

46th Street Pilot Street Lighting Study

PROJECT UPDATE



Hennepin County Housing, Community Works, and Transit

October 2012

Testing Energy Efficient Lights along 46th Street

One of the largest studies of energy efficient street lighting in Minnesota was installed in 2010 as part of Minnehaha-Hiawatha Community Works. The lights are located in south Minneapolis along 46th Street from 34th to 46th avenues.

Hennepin County worked with the City of Minneapolis, Long-fellow Community Council, and Standish-Ericsson Neighborhood Association on this project to enhance the walking, biking, and driving environment along 46th Street connecting to the light rail transit station.

The project cost approximately \$475,000, including a 20 percent contribution from the City of Minneapolis and Local Road Research Board.

Energy Efficient Street Lighting Options

Induction and light-emitting diode (LED) are two commonly used energy efficient light sources. Energy efficiency means these types of lights require less energy to function at commonly acceptable outputs.

The county, city, and Local Road Research Board partnered to evaluate the new technology streetlights. For this evaluation, collected light data was compared to City of Minneapolis street light standards.

The project involved the installation of 55 energy efficient lights on 46th Street, including:

- 43 **LED lights** from six manufacturers installed east of Hiawatha Avenue, including a mixture of 30-foot poles with shoebox-style fixtures and 15-foot poles with acorn fixtures.
- 12 **induction lights** from three manufacturers installed west of

Advantages of the Lights

- Lower energy consumption
- Longer life span
- White color-spectrum light
- Immediate activation
- Focused, directed light (LED)
- Operates with partial failures (LED)

Disadvantages of the Lights

- Higher upfront costs
- Voltage sensitivity (LED)
- Low light dispersion (LED)
- Loss of light in cold temps (Induction)
- Poor light focus (Induction)

Hiawatha Avenue, all 15-foot poles with acorn fixtures.

Hennepin County and Minneapolis have been monitoring light performance using the following parameters: operating cost, energy use, maintenance, and light quality versus a comparison block with standard high-pressure sodium (HPS) lights located along Lyndale Avenue in south Minneapolis.

Project Area Map



Energy / Maintenance Cost Claims

Installation costs: Energy efficient lights typically have higher initial costs, but lower operating and maintenance costs.

Energy costs: Decreases of 50 percent or more in energy use should result in lower electric bills.

Maintenance costs: A standard street-light lasts approximately 25,000 hours. Manufacturers claim LED and induction fixtures last approximately 50,000 hours. Cost savings could be realized by not having crews replace lights as frequently.

Initial Results

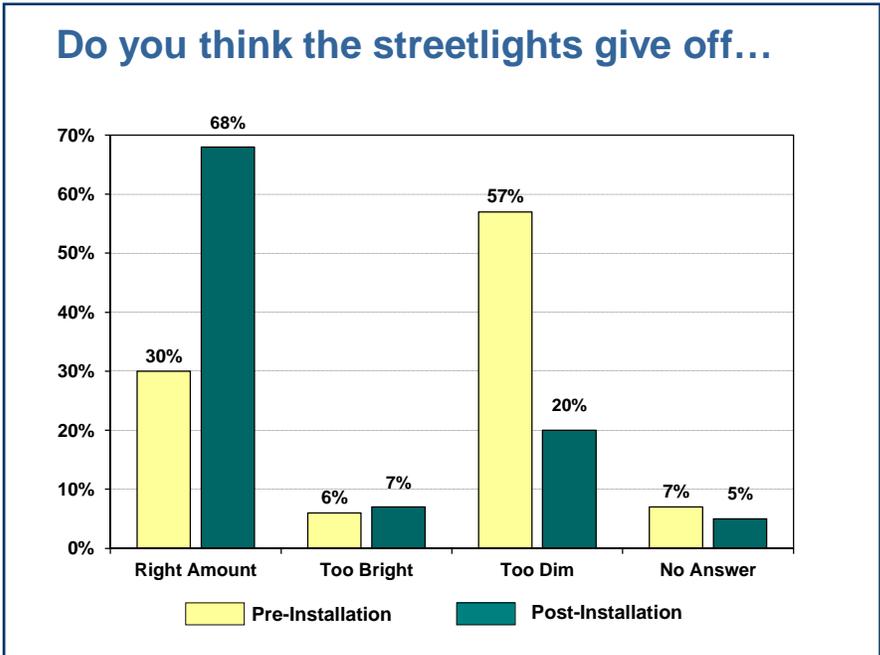
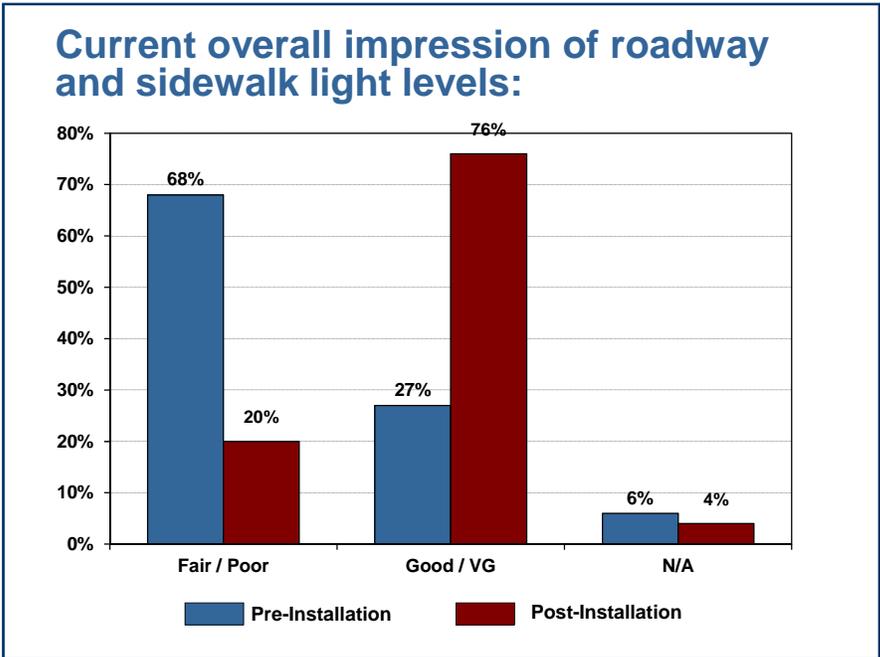
• **Installation costs:** On average, the induction lights cost \$450 more per light than standard HPS lights. The acorn-style LEDs had a \$750 cost premium and the shoebox-style LEDs a \$1,050 premium. This project found a large price variation among manufactures.

- **Energy:** Use decreased 50% to 75% versus standard HPS streetlights.
- **Light output levels:** Induction lights experienced a slight degradation in light output levels during cold temperatures. LED light output levels varied greatly among manufacturers.
- **Maintenance:** One LED and one induction light failed. One LED light was damaged in an accident.
- **Payback:** Estimated payback for the induction lights ranged from 2.9 to 9.5 years. Estimated payback for the LED lights ranged from 2.6 to 21 years for acorn-style and 5.3 to 24 years for shoebox-style lights. In general,

streetlights with higher cost (and longer paybacks) tended to have better light quality.

- Approximately 80% of cost savings from the efficient streetlights comes from reduced maintenance costs and 20% from energy savings.

The lights will remain in place until they fail. Check the project website -- www.minnehaha-hiawatha.com/streetlight -- for more information.



Responses from mail survey of approximately 100 residences within one block of 46th Street.