. This is also a great energy-saving ordinance!

I would like to see some additional compliance written into this ordinance that also includes up grades to homes when they change ownership and a 5-year deadline for all commercial and industrial facilities to come into complete compliance.

Sincerely -

Bill Easton
dtrranch@volcano.net
209-245-3117



Support outdoor lighting ordinance - Public Comment in Support of the Ordinance

William Gore <billg10@aol.com>
To: planning@amadorgov.org
Cc: lsgvolcano@aol.com

Tue, Feb 11, 2020 at 5:45 AM

Dear Planning Commission

Thank you for your work on the Dark Sky Ordinance! We live in the country off of Shake Ridge above Daffodil Hill. We really appreciate that our neighbors limit themselves to low light used where needed. We do the same. But one one neighbor could change he whole neighborhood with high watt lights that light up their yard and the sky. This ordinance is a thoughtful approach to solve that problem. We support the passage of the ordinance.

Thank you
Bill Gore
Lucy Spangler-Gore
22255 Allan Rd
Volcano



Support for outdoor lighting ordinance

bchogan@volcano.net <bchogan@volcano.net>
Reply-To: bchogan@volcano.net
To: pcrew@amadorgov.org, planning@amadorgov.org

Tue, Feb 11, 2020 at 3:30 PM

Hello Supervisor Crew and planning commission,

I just realized that the BOS meeting was this morning, so this comment might be too late.

I wanted to reiterate my support for an outdoor lighting ordinance. I wish it were even stronger, but at least it is a start. I know many folks who come to Amador County specifically because they can still see the stars. If we don't implement a good outdoor lighting ordinance, we won't have that draw for very long.

Not to mention that light pollution has been scientifically linked to many problems we are facing, from human health effects to the loss of insect pollinators to stress on trees.

Please vote in favor the the proposed ordinance (or for something stronger!) If you need additional information about the effects of light pollution, please see links below.

Thank you,
Bronwyn Hogan
Jackson resident

<https://www.nationalgeographic.com/science/2019/04/nights-are-getting-brighter-earth-paying-the-price-light-pollution-dark-skies/>

Light pollution effects on insect pollinators
<https://www.sciencedaily.com/releases/2017/08/170802153907.htm>

<https://www.sciencedirect.com/science/article/pii/S030147971100226X>

Note, the following is from 2009, so we've known about this for a while!
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2627884/>



Support outdoor lighting ordinance

Craig Lafargue <craiglafargue@gmail.com>
To: planning@amadorgov.org

Tue, Feb 11, 2020 at 3:21 PM

I support the outdoor lighting ordinance. There is nothing more beautiful than the Milky Way on a dark clear night - which is one of the reasons I moved up here.

Thank you for your consideration

Craig LaFargue



Support outdoor lighting ordinance

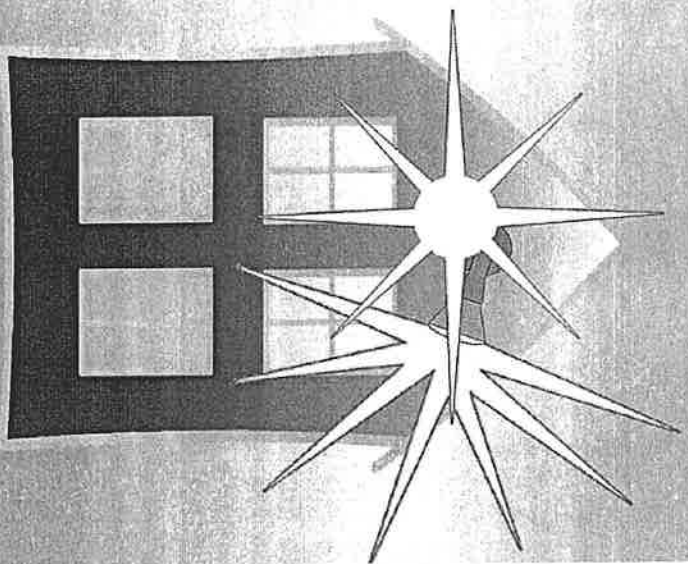
Amanda Paule Parker <oldnrare@att.net>
To: planning@amadorgov.org

Tue, Feb 11, 2020 at 8:42 AM

Please adopt the outdoor lighting ordinance
Thanks
A Parker
Drytown, CA.

