

November 22, 2021

To:

City Attorney
Waukesha, Colorado
Attorneys@waukesha-wi.gov

Re: Spatially Anisotropic Visible Radiation and Civil Rights Violations

Dear City Attorney,

We wish to alert the City of Waukesha to liability issues related to spatially anisotropic radiation from Light Emitting Diodes. Figure 1 shows Waukesha emergency vehicles subjecting all innocent persons in the area to toxic, pulsing radiation from LEDs. 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.

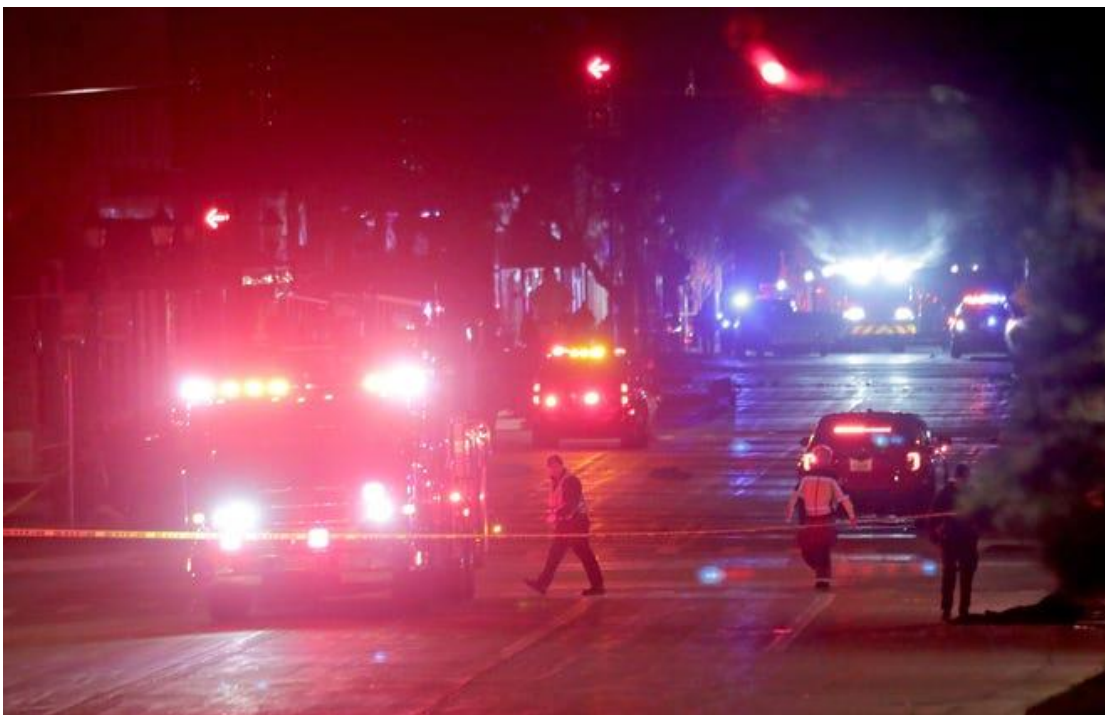


Figure 1 – Fire Trucks

Figure 2 shows Waukesha's use of LED streetlights that increase agitation and aggression in people, are known to cause eye injury, and discriminate against people who have a light sensitivity disability.



Figure 2 – LED Streetlights

Figure 3 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.

