ALL LIT UP

Benefits achieved by switching to LED streetlights

LED Introduction

Light emitting diode (LED) traffic signals save energy, burn brighter and last longer than the traditional incandescent bulbs used in intersections. The use of LEDs in traffic signals is becoming standard practice for municipalities that are looking to cut overhead and improve intersection safety.

LED traffic signal modules are made up of small, individual lights, or diodes, grouped together to provide brighter, longer lasting signals – each module may contain up to 300 diodes. The diodes give off color by running an electrical current through certain gases to produce the desired shade. Initially, only red LEDs were available, however, after amber and green lights started being produced, LEDs quickly gained popularity as a cost saving and more reliable alternative to incandescent traffic signals.

LED Savings

There is tremendous cost savings associated with converting traditional incandescent traffic signals to LED technology. Incandescent bulbs can consume 50 to 150 watts of electricity per hour. In comparison, LEDs use as little as 10 to 15 watts per hour, resulting in a possible 85 percent savings in electricity. The wattage savings directly translates into dollars for municipalities. At current electricity prices, it is estimated that converting one intersection saves approximately $600-$800 per year. These savings will increase as energy prices continue to climb and electricity rate caps are removed.

Conversion

The equipment cost of converting an average intersection to LEDs is approximately $2,000. The approximate cost of installing the LEDs is $1,000 per intersection. The amount of time that it takes to recover the LED investment is estimated at approximately three years.

Converting an existing intersection to LED technology is relatively simple. Most LED units are designed to fit existing signal housings and attach to the existing 120 VAC power.

By **Haley Sankey,** Regional Energy Coordinator, Southern Alleghenies Planning & Development Commission

Benefits

In addition to conserving electricity, LED lights last significantly longer than incandescent, cutting down on overall operation and maintenance costs. The average LED can last 7-10 years, saving the cost of annually replacing incandescent bulbs.

Catastrophic failures are uncommon with LEDs. Incandescent bulbs function from one filament, and if it fails, the entire light goes dark requiring immediate replacement. Since LEDs are made up of dozens of little diodes, when one or more diodes fail, the signal continues to operate. Additionally, LED bulbs burn brighter than traditional incandescent ones, which is a benefit noticed by drivers and as a result, increases intersection safety.

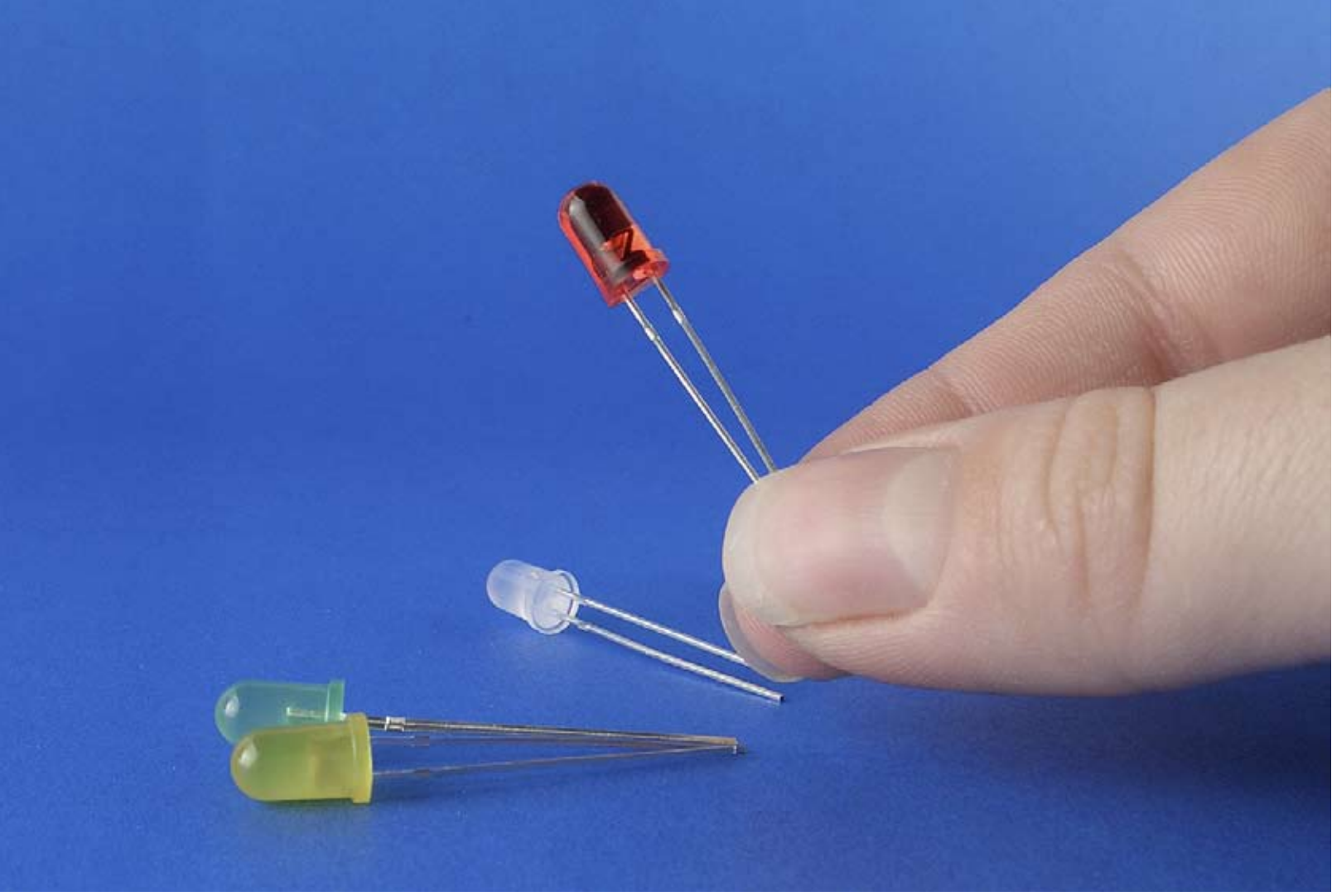
LEDs eliminate a phenomenon known as the phantom effect. With traditional incandescent bulbs, the phantom effect happens when sunlight hits the reflector that is placed behind the bulb and as a result, the light appears illuminated. The phantom effect occurs primarily during morning and evening hours and causes confusion, thus increasing the potential for a dangerous situation. The phantom effect does not occur with LEDs because reflectors are not used.