Amanda Parker Sent from my iPad

Unshielded lights
produce glare,
light trespass,
and uplight



Stop glare, waste, and trespass

*Be good neighbors
shield your lights!*

Parshield is a registered trademark. Patent #6,497,501

Parshield® Glare Visor

The dark sky friendly
shield for PAR bulbs.



The patented Parshield® glare visor

- Prevents glare and improves visibility.
- Redirects lights that would be wasted to useful directions.
- Reduces light trespass so your lights don't annoy neighbors.
- Reduces sky glow by preventing uplight.

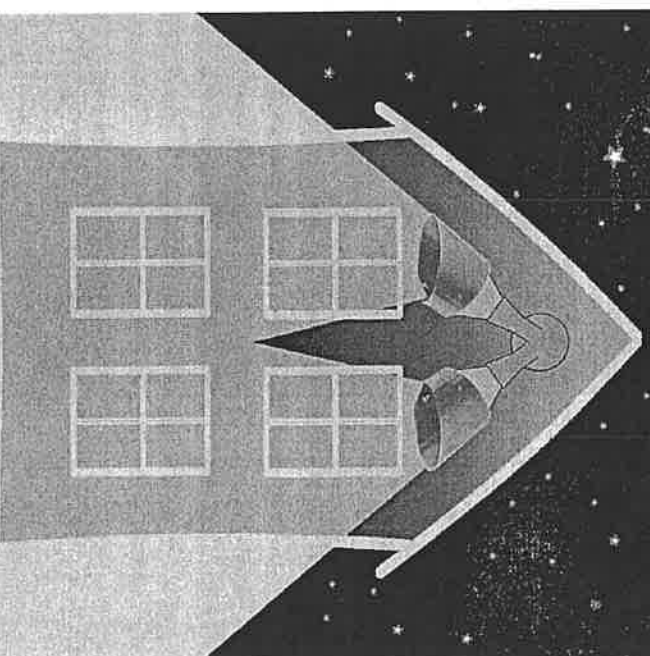
The Parshield glare visor snaps securely onto standard outdoor floodlights and spotlights (PAR-38 style).

Reusable, powder coated, all metal construction. Available in bronze or white. Includes instructions and light pollution information. Bulb and fixture not included.

For more information:
www.parshield.com
info@parshield.com

Copyright © 2007 Parshield

Shielded lights
prevent glare,
stop trespass,
and light the ground



Lighting done right

*Be good neighbors
shield your lights!*

Brochure design by Sisypianther Studios, sisypianther.com

A dark-themed banner for Parshield. On the left, a circular icon with a diagonal slash through it is superimposed over a light-colored area. In the center, the text 'The dark sky friendly shield for PAR bulbs' is displayed. To the right, a close-up image of a floodlight with a Parshield shield attached is shown against a starry night sky background. The Parshield logo is at the top left, and the text 'OUTDOOR FLOODLIGHT SHIELD' is at the top right.

Parshield® **OUTDOOR FLOODLIGHT SHIELD**

Glare
Trespass
Sky glow

The dark sky friendly
shield for PAR bulbs

*Be good neighbors, use
Parshield® glare visors!*

Controls glare
Reduces light trespass
Directs light where you

Parshield®

Parshield® — the patented clip-on visor for outdoor PAR-38 floodlight and spotlight bulbs. The Parshield turns an ordinary flood light into neighbor-friendly shielded lighting. With our light shields and proper aiming, you eliminate light trespass and preserve the dark sky.

[Buy! \(shop.php\)](#)

Up to 45% of light pollution is caused by residential lighting. Be a good neighbor, shield your light!

Raves!

Don't take our word for it. Our customers love Parshield® light shields.

[Testimonials \(raves.php\)](#)

Guides

Background info, mounting and aiming guides, efficiency information, and more.

Good Neighbor

OUTDOOR LIGHTING

PRESENTED BY THE NEW ENGLAND LIGHT POLLUTION ADVISORY GROUP (NELPAG) AND SKY PUBLISHING CORP.

What is good lighting?

Good outdoor lights improve visibility, safety, and a sense of security, while minimizing energy use, operating costs, and ugly, dazzling glare.

Why should we be concerned?

Many outdoor lights are poorly designed or improperly aimed. Such lights are costly, wasteful, and distractingly glary. They harm the nighttime environment and neighbors' property values.

Glare Here's the basic rule of thumb: If you can see the bright bulb from a distance, it's a bad light. With a good light, you see lit ground instead of the dazzling bulb. "Glare" is light that beams directly from a bulb into your eye. It hampers the vision of pedestrians, cyclists, and drivers.

