Presentation to City of Coral Cables

LED STREET LIGHTING CONVERSION

December 8, 2015

The objective of this presentation is:

- Educate
- Present an overview of the City's street lighting system
- Describe alternatives and steps needed to convert the existing City street lights to LED
- Receive direction for Phase 1 implementation

Existing street lighting system

- Conflicting inventory:
  - 4,109 identified by FPL
  - 5,068 street lights identified by city
- 583 luminaires owned and maintained by the City
- Balance owned and/or maintained by FPL

In order to properly execute the conversion of existing street lights to LED the following will be required:

- Determine each street light style, light distribution type, current source of light and rated watts and voltage
- Determine the LED street light replacement type for each street light described in above bullet
- Determine acceptable glare and light pollution

Street light styles

Acorn (decorative)

Traditional (decorative)

Contemporary (decorative)

AECOM

Open Bottom

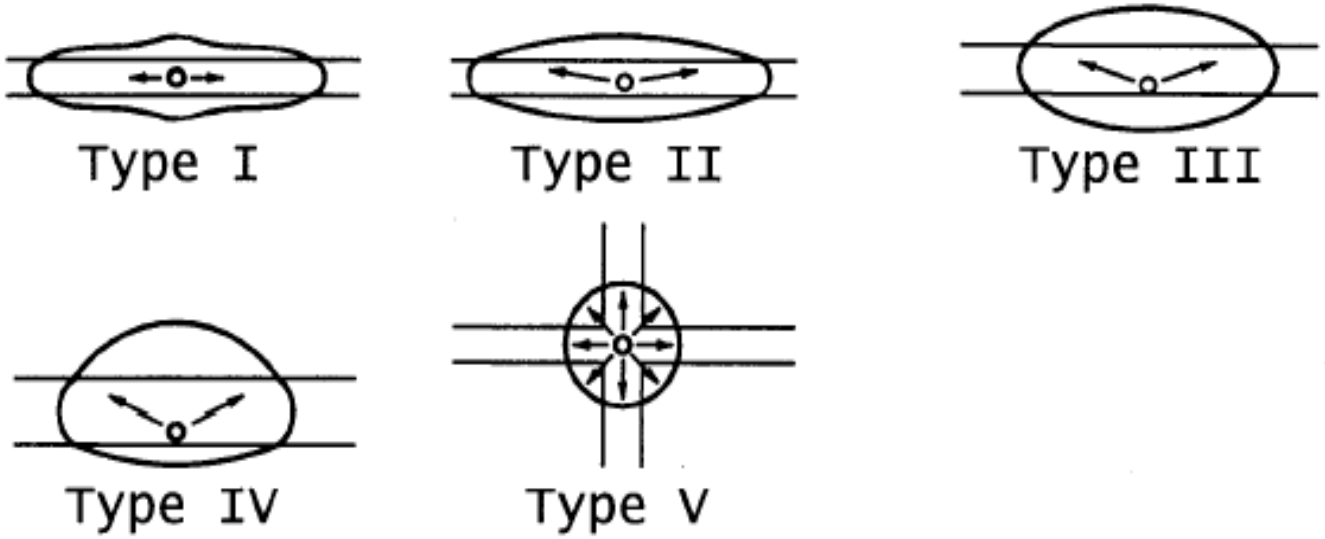
Cobra head

Tear drop

AECOM

Other characteristics

– Distribution patterns



– Each of the City street light style may have any of these types (distribution patterns)

Other characteristics

Wattage

– Most common are: 70 watts, 100 watts, 150 watts, 200 watts, 250 watts and 400 watts.

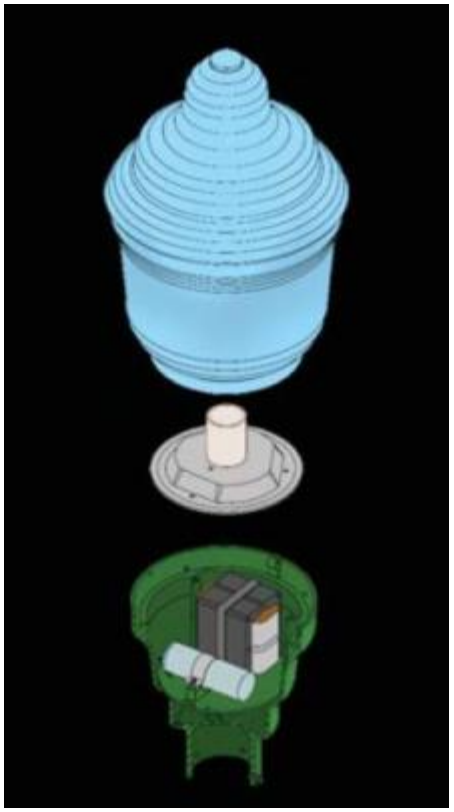
Voltage ratings

– Depends on the connection between the circuit and the light

– Preliminary information indicates street lights in the City use one of the following voltages: 120 volts, 240 volts, 277 volts and 480 volts.

