

1 FORT MYERS BEACH

2 CITY COUNCIL

3 SOFT LIGHTS,

4 Advocates for Light Sensitive Persons,

5 Response to:

6 TOWN LIGHTING,

7 Civil Engineering Firm

PUBLIC COMMENT

8 **I. Introduction**

9 Town Lighting is a subsidiary of REDD, Inc., a civil engineering firm. Soft Lights is an  
10 advocacy group whose primary objective is to protect people with light sensitivity disabilities  
11 from the harms of artificial light, with a focus on protecting people from non-uniform luminance  
12 light.

13 Town Lighting made a presentation on May 12, 2021 that discussed various topics  
14 surrounding the issue of replacing the existing streetlights on Estero Blvd. in Fort Myers Beach.  
15 Soft Lights feels that Town Lighting did not adequately discuss the protection of the natural  
16 night resource and the safest options for lighting and therefore we wish to provide these public  
17 comments that address the presentation.

18  
19 **II. Statement of Facts**

20 Figure 1 is a screen grab of the city's presentation that shows Estero Boulevard at night.  
21 As is shown in the photo, there are many sources of light, including vehicle headlights and  
22 taillights, private business signs and floodlights, and public streetlights. Given the phenomenal  
23 amount of light already present, it would be extremely unwise, wasteful, and dangerous to

1 simply replace existing streetlights with non-uniform luminance LED streetlights without having  
2 a comprehensive plan for addressing all the sources of artificial light.



3  
4  
5  
6  
7  
8  
9  
10  
11  
12 *Figure 1 – Estero Blvd. at Night*

13 **A. Pedestrian Safety**

14 Figure 1 shows a pedestrian attempting to cross the street at a crosswalk. Due to the glare  
15 from so many light sources, it is challenging to see the pedestrian. Town Lighting recommends  
16 that the solution to this problem is add even more light at even higher color temperatures to make  
17 the crosswalk area stand out. We disagree with this approach as we contend that this simply  
18 leads to more light pollution and a never-ending escalation in the war to turn night into day.

19 The keys to safety for the pedestrian are to reduce the amount of glare, reduce the number  
20 of light sources, reduce the intensity of the surrounding lights, reduce vehicle speeds, and reduce  
21 the amount of time that the pedestrian is off the sidewalk and in the street. For example, shorten  
22 the amount of time that the pedestrian must be in the vehicle roadway.  
23

1           Figure 2 shows a traffic signal that a pedestrian could trigger with a button push. The  
2 light would typically remain off, but would turn on for yellow, then red, to allow a pedestrian to  
3 cross. Notice that this light does not have exceedingly high peak luminance and is well diffused,  
4 thus keeping the overall amount of light and glare at low levels.



5  
6  
7  
8  
9  
10  
*Figure 2 – Traffic Signal to Allow Pedestrian Crossing*

11  
12           Some cities have installed Rectangular Rapid Flashing Beacons to make the crosswalk  
13 more noticeable. These high luminance LED flashing lights are aimed directly at drivers, which  
14 reduces their vision. For persons who are light sensitive, this intense flashing light may trigger  
15 migraine headaches, emotional terror, seizures, or flashbacks. In other words, these RRFBs are  
16 discriminatory and should never be used.

17  
18 **B.       Bicyclist Safety**

19           Figure 3 shows zebra cycle lane separators. This unobtrusive barrier helps to keep  
20 vehicle drivers from drifting into the bicycle lane. The use of a proper reflector coating will  
21 further protect cyclists at night.



Figure 3 – Zebra

### C. Crime Prevention

Town Lighting used misleading data in their presentation to show that crime is reduced with the use of bright white lights. This is simply not true. The study that Town Lighting referenced is from 2008 and is found here <https://cops.usdoj.gov/RIC/Publications/cops-p156-pub.pdf>

Town Lighting ignored the many other studies which conclude that street lighting does not reduce crime.

The effect of reduced street lighting on crime and road traffic injuries at night – This UK study concludes that streetlights reduces neither crime nor traffic accidents.

Streetlights and how they relate to crime – This Rice University study found that streetlights do not reduce crime, and that areas with higher concentrations of streetlights had more crime.

