

Fort Myers Beach Lighting Analysis

By SoftLights.org

Executive Summary

The town of Fort Myers Beach is considering switching to LED technology for streetlight replacement. The town is being fed false and misleading information about how LED streetlights function and their impacts on humans and the ecosystem. We wish to address this misinformation to assist the council in making a sound, scientific decision regarding the protection of the natural night resource.

Pittsburgh Report

[SoftLights.org](https://www.softlights.org) recently delivered a report and made a presentation for the city of Pittsburgh. Rather than replicate the information in this analysis, the Pittsburgh report and presentation slides will be attached. The Pittsburgh report discusses the harms of LED lights, the false claims of energy savings and offers solutions that do not include LED lights.

Disability Rights

Here we refer to the report of September 9, 2021, titled Street Light Design Recommendations. We are unable to know for sure, but this report appears to be written by Fort Myers Beach staff. [SoftLights.org](https://www.softlights.org) has repeatedly notified Fort Myers of its duty to comply with the federal Americans with Disabilities Act, and yet the staff report continues to fail to address this issue.

In the June 8, 2021 report and in response to SoftLights.org raising the issue of disability rights and the ADA, the report responded as follows: "Without debating ADA applicability to light sensitive persons, the design and products will comply with applicable federal, state, county and local laws." There was no further discussion of the ADA in the September 9, 2021, report.

We wish to make it clear that the federal ADA prohibits discrimination. There are now multiple documented cases of LED streetlights causing epileptic seizures, disabling migraines, psychological trauma, and eye damage.¹ In other words, Fort Myers Beach cannot possibly install LED street lighting without violating the federal Americans with Disabilities Act.

While the US Access Board refuses to provide guidance on the issue of LED lights, that does not mean that government agencies are allowed to install discriminatory LED lighting. There are ongoing

¹ <https://www.softlights.org/stories/>

legal actions currently involving the Human Rights Commission, private lawsuits, and legislative action that we expect to find in favor of the civil rights of those with light sensitivity disabilities. We fully expect that most, if not all, LED streetlights will need to be removed soon.

Artificial Light is an Unregulated Toxin

The September 9, 2021, report sets up a set of false choices, as if LED is the only option or that streetlights are a necessity. We wish to make clear that the council is being led to the wrong conclusions based on these distorted statements.

Humans and all other biological systems evolved over millions of years with a day/night cycle. The invention of artificial light has severely disrupted this system and is now a significant stressor on biological life. LEDs have exacerbated the problems.

Nighttime is when humans and other diurnal creatures must sleep. During this sleep time, the body repairs cells and this repair work is controlled by the hormone melatonin. Artificial light, even tiny amounts, suppresses melatonin production, disrupting the cell repair process. This disruption of the circadian system by artificial light has led to dramatic increases in thyroid, breast and prostate cancer, mood disorders, and premature births.² The goal of the council must be to eliminate most, if not all, artificial light from the outdoor environment to protect the health of residents, guests, and turtles.

Blue wavelength light at night is especially harmful, as blue wavelength is the circadian rhythm controller. A 4000K correlated color temperature LED has not only a large spike of blue wavelength, but the unnatural spectral power distribution causes its own set of harms to humans. (In fact, it's not even possible to give a single value CCT for LED due to the Lambertian shape of the LED light). While Fort Myers Beach might then consider 3000K LED, this color temperature still has far too much blue. The International Dark Sky Association adopted a 2200K maximum in January 2021 and the United Nations has proposed the same maximum.

LEDs are Toxic, Dangerous and Discriminatory

SoftLights.org members have documented cases of life-threatening epileptic seizures, life-altering migraine headaches, and severe psychological trauma. The reason for these reactions is because LEDs emit light from a flat chip which results in a directed-beam, Lambertian shape that is incompatible with the human central nervous system. The September 9, 2021, report fails to address this.

Two recent studies from August 2021, prove that LED lights are worse for the environment than HPS.

Quote: "We estimate the hidden impact of the transition to solid-state light-emitting diode (LED) technology, which increases emissions at visible wavelengths undetectable to existing satellite

² <https://www.softlights.org/resources/>

sensors, suggesting that the true increase in radiance in the visible spectrum may be as high as globally 270% and 400% on specific regions.” - <https://www.mdpi.com/2072-4292/13/16/3311/htm>

Quote: “Negative impacts were more pronounced under white light-emitting diode (LED) street lights compared to conventional yellow sodium lamps. This indicates that ALAN and the ongoing shift toward white LEDs (i.e., narrow- to broad-spectrum lighting) will have substantial consequences for insect populations and ecosystem processes.” - <https://www.science.org/doi/10.1126/sciadv.abi8322>

LEDs Do Not Comply with Standards

The Florida Department of Transportation Green Book of 2018 states, “HPS lamps have a very high initial luminous efficiency of over 100 lumens per watt”. Why would the town install LEDs when HPS is already so efficient?

The FDOT Green Book makes no mention of peak luminance, Lambertian shape or non-uniform luminance, and yet the FDOT Green Book states, “Light Emitting Diode (LED) – is the preferred light source for street lighting.” This makes no logical sense. LEDs are a directed beam, non-uniform luminance light that has horrible uniformity which is entirely contrary to this statement from the Green Book, “To avoid vision problems due to varying illumination, it is important to maintain illumination uniformity over the roadway.”

The Illuminating Engineering Society’s IES RP-8-18 Roadway Lighting standard is no better. The IES claims that LEDs are “point sources” of light. This is false. LEDs emit light from a flat source which creates a non-uniform luminance Lambertian shape. This false claim by the IES will likely form the foundation of lawsuits in the future.

None of the photometric software that the industry uses have been updated for non-uniform luminance light sources. All current photometric calculations for LEDs are invalid.

Because none of the existing standards are applicable to LED streetlights, if Fort Myers Beach chooses to install LEDs, the town will have no legal protections because of the experimental nature of LEDs and lack of applicable standards that would normally be used to protect a town from liability.

False Safety Claims

Utility companies often claim that LEDs increase safety. This is a false statement.

As you can see in the photo and video below, there are many LED streetlights. A man was murdered under these streetlights that supposedly “improve safety”.



<https://youtu.be/45JpF4ywl2c>

Here is a NHTSA report showing that fatalities have been increasing, in lockstep with the release of LED streetlights and LED vehicle headlights. <https://www.nhtsa.gov/press-releases/2020-fatality-data-show-increased-traffic-fatalities-during-pandemic>

Multiple research studies show that artificial street lighting in no way reduces crime or reduces vehicle crashes.³ The high-glare and Lambertian shape of LED streetlights greatly decreases vision and greatly increases neurological trauma, thus reducing safety. Of course, artificial light at night, especially directed beam and high-energy blue wavelength light, increases cancer risk, and risk of mood disorders, none of which is "safe".

Recommendations

Soft Lights recommends that Fort Myers Beach take the following actions:

- 1) Develop a comprehensive protection plan for the natural night resource to protect the health and well being of residents, guests, turtles, and all other biological systems.
- 2) Use satellite data or hand-held Sky Quality meters to get baseline readings for sky brightness. Any area that measures below 20.5 mpsas is light polluted and causing health problems.
- 3) Switching from 100 watt HPS to 50 watt HPS will be a 50% energy savings, without incurring the toxicity penalty of LED lights, and there would be no loss of safety.
- 4) Shield all outdoor lighting to prevent light trespass.

³ www.softlights.org/resources

Sincerely,

Mark Baker

Mark Baker, B.S.E.E.
SoftLights.org
mbaker@softlights.org