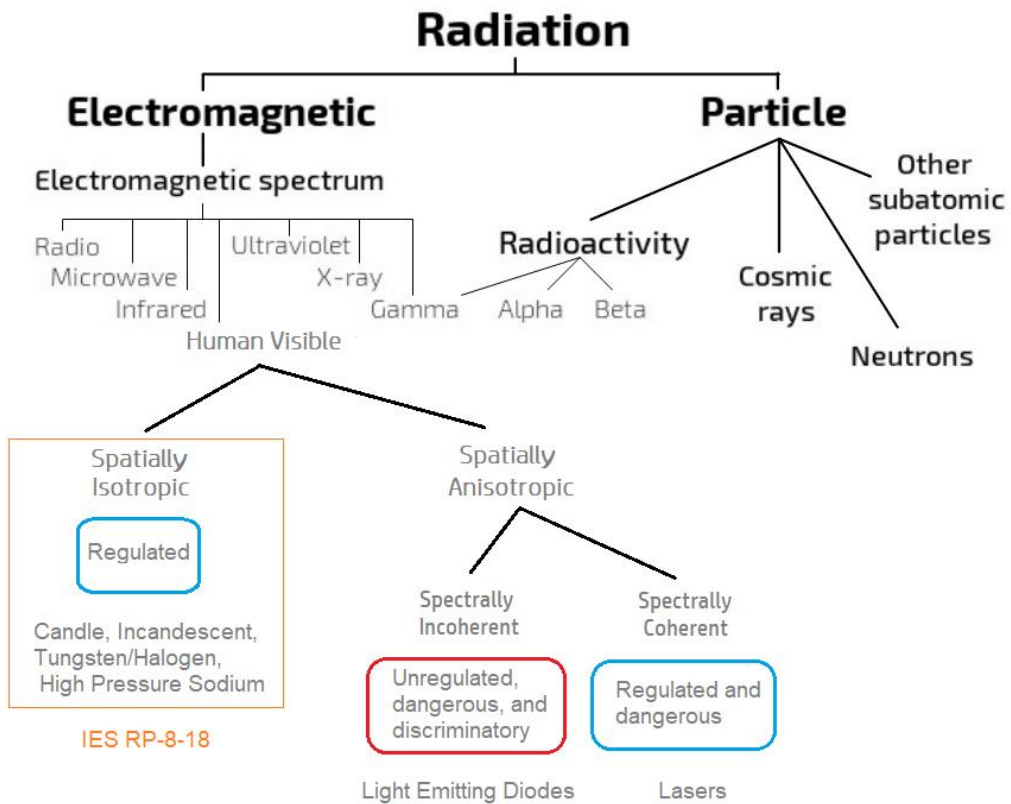


Figure 3 - Radiation Types

The Illuminating Engineering Society Recommended Practice for Design and Maintenance for Roadway Parking Facility Lighting (IES RP-8-18) is the de-facto standard for outdoor lighting for streets and parking lots. The references to “light” in IES RP-8-18 are for *spatially isotropic radiation in the visible portion of the electromagnetic spectrum*. The word “light” in IES RP-8-18 does not refer to microwaves, laser beams, or spatially anisotropic, spectrally incoherent radiation such as LEDs.

The reason this is important is because Waukesha has installed LED streetlights that do not comply with existing standards, emit dangerous radiation, discriminate against persons with light sensitivity disabilities and have unregulated spatial, temporal, and spectral characteristics. Even more serious is the use of directed energy LED flashing lights on police and other emergency vehicles which place lives in immediate danger due to the anisotropic radiance and flash rate. LED radiation has been shown to cause pain, sickness, eye damage, seizures, migraines, emotional trauma, and thoughts of suicide.

The Illuminating Engineering Society does not guarantee their own standards and disclaims any liability for the use of their standards. Thus, if the City of Waukesha claims that they followed standards for LED lighting and are therefore not liable for the harms caused by LED lighting, Waukesha’s claim will fail, both because IES RP-8-18 is not applicable to LED lights, and because IES has warned that their standards are not trustworthy enough to be guaranteed or relied on.

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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.³ 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. Waukesha 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. The use of pulsing LED radiation by the police constitutes police brutality.

As an example of how dangerous LED radiation is, consider this warning shown in Figure 4 from the company Gear Light.

WARNING: To avoid eye injury, do not stare directly into the light beam or shine the beam directly into anyone's eyes. This product is not designed, intended, or recommended for children or hazardous environments.



Figure 4 - LED Flashlight

The fact that LEDs are unregulated and lack standards, cause sickness and eye damage, interfere with the human nervous system, and discriminate against people with light sensitivity disabilities makes

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

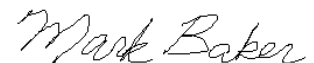
² <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5313540/>

³ https://www.energystar.gov/about/about_energy_efficiency

Waukesha liable for the harm and discrimination they cause because Waukesha has authorized the use of LED radiation.

To protect human health and reduce liability, Waukesha must protect the natural night resource, and set policy to limit visible radiation. Any artificial lighting must be fully shielded (not just full cutoff) luminaires and use *only spatially isotropic* radiation with a Correlated Color Temperature of 2700 Kelvin or less, with 2000K preferred to protect the natural night resource. Pulsing LED radiation such as on fire trucks, police cars, other emergency vehicles, utility trucks, and signs must be eliminated completely due to their civil rights violations and the excessive danger they pose.

Sincerely,

A handwritten signature in black ink that reads "Mark Baker". The signature is written in a cursive style with a large initial "M".

Mark Baker
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