EVSE Innovation:

Streetlight Charging in City Right-of-Way

01/24.23

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Project Objective:

Substantially increase access to electric vehicle (EV) fueling in Kansas City, with attention to future usage as well as equity concerns, while saving time and money by combining charging stations with existing streetlight infrastructure

Partnerships:

- Metropolitan Energy Center (lead)
- City of Kansas City, MO
- Evergy
- Black and McDonald
- Lilypad EV
- Missouri University of Science and Technology/Penn State University
- National Renewable Energy Laboratory
- EV Noire
- Westside Housing Organization

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This material is based upon work supported by the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE) under the Award Number DE-EE008474.

Metropolitan Energy Center

Our mission is to create resource efficiency, environmental health and economic vitality in mid-America.

Kansas City area nonprofit since 1983

- 38 years of energy efficiency

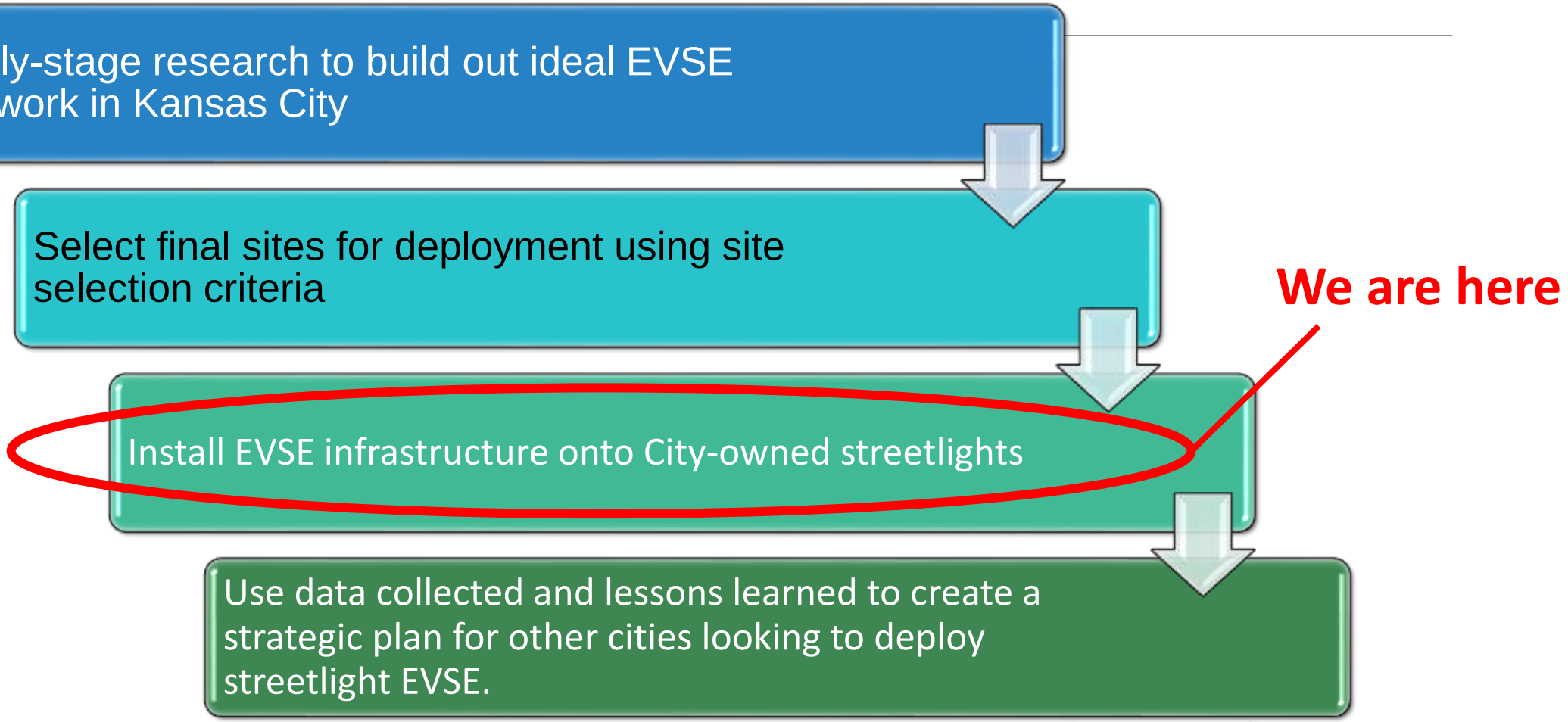
Energy Efficiency in the Built Environment

