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1 Background

The Town of Fort Myers Beach and its consultant are working toward improving the streetlight design for Estero Boulevard. The scope of work includes recommendations for side street lighting.

An important step toward the lighting design success is to seek, receive, respond to and accommodate as much as possible the input from project stakeholders into the design. To this end, the Town’s consultant presented information about lighting in general, and the project in particular at four public meetings:

March 24, 2021 Stakeholder (kickoff)

<https://www.youtube.com/watch?v=40aWSiB-lhs>

May 13, 2021 Stakeholder

https://www.youtube.com/watch?v=O8l_3zjqHhU

May 18, 2021 Public Safety Advisory Committee (PSC)

<https://www.youtube.com/watch?v=SG9vcf-Ex4k&t=4s>

May 19, 2021 Marine Resources Task Force (MRTF) Advisory Committee

<https://www.youtube.com/watch?v=vhtxxfgCS3Y>

The consultant received feedback during the meetings, and subsequent written feedback in emails and on informational handouts provided for that purpose (Attachment 8.1). The Public Safety and Marine Resources Task Force Advisory committees held subsequent special meetings to discuss the outreach document topics so the committees could provide unified feedback (Attachments 8.2 and 8.3)



This document describes the stakeholder and advisory committee feedback and answers questions received during the outreach activities. The feedback content and topics are grouped into the following general categories:

- Scope
- Light Levels
- Light Color
- Safety and Security
- Other Concerns

2 Scope

The project scope was briefly described as lighting design along Estero Boulevard, not including the Times Square area, and recommendations for side streets. The following topics arose:

2.1 Side street lighting uniformity now is poor, and it doesn't feel safe riding a bike at night with light and dark spots (PSC).

Methods for improving lighting uniformity on side streets will be included in the consultant's final report recommendations.

2.2 Recommendation: 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. Suggested alternatives to lighting are pedestrian-activated crosswalk lighting, bike lane separators (physical bumpers), reflective paint, etc. (Soft Lights)

Answer: The use of lighting is one of many toolkit methods to improve safety. The combination of lighting and non-lighting measures is especially applicable at crosswalks, and the consultant will work with the County to provide recommendations for crosswalk treatments.

Also noted is the PSC concern that the county's design of crosswalk solutions might wait and follow behind the consultant's Estero Boulevard lighting system selection, creating design inconsistencies. The consultant is working alongside and concurrently with Lee County to ensure the main road and crosswalk designs are coordinated.

2.3 Lee County Sheriff's Office (LCSO) Input

- **Lighting is our (law enforcement's) friend. The better the light, the better we (responders) can see. We do carry portable light sources, but it's always good to have good lighting.**
- **Light color is important for identifying vehicle and clothing color. When we're responding to a report, it helps us know what we're looking for.**



- **When describing crime deterrent means, we recommend lighting and cameras as the top two measures.**
- **Fort Myers Beach is not considered a high crime area.**

2.4 Fort Myers Beach Fire Department Input

- **Lighting is always a good thing [for us]. We have to be able to see house numbers or other markers.**
- **Operationally, we have no complaints about the current [level, color] of lighting on Estero Boulevard.**
- **Our concern with lower levels of lighting is more of an issue with safety. Apparatus does carry additional scene lighting which may be set up upon arrival, but use of additional [scene] lighting depends on the nature of the call.**
- **We want pedestrians to be able to see. If lighting is removed, or if it is not sufficient to support the pedestrian traffic, then we would not be in favor of that. Lighting needs to be sufficient for the visibility by/of, and security of pedestrians, bicyclists, or any other items on the roadways.**
- **Also [there is a] concern with security, as it relates to being able to see video footage, if needed.**

3 Light Levels

3.1 Question: Where do the Lee County lighting criteria come from? (MRTF)

Answer: The 1.0 footcandle criteria for minor arterials (such as on Estero Boulevard) is based on the American Association of State Highway Transportation Officials (AASHTO) Roadway Lighting Design Guide GL-7 (Reference 7.1). The AASHTO guide is written for agencies (states, counties, cities, towns, etc.) to use for designing roadway lighting systems within their jurisdiction. AASHTO works together with the Illuminating Engineering Society (IES) which publishes the widely used roadway lighting design guide RP-8 (Reference 7.3), for substantial consistency between the guidance documents.

3.2 Question: Does the barrier island of Fort Myers Beach need the brightness stated in the Lee County criteria that originated from the Federal AASHTO guide which also applies to big cities like Chicago? (Stakeholder)

Answer: The light levels indicated in the AASHTO guide (Reference 7.1), similar to other national lighting guides, vary according to roadway functional classifications (e.g., local, collector, arterial, etc.) and level of pedestrian activity, not the size of the city; though large cities are likely to have more roads with higher classifications. The



considerations for determining roadway functional classifications involve such features as access points, route spacing, speed limits and traffic volumes, number of travel lanes and other qualities. Estero Boulevard's characteristics south of San Carlos are considered by Lee County to fall under the Arterial classification (1.0 footcandle).

3.3 Is more lighting the solution to glare from oncoming headlights? (PSC)

Answer: Sometimes, but not always. The definition of glare from (ANSI/IES LS-1-20) (Reference 7.5) is:

The sensation produced by luminances within the visual field that are sufficiently greater than the luminance to which the eyes are adapted to cause annoyance, discomfort, or loss in visual performance or visibility.

