

November 20, 2021

To:

Cydney Vandercar, Interim Superintendent
Eugene Oregon School District
vandercar_c@4j.lane.edu

Re: Spatially Anisotropic Visible Radiation and Civil Rights Violations

Dear Cydney Vandercar,

We wish to alert the Eugene School District to liability issues related to spatially anisotropic radiation from Light Emitting Diodes. Figure 1 shows a school bus with a standard headlight on the right side of the photo, and an LED headlight on the left side of the photo. As is clear from the photo, citizen's civil rights are being violated because the radiation is being directed into their eyes, preventing them from using their eyes without pain or damage.



Figure 1 – School Bus LED Headlight

The National Highway Transportation Safety Administration publishes FMVSS-108 which regulates vehicle headlights. FMVSS-108 was originally written in 1967 and is applicable to *spatially isotropic radiation in the human-visible portion of the electromagnetic spectrum*. FMVSS-108 is not applicable to spatially anisotropic, directed energy sources such as LEDs and lasers and is not applicable to non-visible radiation such as microwaves and x-rays.

In addition, aftermarket LED headlights are not approved for the housing that was originally designed for the school bus. NHTSA has determined that all LED aftermarket headlights are illegal. This situation is a liability issue for the Eugene School District because Eugene operates school buses with these unsafe and illegal LED headlights which are sending people to the hospital, causing eye damage, psychological trauma, road rage, loss of work, pain, sickness, loss of civil rights, vehicle crashes, and thoughts of suicide.

Figure 2 is a diagram showing the categorization of radiation. As we can see in the chart, candles, incandescent light bulbs, and High-Pressure Sodium lamps are all spatially isotropic radiation sources. LEDs, on the other hand, emit spatially anisotropic radiation.

