

**STAFF REPORT TO THE PLANNING COMMISSION
FOR THE
WORK SESSION ON JUNE 2, 2014**

PROPOSED DARK SKIES LIGHTING REQUIREMENTS

CASE FILE: PC-2013-3056

SECTION I. INTRODUCTION

In October 2013, the ‘Dark Skies’ regulatory concept was introduced to the Planning Commission who provided direction to staff regarding crafting an outdoor lighting ordinance. Outdoor lighting ordinances are commonly referred to as Dark Skies ordinances in reference to the primary goal to reduce glow in the night skies. Dark skies are one of the many qualities that set rural areas apart from urban and suburban communities. Existing County land use codes only require Dark Skies type lighting standards in specific geographical areas. The proposed code language offers a more holistic approach by applying the Dark Skies requirements to all general zoning districts in unincorporated Multnomah County.

SECTION II. DARK SKIES ORDINANCE - WHY DO IT?

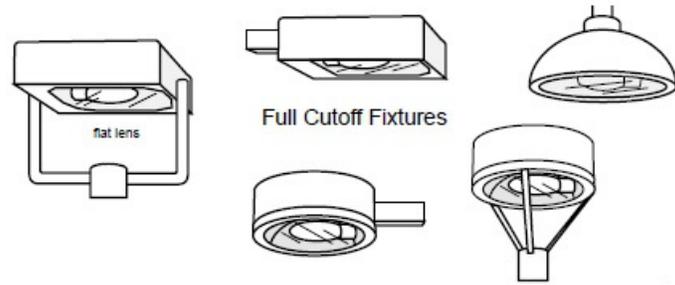
Preservation of the Night Skies

Growth and light pollution from excessive outdoor lighting is diminishing the view of the stars in and around urban areas, as well as within smaller towns and rural areas. While excessive light may cause a nuisance to others, it also wastes electricity, results in unnecessary emissions of greenhouse gases, and can have negative effects on humans and wildlife.

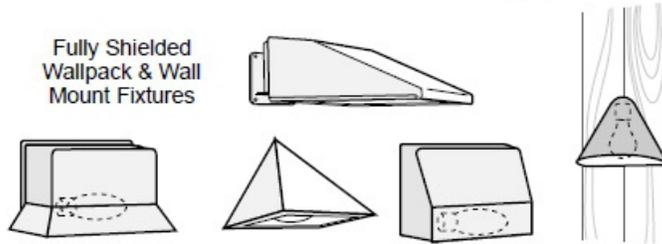
The Dark Skies concept promotes the thoughtful approach to outdoor lighting design. Research has shown links between light pollution and negative impacts on human health, adverse behavioral changes in insect and animal populations, and a decrease of both quality of ambient lighting and safety in the nighttime environment.

Better Lighting Means Better Neighbors

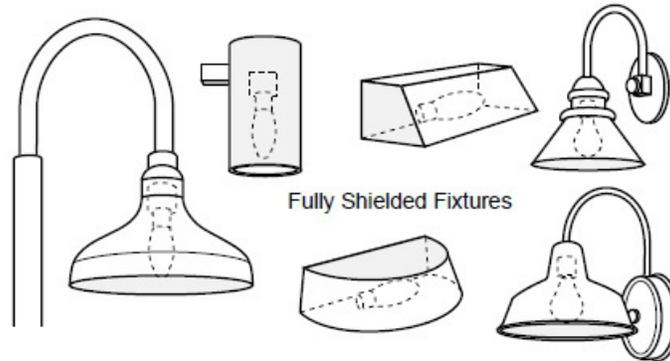
Outdoor lighting, when appropriately directed can improve visibility and safety while minimizing energy use, operating costs, and glare. Improperly aimed lights can shine onto nearby properties creating conflict with neighbors, drivers, and pedestrians. A general rule of thumb is if the bulb is visible from a distance, it's contributing to glare and sky glow. With Dark Sky friendly lighting, only the intended area is illuminated.