Note: The magnitude of the sensation of glare depends on such factors as the size, position, and luminance of a source; the number of sources; and the luminance to which the eyes are adapted.

This two-part definition first implies the greater the ratio of unwanted light to useful light, the greater the sensation of glare. The second part notes that the sensation of glare depends on a lot of other factors. Well-designed street lighting helps to overcome the effects of glare from oncoming headlights when it provides useful illumination of the road and doesn't create more glare.

3.4 Question: Can you provide data on the risks and dangers of glare. (PSC)

Answer: (See item 3.3 above for glare definition). It is well-known that glare interferes with visibility and therefore safety. It is the intention of every good lighting design to minimize glare – in fact, there is a metric for disability glare in the lighting calculation called “veiling luminance” with limits on acceptable values (Reference 7.3, Section 10.5.1). The limitation constrains the amount of light reaching the eye from the light source to be a small fraction of useful light reaching the eye from the illuminated area, i.e., the pavement, vehicles, pedestrians and other objects. For concerns related to human health and light's effects on human circadian rhythm and sleep cycles, see item 4.5 below.

3.5 Why does the presentation cite the 2016 FDOT Greenbook graphic (for light levels) when there is a more current [design manual] with added wildlife areas of concern (MRTF)?

Answer: The 2016 Greenbook (Reference 7.6) was cited because it is the most current revision of that document, and it shows the lighting illuminance criteria for minor arterials (such as Estero Boulevard) as 1.0 footcandle. Table 231.2.1 of the 2020 FDOT Design Manual (Reference 7.9) also indicates the 1.0 footcandle



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criterion, and the same table indicates 1.0 to 1.5 footcandles for arterials and collectors with wildlife-sensitive lighting.

Section 231.2.1 of the 2020 FDOT Design Manual, “Wildlife-Sensitive Conventional Lighting,” continues with the guidance:

(2) “Design lighting system using luminaires from the Wildlife-Sensitive Conventional Lighting category of the APL.”

According to the 2020 FDOT Design Manual, Wildlife-Sensitive Conventional Lighting products are amber lights. See item 3.6 below.

3.6 Is the Estero design required to follow this (Item 3.5 above) FDOT roadway guidance? (MRTF)

Answer: The consultant’s consideration of a dual-source (amber/white switchable by season) solution would require negotiation with FDOT for allowance of an amber/white dual-source luminaire if Estero Boulevard were FDOT-owned. Estero Boulevard is not an FDOT road. It is owned by Lee County and the Town of Fort Myers Beach; therefore, rather than work with FDOT, the consultant is working with the County and the Town to investigate the feasibility of using a product that provides better visibility than that offered by amber lighting. The final design may use products from the current APL’s Wildlife-Sensitive Conventional Lighting category, but at this point, early in the design, a broader selection is being considered.

In any case, every light that is visible from the beach must be amber during turtle season, and the light’s point source will be shielded regardless of the color.

4 Light Color

4.1 Given that FWC has approved 560nm and 590nm outdoor lighting, we do not understand why high color temperature lighting is being considered for Estero Island. (Soft Lights)

It is important to note that if amber light were best for safety and visibility, it would be recommended throughout the state for all situations throughout the year, but it is not. The reasons high color temperature lighting is being considered for Estero Island are:

1. Visibility is better; therefore, safety is improved. People see better under broad-spectrum lights. 4000 Kelvin is the default FDOT light color requirement per FDOT Specifications 992 (Reference 7.7) because it is identified as having the highest visibility benefit, providing about 20% greater detection distance compared to 3000K and 5000K. (Reference 7.14). See Figure 1. Greater detection distance means a driver can respond sooner to, for example, a pedestrian stepping into the street. Earlier response increases the likelihood that a collision can be avoided.



Figure 1 - 4000K is the default FDOT requirement.

2. Energy efficiency is greater. The stakeholder outreach form included a table roughly comparing the energy costs between some products being considered. The table shows how designing with amber can lead to 192% more energy costs than an equivalent High Pressure Sodium design, and four times more than a design using 4000K. Higher lumen output products are also being considered. Other feasibility factors of newer products are being investigated such as the likelihood of inventory availability in the longer term.
3. Carbon footprint is lower. Following on the lower energy costs is the lower carbon footprint for broad spectrum lighting proportional to the energy increase. Amber lights can have four times the carbon impact as broad-spectrum lights.
4. Initial costs are lower. Notice the (Qty) column in the table (Figure 2). The bottom row shows 561 luminaires on poles would achieve the same light levels that could be accomplished with 146 4000K luminaires. That would make the initial (capital) costs for Amber roughly 4 times greater than a design with currently approved amber luminaires.



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Luminaire	Source	Lumen Output	Power W	Qty.	Total Power W	KW	kWh for 11h/day	kWh for 365 days	Annual Energy Cost	Energy Cost Difference
Cooper OVY Series	200W HPS	17,000	240	175	42,000	42.0	462.0	168,630	\$16,863	Similar to today
eLuminaire 4000K	LED	17,000	146	140	20,440	20.4	224.8	82,067	\$8,207	49% (less)
eLuminaire Amber	Amber LED	16,500	470	140	65,800	65.8	723.8	264,187	\$26,419	157% (more)
Cree-RSW-AMBER	Amber LED	5,300	144	561	80,830	80.8	889.1	324,533	\$32,453	192% (more)

Figure 2 - Comparative energy costs: Amber is highest.