Replacement methods that can be utilized:

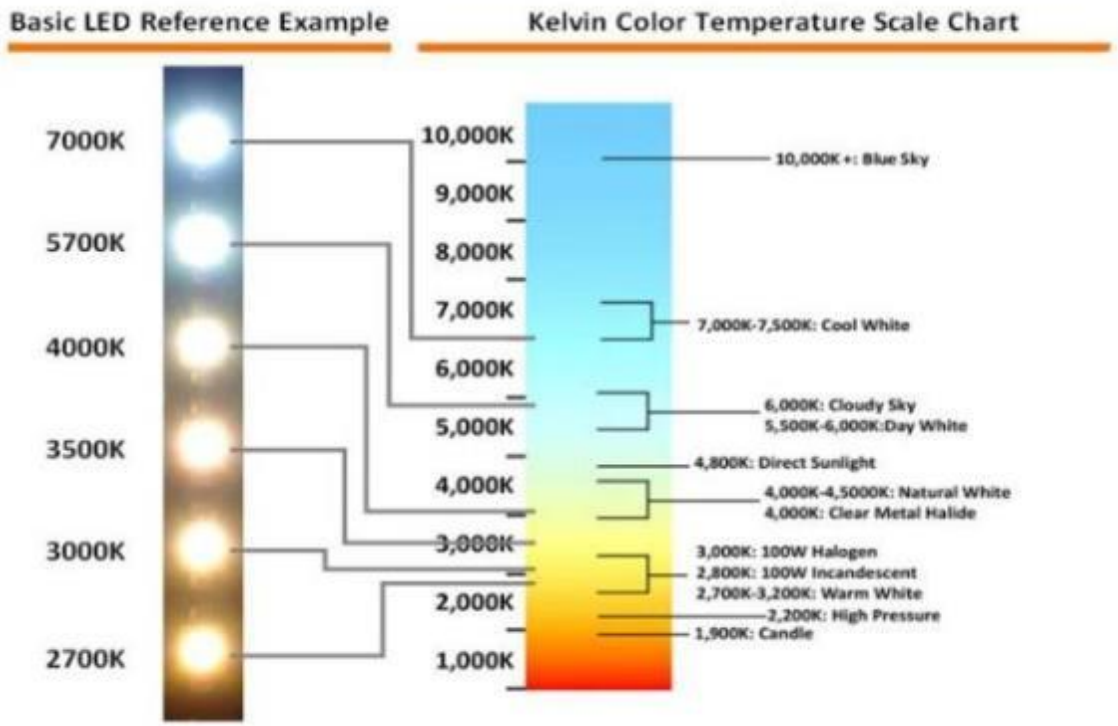
- Replace the complete luminaire. A luminaire is the complete lighting unit or lighting fixture.
- Use a manufacturer LED conversion kit.
- Use a third party LED conversion kit or LED replacement lamp.



Other aspects that impact street light conversion to LED:

Light color

– The correlated color temperature is a specification of the color appearance of the light emitted by a lamp, or luminaire.



Color Rendering Index (CRI)

– CRI is a measure of a light source's ability to show object colors "realistically" or "naturally“

Typical values of CRI are as follow:

LIGHT SOURCE	TYPICAL CRI
High pressure sodium	23
Metal halide	65
LED	80
Incandescent	97

Glare, light trespassing and light pollution:

– Glare is a visual sensation caused by high luminance in the field of view; direct glare is caused by looking directly at a bright light source.

Glare, light trespassing and light pollution:

– Light Trespass is the poor control of outdoor lighting that crosses property lines. It occurs when spill light is cast where it is not wanted

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Glare, light trespassing and light pollution:

– Light pollution is the brightening of the night sky caused by street lights and other man-made sources, which has a disruptive effect on natural cycles, like migration of birds and inhibits the observation of stars and planets

Glare, light trespassing and light pollution:

– Glare and light pollution create:
  - Disabling or discomforting.
  - Ecological Disturbances
  - Sky Glow and view of night sky obscured

The general pros and cons for each alternate are as follows:

Pros and Cons

ALTERNATIVE	PROS	CONS
a) Replace the complete luminaire.	Best performance overall. Nationally Recognized Testing Laboratories (NRTL) listed.	More expensive.
b) Use a manufacturer LED conversion kit.	Less expensive than replacing the complete luminaire, but more expensive than using a third party LED conversion kit. Nationally Recognized Testing Laboratories (NRTL) listed kits are available.	Light performance is less effective than replacing the complete luminaire. Power consumption will be higher than a complete new luminaire if light output is the same. Performance is also impacted by existing luminaire reflecting surfaces and covering glass or plastics being degraded by time and sun light.
c) Use a third party LED conversion kit or LED replacement lamp.	Less expensive.	Light performance is less than replacing the complete luminaire or using a manufacturer LED conversion kit. Power consumption will be higher than a complete new luminaire or using a manufacturer LED conversion kit, if light output is the same. Performance is also impacted by existing luminaire reflecting surfaces and covering glass or plastics being degraded by time and sun light. Reliability could be an issue. It may not be listed by a Nationally Recognized Testing Laboratories (NRTL); or not adequate listing.

Recommendation for Phase 1 and overall conversion program:

Phase 1 Conversion program

- Convert City owned and maintained lights
- 583 street lights own by the City of Coral Gables
- Approximately 1 year to convert lights after award of contract

Estimates for Phase 1

- Cost involved depends on the solution selected
- Replace the complete luminaire: $912,000
- Manufacturer retrofit: $612,000
- Third party LED conversion kit : Cost cannot be determined at this time.

Phase 2 will convert FPL owned lights

Determine FPL requirement and limitations to proceed with the LED conversion

Identify how various service agreements with FPL impact conversion:

– Energy only

– Full maintenance

– Relamp only

Next step: Prepare RFP

RFP outline

A. Existing conditions.
B. Scope of work will include:
    1. Development of a geographic information system (GIS) that will include City lighting pole locations and main characteristics of new luminaires (lighting fixtures).
    2. Replacement of existing luminaires with selected similar LED luminaires or retrofits.
    3. Maintenance contract – Alternate.
    4. City lighting poles monitoring system – Alternate.
    5. Work phasing.
    6. Procurement methods.

The neighborhood lighting program

- The response to this RFP will include poles and fixtures pricing.
- This will allow the City to facilitate implementation of its neighborhood lighting program (a separate project).
- The neighborhood lighting program will provide neighborhoods the opportunity to add decorative streetlights to create warmth and elegance.

Thank you

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