

Project Profile

Objective:

Install new street lighting as part of an improvement project to enhance historic character and improve appearance of the business district.

Old System:

44 cobrahead fixtures with 400W HPS lamps on 30-35 foot poles

New System:

100 historic lantern fixtures with 70W MH lamps on 12 foot poles, with existing cobrahead fixtures remaining only at intersections

Benefits of the New System:

Improved color for shopping and business areas

Improved aesthetics with attractive pedestrian scale fixtures

Saves energy and reduces pollution

'Dual' HPS-MH system increases light levels at intersections

Background

The Village of Lewiston in Niagara County was founded in the early nineteenth century. To enhance the village's historic character and to improve the appearance of its business district, the village broke ground in August 1999 to redesign Center Street, including new street lighting. The main vehicle for funding was the federal Intermodal Surface Transportation Efficiency Act, with supplemental funding and program administration provided by the New York State Department of Transportation. Total federal and state funding was about \$2.5 million. The cost to the village was about \$130,000.

Objectives

The original lighting along the street was provided by 44 cobrahead fixtures with 400-watt high pressure sodium lamps, mounted at a height of about 30 to 35 feet. The fixtures were leased from Niagara Mohawk Power Corporation, the local utility, who provided maintenance service for the lamps and fixtures as well as electricity.

The village hired engineering firm Wendel Duchsherer to provide design services. An important objective of the project was to enhance the "pedestrian experience" in the commercial district. Narrowing the street and widening sidewalks was part of a strategy to slow traffic and to improve perceptions of pedestrian safety and visibility. Consulting with the village, designers selected a colonial era appearance to reflect the village's historic character.

Constraints

Because significant funding came from federal and state sources, the village was required to adhere to a number of regulations and requirements in order to obtain final approval, including obtaining multiple bids for contracting the work. This proved to be challenging, and the bidding process took longer than originally expected.



Center Street, Village of Lewiston.

The village decided to purchase new lighting equipment rather than lease it from the utility in order to provide the desired historic appearance. The utility still provides electrical service for the new equipment, under a rate for electricity negotiated between the village and the utility. Because the village owns the new fixtures, it is responsible for maintaining them and for purchasing and replacing burned-out lamps.

Solution

The new lighting system was complemented by the other street improvements. About 100 fixtures with a historic "lantern" look were mounted on 12-foot poles so that they would contribute to the street's daytime and nighttime appearance.

Fixtures were mounted along both sides of the street, spaced approximately 60 feet apart. They produce a uniform lighting pattern with no dark patches between the poles. Half of the cobrahead fixtures were removed; those near intersections and other conflict points remained for safety. The resulting distribution illuminates both the road and adjacent sidewalks, meeting the objective of providing lighting for pedestrians. Metal halide lamps (70 watt) were used rather than high pressure sodium lamps in the new fixtures to improve color appearance.

The fixtures have a refractor mounted inside the lantern enclosure to direct most of the light output downward and reduce glare. Overall, the resulting installation uses slightly less energy than the previous system, while producing approximately the same amount of light and improving uniformity along the sidewalks.

Project Success

The lighting, in combination with other improvements, has resulted in an attractive environment for pedestrians, while maintaining safety at road intersections and crosswalks. The improvements have been recognized by the American Public Works Association and by the Greater Buffalo-Niagara Regional Transportation Council as an effective example of pedestrian-friendly enhancements that can be made to improve a downtown environment.

The project shows how an attractive, successful design can be achieved without increasing energy use, while using available funding sources effectively. It also emphasizes the benefits of using teamwork among manufacturers, vendors, design staff, and the electric utility, when meeting the needs of the municipality.



Aesthetics and improved visibility improve the pedestrian experience.

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 effective energy-efficient street lighting. 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.

Commercial/Industrial Performance Program: 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 www.nyserra.org or call toll-free 1-866-NYSERDA (1-866-697-3732).

Details

Electric utility: Niagara Mohawk Power Corporation

Project architect/engineer: Wendel Duchscherer

Fixture manufacturer: Antique Street Lamps

Manufacturer's representative: Spectro Lume

Electrical distributor: Andersen Electric Supply

Previous connected load (estimated): 20,460 W

Current connected load (estimated): 20,205 W

Annual energy savings (estimated):
1120 kWh/year

Annual energy cost savings (estimated, assuming \$0.06/kWh): \$67/year

Annual emissions reductions (estimated): 990 pounds CO₂, 3.4 pounds SO₂, 1.7 pounds NO_x

"The new lighting fixtures and poles meet the historical appearance our town wanted while providing good light levels, increased pedestrian safety and energy efficiency."

— Ken Kenney,
Andersen Electric and
Citizen of Lewiston

This case study prepared for NYSERDA by ICF Consulting, Inc. and the Lighting Research Center, Rensselaer Polytechnic Institute.