- It is more useful to first responders. Broad-spectrum light is more first-responder friendly because of the better color-rendition. First responders have shared with us that it IS important to be able to see colors to identify people and vehicle color, and that is not possible under amber lighting as shown in Figure 3. See LCSO and Fire Dept input under Items 2.3 and 2.4 above.



Figure 3 – A1A Lighting: Amber does not allow perception of different colors

4.2 The appearance of having to choose between humans and turtles depending on the season is an unacceptable position. (PSC)

Answer: Federal and State laws mandate the protection of sea turtles, and that is why amber is being considered when visibility of the light from the beach cannot be prevented by shielding or other means. In every other case, such as when lights can be effectively shielded, and during times when the turtles are not nesting, we are not restricted by law to using amber; instead, we can follow the default FDOT recommendation to use 4000K light for optimal visibility (Reference 7.7). The broad-spectrum versus amber selection is a way to use the best achievable visibility solution allowed by law at all times.



Also noted and agreed is the PSC's recommendation that the best possible alternative for pedestrians, cyclists, and vehicle operators should not be reduced during turtle season and that uniformity throughout is important.

4.3 Question: Are there any other lighting solutions besides narrow-band, amber LED lighting that satisfy marine sea-turtle regulations? (MRTF)

Answer: The narrow-band amber LED light color is required at every location where light is visible from the beach. There are ways to mitigate (i.e., reduce or block) the visibility of lights from the beach, but because there are many areas of clear visibility from the beach to Estero Boulevard, the turtle-season solution may require at least some amber LED lights.

4.4 Question: How are the lighting visibility studies created in other cities and countries relevant to Fort Myers Beach? (Stakeholder)

Answer: Lighting visibility studies analyze the human optical response and physical response times under controlled conditions and are not geographically dependent.

4.5 Question: Can you provide references supporting the statement that the AMA's recommendation to limit light color to 3000K should not be applied to street lighting? (Stakeholder, MRTF, Soft Lights)

Answer: The Illuminating Engineering Society (IES) document PS-09-17 (Reference 7.12). responded to AMA CSAPH Report 2-A-16, "Human and Environmental Effects of Light Emitting Diode (LED) Community Lighting." (Reference 7.2) In it, the IES affirmed its alignment with the AMA in support of proper conversion of outdoor area and roadway lighting to LED light sources, with proper optics and shielding to reduce glare and light trespass. The IES disagreed with the limitations on spectral content for outdoor area and roadway lighting emphasizing that, while the principal motivators were understandable, there was not sufficient supporting information, and recommended a more comprehensive analysis of the public health impacts of outdoor and roadway lighting prior to adopting policies that could have a negative effect on the safety of drivers and pedestrians.

The National Electrical Manufacturers Association (NEMA) published a lighting systems document LSD 55-2017, "Outdoor Lighting and Human/Animal Factors : An Industry Evaluation" (Reference 7.16), wherein NEMA acknowledged sharing the same fundamental concerns as many do regarding the need for energy conservation, dark sky preservation, mitigation of potential ecological impacts of outdoor lighting, and the growing body of research that seeks to understand and explain the effect of the circadian cycle on human and animal health. NEMA members support the ongoing efforts of the IES, the International Dark-Sky Association, and the United States Department of Energy (DOE), as well as initiatives that minimize the amount of outdoor electric lighting needed to achieve functionality that reduces unnecessary stray light. NEMA Lighting Systems Division members communicated significant



concerns with published materials portraying outdoor lighting as contributing to a negative nighttime environment without giving due consideration to all the factors involved, and the existing body of scientific research. The document cites the Rensselaer Polytechnic Institute Lighting Research Center (LRC) response to the AMA report (Reference 7.17) stating several studies have documented that the required exposure to higher color temperature “blue” light to the retina is extremely unlikely to be achieved under outdoor lighting conditions.

4.6 Question: If 4000K LED streetlights are added, would that increase skyglow to an extent roughly proportional to the number of lights added? (Stakeholder, MRTF)

Answer: Not necessarily. Skyglow can be limited or reduced by proper lighting design and shielding.

4.7 Question: Are the (FPL) 3000K and 2700K luminaires available now? (Stakeholder).

Answer: The current FPL LED Catalog (Reference 7.10) contains 3000K streetlight products, and no 2700K products.

4.8 Question: What are our neighboring Floridian coastal communities doing for streetlights in wildlife-sensitive areas? (Stakeholder, PSC, MRTF)

Answer: Some of the neighboring communities’ streetlight solutions in wildlife sensitive areas are:

- The City of Treasure Island installed a trial of eight amber LED luminaires in collaboration with Duke Energy (i.e., on power utility poles). See Figure 4. The installation was approved by FWC, and the City is planning to add 80 more. Treasure Island police and fire departments have expressed opposition to the amber installation. The light quality has been subjectively described as “muddy,” similar to low pressure sodium, with poor discernment of color. The trial luminaires were not on Duke Energy’s approved light list, a favorable sign toward the possibility of the Town of Fort Myers Beach project introducing new utility program products for Estero Boulevard. Both utility and non-utility program systems are being considered for Estero boulevard.
- Sarasota county uses low pressure sodium luminaires where turtle friendly lighting is required.
- Siesta Key had installed a test streetlight installation of Amber LED luminaires several years ago through the FPL street lighting program; however, it has since been removed. Today, luminaires visible from the beach are turned off.



