Brief: Kansas City, Missouri, Streetlight Electric Vehicle Charging

Strategies and challenges for site selection of streetlight electric vehicle infrastructure in Kansas City, Missouri

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Acknowledgements

The Kansas City Streetlight Electric Vehicle Charging Pilot Project would not have been possible without the dedicated efforts and invaluable contributions of our partners and community members. Thanks to the U.S. Department of Energy (DOE) for their financial support and commitment to advancing sustainable transportation solutions. To the Missouri University of Science and Technology (MST) and Pennsylvania State University for developing the demand prediction models that were crucial in our site selection process. We also appreciate the National Renewable Energy Laboratory (NREL) for their expertise in modeling potential EVSE siting locations and for their continued support throughout the project.

We're grateful for Evergy, Black and McDonald (B&M), LilyPad EV, EVNoire, and Westside Housing Organization (WHO) for their in-kind contributions, technical support, and unwavering collaboration. Their combined efforts ensured the successful installation and implementation of the charging infrastructure.

Lastly, we want to thank the City of Kansas City and its residents for their participation, feedback, and support. The community's involvement was essential in shaping a project that truly meets the needs of its people. This collaborative effort has set a solid foundation for future advancements in sustainable transportation and equitable access to EV charging infrastructure.

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Executive Summary

The Kansas City Streetlight Electric Vehicle (EV) Charging Pilot Project is an innovative initiative by the Metropolitan Energy Center (MEC) aimed at expanding access to EV charging infrastructure. This project seeks to improve public health by reducing transportation emissions and provide economic benefits through reduced reliance on fluctuating gas prices. With a focus on equitable access, the project ensures that diverse community needs are met.

Project Overview

Introduction

The Kansas City Streetlight EV Charging Pilot Project addresses the growing need for accessible EV charging, especially for residents of multifamily housing and rental properties without home charging options. The goal is to create an affordable, equitable, and scalable curbside charging network, making EV charging convenient for all community members.

Community and Data Driven Site Selection

The site selection process relied heavily on data and community input. Partners from Missouri University of Science and Technology (MST) and Pennsylvania State University (Penn State) developed a demand prediction model. The National Renewable Energy Laboratory (NREL) used this model to identify potential EVSE (Electric Vehicle Supply Equipment) sites based on factors like potential EV adoption, residential demand, and equity considerations. Community feedback was integral to the process, ensuring the project met local needs.

Project Partners

The project was funded by the U.S. Department of Energy (DOE) and executed by MEC with support from:

- Missouri University of Science and Technology (MST)
- Penn State University
- National Renewable Energy Laboratory (NREL)
- City of Kansas City, Missouri
- Evergy
- Black and McDonald
- LilyPad EV
- EVNoire
- Westside Housing Organization

These partners contributed resources, and support throughout the project's phases below.

Implementation Phases

The project was structured into five main phases:

- **Design and Modeling:** Development of demand prediction models and site maps.
- **Site Feasibility Assessment:** Evaluation of technical feasibility, safety considerations, and charging network siting needs.
- **Outreach and Deployment:** Community engagement, site selection, and installation of charging stations.
- **Monitoring:** Tracking usage data and community feedback.
- **Analysis:** Evaluating the project's success and impact.

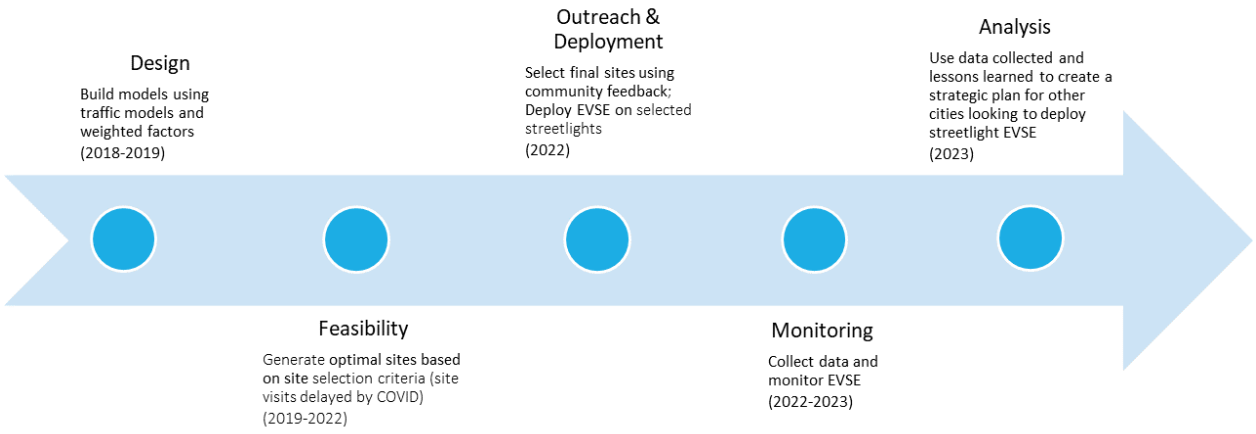

Figure 1. Streetlight EV charging project timeline for major tasks.
Source: metroenergy.org/current-projects/streetlight-ev-charging/

