Soft Lights Foundation

9450 SW Gemini Drive
PMB 44671
Beaverton, OR 97008
www.softlights.org

February 19, 2022

BY EMAIL

Brian Wiese, Mayor
Qualicum Beach, British Columbia, Canada
mayor@qualicumbeach.com

Re: The LED Fraud

Dear Brian Wiese,

We were asked to contact Qualicum Beach to notify you about the dangers of LED streetlights. We understand that Qualicum Beach converted to 75-Watt 4000K LED streetlights which negatively impacted the residents of Qualicum Beach. We can explain to you and the Council why LED lights cause so much glare and light trespass and why LED streetlights are dangerous.

LED light is not just regular light. The difference between regular light and LED light is that regular light comes from a spherical emitter, while LED light comes from a flat surface emitter. The differences between a spherical emitter and flat surface emitter must be understood by all involved, including council, city staff, and the public before we can begin to discuss solutions to the glare, light trespass, health hazards, and discrimination of LED light beams.

The left side of Figure 1 shows light from a spherical emitter. The light is uniformly spread and follows the well-known Inverse Square Law.[1]

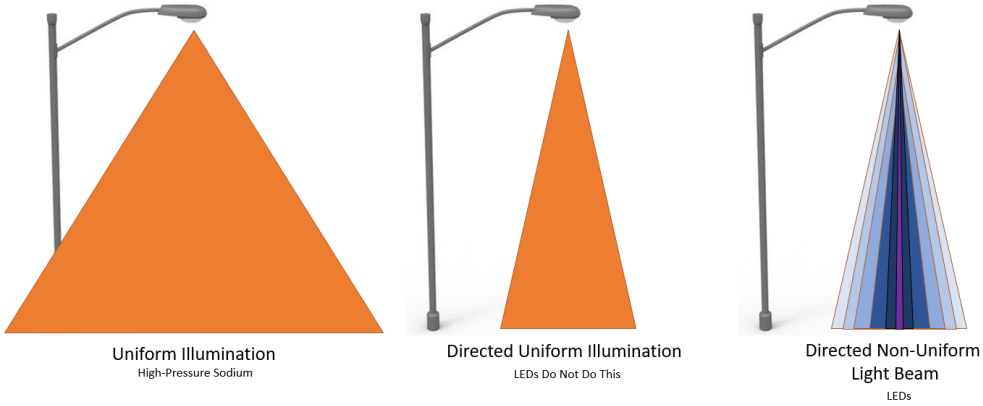

Figure 1 - Streetlight Comparison

[1] https://en.wikipedia.org/wiki/Inverse-square_law

What BC Hydro did not explain to Qualicum Beach is that flat surface emitters do not emit uniform light. BC Hydro likely told Qualicum Beach that LED light beams are "directed", which is shown in the middle of Figure 1. While flat surface emitters do indeed emit directed light beams, those light beams are not uniform. The middle image in Figure 1 is a non-existent shape.

The true shape of light from a flat surface is shown on the right in Figure 1. The energy is non-uniform, with the light beam being extremely dense in the center of the chip, and much less dense on the edges.[2] This non-uniform light from the tiny source interferes with human nerve signaling because human nerves were only designed to receive signals that arrive with uniform energy.

The Parksville Qualicum Beach news story stated, "Weir indicated the consultants informed them if they switch to 39W, the town needs to tighten up the streetlighting poles to give the street enough light coverage."[3] The reason that the consultants recommended reducing the distance between the streetlight poles for a 39W 3000K LED streetlight is because with LED light beams, the edges won't get enough light unless the center of the beam is extremely intense. This issue is shown in Figure 2.