Figure 4 - Treasure Island test installation. Reference 7.11.

- Siesta Key has installed pushbutton-activated flashing beacons at crosswalks.
- Siesta Key public parking lots are lit with amber LED decorative luminaires with 270° beach-side shielding on 14 ft poles.
- Bradenton Beach installed a test installation of amber LED luminaires several years ago through the FPL street lighting program, however, it has since been removed.
- Ft Lauderdale Beach installed an amber LED streetlight system along A1A, replacing some existing broad-spectrum lights with amber lights on utility poles on the landward side of A1A, and new decorative pedestrian-level amber LED lights on the beach side in other areas. See Figure 3 above.

4.9 Statement: [Visibility to Estero Boulevard is] wide open at our beach access. A corridor of white light can attract the hatchlings and disorient the mother sea turtles because they can see underneath and between buildings [and reflections from buildings and other structures]. A corridor of white light is not the answer. (Stakeholder)

Answer: It is required to shield light sources from beach visibility, no matter whether the light is white or amber. If it is not possible to shield the source and the volume of light in the air between the luminaire and the pavement, then amber lighting will be required during turtle nesting season.

4.10 There is a relatively large contingent on the beach that understands and rejects white light and would like to ensure there is consideration for an IDA compliant, narrow-band amber lighting solution for the Town on a full year basis. (Public)

Answer: Narrow-band amber lighting is not the only IDA-compliant type of lighting, as is demonstrated by the darksky.org example of a successful before/after implementation of Dark-Sky measures (Figure 5). IDA principles for responsible outdoor lighting focus on purpose, limiting light to the locations and brightness needed, and limiting the amount of shorter-wavelength light to where it’s needed (Reference 7.13).



Figure 5 - Example of a successful Dark-Sky conversion project using non-amber lights at darksky.org/get-involved/

5 Lighting Extents

The topic of lighting extents refers to how much of the roadway and its surrounds are to be illuminated, i.e., only the roadway, the roadway and sidewalk, or the roadway, sidewalk and property to the building, sometimes centerline-to-keyhole (considered to have some security benefit). The consultant’s recommendation was to light the roadway and sidewalk because:

1. Lighting sidewalks would provide better visibility of pedestrians, for better advance indication of their travel direction.
2. There is no apparent desire to light property behind the sidewalk toward buildings.
3. Crime prevention is not a main goal of the lighting project.

The PSC recommendation was also to light the roadway and sidewalk; MRTF recommendation is to light the roadway to sidewalk.



On the topic of lighting and crime, the following comments were received.

5.1 The following studies conclude that street lighting does not reduce crime. (Soft Lights)

1. ***The Effect of Reduced Street Lighting on Crime and Road Traffic Injuries at Night (England and Wales)*** <https://www.ncbi.nlm.nih.gov/books/NBK316511/>.
2. ***Streetlights and How They Relate to Crime (Houston)*** <https://kinder.rice.edu/sites/default/files/documents/Kinder%20Streetlights%20and%20Crime%20report.pdf>.
3. ***Outdoor Lighting and Crime, Part 1: Little or No Benefit (Australia)*** <http://asv.org.au/downloads/Outdoor%20Lighting%20and%20Crime,%20Part%201.pdf>.

Answer: The comment is responding to the consultant's reference to a US Department of Justice guide, "*Improving Street Lighting to Reduce Crime in Residential Areas*," (Reference 7.18). The guide advises that reductions in crime can be achieved by improvements in street lighting, and the improvements can reduce crime during the day and night.

The three studies cited by the commenter raise doubts about the correlation of crime increases and/or reductions to nighttime artificial lighting.

1. The England/Wales study investigated the effects of removing or dimming lights. Although it recognized that adding lighting seemed to reduce the occurrence of road collisions, the study found no evidence of reductions in traffic collisions or crime as a result of reducing or dimming outdoor lighting. The study further cautions against generalizing the results, since its overall conclusions varied across contexts. Some study areas where lighting appeared to reduce crime were more deprived areas, and part-night lighting was only associated with decreases in burglary and vehicle crime in less-deprived areas.
2. The Houston study found that the observed reduction in crime (one percentage point decline) cannot be confidently linked to the presence of lighting, since the relationship between streetlights and crime is complicated and includes such factors as density, activity, and the presence of opportunity. The authors of this study did not identify themselves or the sponsor of the study. There is no statement of context or evidence of peer review as is required by such national organizations as the National Academies of Science.
3. The Australian study concluded that although artificial light at night tends to allay the *fear* of crime, any deterrent effect on *actual* crime is difficult to investigate because of pervasive extraneous influences.

All three studies recognize that the link between lighting and crime varies with context and is integrated with many other factors. All three studies acknowledge that other



lighting effects were not studied, e.g. feelings of security, appearance of pride or neglect from adding or removing lights, respectively.

The commenter cited four additional studies:

- An Australian astronomical society study stating that although lighting allays fears of crime, the correlation between lighting and crime rates is not evident.
- A news report stating that thefts and burglaries in a Swedish municipality were halved in the months after lights were darkened because of a billing dispute with the municipality's energy company. A contributor postulated that it may be because people were staying indoors more.
- A Canadian astronomical society study stating that although lighting allays fears of crime, the correlation between lighting and crime rates is not evident.
- An International Dark-Sky Association information sheet indicating that campuses lighted at night encourage assembly and therefore vandalism.

