



# **HPS Street Lights**

**(High Pressure Sodium)**

**VS**

# **LED Street Lights**

**(Light Emitting Diodes)**

September 20, 2016



# Existing Street Lights

Where are we with Charlotte County's street light system?

- Charlotte County maintains 2,145 High Pressure Sodium (HPS) lights
- The industry is moving toward LED lights
- LED lights are more energy efficient
- We do not know how long we will be able to purchase replacement lights for our current system
- One-fourth of our HPS light types can no longer be purchased



**The question today is not **IF**, rather **How Fast** is Charlotte County going to convert it's street light system to LED lights ?**



# Existing Street Lights

Charlotte County currently uses a High Pressure Sodium (HPS) street light. Our street light network ranges in age from 1991 to currently under construction.

The County currently maintains:

1,137 “Cobra Head” Street Lights



364 “Turnpike” Street Lights



644 Decorative Street Lights  
(121 are funded from a MSBU)



## Life Span:

HPS bulbs are expected to last approximately 20,000 hours of use. This means we expect to change out each bulb every 5 years

(We only change bulbs on a as-needed basis)



# HPS Street Lights

Currently we are experiencing the following maintenance cost on some of our oldest HPS street light system:

## Today's Maintenance Cost per Head

(Average based on our maintenance records)

Cobra Head	\$30.00 per year
Turnpike Head	\$55.00 per year
Decorative Heads	\$28.00 per year

(+/- 30% of this cost is due to power surges and lighting strikes causing outages)

As the age of the system increases, we expect the maintenance cost will rise.



# HPS Street Lights

## **Power Cost:**

A normal 400 watt HPS street light uses +/- \$ 12.00 worth of power per month. Based on current FP&L rates, this equals an annual power consumption for our system of +/- \$310,000

## **Total Annual Cost:**

Based on the maintenance and the power cost, the County spends approximately \$390,000 per year to keep the lights on.



# HPS vs LED Street Lights

As with all new technologies, we expect the cost of LED lights to continue to decrease.

Current cost comparisons to purchase a new complete head:

	HPS	LED
Cobra Head	\$ 345.00	\$ 780.00
Turnpike Head	\$ 800.00*	\$ 770.00
Decorative Head	\$1,200.00	\$1,800.00

\*The County was notified in early 2016 that the turnpike head is no longer manufactured. The only currently available head for a Turnpike light is an LED head.



# HPS vs LED Street Lights

Based on the best information we have, an equivalent LED light is approximately 50% more energy efficient than the existing HPS lights.

As an example using a standard 400 watt HPS Cobra Head.

<u>Cobra Head</u>	<u>HPS</u>	<u>LED</u>
“Bulb” Size	400 watt	260 watt
Power Cost per Month	\$ 12.00	\$ 6.00

Once all the County’s existing HPS lights are converted, the County should realize approximately \$155,000 per year in power saving, at today’s rate.



# HPS vs LED Street Lights

As shown below, the HPS light produces a brownish light. The LED provides a more pure white light, referred to as color temperature (Deg K)



HPS Street Lights



LED Street Light

Due to the light color difference, it is recommended an entire roadway be converted from HPS to LED at the same time



# LED Street Lights

At today's prices, the 20 year life cycle cost of HPS and LED lights are basically equal when including the cost of conversion. However, over time the life cycle cost of the LED heads are expected to become more and more economical for the following reasons:

## **HPS Lights**

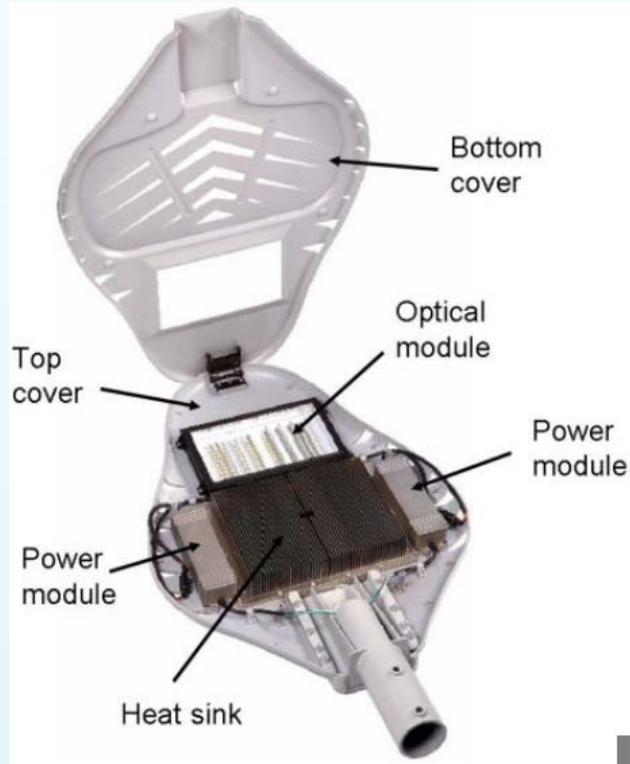
- ▲ Power cost will increase
- ▲ As the system ages, the annual maintenance cost will increase

## **LED Lights**

- ▲ Savings from the reduced power consumption as the power cost increases
- ▼ Cost to purchase LED components will decrease
- ▼ The Capital Cost to convert from HPS is ONLY the first year.



# LED Street Lights



Based on manufacturer's recommendations, we would expect the following on going maintenance:

<u>Component</u>	<u>Life Expectancy</u>	<u>Cost*</u>
LED Power Module	5 years	\$150.00
LED Optical (light) Module	20 years	\$750.00

\*These are today's cost. The cost of these components are expected to reduce over time

As with our current system, we would expect the lighting damage of +/- 30% of the system per year.



# LED Street Light Conversion

An estimate to convert all current HPS lights to LED would be an average of +/- \$1,200 per head, for an estimated total cost of \$2,575,000

This amount would include:

- Develop a long range plan to replace all existing HPS lights in the Charlotte County system, based on budget limitations
- Hire an Engineering Consultant
  - Evaluate the existing road street lighting system
  - Determine what is needed to change from the HPS to LED light source
  - Prepare a complete plan & specification bids package
- Select a Contractor
  - Remove the entire HPS light head
  - Install the entire new LED light head
  - Upgrade the other power components within the system
  - Deliver the replaced HPS components to the County for use in other HPS lights until they are replaced



# LED Street Lights

## Recommendation:

At a regular Board of County Commission Meeting

- Establish a policy to install LED light heads only on all new road projects.
- Establish a budget to convert the County's entire HPS street light system with a standardized LED light source.
  - The conversion would start with the oldest and most maintenance intensive road first, based on budget.
  - As the old HPS system is removed the operative parts would be salvaged and used as spare parts for the remaining HPS lights, thus reducing the County's maintenance cost.