

## Lighting Checklist— Traffic Signals

Municipalities across the country have expressed interest in using funding to upgrade traffic signals and crosswalk signs to light-emitting diode (LED) technology. The use of LED technology in these applications is a well established practice that has been around since the 1980s. The advantages of LED include:

- Longer life based on LED technology vs. incandescent lighting;
- Energy savings compared to their incandescent counterparts;
- The elimination of total failures. Incandescent lamps have a single filament. If the filament fails, the display goes dark and must be immediately replaced. LED lamps will continue to work even if several of the miniature diodes stop working; and
- LED signals are typically brighter compared to incandescent traffic signals, which enhances intersection safety.

### Checklist for a Successful Project

#### Step 1: Conduct a Complete Inventory.

Consider all opportunities and list what you want to replace

- A. Directional arrows
- B. Pedestrian crosswalks
- C. Red and green lights only
- D. All lights

Although some of the opportunities (such as red and green signals) may have a better payback than others (such as amber lights which are on for less time), for maintenance and group relamping it is often more cost effective to consider the entire package.

#### Step 2: Decide on Retrofit vs. New.

The decision to retrofit existing equipment with new lamps, or replace the entire units should be based on the age of the equipment. If the municipality anticipates replacing the entire units (due to the physical condition of existing units) within a few years, then the cost analysis should take both options into consideration.

#### Step 3: Consider the Tariff Structure.

The energy cost for traffic signals and pedestrian crossing light modules for municipalities (i.e., utility bill) may be based on actual metered usage or a charge per signal, signal face, or intersection. It is important to understand the billing structure in order to anticipate energy savings. Discuss options with your utility company. Some municipalities have been successful in moving to metering or having the fees reduced in order to benefit from the energy savings.



#### Step 4: Investigate Utility Incentive Programs.

Some utility programs may offer incentives to help buy down the initial cost of the products in order to reduce the overall electric load. Be sure to contact your local utility before purchasing the lights, as some utilities require pre-approval. Additionally, the utility may be able to help you identify the products that meet their specifications for incentives. A database of state incentives for renewables and efficiency sponsored and maintained by US Department of Energy can be used to help identify incentive programs (<http://www.dsireusa.org>).

#### Step 5: Evaluate Maintenance Costs.

Part of the initial cost of these types of projects includes labor to replace the lamps and to maintain them over time. Maintenance savings can be significant (think of the manpower and equipment to change one lamp in the middle of a busy intersection). However, if the municipality has a maintenance contract with an outside company with set fees per year, it may be beneficial to renegotiate the contract allowing funds for the initial installation costs and reduced maintenance fees per year.

#### Step 6: Determine Specifications.

In EPCA 2005, Congress passed a new minimum federal efficiency standard for traffic signals at the same level as the ENERGY STAR® specification (and referencing the 2005 ENERGY STAR specification). All traffic signals manufactured on or after January 1, 2006 must meet these new criteria. When specifying traffic signals and pedestrian crossing light modules, the DOE standards should be referenced as the minimum requirements. Additionally the supplier and installers should be required to provide equipment and installation as required by the “specifications of the Institute for Transportation Engineers (ITE)” and to state such compliance in their proposal and scope of work.

**Step 7: Solicit Bids.**

Using the results of steps 1 through 6—the inventory list, your knowledge of the tariff structure, the incentives available, maintenance and installation needs and costs to be addressed, and the required specification—you can prepare a successful request for proposal (RFP). The DOE's Technical Assistance Center can help by reviewing the RFP to be sure all of the previous steps have been taken into account. It should be noted that for LED based traffic signals, DOE-EERE waiver from the Buy American Act Requirements (Federal Register Volume 75, Number 43, Page 10246-10247) was withdrawn on December 1, 2010.

**Step 8: Life-Cycle Cost Analysis.**

Although the initial cost of LED traffic signals and pedestrian crosswalk modules is higher than incandescent sources, the energy savings and maintenance costs will usually offset the initial cost difference. A life cycle cost analysis, based on the bids received, will help determine the true savings over time and justification for the expenditure.

**Step 9: Purchase and Install.**

In the purchase order and/or contract, be sure the specifications are clearly called out, including the references to ITE requirements, warranties, and maintenance if applicable. Unlike many other lighting products, with proper installation based on standard practice, commissioning is not usually needed. Visual inspection will determine if the products are properly installed and working.

**Other resources for Traffic Signals:****ENERGY STAR:**

[http://www.energystar.gov/index.cfm?c=traffic.pr\\_traffic\\_signals](http://www.energystar.gov/index.cfm?c=traffic.pr_traffic_signals)

**Consortium for Energy Efficiency Report:**

[http://www.cee1.org/gov/led/little\\_rock.pdf](http://www.cee1.org/gov/led/little_rock.pdf)

**Free Life Cycle Cost Tool for Traffic Signals:**

<http://www.lrc.rpi.edu/programs/transportation/led/nystrafficsignals.asp>

*In addition to providing one-on-one assistance, providers are available to work with EECBG and SEP grantees at no cost to facilitate peer-to-peer matching, workshops, and trainings. Requests for direct assistance can be submitted online via the **Technical Assistance Center** (<https://tac.eecleanenergy.org/>) or by calling 1-877-EERE-TAP (1-877-337-3827). Once a request has been submitted it will be evaluated to determine the level and type of assistance TAP will provide.*

### EECBG & SEP Technical Assistance Program: Creating Jobs and Building Clean Energy Capacity

The Department of Energy's (DOE) Technical Assistance Program (TAP) supports the Energy Efficiency and Conservation Block Grant Program (EECBG) and the State Energy Program (SEP) by providing state, local, and tribal officials the tools and resources needed to implement successful and sustainable clean energy programs. Through TAP, DOE has launched a \$25 million effort to assist EECBG and SEP American Recovery and Reinvestment Act recipients. This effort, which is jointly-funded with EECBG and SEP Recovery Act dollars, is aimed at accelerating payments, improving project and program performance, and increasing the return on Recovery Act investments.

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