

Memorandum



Date: July 22, 2019

To: Honorable Chairwoman Audrey M. Edmonson
and Members, Board of County Commissioners

From: Carlos A. Gimenez
Mayor

Subject: Report Relating to Auditing of Installed LED Street Lighting Pursuant to Ordinance No. 19-22

Agenda Item No. 14B2
July 23, 2019

On March 5, 2019, the Miami-Dade County Board of County Commissioners (Board), approved Ordinance No. 19-22 authorizing the conversion of outdated or obsolete lighting technology in existing street lighting Special Taxing Districts to modern equivalent lighting technology. As a result, the County reexamined existing Florida Power & Light Company (FPL) agreements and executed replacement agreements for the complete conversion of street lighting systems from High Pressure Sodium (HPS) to the nearest equivalent Light-emitting Diode (LED) technology for 18,617 poles within phase one out of four total phases of street lighting districts. On June 4, 2019, the Board expressed concerns over recently-converted street lighting districts, and moved to pause any further conversion of street lights within street lighting Special Taxing Districts until such time as County staff performed an audit on the outcome of those conversions already completed and report the results of the audit to the Board. This report outlines the findings of the audit and includes recommendations to address the concerns raised by the Board.

Methodology

Special Taxing Lighting Districts are created and established pursuant to Chapter 18 of the Code of Miami-Dade County for the purpose of providing street lighting along public rights-of-way. LED street lights allow for the light to be directed towards the intended purpose of lighting roadways more efficiently, while eliminating light loss. In reviewing the benefits of converting street lighting districts to LED, the Special Assessment Districts Division (Division) conducted field inspections throughout different Miami-Dade County and Broward County cities that had recently converted to LED. Further, the Division conducted nationwide research in order to determine which types of street lighting are being deployed, and what, if any, were the greatest concerns from residents. The top factors supporting conversion to LED street lights revolved primarily around energy and cost savings, improved visibility and safety, reduction in glare, and a reduction or elimination of light trespass, light illuminating areas that are unintended such as the sky. These benefits are mostly derived from the improved color rendition provided by LED (white hue) versus HPS (orange hue), which provides better color illustration, identification of objects, and increased visibility resulting in safer street conditions. The Division's research found that there were very few complaints registered regarding LED street lights. While a small number of these complaints have reported that LED street lights are not providing sufficient illumination, the vast majority of these complaints have reported that LED street lights are too bright

Benefits of LED Conversion

In analyzing the various roadway lighting LED fixture models that were presented by FPL, the Division opted to select the Cree RSW model to replace most of the bracket-arm street lights, which also corresponds with the type of LED fixture that is being used primarily throughout the municipalities in Miami-Dade County. In addition, this model has been certified by the International Dark Sky Association for outdoor lighting as being dark-sky friendly, meaning that they minimize glare while reducing light trespass and skyglow. Unintended lighting of the sky affects bird migration and impedes star gazing.

These lights have a minimal failure rate and a life span of approximately 11 years, in comparison to the 5 year-average provided by HPS street lights. As such, approximately 42,000 HPS street lights, with an average lifespan of 5 years, results in roughly 700 lights failing every month. In contrast, converting to LED street lights would result in the reduction of failing lights by approximately 55%, therefore providing safer road conditions.

An increased life span with minimal failure rate also results in a reduction in maintenance costs, and will provide improved lighting consistency throughout streets lights along the public rights-of-way. The Division spread the conversion throughout four phases, with phase 1 having an initial estimated savings of 56% in energy costs and 8% in maintenance costs. Moreover, after an analysis of the carbon footprint impact, the conversion of 56 street lighting districts in phase one would yield the equivalent of removing 739 cars from the roads.

As part of the Division’s communication efforts, approximately 57,000 postcards were mailed to the residents of street lighting districts within phase one, who were identified as being scheduled for the initial LED conversion. In addition, notifications were sent through Nextdoor social networking service targeting similar areas. As of mid-July 2019, the Division has received 103 calls/emails, out of which, only 41 expressed a concern that the LED lights were either not bright enough or too bright. The table below shows the municipalities that have successfully converted or that are in transition to convert to LED street lights within the tri-county region.

South Florida Cities using LED

Miami-Dade County	Broward County	Palm Beach County
Miami	Hollywood	West Palm Beach
Miami Springs	Weston	Wellington
Miami Lakes	Miramar	Juno Beach
Miami Shores	Lauderdale Lakes	Highland Beach
North Miami	Hallandale Beach	Belle Glade
North Miami Beach	Lauderdale by the Sea	Boynton Beach
Golden Beach	Tamarac	Palm Beach Gardens
Virginia Gardens	Wilton Manors	Town of Palm Beach
Florida City	Lauderhill	Lake Park
South Miami	Oakland Park	South Bay
Miami Gardens		

Audit Results

Throughout Miami-Dade County, FPL has replaced more than 25,000 HPS street lights with LED fixtures; of those, 7,400 are within Special Taxing Lighting Districts. Phase one consists of 56 street lighting districts. The Division conducted night-time audits of 9 street lighting special taxing districts that were identified by FPL as fully or substantially converted. In addition, a road within one of the converted street lighting districts was selected as a sample, and photometric calculations were conducted in order to determine how a newly installed LED light compared to an existing bracket-arm open bottom HPS light. The LED lights being used for the conversion were found to most closely resemble the existing HPS street lights in regard to their photometric spread. Further, the Division contacted other LED manufacturers in order to verify the photometric calculations used for the phase one conversion, and the results received corroborated the prior

calculations and were in line with the photometric comparisons provided by the original manufacturer. Please see attached photometric study.

