

LED Slideshow for Public Officials

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Introduction

- My project is an informational slideshow about LED street lighting meant for public officials
- In regards to light pollution, my project focuses on the street lighting aspect
- Goal: Explore how LED street lighting affects people and the environment, and communicate findings to public decision-makers

LED Street Lighting:
A guide for public
awareness

By Malcolm Kuo





Objectives/Research Focus

- **Health: Investigate how exposure to blue-rich LED streetlights at night affect human sleep patterns, circadian rhythms, and overall health.** (What does medical research say about bright nighttime lighting and consequences like sleep disruption, headaches, etc.?)
- **Community: Understand the impacts of LED streetlights on community life and comfort.** (Are people happier with brighter streets, or are there many complaints? How do LEDs influence things like walking or driving visibility?)
- **Environment: Examine how LED street lighting contributes to environmental issues such as skyglow and ecological disruption.** (What will happen to birds, insects, or nocturnal animals when we introduce certain types of lighting? What will happen to our sky and star visibility?)
- **Recommendation: Recommend practical design and policies that can be adopted to mitigate the negative effects of LED streetlights.** (This includes technical solutions like proper shielding and warmer light colors, as well as policy solutions like dimming schedules.)



Process



- Early phase: News articles, Reddit posts, stories
- Moved into academic papers/articles (Science, AMA, IDA, IEEE, Soft Light Foundation)
- Organized ideas into a Google Doc and grouped by topic (health, community, environment, recommendations)
- Kept audience in mind throughout: how to explain this to a public official with no science background

Soft Lights Foundation



DarkSky



Analysis

- I identified recurring issues with blue-rich light such as glare, and ecological disruption, and categorized them
- Compared expert opinions: lighting engineers vs. medical professionals
- Synthesized conflicting views to present a well-rounded overview in the final slideshow
- Used informational images as pictures are easier to understand

Design Debates - Color Temperature

- Lighting Engineers: Prefer 4000K–5000K LEDs for brightness, visibility, energy savings
- Medical Experts (AMA): Recommend $\leq 3000\text{K}$ to minimize melatonin disruption
- Newer Research: Suggests 2700K or lower may be safer (Motta, 2024)
- The Conflict: Efficiency vs. Health & Environmental Protection





Why is this project important

- Raises awareness on how overlooked issues like light pollution have big impacts
- Allows public officials to be more informed about light pollution which translates to smarter policies

Lessons

- Research can emerge from everyday life; I decided to do this project as there was a bright street light in front of my house
- How you explain research is as important as what you find
- Instead of critiquing LED's, it is better to offer alternatives and educate other people on it
- Using anecdotal evidence is important, as it appeals to pathos of audience



Recommendations

- Update ordinances to require shielding and 3000K or less for LED streetlights
- Dimming schedules/motion sensors
- Involve public in lighting decisions

Thank You





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