Full Cutoff Fixtures



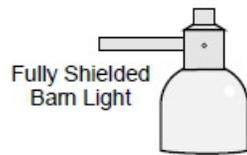
Fully Shielded
Wallpack & Wall
Mount Fixtures



Fully Shielded Fixtures



Full Cutoff Streetlight



Fully Shielded
Barn Light



Fully Shielded
Walkway
Bollards



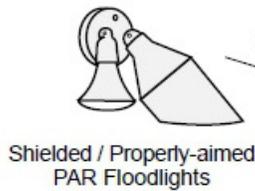
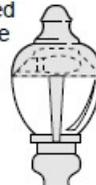
Fully Shielded
Decorative
Fixtures

bulb shielded
in opaque top

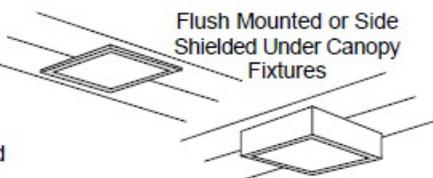


Fully Shielded
'Period' Style
Fixtures

bulb shielded
in opaque top



Shielded / Properly-aimed
PAR Floodlights



Flush Mounted or Side
Shielded Under Canopy
Fixtures

Designed / illustrated by Bob Crelin ©2/05

Impacts on Human Health

Excessive light at night negatively impacts many areas of human health. Bright points of light from poorly designed lighting produces a condition known as “disability glare”. Disability glare is so intense it causes us to avert our eyes from the veil of light being scattered across our retinas.

The 24 –hour day/night cycle, known as the circadian clock, affects physiologic processes in almost all organisms. Studies show disruption of these rhythms can result in insomnia, depression and cardiovascular disease. In June 2009 the American Medical Association adopted resolutions that support reducing light pollution and glare and advocate for use of fully shielded outdoor lighting.

Impacts on Wildlife

Studies suggest that artificial night lighting has negative effects on a wide range of wildlife, including amphibians, birds, mammals, insects and even plants. Light pollution disorients migratory birds, disrupts mating behavior of frogs and interferes with predatory/prey relationships. Since the eyes of nocturnal animals have evolved for foraging in low-light conditions, small changes in illumination can alter their relationship with prey species. Light fixation is also a bird hazard that kills thousands of birds in urban areas every year.

Safety

Brighter light does not necessarily mean safety. Bright, glaring lights that illuminate nighttime events or locations can actually decrease the security of the sites. Excessively bright lighting can create a sharp contrast between light and darkness, making the area outside the light nearly impossible to see. Most property crime is still committed during the day, or inside lit buildings. A safe environment involves shielding lighting for roadways, parking lots, homes, businesses and landscapes, increasing visibility and decreasing distractions, such as glare.

Economic Case for a Lighting Ordinance

According to the International Dark Sky Association, inappropriate outdoor lighting results in wasted energy amounting to over one billion dollars a year. When lighting is used only where needed, money that would otherwise be spent on the electric bill can instead be spent on other things, which is good for property owners and good for the economy.

SECTION III. DRAFT DARK SKIES CODE LANGUAGE

Planning staff has crafted preliminary code language which reflects the direction of the Commission in October. Planning staff heard that the lighting ordinance should:

- Apply to all unincorporated Multnomah County;
- Seek to bring existing lighting fixtures into compliance with the ordinance over time;
- Not cover specific lighting technology as it is changing too rapidly; and
- Allow for a cost-effective solution to modify existing fixtures or shield bulbs.

The draft language contains four parts:

SECTION III, PART A - REFERENCE WITHIN ZONING DISTRICTS TO NEW DARK SKIES CODE SECTION

SECTION III, PART B - DARK SKIES PURPOSE STATEMENT

SECTION III, PART C - DARK SKIES LIGHTING STANDARDS

SECTION III, PART D - PROPOSED EXEMPTIONS TO DARK SKIES LIGHTING STANDARDS

Staff envisions that lighting review associated with a development proposal would utilize the basic non-discretionary process for building plan review. For example, an applicant owner would mark on the site plan the location of all existing and proposed outdoor lighting. This would be required information just like property lines, building and driveway locations, etc. and would be listed on the County's building permit checklist. Photographs or lighting details may also be required for both existing and proposed light fixtures, depending on the proposal details.