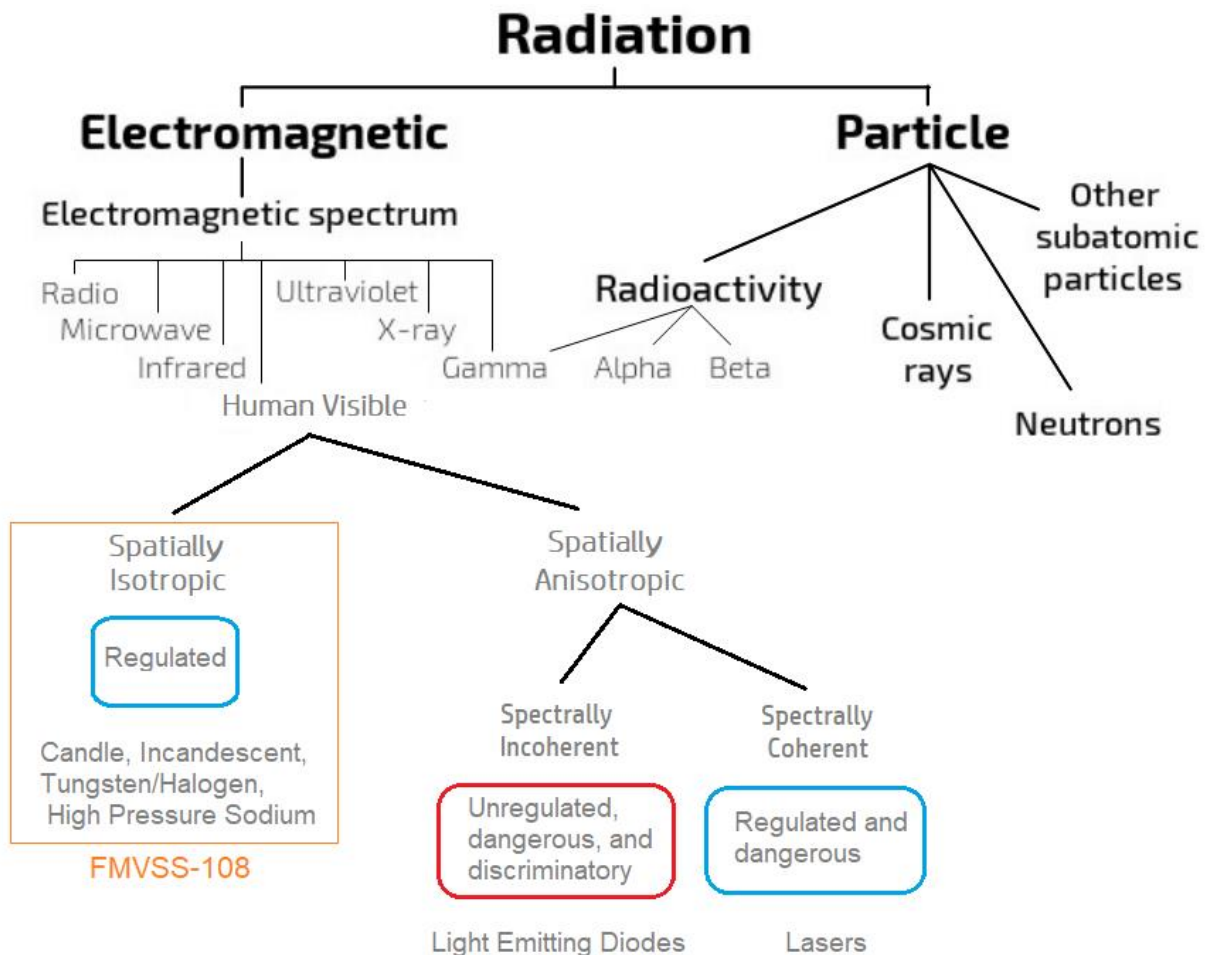


Figure 2 - Radiation Types

To our knowledge, there are no ocular exposure standards for LEDs. In his 2009 presentation, Senior Engineer Michael Shulman of Underwriters Laboratories wrote, "Currently, neither the U.S. nor Canada have mandatory standards or regulations for ocular exposure to LEDs emitting incoherent visible light."¹ In the research article, titled Light Emitting Diode Induced Retinal Damage² the authors state, "Excessive LED light exposure presents a potential hazard to retinal function." In other research, those in Risk Group 3 (those with epilepsy, autism, migraines, photophobia, etc.) are often purposely ignored during the research, invalidating results that might have shown that LEDs are safe.

LEDs are not "energy efficient" as claimed by the LED lighting industry. To be energy efficient, a technology must provide the same quality of service and perform the same task as the previous technology. The task in this situation is to provide uniform illumination without harm. Since LED radiation does not provide uniform illumination, and since the LED radiation is sending people to the hospital, causing eye damage, and violating civil rights, LED radiation is not energy efficient and therefore should not be used for the purpose of illumination. The claim of "energy efficiency" by the LED lighting industry is fraudulent.

The federal Americans with Disabilities Act prohibits discrimination. Since LED radiation interferes with major life functions such as seeing, thinking, and concentrating for people with light sensitivity disabilities, such as those with epilepsy, autism, PTSD, migraines, bipolar disorder and others, LED radiation is discriminatory. The Eugene School District cannot claim that LEDs comply with the ADA just because the US Access Board has not yet developed guidelines for spatially anisotropic radiation from LEDs. Since LED radiation prevents safe access to public services such as roads, sidewalks and government facilities, LED radiation is discriminatory.

As an example of how dangerous LED radiation is, consider this warning shown in Figure 3 from the company Gear Light. Also consider that human comfort level for luminance is around 300 nits, while LED chips are already exceeding 100,000,000 nits of peak luminance.



Figure 3 - LED Flashlight

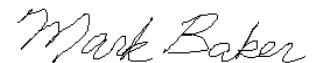
¹ http://www.softlights.org/wp-content/uploads/2021/10/MichaelShulman_LEDFireElectricalSafety.pdf

² <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5313540/>

The fact that LEDs are unregulated and lack standards, cause sickness and eye damage, interfere with the human nervous system, discriminate against people with light sensitivity disabilities, endanger public safety, and are illegal, makes the Eugene School District liable for the accidents, harm and discrimination caused by the school buses that emit LED radiation.

To protect human health, comply with federal regulations and reduce liability, the Eugene School District must only use headlights, daytime running lights, and flashing lights that comply with federal regulation FMVSS-108 on their buses.

Sincerely,

A handwritten signature in cursive script that reads "Mark Baker".

Mark Baker
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