The Division's audit confirmed that the overall square footage being covered by the newly installed LED fixture is greater than its HPS counterpart. However, the area covered is different with the LED fixture covering more of the street and less of the private property. LED lights with this pattern have been found to be more desirable for roadway lighting because they light a greater area of the street and generate fewer complaints from residents regarding light trespass. In communities where poles are further apart, both lights leave dark spots between the poles. In the case of the LED lights, these dark spots are more prominent now because the white light emitted by the LED fixture provides more of a contrast than the amber lighting provided by the HPS fixture. In addition, factors such as house lights, setbacks, and foliage also impact the coverage of the street lights.

Recommendations

As a result of the audits conducted, the Division found that the areas where residents expressed a concern with dark spots coincided with the spacing of the poles, unmaintained foliage, and/or minimal residential lighting. To address these concerns, the Division would consider adding or moving lights, changing the orientation or tilt of the light, and foliage maintenance. Adding or moving lights would result in a cost to the district that could potentially be offset by the savings from the conversion.

The Division recommends that lighting issues expressed by residents be addressed on a case-by-case basis as all street lighting districts are unique. Furthermore, the Division will work with homeowner associations, neighborhood crime watches, and civic associations to inform residents of their responsibility to maintain the landscaping on swales, especially when it impacts the illumination from street lighting fixtures.

Lastly, as part of our audit it came to our attention that due to a clerical error by FPL, a number of lights were subsequently converted after the Board's request to place the conversion on hold on June 4, 2019. The areas that were affected encompassed Colonial Drive Street Lighting Special Taxing District and South Miami Heights Street Lighting Special Taxing District. Upon this discovery, FPL has assured us that work was immediately stopped.

In accordance with Ordinance No. 14-65, this memorandum will be placed on the next available Board meeting agenda. If additional information is needed, please contact the Parks, Recreation and Open Spaces Department, Chief of the Special Assessment Districts Division, Lorena Guerra-Macias at (305) 375-2702.

Attachment 1: Photometric Study

- c. Abigail Price-Williams, County Attorney
Geri Bonzon-Keenan, First Assistant County Attorney
Michael Spring, Senior Advisor, Office of the Mayor
Maria I. Nardi, Director, Parks, Recreation and Open Spaces
Adeyinka Majekodunmi, Commission Auditor
Linda L. Cave, Director, Clerk of the Board Eugene Love, Agenda Coordinator