SECTION III, PART A - REFERENCE WITHIN ZONING DISTRICTS TO NEW DARK SKIES CODE SECTION

The proposed Dark Skies concept begins by adding a simple code language trigger to each of the general zoning districts which reference a separate code section with the title "Dark Skies Lighting Standards". Although County Code Chapter 33 (West Hills) is used as an example below to illustrate the location and structure of the proposed changes, the changes will also be applied to other plan areas regulated by County Code Chapters 34, 35, 36 and 11. Code amendments will likely also be made to Chapter 38 (Columbia River Gorge National Scenic Area), if necessary, for consistency with other portions of the county.

Please note the following formatting styles used for the proposed code language:

Bold = Existing Code Language

Double Underline = Proposed new language

~~Strikethrough~~ – Language proposed for removal

1. General District Revisions

For the Exclusive Farm Use (EFU), Multiple Use Agriculture – 20 (MUA-20), Rural Residential (RR), Rural Center districts (BRC, OR, OCI, PH-RC, RC, SRC), and various urban zoning designations, the existing code sections dealing with the dimensional requirements (setbacks, minimum front lot line length, building height) will be renamed to **Dimensional Requirements and Development Standards**. This rename will make Chapters 11.15, 33, 34 and 35 consistent with Chapter 36 in style. The following shows an example of the change to Chapter 33's EFU district:

Change the section header **MCC 33.2660 Dimensional Requirements** to **MCC 33.2660 Dimensional Requirements and Development Standards**

The following code language would then be added at the end of the section as a trigger requiring compliance with the new Dark Skies standards in MCC 33.0560.

(G) All exterior lighting shall comply with MCC 33.0560.

For the Commercial Forest Use (CFU-1, CFU-2, CFU-3, CFU-4, CFU-5, CFU) zones, the above trigger language would be added to the end of the existing code section titled **Development Standards for Dwellings and Structures** as follows:

§ 33.2261 DEVELOPMENT STANDARDS FOR DWELLINGS AND STRUCTURES

All dwellings and structures shall comply with the approval criteria in (B) through (E) below except as provided in (A):

(A) For the uses listed in this subsection, the applicable development standards are limited as follows:

(1) Expansion of existing dwelling.

(a) Expansion of 400 square feet or less additional ground coverage to an existing dwelling: ~~Not subject to development standards of MCC 33.2261~~ Shall meet the development standards of MCC 33.2261(E);

(b) Expansion of more than 400 square feet additional ground coverage to an existing dwelling: Shall meet the development standards of MCC 33.2261(C) & (E);

(2) Replacement or restoration of a dwelling.

(a) Replacement or restoration of a dwelling that is within the same foot-print of the original dwelling and includes less than 400 square feet of additional ground coverage: ~~Not subject to development standards of MCC 33.2261~~ Shall meet the development standards of MCC 33.2261(E);

(b) Replacement or restoration of a dwelling that is within the same foot-print of the original dwelling with more than 400 square feet of additional ground coverage: Shall meet the development standards of MCC 33.2261(C) & (E);

(c) Replacement or restoration of a dwelling that is not located within the footprint of the original dwelling but it is located where at least a portion of the replacement dwelling is within 100 feet of the original dwelling: Shall meet the development standards of MCC 33.2261(C) & (E) and the applicable driveway/road requirements of 33.2261(E); [This is a housekeeping correction.]

(3) Accessory buildings.

(a) Accessory buildings within 100 feet of the existing dwelling: Shall meet the development standards of MCC 33.2261(C) & (E);

(b) Accessory buildings located farther than 100 feet from the existing dwelling: Shall meet the development standards of MCC 33.2261(B), & (C) & (E);

(4) Temporary dwellings.

