ENERGY EFFICENCY CASE STUDIES
GREATER PHILADELPHIA REGION

LED TRAFFIC SIGNAL RETROFIT

Abington Township, PA

LED Traffic Signal Retrofit

Abington Township Pennsylvania

retrofit at a glance

- 2,500 LED Traffic Signal Lamp Retrofits
- Investment of $120,000 Over a 3-Year Period
- $50 Per Lamp
- 90% Reduction in Energy Costs
- Three Year Project Payback

Overview

In 2000, Abington Township (Montgomery County, Pennsylvania) began a three-year project to convert the incandescent traffic signal lights at its 104 signaled intersections to LEDs as a way to reduce energy consumption and lower energy bills. Prior to the installation, Abington Township performed an informal financial analysis that showed a five-year payback on the new lights; in reality, the payback was only three years. In total, over 2,500 lamps were retrofitted including red, green, and yellow traffic signals, and pedestrian signals.

Procurement and Installation

Abington Township participated in a bulk purchase of LED traffic signal lamps through a competitive bid by the Montgomery County Consortium of Communities. Over the five-year bid, renewed annually, the Consortium purchased lamps from three manufacturers: Dialight, GE, and Tri-Star. All lamps purchased through the bid process met PennDOT purchasing requirements. The differences between the three lamp types were in their pixilation qualities.

Abington Township invested $40,000 per year for three years out of its capital budget for a total of $120,000, or roughly $50 per lamp replaced. The Township's traffic signal maintenance department installed the lights using in-house labor, which helped manage their overhead costs. After the retrofit, Abington recycled the metal and plastic components of the old fixtures and disposed the incandescent light bulbs.

Performance

The township saw a 90 percent reduction in its energy cost for traffic signals after all lamps had been replaced. Additionally, after maintenance crews became familiar with LED technology retrofits, the LED lights have required significantly less maintenance than the incandescent lights they replaced. Snow accumulation is infrequently cited as a problem with LED lights; Abington had only one snow-caused obstruction in the last 10 years. The Township residents responded positively to retrofit as well, citing approval of the brighter light emitted by the LEDs.

Lessons Learned

As one of the earlier municipalities in the region to retrofit their traffic signals to LEDs, Abington experienced a minor setback during the initial installation. Abington discovered that the lights from one of the manufacturers were too large and did not fit into the existing signal heads. The township quickly corrected this problem in its subsequent orders, requiring all new lamps to be the appropriate size and dimension for their fixtures.

Despite this setback, Abington Township felt the program was an overwhelming success. In the ten years since their installation, the LEDs provided improved lighting quality, reduced energy use and greenhouse gas emissions by over 90 percent, lowered maintenance costs, and saved the Township substantial operating costs every year. With a short payback of only three years, Abington's experience clearly demonstrates the benefits of switching from incandescent to LED traffic signals.

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This is one in a series of Energy Efficiency Case Studies developed by DVRPC in collaboration with the City of Philadelphia and US EPA to profile replicable and cost-effective energy-efficiency projects in the Greater Philadelphia region. For more information, see www.dvrpc.org/EnergyClimate. DVRPC, 2010

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