HPS

ATTACHMENT #1



Note: Poles are at 240' apart

 = .5 FOOT CANDLE

 = .2 FOOT CANDLE

 HPS = HIGH PRESSURE SODIUM

FOOT CANDLE = MEASURED AMOUNT OF LIGHT

SQUARE FEET COVERED
5,541' HPS

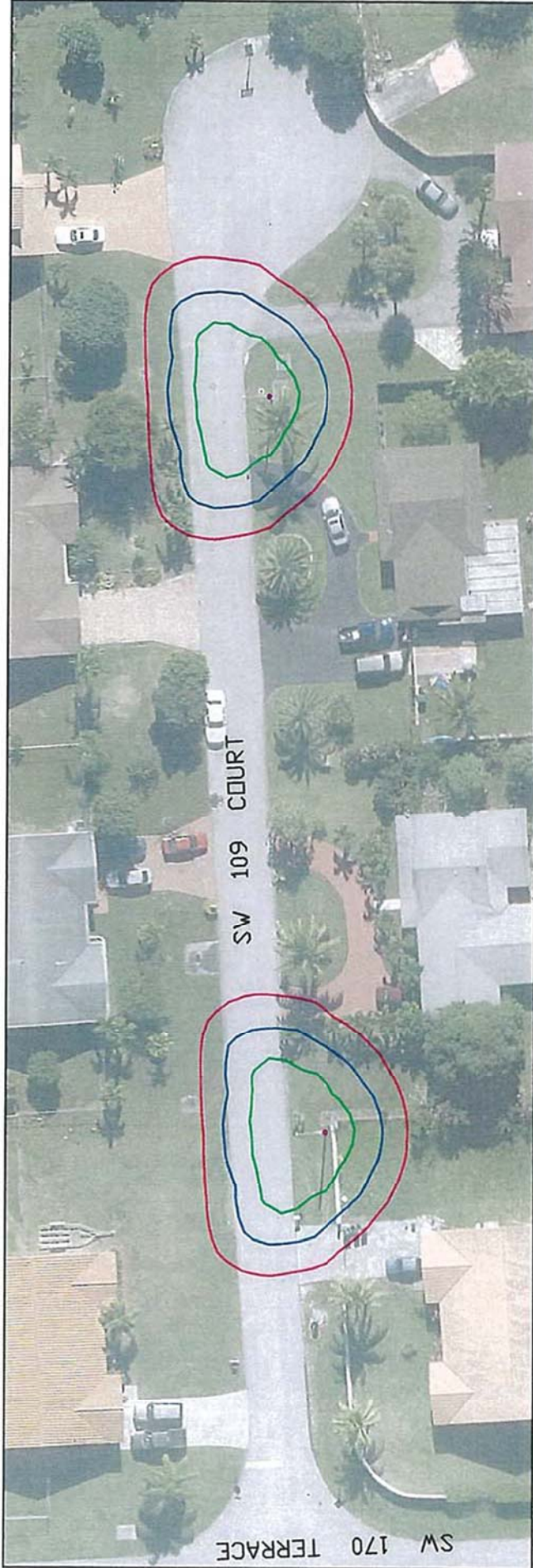
L-0069 / SOUTH MIAMI HEIGHTS

SCALE: 1" = 50'



LED

ATTACHMENT #1



Note: Poles are at 240' apart

- = 1 FOOT CANDLE
- = .5 FOOT CANDLE
- = .2 FOOT CANDLE

■ LED = LIGHT EMITTING DIODE
■ FOOT CANDLE = MEASURED AMOUNT OF LIGHT

SQUARE FEET COVERED
5,723' LED

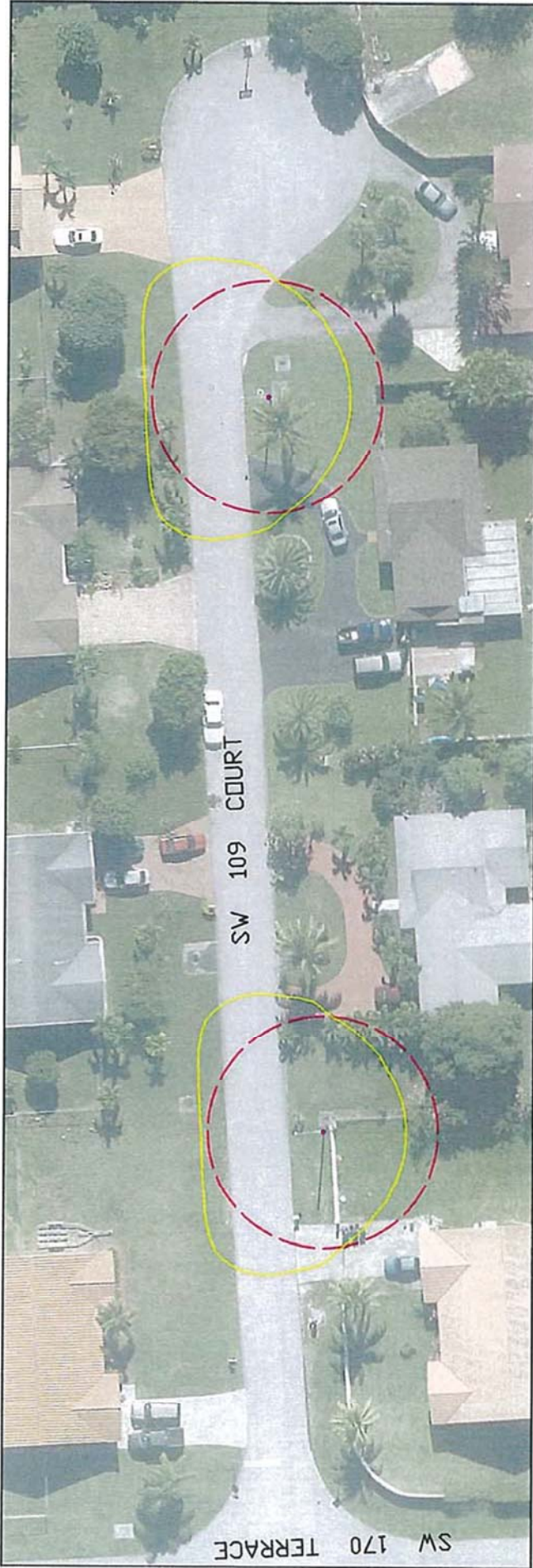
L-0069 / SOUTH MIAMI HEIGHTS

SCALE: 1" = 50'



HPS WITH LED

ATTACHMENT #1



Note: Poles are at 240' apart

- = .2 FOOT CANDLE
- = .2 FOOT CANDLE

	SQUARE FEET COVERED
■ HPS = HIGH PRESSURE SODIUM	5,541' HPS
■ LED = LIGHT EMITTING DIODE	5,723' LED
FOOT CANDLE = MEASURED AMOUNT OF LIGHT	

L-0069 / SOUTH MIAMI HEIGHTS

SCALE: 1" = 50'