(a) A temporary health hardship mobile home located within 100 feet of the existing dwelling: ~~Not subject to development standards of MCC 33.2261~~ Shall meet the development standards of MCC 33.2261(E);

(b) A temporary health hardship mobile home located farther than 100 feet from the existing dwelling: Shall meet the development standards of MCC 33.2261(B), &(C) & (E);

(c) A temporary mobile home used during construction or reconstruction of a dwelling located within 100 feet of the dwelling under construction: ~~Not subject to development standards of MCC 33.2261~~ Shall meet the development standards of MCC 33.2261(E);

(d) A temporary mobile home used during construction or reconstruction of a dwelling located farther than 100 feet of the dwelling under construction: Shall meet the development standards of MCC 33.2261(B), &(C) & (E);

* * *

(E) All exterior lighting shall comply with MCC 33.0560.

SECTION III, PART B - DARK SKIES PURPOSE STATEMENT

The purpose statement provides the reasons for the ordinance and what the ordinance seeks to prevent or correct. Planning staff have crafted the following draft purpose statement:

MCC 33.0560 Dark Skies Lighting Standards

(A) The purpose of the Dark Skies Lighting Standards is to protect and promote the public health, safety and welfare by permitting reasonable uses of exterior lighting for nighttime safety, utility, security, and enjoyment while minimizing light pollution and the adverse impacts of exterior lighting on wildlife habitat and human health.

SECTION III, PART C - DARK SKIES LIGHTING STANDARDS

The proposed Dark Skies standards in MCC 33.0560(C) below establish the non-discretionary rule that all new and replacement exterior lighting must be dark skies compliant. The intent of establishing non-discretionary Dark Skies standards is to provide for 'over the counter' implementation.

State law preempts the county from adopting retroactive ordinances which impose new standards upon uses that exist on the date that new regulations are adopted. For example, the county does not have the authority to require ALL existing exterior lighting in Multnomah County to come into compliance within a certain timeframe. However, the county does have the authority to require Dark Skies compliance for all proposed and existing lighting associated with a proposed development application. Additionally, the county has the authority to require the Dark Skies lighting standards to be met anytime an existing non-Dark Skies compliant lighting fixture is replaced whether replacement is associated with a development proposal or not.

It should be noted that subsection (B)(1) exempts exterior lighting legally existing prior to the adoption of this ordinance that will in no way support a proposed new use or alteration or expansion of an existing use until such time that lighting is replaced.

MCC 33.0560 Dark Skies Lighting Standards

* * *

(C) All new and replacement exterior lighting shall be shielded such that:

(1) The light source (bulb, lamp, etc.) is fully shielded and directed downwards;

(2) The area of direct illumination is contained on the site; and

(3) No light creates a hazard to the traveling public on any road, such as night-blindness or glare on the roadway.

SECTION III, PART D - PROPOSED EXEMPTIONS TO DARK SKIES LIGHTING STANDARDS

As with any requirements, exemptions are needed for certain circumstances, but should not be so broad as to pre-empt the ultimate purpose of the ordinance. The exemptions proposed are chiefly for existing lighting having no relationship to a proposal and for temporary lighting in various circumstances. These include temporary lighting for agricultural and forest practices, construction sites, decorative seasonal lighting, etc. Traffic control devices that are consistent with the Manual on Uniform Traffic Control Devices would also be exempt for safety purposes. Planning staff is not proposing an exemption for security lighting for utilities as a hooded fixture would still allow illumination of the grounds where needed and prevent sky glow. Information provided by the International Dark Sky Association (Attachment A) suggests Dark Skies lighting can be safe when considering security needs.

In many of the model ordinances or adopted ordinances reviewed, permanent lighting installed by government agencies and utility facilities are exempt. It could be argued that this sets a poor example for the citizens in a jurisdiction and does not seem necessary. Planning staff found various commercial light fixtures and security lighting that would provide proper lighting of an area and not contribute to sky glow.

MCC 33.0560 Dark Skies Lighting Standards.

