



Onondaga County Department of Transportation Installing Electric Meters to Capture the Energy Cost Savings of LEDs

Background

Located in central New York State, Onondaga County is home to more than 450,000 residents in the City of Syracuse and surrounding towns and villages.

The Onondaga County Department of Transportation (ODOT) maintains the traffic signals for 85 intersections, largely in suburban areas of the county. In 1998, ODOT learned about an exciting opportunity to cut its energy and maintenance costs through the use of light-emitting diode (LED) traffic signals.

ODOT's traffic signal supplier, Traffic Engineering and Sales of Providence, Rhode Island, introduced ODOT staff to the idea of retrofitting traffic signals with LED technology as a way to reduce maintenance and energy costs. Dennis Schuelke, ODOT's traffic signal supervisor, was intrigued and agreed to conduct an LED pilot project, which involved replacing two 116-watt incandescent lamps with two Dialight 12-watt red LED signal heads provided by Traffic Engineering and Sales.

Impressed by the brightness of the LEDs and the potential for energy and maintenance savings, shortly after the pilot project began, Schuelke decided to move forward with a larger, countywide LED-retrofitting program.



An incandescent traffic signal in Onondaga County being retrofitted with LED technology.

Installing LEDs and Meter Sockets

Historically, traffic signal electricity use in Onondaga County was billed at an unmetered rate. To reap the full energy cost savings of LEDs, ODOT decided to convert all intersections with LED traffic signals to a metered utility tariff. ODOT installed the meter sockets for these intersections at its own expense—roughly \$200 each—having determined that the energy savings from the LEDs would more than compensate for the cost of the meters.

Based on the department's cost analysis, ODOT determined that it made sense to retrofit the red signals—including red balls and arrows—at its larger intersections (i.e., those with eight or more signal faces) where the energy savings would be the greatest, and to install meters at those intersections. ODOT's largest retrofitted intersection at Route 57 and John Glenn Boulevard has 14 signal faces. ODOT also retrofitted one 4-way stop using red flashers.

ODOT recently experimented with green LED arrow signals in three of its newly-signalized intersections. Based on the outstanding performance of these green LED signals and the potential to garner much greater electricity savings, ODOT plans to expand its LED retrofit program to include green ball and green arrow signals. In addition, ODOT is testing a small number of yellow LED arrows and plans to install a dozen LED pedestrian signals. The first intersection will be operational in early 2002.

In unmetered areas, consider installing meter sockets at intersections retrofitted with LEDs to monitor the full energy cost savings of LEDs.

Project Profile

Number of Signalized Intersections:

85

Percent of Intersections Retrofitted:

25

Objective:

Reduce energy bills and in-house maintenance costs

Project Feature:

Using in-house labor to install electric meters to capture the energy cost savings of LEDs

NYSERDA

Purchasing Over Time

ODOT purchases traffic signals through its annual supply budget. By limiting its retrofits to approximately 10 intersections per year, ODOT is spreading the cost of the retrofits over several years, thereby avoiding battles over the additional funds required for LED signal purchases and meter socket installations. Due to its use of in-house labor, ODOT can perform the retrofits and installations without additional up front labor costs. The reduced maintenance associated with LED traffic signals has cut down on overtime for emergency signal maintenance and allows staff to focus on other projects.

The Bottom Line

As of December 2001, ODOT retrofitted 20 intersections with red LED signals, including 19 intersections with three-color signals and one with red flashers. All of the intersections with LED signals were equipped with electric meters. ODOT's inventory includes 158 red, 20 green, and 8 yellow LED signal heads.

ODOT calculates that the installed LED signals have cut the department's electricity consumption by approximately 72,750 kWh per year. At an average electricity cost of \$0.066 per kWh, annual energy cost savings have totaled more than \$4,800 for red signals alone. Installations of additional green signals will further boost ODOT's energy and dollar savings.

"With energy costs always a concern, LEDs are the way to go," said Dennis Schuelke, ODOT's traffic signal supervisor. Even though the LED signals have a higher purchase cost, the energy savings and relatively low cost of using in-house labor to install electric meter sockets will allow ODOT to recoup its LED retrofitting investments in less than three years.

Enthusiastic Approval

The county is pleased with the performance of its LED installations. Maintenance crews appreciate the ease with which they can install the product. An entire intersection can be retrofitted in less than two hours—about the same time required for a routine relamping of shorter-lived incandescent signals. And many people in the community have stated a preference for the new LED traffic signals, which are generally perceived to be brighter than incandescent signals.

ODOT welcomes the potential reduced risk of injury-and related liability costs-to maintenance

Type	Qty Replaced	Annual kWh Savings/Lamp	Total Annual kWh Savings
8" Red Ball	8	225	1,800
12" Red Ball	100	410	41,000
12" Red Arrow	50	418	20,900
12" Green Arrow	20	418	8,360
12" Yellow Arrow	8	86	688
Total Annual kWh Savings			72,748

Based on the current rate of \$0.066 per kWh, Onondaga County could save more than \$4,800 per year in reduced energy costs.

crews and the public associated with fewer signal outages in LED intersections. "Any time you can avoid sending maintenance crews out in the middle of the night to a dangerous intersection, it's a real plus," said Schuelke.

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.nyserda.org.



Close-up view of a green LED arrow signal.

"With energy costs always a concern, LEDs are the way to go."

**Dennis Schuelke,
Traffic Signal
Supervisor,
Onondaga County
Department of
Transportation**