All of the above-cited reports, studies, and articles are multifaceted documents, and it is not the intent of this outreach document to completely analyze, confirm, or refute any of them. They can all provide input and considerations for the Town of Fort Myers Beach—the most important of which is that the link between lighting and security depends on context.

It has not been a goal of the Estero Boulevard Lighting Design Project to resolve security problems. The main goal of the Estero Boulevard Lighting Project is to improve pedestrian and bicyclist safety. Nevertheless, please see LCSO and Fire Department input under Items 2.3 and 2.4 above.

5.2 There is a sight-distance concern surrounding too many additional poles; placement of poles may interfere with vehicle operators' ability to see pedestrians and cyclists as the vehicles are exiting driveways onto Estero Boulevard.

Answer: The FDOT Access Management Guidebook (Reference 7.8) includes the "sight triangle" as an important consideration for any roadway design project involving vertical elements such as poles, control cabinets, structures, or landscaping. Designs are prepared to minimize or eliminate sight distance problems.

6 Dark-Sky Concerns

6.1 Question: Does light equal pollution? (MRTF)

Answer: Light falling outside the area intended to be illuminated is light-trespass when it crosses a property line or right-of-way. Unwanted light trespass is considered by some to be pollution. LED lighting is far superior to previous technologies in its ability



to direct light to the intended area with less spill light (trespass) than was generally possible with HPS. Well-designed lighting that is provided to improve safety of pedestrians, bicyclists, and drivers is generally not considered to be pollution.

6.2 Does the consultant team have Dark-Sky design experience (MRTF)?

Answer: Yes.

6.3 Statement: None of the existing standards (e.g. IES RP-8, FDOT Greenbook, etc.) would be applicable for LED lighting. (Soft Lights)

Answer: All the cited standards are applicable to LED lighting. All promote LED technology as the most efficient light source with no concerns about application.

Abney's Law of additivity states that the total luminance composed of a mixture of wavelengths is equal to the sum of the luminance of its monochromatic components. This provides the basis for color mixing of light, such as R, B, & G colors being used to create white and other colors of light. Two examples are being able to see white light, and viewing of a rainbow. The same principle allows non-homogeneous sources to mix light and appear homogenous at distances greater than 100 times the size of the source (this is approximate based on light control elements). For LEDs this is 4 inches. ANSI/IES standards require that outdoor luminaires be photometrically tested using far-field photometry (Reference 7.4). This dictates a test distance of luminaire/source to photodetector of 25 feet minimum. At this distance, discrete LEDs (single die) appear as point sources. These are generally mounted in arrays. The size of an array may approach that of an HID lamp. Regardless of the size or shape of the light source, the design goal is to provide uniform lighting while limiting direct view of light by drivers, pedestrians, and sea turtles.

6.4 The Americans with Disabilities Act (ADA) prohibits discrimination against light-sensitive persons. The design of streetlighting must not harm sensitive receptors. (Soft Lights)

Answer: Without debating the ADA applicability to light sensitive persons, the design and products will comply with applicable federal, state, county, and local laws.

6.5 Statement: In most cases, the poor application of lighting will not contribute to a sense of safety and community. (Soft Lights)

Answer: The designation of poor lighting is a subjective qualification. There is no context to respond to this statement without defining good versus poor application of lighting. The sense of security and community varies from individual to individual for a given lighting condition. Each person has their own psychological response to their environment. What one person considers glary and annoying, others prefer as a good security light for their residence as evidenced by millions of security lights being installed in the U.S. alone. When surveyed in groups, people tended to agree that



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more lighting felt more secure at night. This response was generally consistent in the range of 1 to 5 footcandles (fc). Further increases above 5 fc were unlikely to improve perceptions of safety and security (Reference 7.14).

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- 7.18 United States Department of Justice, Office of Community Oriented Policing Services (COPS), Problem-Oriented Guide for Police Response Guides Series No. 8, “Improving Street Lighting to Reduce Crime in Residential Areas,” December, 2008, <https://cops.usdoj.gov/RIC/Publications/cops-p156-pub.pdf>.

8 Attachments

- 8.1 Outreach Form (Page 18)**
- 8.2 PSC Feedback (Page 26)**
- 8.3 MRTF Feedback (Page 29)**



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1. Introductory Video (6 minutes)

2. Project Scope Details

2.1 Street lighting design for Estero Boulevard

- North of San Carlos Blvd: Town Owned
- South of Crescent Blvd: County Owned

2.2 Special attention to the 45 crosswalks (partnership with Lee County)

2.3 Recommendations for public side streets (shown in yellow)

2.4 Not in scope:

- Times Square area
- San Carlos Blvd (FDOT owned)
- Private side streets (shown in purple), e.g.:
 - Bay Beach Dr
 - Bay Village Dr.
 - Widgeon Ter.
 - Sand Dollar
 - Sunset Cir.



