



Dark Skies

Strategies for reducing light pollution
in Portland

City Council Session
September 17, 2020



Bureau of Planning and Sustainability
Innovation. Collaboration. Practical Solutions.

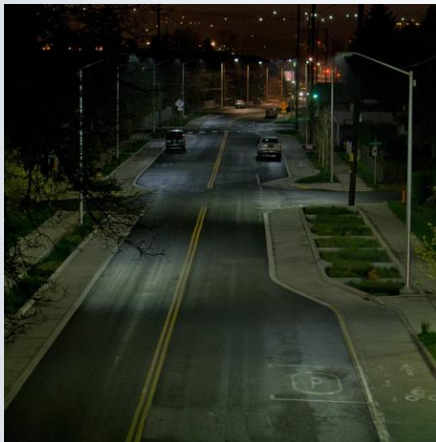


Introduction

- Project background
- Definition of light pollution
- Negative impacts from light pollution
- Best practices for reducing light pollution
- Recommendations

Introduction

- Outdoor lighting is an important element of urban areas at night.



Introduction

- Poorly designed and poorly shielded outdoor lighting produces light pollution.



Introduction

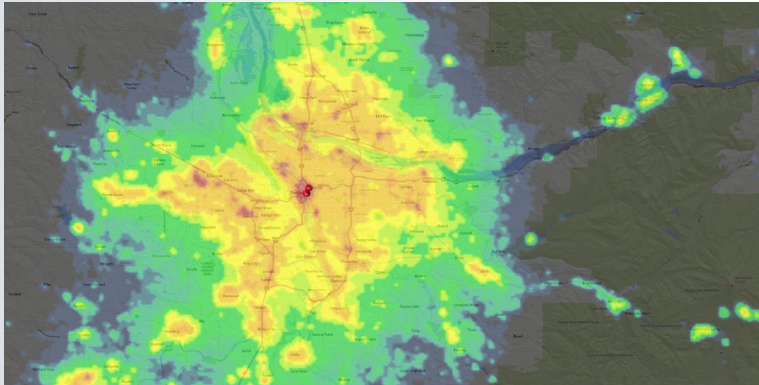
- Light pollution has negative impacts on humans and wildlife and impairs our ability to see the night sky.



Background



- Portland has moderate levels of light pollution.
- Portland is a growing city.
- Smart City policies and regulations can reduce the light pollution as the city grows.



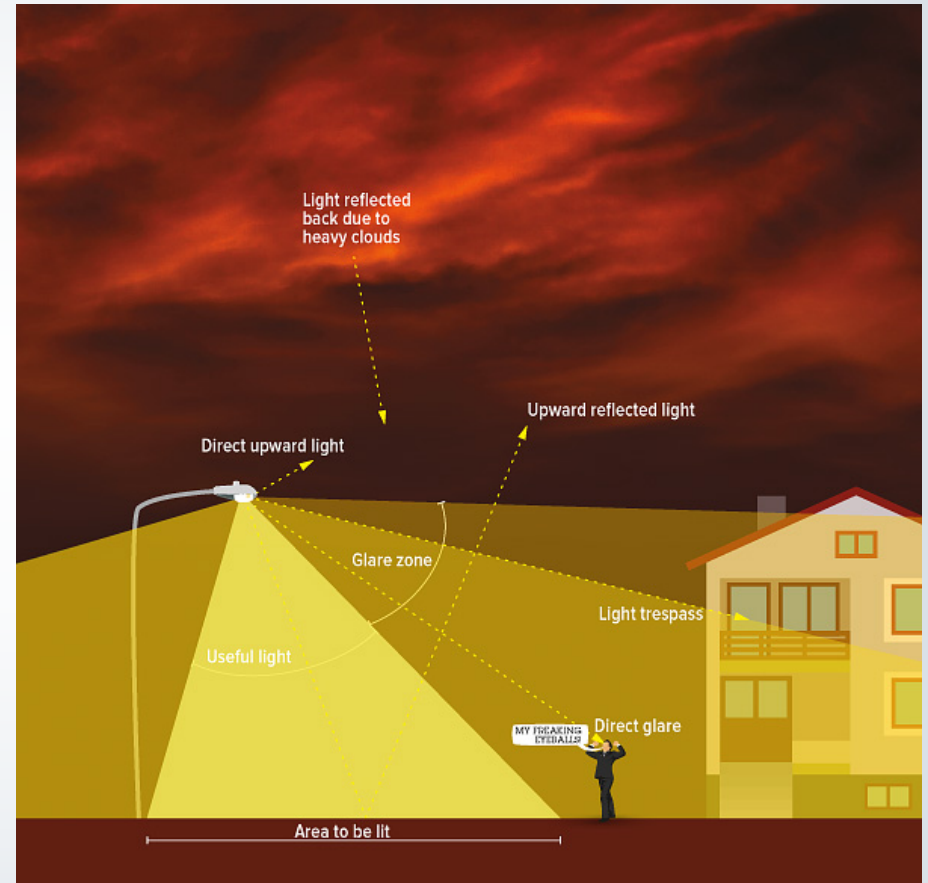
Existing City Policy



- Urban Bird Treaty City
- Climate Action Plan
- 2035 Comprehensive Plan
- Central City 2035 Plan
- Green Building Policy

What is light pollution?