Due to the low energy demand with LEDs, it is feasible to operate intersections on battery back-up-power if needed. Additionally, if desired, solar panels may be installed to supply the power needed to operate the LED units, further reducing operating costs.

LEDs do not release heat when in use. Therefore, a geographical area where snow fall is common, the possibility of snow build up on the light lens is a concern. This is something that should be considered during LED installation and the light canisters should include snow shields to keep snow from settling on the lens. A protective coating may also be added to the lenses to prevent snow and ice from sticking.

LEDs Locally

In 2008, three Local Development Districts (LDDs) combined efforts to bring the money saving benefits



TECHNO SPEAK **Light emitting diodes use as little as 10 to 15 watts of electricity per hour**

of LEDs to local municipalities. Brandon Carson of the Southern Alleghenies Planning & Development Commission in Altoona, Maria Kirby of the Northwest Pennsylvania Regional Planning & Development Commission, based in Oil City, and Megan Epler of SEDA Council of Governments, located in Lewisburg, created LED grant program to assist local governments in adopting the LED technology. The three LDDs collaborated with Tim Fulkerson, COSTARS Director of Marketing and Constituent Relations, to negotiate pricing with suppliers listed on the Pennsylvania Department of General Services (DGS) COSTARS LED contract. The Hite Company, a Pennsylvania based company with 19 distribution points throughout the state, agreed to offer the equipment at a cost that is 25 percent lower than the original COSTARS contract bid price. Therefore, the Hite Company was chosen as the supplier for the grant program. The 25 percent reduction in price ultimately resulted in an $80,000 reduction in equipment costs for the participating municipalities.

The Southern Alleghenies Planning & Development Commission worked with 14 municipalities in 5 counties (Bedford, Blair, Cambria, Huntingdon and Somerset) across the Alleghenies Region to convert 50 of the 400 intersections in the region to LEDs. The municipalities participating in this bulk purchase will realize an estimated annual energy savings of approximately $40,000.

SEDA-COG worked with 37 municipalities in 8 counties to convert 125 intersections to LEDs. Participating municipalities will realize an annual energy savings of approximately $100,000 as a result of the conversion. Virtually all of the intersections in SEDA-COG's 11-county region have now been converted to LED.

To date, the Northwest Pennsylvania Regional Planning & Development Commission has received resolutions from 31 municipalities who are interested in converting signalized intersections from incandescent to LED lamps. These participating municipalities have requested an aggregate of nearly 4,700 LED lamps.

In addition to providing grants and consortium pricing for LEDs, the LDDs also offer educational workshops on the benefits, installation, operation and maintenance of the LED modules. Response to the overall conversion program has been tremendous and as a result of the traffic signal successes, several municipalities have requested a similar program to retrofit their street lights. (Street lighting ranks as one of the highest annual expenses for most municipalities.)

LED traffic signal conversions have proven to provide immediate cost savings and very quick pay backs for municipalities. The low maintenance, long life and additional safety benefits of LEDs add to their appeal. Additionally, the threat of looming electricity rate cap removals make the conversion to LEDs a near necessity for local governments with increasing budget demands. The environmental benefits are numerous and provide one way in which municipalities can go red, yellow and *green*. **(B)**

IN YOUR POCKET **The cost of converting an average intersection and installing LEDs is approximately $3,000, but in only takes about three years to recoup the costs**

SMITH CARTWRIGHT LLP
ATTORNEYS AT LAW

Representing public and private clients in the areas of land use, zoning, land development, environmental and public utility law.

Special Solicitor and Special Land Use Counsel Services Available.

Camp Hill, Pennsylvania
717.763.1650

www.smithcartwright.com

Aquatic Facility Design
INCORPORATED

Aquatic Facility Designers and Consultants

Aquatic Facilities • Spray Parks • Community Swimming Pools
Feasibility Studies/Facility Assessments
Renovations/New Construction • Play Features/Amenities
Filtration Systems • Chemical Systems

Member - NSPI (National Spa & Pool Institute) • World Waterpark Association

800-680-7946 • 717-692-0950 Fax
www.aquaticfacilitydesign.com

kcba
Architects

8 East Broad Street
Hatfield, PA 19440-2401

8705 Germantown Avenue
Philadelphia, PA 19118-2716

215.368.5806
kcba-architects.com