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3. Light Level Considerations

3.1 Lighting Level

Estero Boulevard is minor arterial along most of the island. Here is the light level standard for minor arterials:

Topic # 825-000-015
 Manual of Uniform Minimum Standards
 for Design, Construction and Maintenance
 of Streets and Highways

April 2016

Lighting Levels:
 $E_{AVG} = 1.0 \text{ fc or}$
 11 Lux
 $L_{AVG} = 0.9 \text{ CD/M}^2$



TABLE 6 – 1 Level of Illumination for Streets and Highways

Roadway and Walkway Classification	Off-Roadway Light Sources	Illuminance Method				Illuminance Uniformity Ratio	Luminance Method			Additional Values (Both Methods) Vailing Luminance Ratio
		Average Maintained Illuminance (Horizontal)					Average Maintained Luminance			
		R1	R2	R3	R4		L_{avg}	Uniformity		
Principal Arterials (partial or no control of access)	Commercial	1.1	1.6	1.6	1.4	3:1	1.2	3:1	5:1	0.3:1
	Intermediate	0.8	1.2	1.2	1.0	3:1	0.9	3:1	5:1	0.3:1
	Residential	0.6	0.8	0.8	0.6	3:1	0.6	3.5:1	6:1	0.3:1
Minor Arterials	Commercial	0.9	1.4	1.4	1.0	4:1	1.2	3:1	5:1	0.3:1
	Intermediate	0.8	1.0	1.0	0.9	4:1	0.9	3:1	5:1	0.3:1
	Residential	0.5	0.7	0.7	0.7	4:1	0.6	3.5:1	6:1	0.3:1
Collectors	Commercial	0.8	1.1	1.1	0.9	4:1	0.8	3:1	5:1	0.4:1
	Intermediate	0.6	0.8	0.8	0.6	4:1	0.6	3.5:1	6:1	0.4:1
	Residential	0.4	0.6	0.6	0.5	4:1	0.4	4:1	6:1	0.4:1
Local	Commercial	0.6	0.8	0.8	0.6	6:1	0.6	6:1	10:1	0.4:1
	Intermediate	0.5	0.7	0.7	0.6	6:1	0.5	6:1	10:1	0.4:1
	Residential	0.3	0.4	0.4	0.4	6:1	0.3	6:1	10:1	0.4:1
Alleys	Commercial	0.4	0.6	0.6	0.5	6:1	0.4	6:1	10:1	0.4:1
	Intermediate	0.3	0.4	0.4	0.4	6:1	0.3	6:1	10:1	0.4:1
	Residential	0.2	0.3	0.3	0.3	6:1	0.2	6:1	10:1	0.4:1

Continued on next page

Lighting

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4. Light Color Considerations

- 4.1 In areas visible to the beach during nesting season, amber color lights will be required.
- 4.2 Higher color temperature means more skyglow, which could distract turtles.
- 4.3 Higher color temperature means better visibility, which could reduce crashes.
- 4.4 Higher color temperature means better energy efficiency. Here is an example of comparative energy costs between HPS, 4000K LED, and amber LEDs. Each row in the example delivers roughly the same amount of lighting for a length of roadway similar to Estero Boulevard.

Luminaire	Source	Lumen Output	Power W	Qty.	Total Power W	KW	kWh for 11h/day	kWh for 365 days	Annual Energy Cost	Energy Cost Difference
Cooper OYV Series	200W HPS	17,000	240	175	42,000	42.0	462.0	168,630	\$16,863	Similar to today
eLuminaire 4000K	LED	17,000	146	140	20,440	20.4	224.8	82,067	\$8,207	49% (less)
eLuminaire Amber	Amber LED	16,500	470	140	65,800	65.8	723.8	264,187	\$26,419	157% (more)
Cree-RSW-AMBER	Amber LED	5,300	144	561	80,830	80.8	889.1	324,533	\$32,453	192% (more)



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4.5 EXERCISE

Different light colors have certain advantages / disadvantages for human safety and effects on turtles. Share your thoughts on this. Assign a priority of 1 – 10, with 1 being most important.

Light Color	Pros / Cons	How Important Is This in Turtle Season?	How Important Is This outside Turtle Season?
4000K	Increased skyglow		
	Increased chance of turtle disorientation		
	Best color rendition for <ul style="list-style-type: none"> • Sense of Security • First Responders • Tourism 		
	Best visibility of pedestrians / decreased chance of accidents		
	Least Energy Use ~120 Lumens per Watt Efficacy		
2700K - 3000K (2700K is low availability)	Existing side street light color		
	Increased skyglow, possibly less than 4000K		
	Increased chance of turtle disorientation, possibly less than 4000K		

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Light Color	Pros / Cons	How Important Is This in Turtle Season?	How Important Is This outside Turtle Season?
	Good color rendition, but less than 4000K for: <ul style="list-style-type: none"> • Sense of Security • First Responders • Tourism 		
	Good visibility of pedestrians, not as good as 4000K		
	Energy Use Comparable to 4000K, about 5% worse.		
Turtle-Friendly Amber	Very little skyglow		
	Little chance of turtle disorientation		
	Poor color rendition for: <ul style="list-style-type: none"> • Sense of Security • First Responders Tourism		
	Decreased visibility of pedestrians / increased chance of accidents <ul style="list-style-type: none"> • 		
	Worst Energy Efficiency ~36 Lumens per Watt Efficacy Significant additional capital costs		

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Light Color	Pros / Cons	How Important Is This in Turtle Season?	How Important Is This outside Turtle Season?
<p>How does the importance of the above considerations differ between Estero Boulevard and side streets?</p>			
<p>Other Light Color / Level / Quality Considerations</p>			

5. Lighting Design Extents

5.1 An Estero Boulevard safety risk is pedestrians suddenly walking into the street at crosswalks and non-crosswalk locations. Lighting for areas surrounding the roadway can improve driver visibility of pedestrians, providing longer detection distance and reducing the chance of accidents.