Outdoor Lighting and Crime, Part 1: Little or No Benefit – Australian Study

1 [Outdoor Lighting and Crime, Part 2: Coupled Growth](#) – Australian Study

2 [Halved Crime in a Dark City](#) – Swedish Study

3 [Light and Crime](#) – Royal Astronomical Society of Canada

4 [Dark Campus Programs](#) – The standard myth is that lighting prevents crime, but by  
5 turning off the lights, school campuses have reduced vandalism.

6  
7 **D. Sense of Safety and Community**

8 In their presentation, Town Lighting attempted to convey the idea that lighting leads to a  
9 sense of community and sense of safety. In most cases, the poor application of lighting will have  
10 the opposite effect. Figure 4 shows the natural night resource that truly brings about a sense of  
11 calm, safety, wonder, awe, and community spirit.



19 *Figure 4 - Sunset and Stars*

20  
21 Figure 5 and Figure 6 show Myers Beach at sunset and during moonrise. It is hard to  
22 imagine that these settings would make people feel unsafe. On the contrary, the natural sunset  
23 and natural moonlight provide romance and comfort. Many songs have been written about



1 dancing under the stars and moonlight and many novels have told the tale of taking a romantic  
2 walk on the beach at sunset.



9  
10

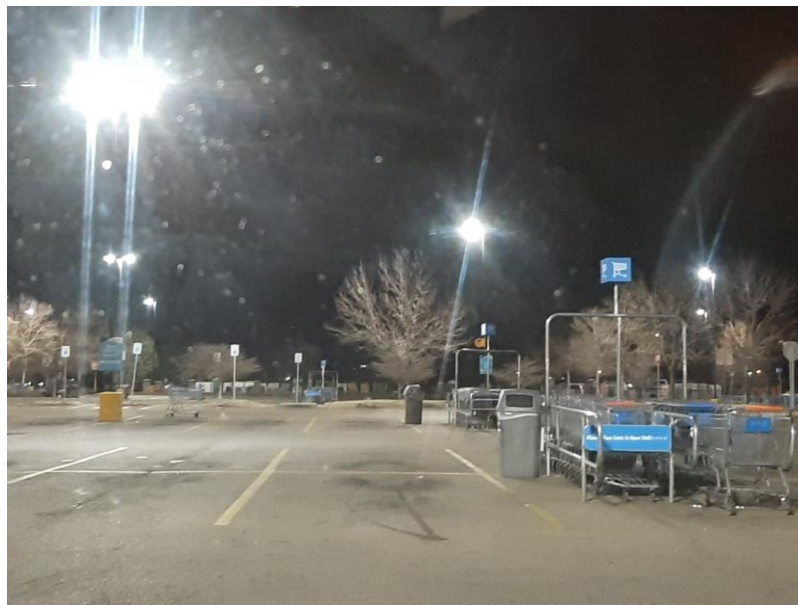
*Figure 5 - Sunset at Fort Myers Beach*



21  
22  
23

*Figure 6 - Moonrise over Fort Myers Beach*

1 A report on research that studied people’s perceptions of safety under different lighting  
2 conditions stated, “*The findings show that sites with higher light levels are more likely to be*  
3 *perceived as unsafe sites*” - [https://theconversation.com/more-lighting-alone-does-not-create-](https://theconversation.com/more-lighting-alone-does-not-create-safer-cities-look-at-what-research-with-young-women-tells-us-113359)  
4 [safer-cities-look-at-what-research-with-young-women-tells-us-113359](https://theconversation.com/more-lighting-alone-does-not-create-safer-cities-look-at-what-research-with-young-women-tells-us-113359) These findings make  
5 sense because we intuitively realize that the bright white lights were put there to ward off some  
6 type of dangerous situation, which in turn means that the area itself is dangerous. Figure 7  
7 shows the harsh white lighting at a Walmart parking lot. The glare, excessive blue wavelength  
8 light and high contrast promote feelings of anxiety and concern.



