

STREET LIGHT CONVERSION FEASIBILITY STUDY

RESILIENT COMMUNITIES PROJECT – RCP 44

About the Partner

The City of Buffalo, population 16,670, is the county seat for Wright County and located outside the Twin Cities Metro area, just 42 miles from Minneapolis and 36 miles from St. Cloud. Buffalo boasts a vibrant downtown with local businesses, large retail, and many natural amenities to draw visitors.



The Minnesota Municipal Power Agency (MMPA) is the City of Buffalo's community-owned power provider and consists of a partnership among 12 communities, including Buffalo. City of Buffalo Municipal Utilities is in a unique position as the primary electrical supplier of municipal and residential power for Buffalo. The utilities department is also responsible for fiber internet communications, street lighting, water, and water reclamation.

Project Description

Under the leadership of the City's municipal utility, Buffalo is considering conversion of its street lighting system to one that is more energy efficient, environmentally friendly, and easier to maintain. According to a recent review of municipal energy use, Buffalo's streetlights are the second-highest consumer of electricity in the city. City staff estimate that roughly half of all City-owned streetlights have already been converted to LED, with the remainder being high-pressure sodium fixtures. As energy costs continue to increase, the City of Buffalo recognizes both the financial and environmental need to consider alternatives.

The City of Buffalo Electric Department is seeking a feasibility study to examine the best options (complete LED conversion, solar-powered lights, etc.) for replacing the remaining high-pressure sodium lights with an alternative that is more energy efficient and would require less maintenance. In addition to researching the feasibility and relevant case studies of such alternatives, student researchers may interview utility and City staff members, as well as survey Buffalo residents, to better understand community needs and preferences.



Resilient Communities Project

UNIVERSITY OF MINNESOTA

Key Issues, Questions, and Ideas for Students to Explore

1. Conduct a cost-benefit analysis of the conversion of the remaining high-pressure sodium streetlights to LED street lighting, as well as the conversion of ALL streetlights to solar (including existing LED-street lights). What are the expected ROI and projected future costs to cover maintenance and materials for each of these scenarios?
2. Relevant case studies of other municipal electric departments that have converted their streetlights to solar/alternative energy systems, and any positive or negative effects on their electric infrastructure, resident safety, light pollution, etc.
3. Relevant research on reliable, robust solar lighting that can withstand weather-related environmental extremes and seasonal natural light fluctuations.
4. Potential partnerships that other municipalities have explored to implement solar streetlights.

How Student Work Will Build Community Resilience

This project would not only improve the City's lighting infrastructure but would ideally reduce the need for maintenance, allowing electric crews to focus on other needs such as the reconstruction and installation of other energy-efficient electric infrastructure. An improved, energy-efficient streetlighting system would also provide an increased level of safety and security for the residents and property owners in areas where existing streetlights are insufficient. Finally, a feasibility study would also help Buffalo capitalize on new federal and state infrastructure funding streams and allow the City to strategically update its infrastructure in a cost-efficient way.

Potential Partners or Stakeholders

- Minnesota Municipal Power Agency (MMPA)
- Xcel Energy

Existing Plans and Reports

- [ACEEE Toolkit: Reducing Energy Use in Public Outdoor Lighting](#) (2015)
- [Minnesota Climate Action Framework](#) (2022)
- Greenstep Cities, [Best Practice 4: Efficient Outdoor Lighting and Signals](#)

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