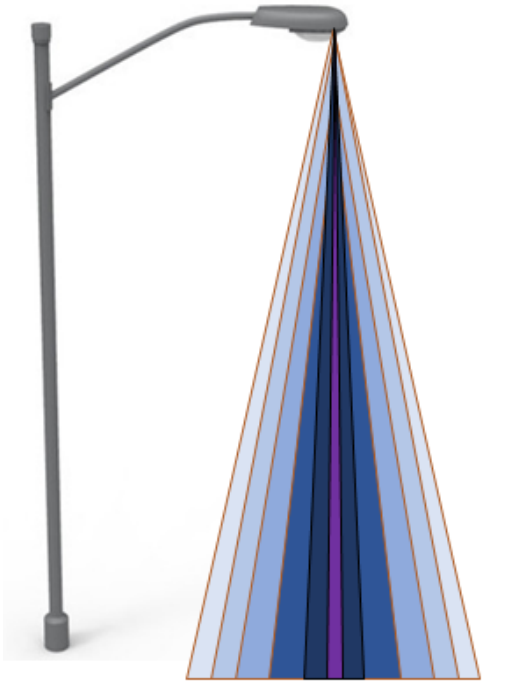

Figure 2 - Directed Non-Uniform Light Beam

None of the streetlight standards such as the Illuminating Engineering Society IES RP-8-18 Roadway and Parking Lot lighting are applicable to LED light beams. IES RP-8-18 is only applicable to

[2] https://ieeexplore.ieee.org/document/8879542
[3] https://www.pqbnews.com/news/bright-lights-small-town-qualicum-beach-council-again-discusses-streetlight-issue/

spherical emitters. What the consultants didn't tell Qualicum Beach is that, while putting the poles closer together would indeed provide the needed amount of light on the edges, the center of the light beam would become extremely intense and dangerous. LED streetlights do not comply with any standards, and this is a major safety and liability issue for Qualicum Beach.

BC Hydro also likely informed Qualicum Beach that LED streetlights are "energy efficient". This is a fraudulent claim because, by definition, to be energy efficient, a new technology must provide the same service as the previous technology but using less energy.[4] Since flat surface emitters don't provide the uniform illumination that the previous technology provided, flat surface emitters cannot be compared to spherical emitters in terms of energy use. Spherical emitters and flat surface emitters are simply two different products, just like lemons and lemon-scented soap are two different products. This lack of uniform illumination from LEDs is why the consultants recommend 75-Watt 4000K streetlights as an attempt to compensate for the lack of uniformity.

4000K and 3000K LED streetlights emit dangerous glare because of the large spike of 450 nanometer blue wavelength light. When we combine the non-uniform spectral properties and non-uniform spatial properties of LED light beams, we have a very dangerous type of light that puts drivers and pedestrians at high risk because they can neither see nor be seen properly. The only way to provide safe illumination is to use spherical emitters such as incandescent or High-Pressure Sodium.

One of the most tragic outcomes of using LED light beams is its effects on those who are LED-reactive. This includes people with epilepsy, autism, migraines, PTSD, and other neurological conditions where the non-uniform energies of the LED light beams cause the nerves to overload and short circuit, resulting in epileptic seizures, migraines, panic attacks, anxiety, and agitation. Some of these heart-wrenching stories are posted on our website here. LED lights are discriminatory because they interfere with a person's major life functions such as seeing, thinking, and concentrating.

The Parksville Qualicum Beach news story quoted town engineer Bob Weir as stating that streetlights were needed for safety. This idea that streetlights provide safety is a myth. Nearly all research studies on the subject have concluded that streetlights, and especially LED streetlights, do not increase safety and do not reduce crime.[5] If the natural night were so dangerous, then how do Dark Sky parks exist and why are they such a tourist draw? Wouldn't these areas designated as Dark Sky friendly be unsafe if they don't have 4000K LED streetlights? The answer is that the natural night is not inherently dangerous, nor unsafe and adding artificial light pollution does not make a location safer.

The natural night is a fundamental resource that is critical to the health of humans and nearly all biological systems. Adding artificial light pollutes the natural night resource, resulting in significant increases in rates of cancer, premature births, and mood disorders.[6] We urge the Council to reconsider the use of artificial light and develop a long-term plan of protecting the natural night resource. The Soft Lights Foundation makes the following recommendations.

1) BC Hydro should remove the dangerous LED streetlights at their cost.
2) Develop a long-term plan to protect the natural night resource.

[4] https://www.energystar.gov/about/about_energy_efficiency
[5] http://www.softlights.org/crime-and-safety/
[6] http://www.softlights.org/human-health/

3) Use only tiny amounts off artificial light for wayfinding.
4) To prevent injury and discrimination, do not use flat surface emitters as a light source.

Our website (www.softlights.org) has a wealth of educational information that will help the Council, city staff and the public understand the difference between a spherical emitter and flat surface emitter. In addition, we are available to answer any questions you might have.

Sincerely,

Mark Baker
President
Soft Lights Foundation
mbaker@softlights.org