9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
*Figure 7 - Walmart Parking Lot*

19 **E. Luminance**

20 Town Lighting made some reference to the directed nature of LED lights versus spherical  
21 emitters such as gas-discharge lights, but they did not discuss the main issue of uniform  
22 luminance from spherical emitters versus non-uniform luminance from flat emitters such as  
23 LEDs. The sun, candles, incandescent lightbulbs, and gas-discharge lights all generally can be

1 reduced to a spherical point source for lighting calculations. Standards such as the Illuminating  
2 Engineering Society's IES RP-8-18, the Federal Highway Administration's Manual of Uniform  
3 Traffic Control Devices, and the Florida Department of Transportation Greenbook have all been  
4 written with the understanding that the light source has uniform luminance.

5       LEDs emit light with non-uniform luminance where the peak luminance is in the center  
6 of the chip. There are no government regulations for the maximum of this peak luminance.  
7 LED chips already can exceed 1,000,000 nits, while maximum human tolerance is around 300  
8 nits. None of the existing standards (e.g., IES RP-8-18, FHWA MUTCD and FDOT Greenbook)  
9 can be used for designing streetlighting systems that use non-uniform luminance LED lighting.  
10 Therefore, when Town Lighting discussed the concept of smoothing out the dark and light  
11 locations or discussed the concept of uniformly lighting the roadway where vehicles travel, they  
12 did not accurately note that none of the existing standards would be applicable for LED lighting.

#### 14 **F. Light Sensitive Persons**

15       Town Lighting made no mention of how the proposed LED streetlights will affect  
16 persons with light sensitivity disabilities. Some people can tolerate the non-uniform and high  
17 luminance of LED lights because their senses become saturated, and they can no longer detect  
18 the higher luminance. However, people who have excellent sensors, who we call light sensitive  
19 persons, can detect the difference between 1,000 nits and 1,000,000 nits. These people include  
20 those who have light sensitivity disabilities such as people with epilepsy, autism, PTSD,  
21 migraine sufferers and others who are Highly Sensitive Persons. The detection of the unnatural  
22 non-uniform luminance and the exceedingly high peak luminance may cause seizures, emotional  
23 terror, flashbacks, or debilitating migraine headaches.



1 The Americans with Disabilities Act prohibits discrimination against light-sensitive  
2 persons. Therefore, Town Lighting must research and ensure that the design of the streetlighting  
3 does not harm sensitive receptors. Many Soft Lights members are light sensitive, so we will be  
4 monitoring this project carefully to ensure that Town Lighting and the city's ADA Coordinator  
5 engage in meaningful communication with the disability community and ensure that the selected  
6 lighting, if any, does not discriminate against light-sensitive persons.

### 7 8 **G. Health Effects of Artificial Light**

9 In our opinion, the most disturbing portion of the Town Lighting presentation was their  
10 attempt to use an unpublished study, by the lighting-industry-friendly Virginia Tech  
11 Transportation Institute, to claim that artificial light, and especially blue wavelength light from  
12 streetlights, poses little to no harm to biological systems. Here are links to recent research  
13 studies showing that artificial light has a strong negative impact on human health.

14 1) March, 2021 - "Any LED spectrum light source may further suppress melatonin levels," - Dr.  
15 Vsevolod Polotsky, Director of Sleep Research, John Hopkins University

16 - <https://www.cnn.com/2021/03/02/health/smartphone-addiction-effects-on-sleep-wellness/index.html>

17 2) February, 2021 - Artificial Light Increases Thyroid Cancer Risk by 55%

18 - <https://acsjournals.onlinelibrary.wiley.com/doi/abs/10.1002/cncr.33392>

19 3) January 2021 - Synchronization between moon cycle and sleep

20 - <https://advances.sciencemag.org/content/7/5/eabe0465>

21 4) January 2021 - Light pollution linked to premature births - <https://news.ucdenver.edu/light-pollution-linked-to-preterm-births-reduced-birth-weights/>

22 5) January 8, 2021 - United Nations report on protecting natural night. Quote:

1 53. DS\_Oas-10: *If phosphor-converted amber LED or white LED lights are used, the amount of blue*  
2 *light ( $\lambda < 500 \text{ nm}$ ) should be below 5 per cent of the total spectral power. Generally, this requires using*  
3 *LED luminaires with a correlated colour temperature of 2200 K or less.*

4 . <https://www.iau.org/static/publications/uncopuos-stsc-crp-8jan2021.pdf>

5 These are just a few of the most recent studies showing that artificial light at night is  
6 causing significant damage to human health. There are many hundreds of additional studies that  
7 confirm that same thing. Town Lighting's attempt to distort the truth should weigh heavily on  
8 the minds of the decision makers.