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5.2 EXERCISE

Share your thoughts about the extents of lighting. Assign a priority of 1 – 10, with 1 being most important.

Lighting Design	Pros / Cons	How Important Is This for Estero Blvd?	How Important Is This for Side Streets?
Roadway Only	<ul style="list-style-type: none"> • Lowest Cost • Least Lighting • Least Pedestrian Visibility 		
Roadway + Sidewalks	<ul style="list-style-type: none"> • Medium Cost • More Lighting than Roadway Only • Better Pedestrian Visibility 		
Roadway + Sidewalks + Surrounds, Not Buildings	<ul style="list-style-type: none"> • Highest Cost • Most Lighting • Greatest Pedestrian Visibility • Possible Property Security Benefit 		

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Lighting Design	Pros / Cons	How Important Is This for Estero Blvd?	How Important Is This for Side Streets?
Other Design Extents Considerations			
Other Overall Considerations			

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Public Safety Committee feedback/recommendations for Lighting Consultant:

Street lighting requirements and concerns as determined by the Public Safety Advisory Committee.

The Public Safety Committee was established by Town of Fort Myers Beach ordinance 18-06, Establishment of Boards, with the following directive:

(g) - Public Safety Committee - The PSC shall address any safety and transportation issues specifically assigned to the committee by the Town Council for the purpose of the health, safety and welfare of the citizens and visitors to the Town of Fort Myers Beach. The committee shall review, discuss and evaluate the most significant safety and transportation issues within the Town. The PSC shall advise the Town Council on these matters or any other topics as assigned by the Town Council.

Therefore, the Committee took the approach of determining street lighting requirements which best protect the pedestrians, cyclists and vehicle operators on the island. We recognize that mandates exist for protection of island wildlife, with special attention to turtles and disorientations. However, that is not part of the Public Safety Committee's direction from the Council. It is our expectation that you will consider these requirements and concerns regarding pedestrian, cyclist and vehicle operators and factually present and position them to the Council equally with the requirements needed to be in compliance with FWC regulations.

Each committee member attempted to complete the survey provided to us, however it did not allow the committee to accurately document our requirements. Further it was asking very specific questions regarding various lighting intensity and color solutions. The committee felt it was not competent to answer those questions, we expect you will review our requests/recommendations and provide the facts as to how each of these viable lighting options is impacted by the various scenarios.

Survey Feedback:

- ⇒ Page 4 of 8 - We recommend light uniformity along the entire length of Estero Boulevard. The light solution must be consistent for the entire year (both in turtle season and out of turtle season). Whatever solution is recommended to the Council should ensure the best possible alternative for pedestrian, cyclist and vehicle operators and should not be reduced during turtle season. The end result of reducing the lighting efficiency during specific periods would basically be saying that human safety is less of a priority at various times of the year. The Public Safety Committee believes that is an unacceptable position.
 - ⇒ Side street and beach access lighting — there needs to be a "uniform" transition between side street and beach access lighting and the solution proposed for Estero Boulevard. It is our understanding that lighting uniformity is the key to reducing the negative impact of "eye confusion" on visibility. At no time should the solution be to turn off lights or reduce the lights during specific times of the year. (see above)
- ⇒ Page 5 of 8 - Conflicting studies to those you presented have been raised by the Stakeholders group on the effect of lighting for emergency responders. The Committee doesn't question the validity of these studies but they seem to represent differing population density and possibly differing operating models for emergency responders. We therefore, request that you interview representatives from the Fort Myers Beach Fire Department and the Lee County Sheriff's Office to determine their operating procedures to assess if/how the lighting solution that is recommended will have an impact on our local emergency response units.



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- o You ask a question of decreasing visibility – it is impossible to answer that question without the metrics and impact of how much the recommended solution options decrease visibility and what the impact would be on public safety. Therefore, when you are making your recommendations to the Council, we ask that you document the degree of impact the decrease has in life situation metrics. For example, time for vehicle operator to respond when seeing a pedestrian, distance at which a pedestrian or cyclist is visible. Percentages really wouldn't be an effective way to assess the impact.
- Page 7 of 8 The Committee recommends that the street light coverage include both street and sidewalk. Since the streetlights are physically on the gulf side of the Boulevard, we would like further explanation of how any proposed solution will light the sidewalk on the Bay side of the Boulevard. Will there need to be additional poles installed on the Bay side? In addition to the more obvious need to have visibility to pedestrians stepping off the sidewalk onto the street there is also the problem of cyclists riding on the sidewalks in conflict with pedestrians. Without adequate lighting on both sidewalks the clash of these two sidewalk users is a risk to public safety.

Other Recommendations and Concerns:

- Solution must conform to the laws of the State of Florida, Lee County and Town of Fort Myers Beach.
- The solution must be fiscally viable beyond initial implementation. The costs of future maintenance must be reasonable as to ensure that funding will never create a situation where street lighting is not operating as designed, thereby creating lighting gaps and increasing the risk to the public.
- The lighting product(s) that are recommended must allow for sufficient inventories to address timely replacement or rebuilding of any damaged fixtures in the event of a disaster or other event that causes lighting outages.