* * *

(B) The following are exempt from the requirements of paragraph (C) of this section:

- (1) Exterior lighting legally existing prior to the adoption of this ordinance that will in no way support a proposed new use or alteration or expansion of an existing use. This exemption does not apply to replacement exterior lighting.
- (2) Decorative seasonal lighting and which shines for not more than 60 days.
- (3) Temporary lighting associated with discrete farming practices as defined in ORS 30.930 and agricultural use as defined in OAR 603-095-0010, *except* that permanent lighting on buildings, structures or poles associated with farm practices and agricultural practices is subject to the requirements of this Section.
- (4) Temporary Lighting associated with discrete forest practices as defined by ORS 527 (The State Forest Practices Act), *except* that permanent lighting on buildings, structures or poles associated with forest practices is subject to the requirements of this Section.
- (5) Work necessary to protect, repair, maintain, or replace existing structures, utility facilities, service connections, roadways, driveways, accessory uses and exterior improvements in response to emergencies pursuant to the provisions of MCC 33.0535 Responses to an Emergency Disaster Event, provided that after the emergency has passed, all lighting to remain are subject to the requirements of this Section.
- (6) The placing or use by a public agency of temporary lighting to serve the public.
- (7) Temporary lighting for theatrical, television, performance areas and construction sites.
- (8) Lighting required by the Federal Aviation Administration or other applicable *aviation-related* federal or state agency.

(9) Emergency warning systems. Examples include temporary lighting associated with emergency response alarm systems including but not limited to fire alarms.

(10) Night-time illumination of the flags of the United States of America and the State of Oregon.

(11) Illuminated signs authorized through the provisions of Multnomah County Sign Code (MCC 33.7400 *et. seq.*) provided the sign is internally illuminated or the lighting is in compliance with (C) below.

(12) Search and rescue / recovery operations.

(13) Traffic control devices that are consistent with the Manual on Uniform Traffic Control Devices.

SECTION IV. ATTACHMENT

Attachment A: A-8 Security Lighting Info IDA #24

Security Lighting: Let's Have Real Security, Not Just Bad Lighting

One of the main goals for nighttime lighting is to have good safety and security at night, both at home and away from home, for ourselves, our families, our homes and property. However, the task is to **be** safe, not just to **feel** safe. This means that we need effective and efficient lighting. Good visibility is the goal. We want to be able to see well, rather than just lighting the criminal's way. This goal exists for us at home, on the streets, in parking lots, at work, wherever. Good lighting can be a help; poor lighting always compromises safety.

While most crime occurs during the day or inside buildings, we nonetheless want the feeling and the reality of being safe outside at night. That does not mean putting in the brightest light we can find, blinding everyone in the area, creating light trespass, and lighting up the night sky. What we need is effective lighting, lighting that puts light where we need it (and nowhere else) and where it will help visibility. That means: no glare, no light trespass, no direct upright, no harsh shadows, no steep transitions from light to dark, etc. Lighting by itself does not ensure safety. Is there more crime in the "well lit" centers of large cities or in smaller towns with much less lighting? A cynic might derive a positive correlation between crime and light: the more light, the more crime. Current and past studies by competent crime authorities can be summarized as follows: "The paucity of data precludes any definitive statement regarding the relationship of lighting and crime, but there is a strong indication that lighting decreases the fear of crime." Quality lighting rather than a large quantity of poor lighting is essential for any real security.

Here are some examples of bad security lighting--lighting that too often compromises safety. Poor quality fixtures can give the illusion of safety or the feeling of security, but in reality they don't add to safety at all; they often make things worse. They are beacons to the criminal: "Come and get me, my lighting will help you, not me." In essence, they provide criminal-friendly lighting and a false sense of security.

1. The 175-watt dusk-to-dawn "security light". This fixture was designed in the old days when energy was cheap, there were no good lighting fixture designs, and the adverse effects of bad lighting were not well appre-

ciated. It sells for \$29.95 or less, but uses more than 200 watts of power. That means it costs about \$70 per year to operate in most locations much more in high electricity cost areas. A good deal of the light output is wasted, going up or sideways where it does no good at all. This fixture has a great deal of glare, often blinding the homeowner and others. It splatters light everywhere, alienating neighbors. It casts harsh shadows behind trees and buildings, allowing criminals plenty of dark areas to hide in. It is a prime example of bad lighting. But it is in use by the millions throughout the country. Why? It's cheap, and bright. We see lots of glare so we think there is lots of light. But it is a most ineffective and inefficient light. (See IDA Information Sheets No. 3, 26, and 103 for more information.)