#### 9 **H. Insignificant Situations**

10 During their presentation, Town Lighting attempted to elevate situations that are trivial  
11 when compared to importance of protecting the natural night resource. For example, Town  
12 Lighting stated that first responders had noted that it was difficult to see the difference between  
13 blood and oil on the scene of an accident. However, First Responders will have flashlights and  
14 excessively bright lighting on their vehicles that will overwhelm any streetlight. At no time  
15 should a city be designing their street lighting around this situation.

16 As another example, Town Lighting stated that the police find it difficult to read license  
17 plates or note the color of a person's shirt with low CRI lighting. Infrared cameras can read  
18 license plates in the dark and not knowing the color of a person's shirt will not make or break a  
19 case. Again, at no time should the city or county consider this issue, as this concern is truly  
20 insignificant when compared to the negative health effects of artificial light on biological  
21 systems, including humans and turtles. We cannot and must not pollute and damage the natural  
22 night resource for such situations.

1 **I. Amber LED**

2 While not enough research has been done on the effects of amber LED lighting on the  
3 environment or sensitive human receptors, there is a much better chance that low color  
4 temperature, low luminance LED lighting will be less damaging to the environment, less likely  
5 to cause health problems, and less likely to discriminate against sensitive receptors.

6 Figure 8 shows a 2000K LED streetlighting project that was recently installed in front of  
7 the Santa Fe New Mexican newspaper in Santa Fe, New Mexico.



