



**Date:** March 5, 2019

**To:** Thomas J. Bonfield, City Manager  
**Through:** Keith Chadwell, Deputy City Manager  
**From:** Bill Judge, Interim Director of Transportation  
**Subject:** Conversion of existing public street lights to light emitting diode (LED)

### **Executive Summary**

Transportation has worked with Duke Energy Carolinas (DEC) to develop a conversion program to convert 21,017 existing inefficient High Pressure Sodium (HPS) and Mercury Vapor (MV) public street lights to more energy efficient Light Emitting Diode (LED) public street lights. The proposed conversion program is consistent with multiple objectives and initiatives associated the Sustainable and Natural Built Environment Goal of the City's adopted Strategic Plan. To complete the conversions there will be both one-time costs associated with the change out of equipment and a slight increase to the monthly service fee paid by the City to DEC for the ongoing operation and maintenance of the public street lights. With the savings from a recent rate reduction that went into effect on September 1, 2018, the estimated costs for the conversion program can be funded within the existing street lighting operating budget. DEC estimates it will take approximately 18 months to complete the conversion program.

### **Recommendation**

The Administration recommends that the City Council authorize the City Manager to implement a conversion program with DEC to convert all existing HPS and MV street lights to more energy efficient LED lights. DEC expects to begin the conversion on or around May 1, 2019 and complete the project in approximately 18 months (December 1, 2020).

### **Background**

Except for a small area in the northern portion of the city limits which is served by Piedmont Electric Cooperative, DEC is the electricity service provider for most of the land area within the city limits. The City of Durham pays a monthly service fee to DEC to operate and maintain public street lighting for the portion of the city limits which is within their service territory.

DEC currently operates and maintains approximately 20,914 high pressure Sodium (HPS) and 103 Mercury Vapor (MV) street lights along public roadways inside the city limits. While these older lights continue to provide many safety benefits to city residents, they are significantly less energy efficient than modern Light Emitting Diode (LED) lights. The installation of LED lighting first became available to municipalities on January 28, 2014, and Transportation soon thereafter began utilizing LED lights for most new installations as the monthly service fee for new LED installations was slightly less than the rate for new HPS installations. Since January 28, 2014, DEC has installed approximately 800 LED street lights within the City of Durham.

From January 28, 2014 to September 1, 2018, the NC Utilities Commission approved rate schedule did not make it economical for municipalities served by DEC to convert older HPS and MV lights to LED lights. Under this previous rate schedule, the monthly service fee paid by the

municipality for the new LED lights was significantly higher than the existing monthly rates charged for HPS and MV lights. In addition to higher monthly service fees, municipalities were also required to pay a \$54 one-time transition fee for each light changed from an older technology to LED.

The NC Utilities Commission ordered new rates effective September 1, 2018. This new rate schedule 1) significantly lowered the monthly service rates for all street lights, and 2) made the conversion of HPS and MV lights more economical for municipalities. Under the new rate schedule, the monthly service fee for street lighting paid by the City to DEC was reduced by approximately \$64,000 per month for an annual savings of \$768,000. Additionally, the one-time transition fee was reduced from \$54 per light to \$40 per light and a four-year annual payment option (\$10 per year per light) was provided as an option for municipalities. More importantly, the resulting monthly service fee for lights converted to LED are now much closer to the current rates charged for HPS and MV lights and still significantly lower than the previous rates charged prior to September 1, 2018.

Soon after the new rate schedule went into effect, Transportation began discussions with DEC about developing a conversion program. Transportation initially requested DEC to develop a change-out program by light type (wattage) and to start the conversion program by first changing out those lights where the monthly cost-savings was the greatest. DEC has indicated that for work efficiency reasons they would not do a change-out by light wattage as initially requested by Transportation as the various light wattages are widely scattered through-out the City. DEC subsequently identified and developed a proposed plan to convert all existing HPS and MV street lights to LED by dividing the City into ten districts to allow for effective work progress. DEC estimates it will take 6-8 weeks to complete the conversion in each district and the entire city can be completed in approximately 18 months.

### **Issues/Analysis**

The proposed conversion of less energy efficient HPS and MV street lights to more energy efficient LED lights is consistent with the following objectives and initiatives associated the Sustainable and Natural Built Environment Goal of the City's adopted Strategic Plan:

- Goal: "Guide equitable, efficient, and environmentally sound investments in the City's built and green infrastructure assets."
- Objective: "Invest in Sustainable Infrastructure – Make intentional and sustainable infrastructure investments through comprehensive planning that considers the social, environmental, and economic life cycle costs."
- Objective: "Create a More Sustainable Durham – Protect and enhance the natural and built environment through programs, services, and community partnerships that foster a sustainable and resilient city."
- Initiative: "Evaluate and implement maintenance and replacement plans (Street, Park Amenities, Infrastructure and Fleet)."

DEC has estimated the conversion of 21,017 HPS and MV lights will result in an annual energy reduction 6,246,800 kwh/yr. In addition, to the estimated energy reductions, LED lighting provides a white light that allows for improved nighttime visibility and color identification. The existing HPS lights produce an orange glow that makes it difficult to identify different colors and other identifying features.

Based on the new rate schedule adopted September 1, 2018, there will be both one-time and additional monthly costs associated with conversion of HPS and MV lights to LED.

Transportation has identified the following costs associated with this conversion:

- The one-time transition fee for each HPS light is \$40 per light, plus a 7% sales tax. With an estimated 20,914 HPS lights to be converted this transition fee is estimated at \$895,119.20 (\$223,779.80 per year utilizing the four-year annual payment option).
- There are 184 decorative HPS teardrop lights in the downtown area. The conversion of these lights to LED will require the replacement of the entire decorative teardrop head. There will be a \$325,415.76 one-time decorative adder fee required for the conversion of these lights.
- The conversion of all existing HPS and MV lights to LED will result in a slight increase to the monthly service fee. This increase is estimated at \$1,621.50 per month or \$19,458 annually.

Utilizing a portion of \$64,000 monthly (\$768,000 annual) savings from the rate reduction that went into effect on September 1, 2018, the one-time transition fees, decorative adder fees, and increased monthly service fee can all be accommodated within the existing and future annual street lighting budgets.

### **Alternatives**

The Durham City Council could decide to:

- Approve the staff recommendation to authorize the City Manager to execute DEC Service Agreements to implement a conversion program with DEC to convert approximately 20,914 existing HPS and 103 MV street lights to LED; or
- Deny the request, thus keeping most of existing HPS and MV street lights in place. DEC would continue changing out a few of these lights to LED on an as needed basis due to failure or accident.

### **Financial Impact**

Due to the monthly savings of approximately \$64,000 per month with the new rate schedule effective September 1, 2018, there is adequate existing funding in the street lighting budget for the following anticipated project costs:

- The one-time transition fee cost for the conversion of 20,914 HPS lights to LED is \$895,119.20 (\$40/per light \* 20,914 HPS lights \* 7% sales tax). This fee will be invoiced by Duke Energy in four annual installments of \$223,779.80;
- The decorative adder fee for the conversion of 184 existing decorative HPS lights in the downtown area to decorative LED lights is \$325,415.76. This fee will be a single one-time upfront payment; and
- The new monthly service fee will increase by \$1,621.50 (\$19,458 annually) for LED lighting once the transition is complete.

### **Equal Business Opportunity Summary**

Not applicable.

### **Attachments**

DEC Conversion Letter

LED Conversion Costs Summary

DEC Service Agreement for the conversion of 20,730 HPS and 103 MV lights to LED

DEC Service Agreement for the conversion of 184 decorative HPS lights to LED