2. Globes. Again, light is splattered everywhere. Because they waste so much light, they require a high-wattage lamp to get any light on the ground. The lamp means a great deal of glare is produced, so much that it often is not easy to see the ground! Why are so many of these inefficient fixtures used? Mainly because they look good in the daytime! Only a very low wattage lamp (as in the days of gas lighting) should be used, thus preserving the daytime appearance and providing a nice nighttime "ambience". A separate, quality lighting system can be installed to light the ground. There is no glare or light trespass from this system, so it doesn't detract from the looks of the globes. This provides the desired attractiveness as well as good lighting and safety. It costs more initially, but there is now good lighting.

3. Poorly shielded "wall packs" or similar fixtures. These also splatter light everywhere, with some of the light getting where it's needed but most being wasted. They also create lots of glare. Well-shielded wall packs can be excellent light sources, if they have good light control; many have nearly none.

4. Poorly designed or installed flood lights. Flood lights can be good, if they have good light control. But they must be well-designed and well installed to take advantage of their pluses. Often they are poorly

continued

installed, aimed at what seems a random direction or, worse, right at the street (causing terrible glare for motorists) or at a neighbor's yard or bedroom window. We have all seen many examples of such bad lighting at night.

Enough of the bad, here now are some examples of good quality security lights:

1. A well-shielded low pressure sodium (LPS) fixture:

This offers well-controlled light, energy efficiency, no glare. A lack of color rendering is not a disadvantage for most security lighting. Visibility is excellent with LPS lighting.

2. A similar full-cutoff high pressure sodium (HPS) or metal halide (MH) fixture, or the new low-wattage compact fluorescent (PL) lamps used in good fixtures: These have no uplight and no glare.

3. Well-controlled and installed flood lights or spot lights. These need great care in design and installation to be in the "good" camp, for almost all present installations are clearly not that way.

4. The **infrared sensor spot lights** that come on when someone walks into the field of view of the infrared (IR) detector. (They can activate an alarm too, if wanted.) These lights are very effective in terms of cost and security. They scare intruders away, they offer good visibility to the homeowner when needed (e.g. when taking out the garbage, or when there is an intruder). They must be installed so as to put the light only where it is needed, not shooting up into the sky or onto the neighbor's property. Under the house's eave is often a good location.

To see well, we need adequate light, but not too much. Too much can ruin our adaptation to darker areas at night, blinding us just when we need to see. When we go from too bright to too dark or vice versa, we have poor visibility for a while. This effect is called "transient adaptation", and good designs should minimize its adverse effect on visibility.

To see well, we need to minimize glare and dark areas near well-lit areas. This means good lighting design is required.

To see well, we must not allow the eye to be flooded with too much light when driving or walking at night. "Luminance overload" can easily compromise vision and dark adaptation.

Think, too, about energy savings. We should not waste light nor use inefficient light sources. More than a billion dollars is wasted annually in the U.S.A., with much more throughout the world, due to poor lighting.

What else can we do to maximize safety at night? Here are some ideas. Consult libraries, the local police, companies specializing in security equipment, and others for details and other ideas, but here are a few:

- Use good locks; use a peep hole in the door to see who is there before answering the door
- Have an effective alarm system; include motion sensors (such as are used in the IR spotlight mentioned above)
- Have good phone sense (what you say when answering the phone or on your answering machine)
- Play the radio when gone; put indoor lights on a time switch; put labels on your property (and put security labels on your windows)
- Have a dog; join or promote a neighborhood watch program (one of the best ideas: promote quality outdoor lighting through a neighborhood watch or other group).

Write IDA for a list of additional information sheets about outdoor lighting; we also have excellent slides that illustrate the differences between poor lighting and quality lighting.