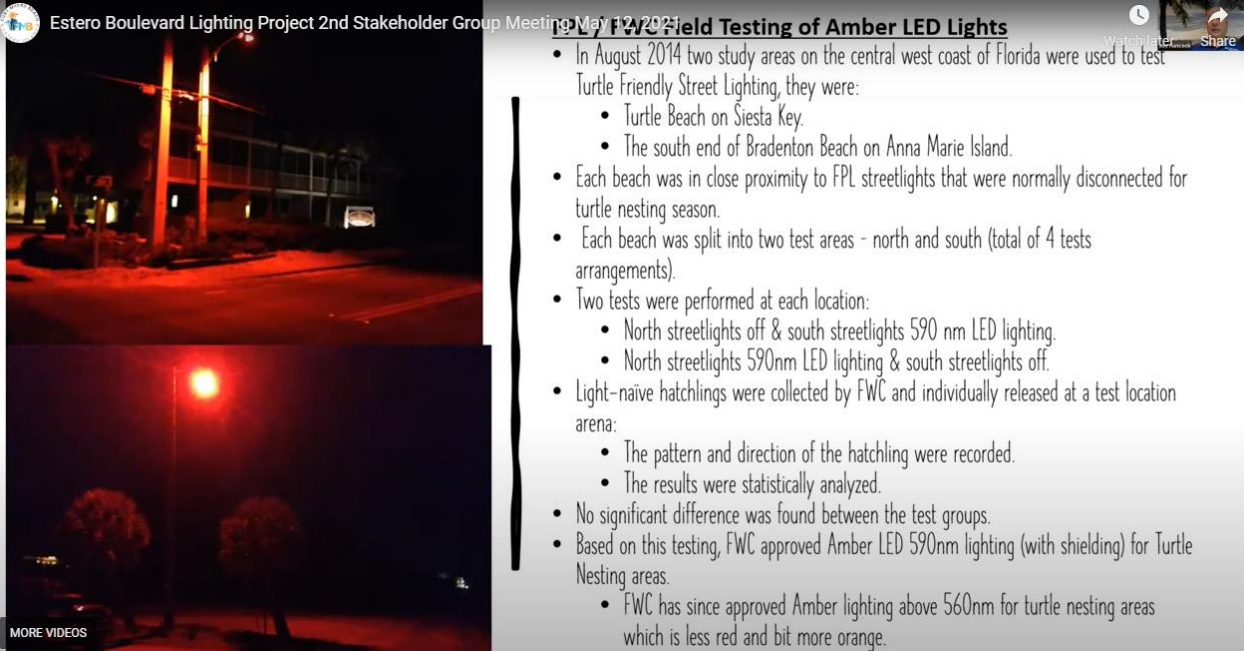
13 *Figure 8 - 2000K LED streetlights*

14 Figure 9 shows a new installation of turtle-friendly amber streetlights on Treasure Island  
15 in Florida.



23 *Figure 9 - Treasure Island Amber Streetlights*

1 Town Lighting also presented information about a 2014 study that used 590nm LED  
2 lighting that stated that there was no difference between turning the lights off and using 590nm  
3 amber. Since that study, the Florida Fish and Wildlife Commission has approved use of 560nm  
4 lights as well.

5  The screenshot shows a video player interface. The title is 'FWC Field Testing of Amber LED Lights'. The video content shows two scenes of streetlights at night. The top scene shows a street with several tall streetlights, some of which are illuminated with a red glow. The bottom scene shows a close-up of a streetlight with a red glow. The video player includes a 'Watch later' button and a 'Share' button. The video title is 'FWC Field Testing of Amber LED Lights'. The video content shows two scenes of streetlights at night. The top scene shows a street with several tall streetlights, some of which are illuminated with a red glow. The bottom scene shows a close-up of a streetlight with a red glow. The video player includes a 'Watch later' button and a 'Share' button.

6 • In August 2014 two study areas on the central west coast of Florida were used to test  
7 Turtle Friendly Street Lighting, they were:  
8 • Turtle Beach on Siesta Key.  
9 • The south end of Bradenton Beach on Anna Marie Island.  
10 • Each beach was in close proximity to FPL streetlights that were normally disconnected for  
11 turtle nesting season.  
12 • Each beach was split into two test areas - north and south (total of 4 tests  
13 arrangements).  
14 • Two tests were performed at each location:  
15 • North streetlights off & south streetlights 590 nm LED lighting.  
16 • North streetlights 590nm LED lighting & south streetlights off.  
17 • Light-naïve hatchlings were collected by FWC and individually released at a test location  
18 arena:  
19 • The pattern and direction of the hatchling were recorded.  
20 • The results were statistically analyzed.  
21 • No significant difference was found between the test groups.  
22 • Based on this testing, FWC approved Amber LED 590nm lighting (with shielding) for Turtle  
23 Nesting areas.  
• FWC has since approved Amber lighting above 560nm for turtle nesting areas  
which is less red and bit more orange.

15 **J. Fish and Wildlife Commission**

16 According to the presentation by Town Lighting, the Florida Fish and Wildlife  
17 Commission has requirements for protecting sea turtles. Given that FWC has approved 560nm  
18 and 590nm outdoor lighting, we do not understand why high color temperature lighting is being  
19 considered for Estero Island. As is generally the case, safe lighting for turtles also means safe  
20 lighting for humans.  
21  
22  
23

### III. Recommendations

Soft Lights supports the following guidelines for the Estero Boulevard Project.

1. Prioritize the protection of the natural night resource. This resource is shown in Figure 10.



*Figure 10 - Natural Night Resource*

2. Create a baseline set of readings of Sky Brightness for all parts of Estero Island by using a Sky Quality Meter. Set a goal of increasing the sky brightness each year until the island reaches at least 20.5 mpsas.
3. People with light sensitivities can be seriously harmed by high luminance LED lights. Ensure that this group of people is not harmed or discriminated against.
4. Protect public health by protecting starlight and moonlight from light pollution.

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23

- 5. A town with an unpolluted natural night will have be safer and have less crime than a town with more light pollution.
- 6. Use traffic calming and safety techniques that do not include the use of artificial light or that keeps the use of such light at extremely low intensities.

May 16, 2021

Mark Baker  
Soft Lights  
[www.softlights.org](http://www.softlights.org)  
mbaker@softlights.org