Crosswalks are not part of your scope within the current RFP. This is a very big concern for the committee. It is our understanding that to optimize lighting at crosswalks requires coordination of street lighting, crosswalk specific lighting and surrounding area lighting. We further understand that the County has indicated that they will design the crosswalk lighting after the Council selects the street lighting solution. While the County is a great partner this sequencing may have the following effect 1) the solution selected by the Council may constrain the crosswalk solutions available to the County and therefore not provide optimal light solutions at these critical pedestrian / vehicle touchpoints or worse have a deteriorating effect on the solution selected by the Council 2) Waiting to design the crosswalks until after the street lighting solution is selected by the Council will further delay providing a lighting solution at these critical intersections of pedestrians and vehicles 3) With the County designing the crosswalk solution the Town will have less input into that design than if crosswalks were included in this initial recommendation by the Town's consultant i.e. Town Lighting.

The number of additional poles that may be added in your recommended solution – the placement of these poles may interfere with the visibility of vehicle operators as they exit personal or commercial accesses/drives. Pedestrians and cyclists may be hidden in a blind spot created by additional poles.

We too would like to have you demonstrate what solutions other like communities have implemented, both narrative description with documented results as well and visuals.



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Finally, if the solution you propose requires compromise to the optimal solutions available to provide the greatest protections to pedestrians, cyclist and vehicle operators we request that you detail where those compromises were made and the impact of those compromises. Again, using situational metrics not percentages or degrees to quantify the impact.



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Estero Blvd Lighting Project—Recommendations

MRTF Advisory Board—Our Purpose & Scope

“The broad objective of the MRTF is to further the welfare of the citizens of the town by helping to promote a better, more healthful, safe and attractive community environment and to ensure that the unique and natural characteristics of our marine resources are present.”

Project Purpose:

- To identify all major aspects involved in the Estero Blvd Lighting Project, discuss the relative impact to our community, and draft our project recommendations for the lighting design firm Town Lighting, our Town Council, and the residents of our community.

MRTF Findings:

- The installation of 3K white LED street lighting installed in 2019 on our side streets and beach accesses proved to not comply as wildlife friendly lighting and now results in over 30 of these new roadway fixtures being turned off during turtle season. Immediately following this project, the County Metropolitan Planning Organization was enlisted to provide a lighting design plan for Estero Blvd. When presented, this plan included the installation of 4K white LED street lighting throughout the Blvd. Our previously seated Council voted three times to reject the 4K white LED plan voting 3-1, 4-1, 4-1.
- The Town of Fort Myers Beach environment continues to be assaulted with water pollution impairment problems, airline noise pollution disturbance, continued residential/commercial development and increased density. Conservation of what remains is of the utmost importance to our community and it’s future.
- Artificial lighting, albeit a help to society, is also a source of light pollution affecting our environment. Artificial lighting at night has a direct impact on our entire ecology, including human health, biodiversity and quality of our night skies. White LED lighting, currently absent on Estero Blvd, emits blue-rich white light that further exasperates the affects of artificial lighting on our natural environment.
- Sky glow, as well as other forms of light pollution can be attenuated using Dark Skies principles. The MRTF is investigating the process of becoming a Dark Skies community, which the use of narrow band amber (NBA) LED street lighting would become the backbone of compliance.
- Safe roadway lighting is incumbent on providing a uniform corridor of illumination. As such, each Estero Blvd lighting recommendation will include an increase of light illumination in order to meet uniform lighting requirements. We find that choosing NBA LED street lighting will offset this increase in light pollution due to it’s long wavelength spectral power distribution while conserving the closest color match to our current HPS street lighting.

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Estero Blvd Lighting Project—Recommendations

MRTF Findings:

- All three current traffic signal projects on FMB incorporate full year, NBA LED lighting due to wildlife sensitive lighting concerns. Lynn Hall Park and Bowditch Point Park are also lit with NBA LED lighting. Harmonizing street lighting and light color will improve visual acuity while contributing to the overall consistency of our community appearance.
- We have examined the current case study of Treasure Island, FL in Pinellas County and consider it to be a parallel experience to what our community is facing. Their coastal street lighting design solution is comprised of safe, FDOT & FWC approved NBA LED street lighting, and should be used as a benchmark when considering street lighting design for Estero Blvd.
- Town Lighting stated in the MRTF presentation that they could proceed today with a full NBA LED solution, similar to that which was adopted by the County signal plan lighting.
- The FPL Director of LED Lighting Solutions presented information to Town Council regarding cost information involving retrofit projects using NBA LED street lighting that minimize costs to the Town through tariff programs.
- The use of wildlife friendly lighting, while minimizing blue-rich white light will preserve the ecological biodiversity of our community and reinforce the eco-tourism branding of our island community.

The Marine Resource Task Force submits the following unanimous recommendations for the Estero Blvd lighting project:

- I. MRTF advises the FMB Council to choose NBA LED streetlights for year around use on Estero Blvd and on the Town side streets.
- II. MRTF advises the FMB Council to comply with Dark Sky lighting principles.
- III. MRTF recommends center line to sidewalk for Estero Blvd lighting design.
- IV. MRTF recommends the enhancement of pedestrian safety at crosswalks utilizing additional on-demand technology while adhering to Dark Sky guidelines and sea turtle lighting ordinances.

Marine Resource Task Force Advisory Board – 28 May 2021		
Wendy DeGaetano	Rose Larkin	Mary Rose Spalleta
Rob Howell	Jennifer Ruak	Greg Fossum, Vice Chair
	Steve Johnson, Chair	