- Small Commercial Buildings
- Residential Energy Efficiency

Reducing Petroleum Use in Transportation

- Kansas City Regional Clean Cities - 1998
- Central Kansas Clean Cities - 2013

Approach


Early-stage research to build out ideal EVSE network in Kansas City
Select final sites for deployment using site selection criteria
Install EVSE infrastructure onto City-owned streetlights
We are here
Use data collected and lessons learned to create a strategic plan for other cities looking to deploy streetlight EVSE.

Market Demand Model

1. Define factors that affect the usage frequency of EVSE charging infrastructure
   - Existing charging station density
   - Traffic volume
   - Trip production and attraction
   - Land use types
2. Develop Linear Regression Model
   - Set existing charging station's daily usage frequency as dependent variable
   - Set defined features as independent variables
3. Retrieve a list of Point Of Interests (POIs) in Kansas City Missouri from Google Maps as candidate locations
4. Predict the usage frequency of candidate locations and select at least 300 streetlights with highest predicted usage rates for further evaluation

Demographic Analysis

Prioritize selection for installation of EV charging equipment for the following three scenarios:

- **Easy Win**: Areas with relatively high PEV shares AND that are likely to have poor residential EVSE availability
- **Unlock Potential**: Areas with relatively low PEV shares AND demographics that suggest they would be amenable to PEV adoption AND that are likely to have poor residential EVSE availability
- **Create Opportunity**: Areas with low incomes, low PEV adoption rates, and high multi-family building shares, (which would imply poor residential EVSE access)

Site Evaluations

(Not all-inclusive)

City approval

Infrastructure ownership

Distance to power source

Electrical capacity

Curbside parking availability

Streetlight placement

Sidewalks and ADA compliance

Environmental and historic impacts (NEPA)

Community feedback

Cost estimates

Construction and excavation difficulty

View Map Online

Outreach Goals

Help communities understand the impacts and benefits of streetlight charging in the city right-of-way

Engage communities to identify high-priority sites for streetlight charging in the city right-of-way

Ensure successful collaboration and coordination with key stakeholders (e.g., community groups, advocacy organizations, enthusiasts, businesses, etc.)

Build support for on-street charging utilizing existing electrical infrastructure on the streetlight system

Enable a feedback loop with stakeholders to collect lessons learned

Educate stakeholders about electric vehicles and electric vehicle charging.

Ownership and Billing

- All sites are in city right-of-way on city-owned poles
- Evergy plans to own the stations
- The City pays a flat rate to the Evergy for streetlight electricity
  - Streetlights are not separately metered
- The consumer will pay per kwh to use the stations

Coordinate early with the utility company and station owner on rates and billing

Right-of-Way and Property Issues

- Not In My Backyard (NIMBY)

- Homeowners
  - May not want EV's parked outside their home
  - May want to use that parking space themselves for a petroleum powered vehicle

- Businesses
  - May already have limited parking outside their business
  - May have time limit restrictions on parking
  - May need business owner support before installing EV charging station

Ensuring local support can minimize issues with NIMBYism and right-of-way

Benefits to the Community

- Pollution from gas and diesel-powered vehicle tailpipes are a leading cause of pollution in Kansas City.
- Transportation pollution has a significant negative impact on our health, increasing our risks of cancer and asthma, along with a host of other illnesses.
- As PEVs replace conventional vehicles, communities could see health benefits from decreased pollution from vehicle tailpipes.
- PEV drivers can also see financial benefits from lower fuel and maintenance costs than what they may see with conventional gasoline vehicles.

Contact Information & Questions

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https://metroenergy.org/programs/clean-cities/projects/streetlight-ev-charging/