Light Trespass Poor outdoor lighting shines onto neighbors' properties and into bedroom windows, reducing privacy, hindering sleep, and giving the area an unattractive, trashy look.

Energy Waste Many outdoor lights waste energy by spilling much of their light where it is not needed, such as up into the sky. This waste results in high operating costs. We waste over a billion dollars a year in the United States needlessly lighting the night sky.

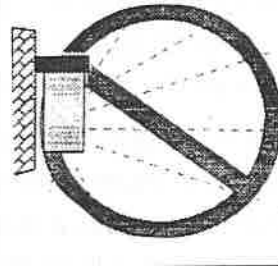
Sky Glow Rays that beam uselessly above the horizon create murky skyglow – the "light pollution" that washes out our view of the stars.

How do I switch to good lighting?

- 1 Provide only enough light for the task at hand; don't over-light, and don't spill light off your property. Specifying enough light for a job is sometimes hard to do on paper. Remember that a full Moon can make an area quite bright. Some lighting systems illuminate areas 100 times more brightly than the

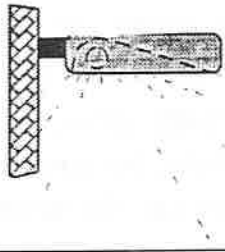
Some Good and Bad Light Fixtures

Typical "Wall Pack"



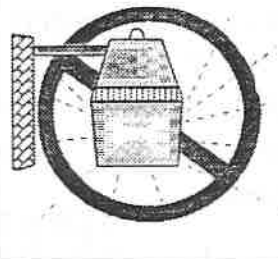
BAD

Typical "Shoe Box" (forward throw)



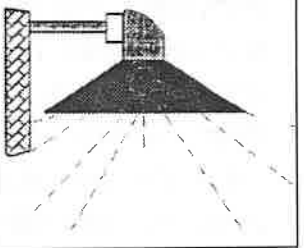
GOOD

Typical "Yard Light"



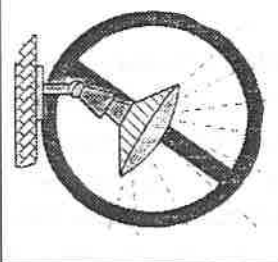
BAD

Opaque Reflector (lamp inside)



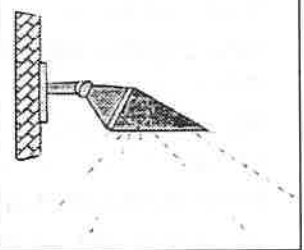
GOOD

Area Flood Light



BAD

Area Flood Light with Hood



GOOD

full Moon! More importantly, by choosing properly shielded lights, you can meet your needs without bothering neighbors or polluting the sky.

- 2 Aim lights down. Choose "full-cutoff shielded" fixtures that keep light from going uselessly up or sideways. Such fixtures produce minimum glare. They create a pleasant-looking environment. They increase safety because you see illuminated people, cars, and terrain, not dazzling bulbs.
- 3 Install fixtures carefully to maximize their effectiveness on the targeted area and minimize their impact elsewhere. Proper aiming of fixtures is crucial. Most are aimed too high. Try to install them at night, when you can see where all the rays actually go.

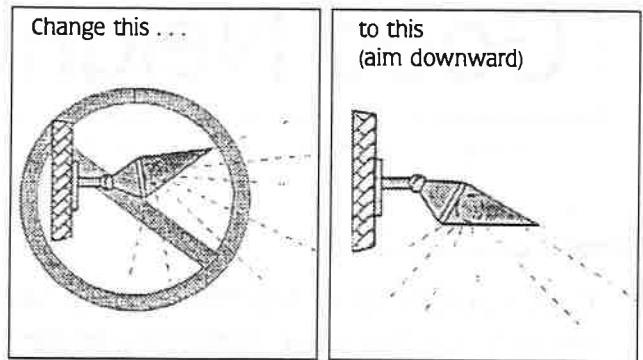
Properly aimed and shielded lights may cost more initially, but they save you far more in the long run. They can illuminate your target with a low-wattage bulb just as brightly as a wasteful light does with a high-wattage bulb.

- 4 Choose energy-efficient low-pressure sodium (LPS) or high-pressure sodium (HPS) lamps wherever yellowish light will do the job. Use less efficient white lights only where ideal color rendition is important.
- 5 Where feasible, put lights on timers to turn them off each night after they are no longer needed. Put home security lights on a motion-detector switch, which turns them on only when someone enters the area; this provides a great deterrent effect!

