



# Westchester County Department of Public Works Completing LED Traffic Signal Upgrades on a Tight Budget

## Project Profile

**Number of Signalized Intersections:**

80  
(65 three-color  
and 15 yellow  
flashers)

**Percent of Intersections Retrofitted:**

55

**Objectives:**

Save energy  
and reduce  
maintenance costs

**Project Feature:**

Covering  
installation costs  
through a routine  
maintenance  
contract

**NYSERDA**



## Background

Just 30 miles from mid-town Manhattan, suburban Westchester County, NY is home to more than 920,000 residents and serves as a commercial center for a number of Fortune 1000 firms. Six cities, 16 towns, and 23 villages comprise the county's 450 square miles.

The Westchester County Department of Public Works (DPW) is responsible for 80 signalized intersections throughout the county, including 65 with three-color traffic signals and 15 with yellow flashers.

In 1996, DPW learned about the benefits of LED traffic signals through a program sponsored by the local electric utility. Convinced of the value of LED traffic signals, Westchester County elected to pursue LEDs even though the deadline for participation in the utility program had passed and the county would have to move forward without any financial assistance.

In 1998, Westchester County began converting the incandescent lamps in its traffic signals to LEDs—a decision that will save the county money on energy and maintenance for years to come.

## Retrofitting in Phases

Westchester County concentrated its initial retrofit efforts on the signals under DPW jurisdiction—those paid for by the county. During the first year of the program, DPW replaced 199 incandescent signal lamps with LEDs. At that time, only red lamps were replaced due to the cost-prohibitive price tags on green and yellow LED signals. However, in 1999 the county expanded the retrofit program to include green signal heads, green and bi-modal yellow/green arrows, and yellow signal heads for flashers.

During the second phase of the installation, DPW installed a total of 111 LED signal heads. In phase three, an additional 192 LED signal heads went live. In 2002, DPW expects to retrofit or construct approximately 18 signalized intersections, adding another 300 LED signal heads to its inventory.

**Use money left over in your operating budget at year's end to purchase and install LED traffic signals.**

## Stretching the Purchasing Dollar

Lacking third party or specific internal funding to support its LED traffic signal initiative, DPW is retrofitting traffic signals as the department's annual operating budget allows, using excess funds at the end of the year to cover the cost of installations.

"Rather than lose the dollars remaining in the department's budget for road maintenance and transportation supplies at the end of the fiscal year," said Westchester County traffic engineer, Kevin Roseman, "we're using these funds to supplement our LED traffic signal retrofits in Westchester County." According to Roseman, the county deems LED signals an appropriate investment given the resulting savings in maintenance and energy costs.

Without knowing how much money will remain in the department's operating budget until the end of the fiscal year, DPW must wait until all other supplies are purchased to determine the number of LEDs it can afford. However, since DPW purchases its LED signals through the New York State Office of General Services' procurement program, the county takes advantage of the bulk procurement rates negotiated by the State of New York.

## Strategic Relamping

A maintenance contractor installs and maintains signals for Westchester County under a standard three-year contract. Since LED retrofits take more



**An installation of red LED signals in the Westchester County service area.**

time than standard relamping, the contractor will spend more time during the first year of the contract than in the subsequent two years. In the end, the contractor will make the full contract amount because it will do the same amount of work—just earlier in the contract—and DPW will benefit because the LED retrofits will be performed without any increase in maintenance costs. The next maintenance contract, to be negotiated in 2002, will reflect the reduced maintenance and relamping costs required for LED signals, promising additional savings for the county.

## Projected Cost Savings

Since 1998, Westchester County has retrofitted more than 30 intersections with red and green LEDs and converted 12 yellow flashers to LEDs. Four new intersections have been completed using red and green LED signals. In addition, the county has retrofitted 14 pedestrian signals—accounting for half of the county’s pedestrian signals—with bi-modal LED man-hand signals.

As the county is charged an unmetered rate for traffic signal energy use, calculated for each intersection based on the equipment in place, DPW has not been able to formally quantify the energy cost savings associated with the LED signals installed to date. DPW has submitted change orders notifying its utility about the signal retrofits and is awaiting calculation of a new rate to reflect the lower energy consumption of the LEDs. Once its new rate is calculated, DPW will be able to more accurately quantify its energy cost savings.

Westchester County expects that the 502 LED signals installed during 2000 will cut electricity consumption by almost 183,000 kWh each year. As the county’s average electricity cost is \$0.13 per kWh, annual energy cost savings could total more than \$23,700.

“The move to install LED traffic signals will save Westchester County a significant amount of money in energy and maintenance savings,” said Westchester County traffic engineer, Kevin Roseman. “Adopting LED traffic signal technology is one of the wisest decisions we have made.”

DPW is pleased with its shift to LED traffic signals and expects the investment to more than pay for itself in energy and maintenance cost savings. The LED signals have performed well with less than six percent failures, and the manufacturer has readily replaced problem signal heads. In addition, most driver comments regarding the new signals have been positive, noting that the LED signals are easier

| Type                            | Qty Replaced | Annual kWh Savings/Lamp | Total Annual kWh Savings |
|---------------------------------|--------------|-------------------------|--------------------------|
| 8" Green Ball                   | 57           | 240                     | 13,706                   |
| 8" Red Ball                     | 102          | 284                     | 28,995                   |
| 8" Yellow Ball                  | 10           | 250                     | 2,497                    |
| 12" Green Ball                  | 101          | 386                     | 39,018                   |
| 12" Red Ball                    | 144          | 443                     | 63,829                   |
| 12" Yellow Ball                 | 25           | 377                     | 9,417                    |
| 12" Green Arrow                 | 29           | 414                     | 12,003                   |
| 12" Yellow/Green Arrow          | 20           | 67                      | 1,337                    |
| 12" Ped Hand                    | 14           | 867                     | 12,141                   |
| <b>Total Annual kWh Savings</b> |              |                         | <b>182,943</b>           |

*Based on the current rate of \$0.13 per kWh, Westchester County could save more than \$23,700 per year in reduced energy costs.*

to see, especially the green arrow signals that were replaced for improved visibility and safety.

## For More Information

This case study was developed by the New York State Energy Research and Development Authority (NYSERDA) to inform municipalities of the energy saving opportunities offered by LEDs. NYSERDA has many programs available that can help your municipality identify energy saving improvements that will reduce your utility costs, including:

**Technical Assistance Program:** Offers cost-shared help from energy engineers and experts for technical assistance. Funds are available for Energy Feasibility Studies, Energy Operations Management, and Rate Analysis.

**Standard Performance Contracting:** Offers fixed-price incentives to energy service companies (ESCOs) that install cost-effective electric energy efficiency measures.

**Smart Equipment Choices Program:** Offers financial incentives to customers for energy-efficient lighting equipment.

To learn more about these programs and others, visit the NYSERDA website at [www.nysesda.org](http://www.nysesda.org).



**A yellow flasher LED installation in Westchester County.**

**“Adopting LED traffic signal technology is one of the wisest decisions we have made.”**

**Kevin Roseman,  
Westchester County  
Traffic Engineer**