

Information Item

Date: January 11, 2020

To: Mayor, Mayor Pro Tempore, and Members of the City Council

From: Johnnie Taylor, Director of Operations
Helen Peplowski, Office of Sustainability Director

Subject: Information on energy efficiency and savings in City facilities and properties

Strategic Focus Area: Healthy Environment

Strategic Objective: Support Green Initiatives

Strategic Plan Action Item: Reinvigorate Sustainability Programs

Key Work Item: No



The Office of Sustainability staff presents the following information about energy efficiency savings. Projects that can be and have been undertaken at city facilities and properties and the outcomes of those projects are also included.

Lighting

LED lighting is more cost efficient now than in the past 10 years due to decreased operating and capital costs and improved quality. Most city facilities currently have fluorescent lighting inside and high intensity lighting outside. Upgrades to LED lighting generally result in a simple payback of seven to twelve years, but paybacks can be quicker where the lights burn 24/7 (parking decks, stairwells). Facility lighting upgrades can be completed as part of the facility renewal program and routine maintenance for the most cost-efficient installment.

In 2019, the city paid \$126,000 to upgrade 6th-Cherry-Trade parking deck lighting which reduced energy consumption by 60% and the electric bill by \$20,000/year. LED installations alone were responsible for a reduction of almost 300,000 kWh, and savings of \$539,430 in 2019. When combined with 2018 data, total reductions due to LED light replacements and upgrades is nearly 750,000 kWh. The total amount saved from streetlight and DOT parking upgrades in two years is \$676,015

In FY20, the city paid \$3,172,000 for street lighting with \$3,091,000 (97%) paid to Duke Energy for 32,900 streetlights including 25,500 high pressure sodium (HPS), 4,550 LEDs and 2,850 mercury vapors (obsolete). All new Duke Energy streetlights will be LED and Duke plans to convert all remaining mercury vapor fixtures to LEDs in 2021. When an HPS streetlight outage is reported, Duke will make basic repairs if possible, but will upgrade to LED if more repairs are needed.

Duke will upgrade HPS to LED fixtures upon request if a \$40 transition fee is paid. If all HPS and mercury vapor fixtures are upgraded to LEDs, then energy consumption and greenhouse gas emissions will decrease 50% (from 21 to 10.5 million kWh's/year). However, Duke's annual streetlight cost will increase 7%.

The city's remaining streetlight costs are for city-owned lights including the Downtown and Research Parkway decorative lights which are mostly LED's; high-mast lights at several interchanges which are not LED's and the legacy Salem Parkway lights which are not LED's. The budget to upgrade the 90 high-mast fixtures is \$140,000 which will reduce energy over 50%, improve reliability and save \$9,000 per year. Budgets required to upgrade the 177 Salem Parkway lights include significant wiring upgrades to meet current requirements.

Previous Projects

The city received \$2.26 million from the Energy Efficiency and Conservation Block Grant program in 2009 with outcomes briefly summarized below:

- City Hall (\$87,400) – Modified HVAC ducting and control systems and modified several lighting circuits. Reduced energy costs over \$39,000/yr.
- Public Safety Center (\$329,200) – Replaced roof with highly insulated and reflective roof (\$254,166); upgraded obsolete fluorescent lighting (\$75,000). Energy costs reduced \$25,000/yr.
- Fire Stations (\$243,460) – Upgraded obsolete light fixtures in all stations; added occupancy/vacancy sensors; added attic insulation in stations #3 and #9; replaced HVAC at Stations #1 and #3. Replaced Station #1 roof (\$117,000) with well insulated, highly reflective roof. Energy costs reduced \$12,000/yr.
- Recreation Centers (\$755,100) – Replaced two roofs (\$236,000), two HVAC systems and upgraded obsolete fluorescent lighting. Energy costs decreased \$24,000/yr.
- LED Street Lights (\$173,200) – Upgraded 340 city-owned streetlights to LEDs. Energy costs decreased \$15,000/yr.
 - NOTE: During this period, LEDs were very expensive and did not provide the reliability or necessary energy cost savings. Many of the upgraded downtown decorative lights were not bright enough and failed prematurely.
- Parking Decks (\$73,700) – Miscellaneous lighting upgraded and control improvements. Energy costs decreased \$6,000/yr.
- Electric Vehicle Purchase (\$39,400) – Grant paid incremental cost of Chevy Volt and Nissan Leaf.
- Office of Sustainability (\$483,900) – Funding for Sustainability Office, Sustainability Resource Center, interns, Green Expos, Earth Day and Creek Week contributions.