- The inappropriate or excessive use of artificial light.
- Components of light pollution:
 - Glare
 - Skyglow
 - Light trespass
 - Over-illumination
 - Color



Negative impacts

1. Human health and safety
2. Wildlife and ecosystem health and safety
3. Energy and carbon
4. Night sky viewing



Human Health and Safety

- Lighting affects human health in the form of **impaired sleep quantity and quality.**
- Blue-rich white light **suppresses melatonin.**
- Bright light causes glare and can reduce the **safety of pedestrians and drivers at night.**

Wildlife Health and Safety

- Light emitted upwards results in **birds colliding with buildings.**
- Research demonstrates widespread and **deleterious impacts on animals and ecosystems.**
 - Mammals
 - Amphibians
 - Bats
 - Fish
 - Turtles
 - Marine invertebrates
 - Primates
 - Insects
 - Trees
 - Plants

Energy and Carbon



- Increases Portland's carbon footprint and contributes to climate change.

Night Sky Viewing

- Light pollution prevents us from seeing stars.

“In a primal sense, we’ve lost our connection to nighttime skies, the tapestries into which our ancestors wove their star-studded stories, timed the planting and harvesting of crops, and deduced the physical laws governing the cosmos.”

*--Nadia Drake,
National Geographic Magazine*



LIGHT TO PROTECT THE NIGHT

Five Principles for Responsible Outdoor Lighting



Illuminating
ENGINEERING SOCIETY



USEFUL



ALL LIGHT SHOULD HAVE A CLEAR PURPOSE

Before installing or replacing a light, determine if light is needed. Consider how the use of light will impact the area, including wildlife and the environment. Consider using reflective paints or self-luminous markers for signs, curbs, and steps to reduce the need for permanently installed outdoor lighting.

TARGETED



LIGHT SHOULD BE DIRECTED ONLY TO WHERE NEEDED

Use shielding and careful aiming to target the direction of the light beam so that it points downward and does not spill beyond where it is needed.

LOW LIGHT LEVELS



LIGHT SHOULD BE NO BRIGHTER THAN NECESSARY

Use the lowest light level required. Be mindful of surface conditions as some surfaces may reflect more light into the night sky than intended.

CONTROLLED



LIGHT SHOULD BE USED ONLY WHEN IT IS USEFUL

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

COLOR



USE WARMER COLOR LIGHTS WHERE POSSIBLE

Limit the amount of shorter wavelength (blue-violet) light to the least amount needed.

Recommendations

- Establish a comprehensive set of regulations for outdoor lighting.
- Address streetlight through shielding and reducing the color temperature (i.e. the amount of blue-rich white light).
- Promote and incentivize participation in an organized Lights Out program.

Strategy 1: Addressing light pollution associated with new and existing development on private and publicly owned property

Action	Lead Organization	Recommended Timeline and Estimated FTE	Priority
<p>1.1 <u>Establish in the Portland City Code, a comprehensive set of regulations for outdoor lighting associated with new construction and remodeling projects. Carry out this action by either:</u></p> <p>Option 1. Amend Title 33, Planning and Zoning, to consolidate and expand existing exterior lighting regulations, OR</p> <p>Option 2: Create a new City Code title specific to outdoor lighting.</p> <p>Use the IDA/IES Model Lighting Ordinance and other municipal ordinances as references to inform development of outdoor lighting regulations for Portland, but at a minimum add regulations for all outdoor lighting, including streetlights if Option 2 is chosen, that:</p> <ul style="list-style-type: none"> • Limit total light output; • Require that exterior lighting be directed only where needed and not shine horizontally, upward, or onto adjacent properties; • Require that exterior light fixtures be shielded and diffused with a Backlight-Uplight-Glare rating of B0, U0 and G0; • Limit the color temperature of outdoor lighting so that it does not exceed 3000 Kelvin, with lower temperature (2200K - 2700K) specified for environmentally sensitive areas and parks. Continue to research impacts of blue-rich white light on people with sensitive receptors and other disabilities and adjust the temperature recommendations as necessary; • Require lighting control devices that allow dimming of interior and exterior lights when full output is not needed; • Require that rooftop and other exterior architectural lighting be directed downward; • Prohibit spotlights that direct lighting into the sky. <p>(see Appendix A for a comparison of outdoor lighting ordinances.)</p>	<p>BPS</p>	<p>within 2 to 5 years</p> <p>Option 1: 1-1.5 FTE for 1.5 years</p> <p>Option 2: 2 FTE for 2+ years</p>	<p>High</p>

Feedback on the Recommendations

- Staff received over 200 comments on the Public Review draft.
- 99% of the comments mention “support” or “strong support” for the recommendations.

Equity Focus Group

- Focus group to discuss the Dark Skies findings and recommendations.
- Hoped to learn from the lived experiences of Portlanders who are members of BIPOC communities.
- Wanted to understand how people experience outdoor lighting in their communities.

Equity Focus Group Findings

- *“I suffer from insomnia and I’ve had to put up blackout curtains to block out the light at night.”*
- *“I live in a townhome community that has LED lighting along sidewalks and paths. I appreciate having the exterior lights for safety, but I feel like there is a tradeoff.”*
- *“I had no idea that I even had a voice in requesting shielding.”*
- *“Lights cause pollution, light causes global warming and other problems. So how do we get away from polluting the atmosphere but still feel safe at night?”*
- *“Many East Portland neighborhoods are devoid of trees. We need more trees.”*

Equity Focus Group

- Feedback from equity focus group supports the recommendations to:
 - Develop and implement a comprehensive set of regulations for outdoor lighting.
 - Fully fund a streetlight shield program that proactively addresses light trespass from streetlights.
 - Design and fully fund a public education and outreach campaign to encourage property owners to retrofit their existing outdoor lighting.

Invited Guest: Portland Audubon



Questions ?