

# COUNTY OF YORK

## MEMORANDUM

**DATE:** June 26, 2024  
**TO:** York County Board of Supervisors  
**FROM:** Mark L. Bellamy, Jr., County Administrator  
**SUBJECT:** Public Street Lighting in York County



### Background

On May 4, 2021, the Board of Supervisors adopted Resolution No. R21-49, approving the FY 2022-2027 Capital Improvement Program (CIP) and thereby CIP project #PW-8798. This CIP project is to facilitate the conversion of the County's high-pressure sodium (HPS) and mercury vapor (MV) streetlights within the York County Public Streetlight Program to solid state light emitting diode technology (LED). The primary purpose of the conversion project is to improve light quality, reduce energy consumption, and improve light fixture longevity, thereby reducing the County's monthly electric bills for the public streetlight system over the long term and fulfilling the County's strategic priorities of environmental stewardship and exemplary public safety.

Streetlights included in the York County Public Streetlight Program are installed and maintained by Dominion Energy Virginia. As of 2020, Dominion Energy ceased the installation of new HPS or MV streetlights. Dominion Energy encouraged Virginia localities to proactively upgrade their public streetlight inventories from HPS/MV fixtures to LED fixtures in order to take advantage of cost savings and improved fixture reliability. Dominion Energy executed an agreement with VEPGA (Virginia Energy Purchasing Governmental Association) to offer a discounted flat fee of \$130 to convert existing standard HPS/MV streetlights to LED. Additionally, Dominion offers a different monthly billing rate for converted LED fixtures. County staff determined the potential cost and energy savings warranted proactive conversion of the public streetlight inventory, taking advantage of the flat fee offered by Dominion Energy. This project is substantially complete as of Spring 2024.

### Public Streetlight Inventory

#### 1. Inventory Conversion

- Any *new* public streetlights installed in County from 2020 onward have been LEDs. However, at the start of the conversion project in 2021, the County had hundreds of outdated HPS and MV fixtures within the public streetlight system. Since the County's public streetlights are owned and operated by Dominion Energy, fixture conversion requests were processed and installed through their local offices in Hampton and Williamsburg. In September 2021, County staff planned public streetlight conversion project phasing based on geographic area, Dominion's work

order guidelines, and conversion requests from residential subdivisions. The project did not include privately owned streetlights, lights located on a VDOT traffic signal, HOA-billed private “watchlights”, and lights owned by other government agencies. In the years since, all phases have been completed, and now 843 HPS/MV streetlights have been converted to LED. During the conversion process, many lights were discovered to have been proactively converted to LED by Dominion as part of a repair (these repair conversions are free of charge under the current VEPGA contract). A small batch of streetlights are now classed as “premium” HPS fixtures (which carried a considerably higher fee to convert than “basic” HPS fixtures), so these were removed from the inventory of streetlights to be converted given budgetary constraints.

- When we examine streetlights that were converted, especially in some of the County’s older subdivisions, we see several improvements in fixture light quality, efficiency, and longevity. LED streetlights use solid-state technology to convert electricity into light. Put simply, LEDs are very small light bulbs that fit into an electrical circuit. Unlike mercury vapor (MV) or high-pressure sodium (HPS) lights, they don’t experience arc discharge failure or contain mercury, and they don’t get very warm. A prime example is our converted MV streetlights. The County inventory contained 92 MV streetlights operating in various locations, largely concentrated in Nelson Circle, Charleston Heights, and Lakeside Forest. MV fixtures are generally considered obsolete for street lighting and are less efficient with poorer light color rendering. Replacing these lights with LED produced improved light quality and fixture efficiency, which I discuss below in further detail. This was also a factor for our old HPS fixtures, which made up the remaining bulk of the County’s streetlights. HPS lights have a much shorter lifespan and poorer color quality than LED fixtures, which proactive conversion improved upon. Another important point to note is that the special LED conversion flat fee only applies to fixtures converted within the August 1, 2019-June 30, 2025 VEPGA agreement timeframe. Given the inflationary nature of today’s economy, I believe we can presume that the LED conversion fee after the current 6-year agreement expires will be higher.

## 2. Streetlight Color Quality and Energy Efficiency Improvements

- One of the visible benefits of upgrading the public streetlight system to LED is an improvement in streetlight color quality. Compared to HPS/MV fixtures, LEDs provide better color rendering- allowing objects and surroundings to appear closer to their true colors and with high quality contrast. LED lights produce a more balanced and complete light spectrum closer to natural daylight. HPS/MV lights emit a narrow spectrum, primarily in the yellow-orange range. Higher streetlight color quality improves visibility and safety for drivers and pedestrians, notably in residential areas. The County also chose to convert streetlights to comparable color-corrected temperatures (CCTs). Since HPS/MV give off a more yellow-orange color, the County opted to install LEDs with a CCT of 3,000 Kelvin, which produces a more “yellow” color than a 4,000 Kelvin fixture (which would appear more “white” in color). While LED lights won’t be able to exactly match the color

of HPS/MV lights, staff felt the improved color quality and visibility would make up the difference for residents.

- LED streetlights are more energy efficient than HPS/MV lights. To utilize a practical application as an example; many of the County's public streetlights within residential subdivisions are 7,000 lumen "suburban colonial" style fixtures. A HPS "suburban colonial" streetlight producing 7,000 lumens typically consumes about 100-120 watts of electricity, while an LED fixture with comparable output typically consumes about 50 watts. To calculate watt-hour (kWh) energy savings on an average monthly basis, we will multiply average watts \* 12hrs/day \* 30days/month. Our total for a HPS fixture is 39,600 watt-hours, or 39.6 kWh per month, versus 18,000 watt-hours, or 18 kWh per month for a comparable LED fixture. The LED streetlight in this example uses about 45.4 % less energy than the HPS light.
- The current Dominion contract with VEPGA provides a tiered monthly service rate for converted LEDs, in comparison to strict kWh service rates for HPS fixtures. When factoring the in the monthly base service distribution rate rider for each kWh, this will result in cumulative long-term cost savings to the County when also factoring in maintenance cost savings. LED streetlights typically last about 11-23 years energized for 12 hours/day, while HPS streetlights last about 5-8 years running 12 hours/day. Increased fixture longevity will reduce the total amount of repairs and replacements.
- Our current, converted streetlight inventory also is more environmentally friendly. Using the 2022 Virginia average of .64 lbs of CO<sub>2</sub> per kWh<sup>i</sup>, a 110-watt HPS streetlight might produce 34.05 lbs of CO<sub>2</sub> per month, while a 50-watt LED streetlight might produce lower CO<sub>2</sub> emissions of 15.48 lbs per month. This is progress towards a "greener" infrastructure and our goal of environmental stewardship.

The remaining fixtures in the CIP project to be converted are 94 streetlights located on York County Schools properties. While most the newer parking lot lighting on school properties are separately metered, the older lights were installed under the York County Public Streetlight Program. These lights are anticipated to be submitted for conversion to Dominion next month. Please let me know if you have any questions or need any further information.

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<sup>i</sup> Virginia Electricity Energy Profile 2022, U.S. Energy Information Administration

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