Outcomes and Measurement

The project successfully installed 23 EV chargers on Kansas City's streetlight system. Installation costs varied from $13,000 to $45,000 per site, depending on the required electrical upgrades. Success was measured through community feedback, utilization data, technical feasibility, and cost analysis.

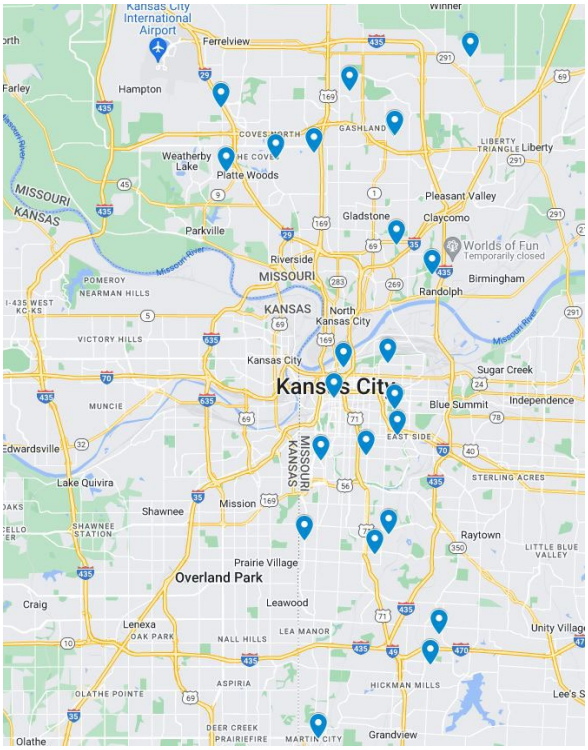

Figure 2. Final sites.

Source: www.google.com/maps/d/u/0/viewer?mid=18CuYjq1xlNlDz4WykXGvBr2FZtqQ-LM&femb=1&ll=39.091700165627756%2C-94.570598805&z=11

Successes and Challenges

Successes

- **Widespread Installation:** EV chargers were installed across all six council districts, ensuring broad access.
- **High Utilization:** The chargers have seen high usage rates, indicating strong community demand.
- **Community Driven Process:** Ongoing engagement ensured the project met local needs and preferences.

Challenges

- **Equitable Distribution:** Balancing high demand areas with underserved neighborhoods required careful planning.
- **Permitting and Agreements:** Navigating bureaucratic processes for permits and agreements posed challenges.
- **Stakeholder Coordination:** Lining up the goals of various stakeholders with community needs was needed but complex.
- **Technical Issues:** Making sure compatibility with existing streetlight systems and addressing power supply issues required technical solutions.

Recommendations

Enhanced Community Engagement

- Continue engaging the community through listening sessions, surveys, and public forums to align future projects with community needs.
- Develop targeted outreach programs to educate residents about EV benefits and charging infrastructure.

Streamlined Processes

- Work with city officials to develop efficient processes for future installations, including streamlined permitting and site selection.
- Set up standard agreements and protocols with utility companies and other stakeholders.

Focus on Equity

- Prioritize equitable access in future expansions, targeting underserved neighborhoods and addressing barriers to EV adoption.
- Consider socioeconomic factors in site selection to maximize public charging benefits for all community members.

Technical Innovations

- Invest in research and development to address technical challenges with streetlight-integrated charging systems.
- Look into new technologies to enhance the efficiency and reliability of the charging network.

Sustainability and Scalability

- Develop a long-term plan for the sustainable expansion of the EV charging network, securing funding and resources for maintenance and upgrades.
- Scale the project to meet future demand, ensuring the infrastructure keeps pace with the growing EV market.

Conclusion

The Kansas City Streetlight EV Charging Pilot Project has laid a solid foundation for a sustainable, equitable, and efficient transportation system. By leveraging advanced data models, engaging the community, and addressing technical challenges, the project has provided valuable insights for future efforts. Continued community engagement, streamlined processes, and a focus on equity will ensure the ongoing success and sustainability of Kansas City's EV charging network.