BENJAMIN FRANKLIN DR. SOLAR LIGHTING

19-23TS SOLAR LIGHTING PROJECT

July 2020

PRESENTATION

- SCOPE OF WORK
- TECHNICAL SPECIFICATIONS
- CURRENT CONDITIONS
- WHY SOLAR?
- PROJECT KEY FACTS
- TRADITIONAL vs SOLAR
- COST-BENEFIT ANALYSIS

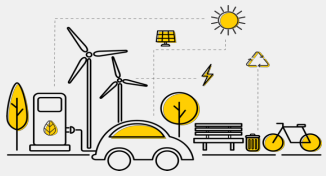
SCOPE OF WORK

Replacing 56 units of 30-ft tall deteriorating light poles and fixtures along Benjamin Franklin Drive from South Washington Dr. to the Southern terminus at South Lido Key Beach with 270 light pole units at maximum mounting height of 18-ft, per current code requirements

- SOLUTIONS
- SAVINGS
- SUSTAINABILITY

1.6 Miles

TECHNICAL SPECIFICATIONS



LIGHTING MINIMUM SPECIFICATIONS

- **Standalone Solar Lighting Systems**
- **All Light-emitting Diode (LED) Amber**
- **3 Days Min. Battery Capacity**
- **Meet FDOT Breakaway Standards**
- **Roadway: 18-ft Max. Mounting Height.**
- **Sidewalk: 12-ft Min. Mounting Height at Beach Front.**

FDOT ROADWAY LIGHTING REQUIREMENTS

- **ROADWAY**
  1.5 FC*
- **CROSSWALK**
  2.3 FC
- **SIDEWALK**
  1.5 FC
- **DRIVEWAYS**
  1.5 FC
- **Max. Illumination at Beach**
  0.1 FC

Florida Fish & Wildlife Conservation (FWC) REQUIREMENTS

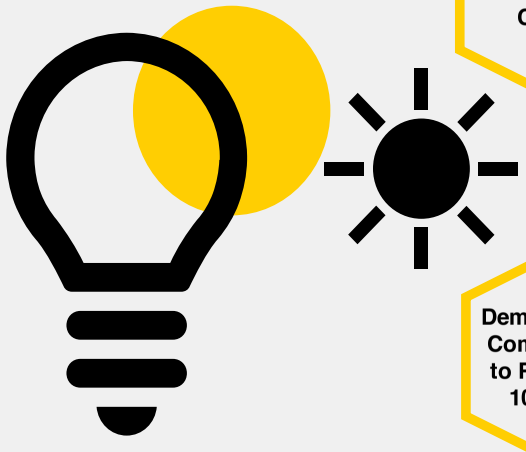
- **560nm** Amber Color**
- **Full Cut-Off**
- **Non-Tilted**
- **Shielded**
- **Phased Approach Construction**

**FC: foot candle, unit of light intensity (lm/ft^2: lumen per square foot)*
***nm: nanometers, unit of wavelength*

CURRENT CONDITIONS

1. 56 UNITS OF PRE-STRESSED CONCRETE POLE .
2. LIGHTS, CONDUITS, AND POLES INSTALLED 40-50 YEARS AGO.
3. RAPIDELY DETERIORATING COMPONENTS.
4. REQUIRE EXTENSIVE MAINTENANCE DUE TO FREQUENT POWER OUTAGES.
5. NO LONGER PERMITTED BY FWC.
6. DO NOT MEET CURRENT MINIMUM ROADWAY LIGHTING STANDARDS.

WHY SOLAR LIGHTING?



- Protects from Rising Energy Costs
- Reduces CO_2 Fossil Fuel Use
- Provides Resiliency Due to Independent Energy Units
- Improves Quality of Life
- Demonstrates Commitment to Ready for 100 Goal
- Environmental Preservation & Sustainability

SEA TURTLE FRIENDLY SOLAR LIGHTING

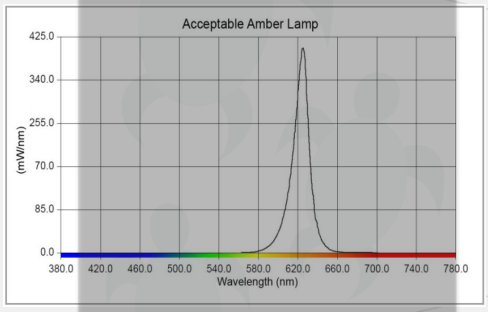
DESIGN

- Phased Construction
- 560 nanometers
- Full Cut-off
- Downward directed
- Low Wattage (Power)

LED LIGHTING

- Amber Color Only
- (Nesting Season: May 1 to Oct 31)

ACCEPTABLE WAVE LENGTH



AESTHETIC DESIGN

FOR OUR COMMUNITY




PROJECT KEY FACTS

- 270 Poles and 346 Lamp Fixtures
- 1.62 Miles Corridor
- 66.0 MWh* of Power Grid Avoided per Year
  Equivalent to 76,463.07 Pounds of Carbon Dioxide (CO_2) per Year
  (U.S. Energy Industry Administration, www.EIA.gov, 10-Yr FL Avg.=1.1588 lbs. CO_2/kWh)
- Approximate Pole Spacing: 75 ft on avg.
  Existing Pole Spacing: 175 ft avg. – between 85 ft to 310 ft
- 63 kW Photovoltaic (PV) Solar Power proposed
- Battery Backup: 4.5 Days
- Light Output per Lamp:
  Up to 12,200 Lumen** (lm)
- Battery Lifespan: 10 Years
- Assembly Unit Lifespan:
  25 Years