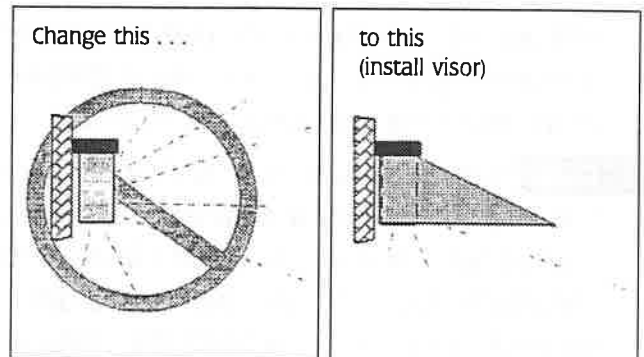
Replace bad lights with good lights.

You'll save energy and money. You'll be a good neighbor. And you'll help preserve our view of the stars.

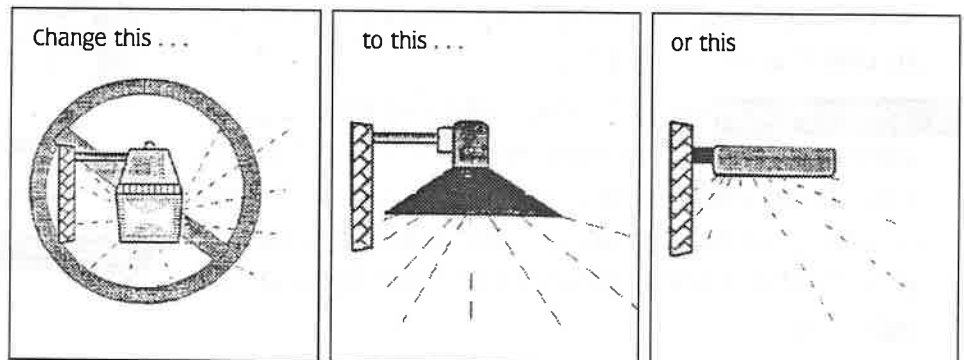
What You Can Do To Modify Existing Fixtures



FLOOD LIGHT



WALL PACK



YARD LIGHT

OPAQUE REFLECTOR

SHOE BOX

Presented by the

New England Light Pollution Advisory Group (NELPAG) (<http://cfa-www.harvard.edu/cfa/ps/nelpag.html>) and **Sky Publishing Corp.** (<http://www.skypub.com/>).

NELPAG and Sky Publishing Corp. support the **International Dark-Sky Association (IDA)** (<http://www.darksky.org/>).

We urge all individuals and groups interested in the problems of light pollution and obtrusive lighting to support the IDA and subscribe to its newsletter. IDA membership costs \$30 per year; send your check to IDA, 3225 N. First Avenue, Tucson, AZ 85719, U.S.A.

SKY
& TELESCOPE®

Sky Publishing Corp.
49 Bay State Road
Cambridge, MA 02138
www.skypub.com

Replacing a Perfectly Good *Bad Light*

If a neighbor shined a flashlight into your bedroom windows, you would probably consider this rude or invasive. Yet, many of us have outdoor lighting that has the same effect. Our outdoor lights lack the deliberate appearance of spying, but they are on all night, shining into neighbors' bedrooms and yards, interfering with enjoyment of the night sky, and contributing to the skyglow that washes out the stars.

The problem is NOT outdoor lighting. Rather, the problem is unaimed lights that miss the target. This problem mostly occurs when we use a decorative light where we want a safety and security light.

My home came equipped with five outdoor lights of poor design. In these lights, a third of the light shines upward, where it provides no safety or security benefit, but contributes to skyglow. Another third shines beyond my property into the yards and bedrooms of my neighbors. This creates glare, disturbs sleep, and interferes with viewing the night sky, a passing comet, or faint fuzzy galaxy.

For \$18 dollars, I replaced the original light with a decorative, hooded light, that does not shine into my neighbors' windows. All the light from this fixture falls onto my yard. Being in the backyard is more pleasant with this type of light because the light doesn't shine into my eyes. I also learned that two of the original lights I replaced had not been grounded properly, and one hadn't been mechanically secured to the wall. It was held on by its wiring. Finding these errors from the builder or former owner alone was worth the effort of replacing the lights.



A common house light with no shielding



A decorative lamp with shielding that preserves the beauty of the night

A few unshielded house lights may not seem like much, but considering our region's growth, this type of light will add up.



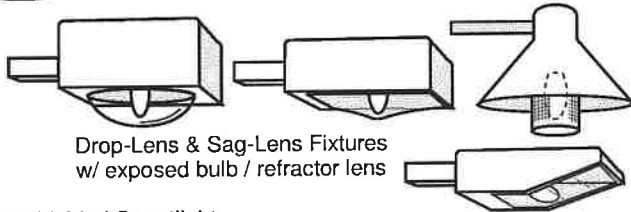
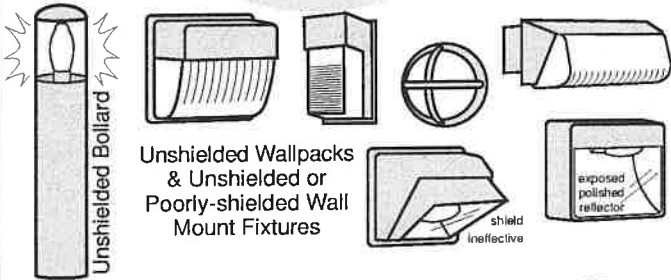
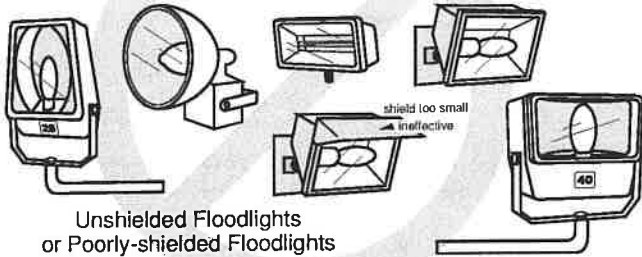
Another disadvantage of an unshielded house light is shown here. If you drove by this house and saw its lights on during the day over a holiday weekend, what might you think?
No one is home!

BETTER LIGHTS FOR BETTER NIGHTS

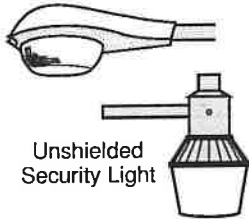
Help eliminate light pollution. Select the best fixture for your application using this guide. Use the lowest wattage bulb appropriate for the task and turn off the light when it's not being used.

Unacceptable / Discouraged

Fixtures that produce glare and light trespass

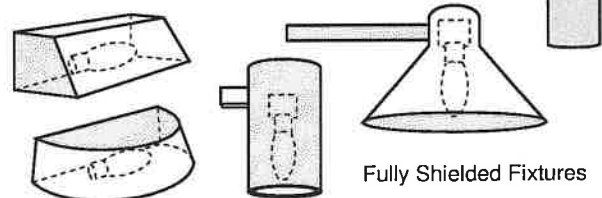
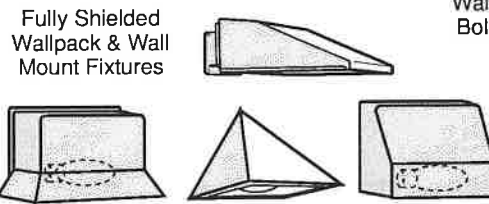
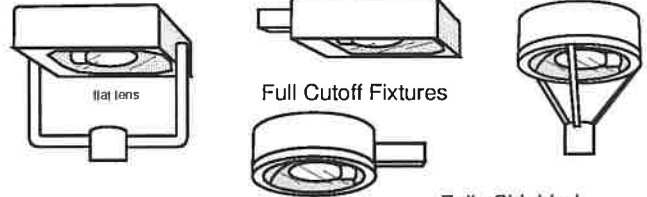


Unshielded Streetlight



Acceptable

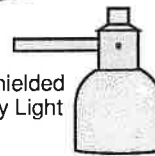
Fixtures that shield the light source to minimize glare and light trespass and to facilitate better vision at night



Full Cutoff Streetlight



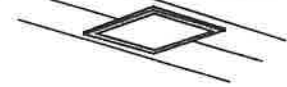
Fully Shielded Security Light



Fully Shielded 'Period' Style Fixtures
bulb shielded in opaque top



Flush Mounted Canopy Fixtures



BC 9/03

presented by the

DARK SKY SOCIETY

www.darkskysociety.org

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