Longest Night: 13hrs, 36min II Average Night: 11hrs, 30min

**MWh: Megawatt-hour, Unit of Energy*
***Lumen: Total quantity of visible light emitted per unit of time*

TRADITIONAL vs SOLAR

TRADITIONAL BASE PRICE	
270 Unit of Traditional Lighting	$ 1,209,550.00
Maintenance of Traffic	$ 50,000.00
Mob/Demobilization	$ 35,000.00
Remove of 56 Unit Existing Pole	$ 68,800.00
32 Unit of Palm Tree Relocation	$ 48,000.00
Erosion Control	$ 103,808.48
Curb Impacts	$ 2,995.00
Bore/Trench/ Appertunances	$ 513,770.00
Owner Directed Allowance (Unforeseen)	$ 203,192.32
	$ 2,235,115.80
Traditional Base Price with 20% Contingency	$ 2,682,138.96
Surface Coating	$ 74,250.00
Final Electrical Design	$ 100,000.00
	$ 2,856,388.96

SOLAR BASE PRICE	
270 Unit of Solar Lighting	$ 1,540,843.36
Maintenance of Traffic	$ 25,000.00
Mob/Demobilization	$ 35,000.00
Remove of 56 Unit Existing Pole	$ 68,800.00
12 Unit of Palm Tree Relocation	$ 18,000.00
Owner Directed Allowance (Unforeseen)	$ 84,382.17
	$ 1,772,025.53
Solar Base Price with 20% Contingency	$ 2,126,430.63
Surface Coating	$ 74,250.00
OPTIONAL- Battery Capacity Increase	$ 40,560.00
OPTIONAL- Battery System Modifications	$ 59,064.00
	$ 2,300,304.63

COST-BENEFIT ANALYSIS

	TRADITIONAL	SOLAR
POLE QTY / FIXTURE QTY	270 / 346	270 / 346
OPERATION & MAINTENANCE*		
1-5 Year	$ 216,500.00	$ 216,500.00
5-10 Year	$ 216,500.00	$ 402,604.00
10-15 Year	$ 216,500.00	$ 216,500.00
ENERGY SAVINGS**		
1-5 Year	$ -	$ (32,992.00)
5-10 Year	$ -	$ (32,992.00)
10-15 Year	$ -	$ (32,992.00)
TOTAL COST OF OWNERSHIP		
DAY-1 (BASE PRICE WITH 20% CONTINGENCY)	$ 2,682,139.00	$ 2,126,430.63
5-Year	$ 2,898,639.00	$ 2,309,938.63
10-Year	$ 3,115,139.00	$ 2,679,550.63
15-Year	$ 3,331,639.00	$ 2,863,058.63

*Maintenance Costs:

1) LED Driver Replacement, Every 5 Years
2) Solar Array Cleaning, Every 5 Years
3) Solar Battery Replacement, Every 8-10 Years
4) System Recoating, Every 5-7 Years

**Traditional Energy Use Calculations:
Fixture wattage x 11.5hr/day x 365 days x $0.10 per kWh
(15,720 watts x 11.5 x 365 x $0.1 / 1,000 kWh x 5 years)

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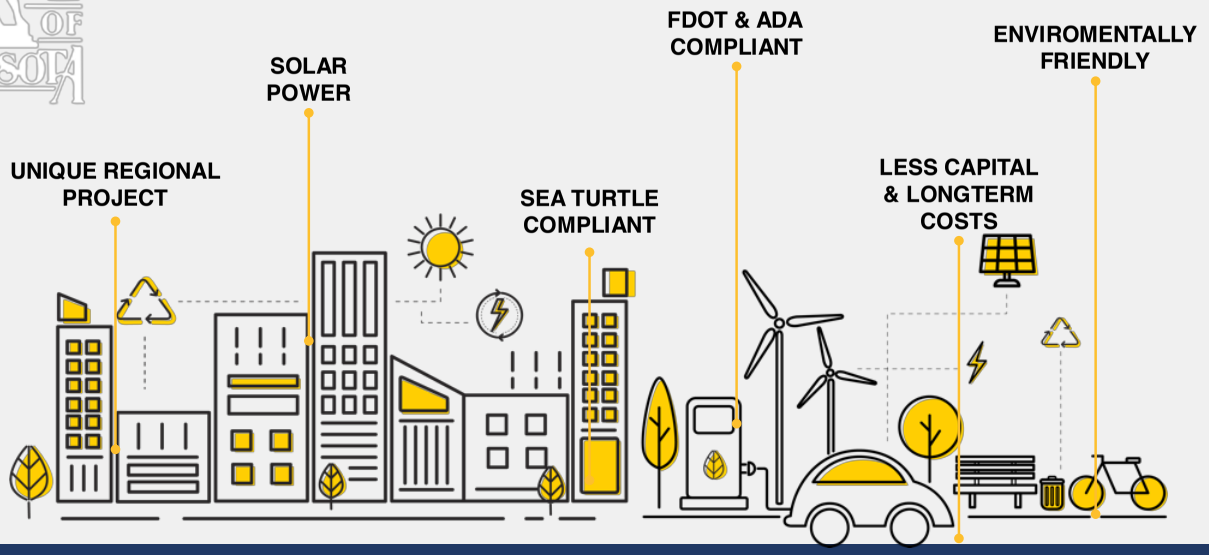
QUESTIONS ?


UNIQUE REGIONAL PROJECT
SOLAR POWER
SEA TURTLE COMPLIANT
FDOT & ADA COMPLIANT
LESS CAPITAL & LONGTERM COSTS
ENVIROMENTALLY FRIENDLY