

Streetlight Electric Vehicle Charging

Provide more public EV charging stations via LED streetlights that have excess electrical capacity



Ebee Streetlight Charging Station in Lancaster, Calif. (Photo courtesy of Green Car Reports)

The Impact

Streetlight electric vehicle (EV) chargers increase the number of public charging options, encouraging wider EV adoption. They are especially important for residents of multi-unit dwellings who are less likely to buy an EV if they don't have access to home charging. Adding more chargers to multi-unit buildings or near them also improves social equity when these buildings house people from marginalized communities. Moreover, increased community adoption of EV vehicles will have considerable effects on transportation-related greenhouse gas emissions, helping cities meet their climate impact goals. Clean vehicles also benefit community health by reducing the emission of harmful fumes.

Description

In recent years, many streetlights have been retrofitted to use LEDs. LED lights require much less energy and last longer than high-pressure sodium streetlights. With this conversion, most streetlights have an excess electrical capacity that can be used to power a Level 2 charger. Other forms of EV charging stations that are built in parking garages and on curbsides require significant installation costs due to needed trenching and electrical upgrades. In contrast, pole-mounted chargers like those on streetlights can save up to 55% on installation costs and up to 30% on overall costs by tapping into existing electrical infrastructure.

These stations can be installed and operated by established companies such as GreenLots, ChargePoint, and EVGo. Cities also can opt to purchase the chargers from these companies and have in-house engineers install them. Each company has its own app, which is used to unlock the chargers and pay hourly fees. The fee for streetlight chargers is usually \$1 to \$2 per hour, which includes the cost of parking. Users can easily charge their vehicles while they eat or shop and can even charge them overnight in some cases. These charging stations are fitted with meters to allow cities to monitor and analyze usage.

Where It's Been Implemented

The Los Angeles Bureau of Street Lighting, in partnership with the LA Department of Water and Power (LADWP) and the LA Department of Transportation, has installed electric vehicle charging stations on almost 750 streetlights as of July 2023. While the first charger was installed in 2016, the project scaled after Mayor Eric Garcetti announced the Green New Deal objective in 2019 to have at least 100,000 EVs in the city by 2025. In 2019 the goal was to install 150 streetlight EV chargers each year, but the city has since surpassed this goal, installing 155 chargers in the first half of 2023. In the first 10 months of the program, more than 130 MWh of electricity were dispensed to EVs, with an environmental impact equivalent to reducing nearly 92 metric tons of greenhouse gas emissions or planting more than 1,500 trees. While 30 streetlight chargers were paid for with grants from the California Air Resources Board, the rest were paid for by the the LA Bureau of Street Lighting and LADWP.

Los Angeles is the only city in the United States that has installed a significant quantity of streetlight EV chargers. On a smaller scale, the city of Lancaster, Calif., installed five chargers in 2017 and Metropolitan Energy Center, a nonprofit, ran a pilot project of 23 chargers in Kansas City, Mo., in 2022.

Key Drivers

Lack of charging infrastructure is one of the major barriers to adoption of EVs. Studies have shown that a robust network of public charging infrastructure, although not the only factor, is vital in promoting EV adoption. In California, the recommended EV-to-plug ratio, based on several studies, is between 7:1 and 27:1. As of late 2019, California had a ratio of 24:1, which is within the recommended ratio window. However, more charging stations are needed to keep up with the growing demand for EVs. In August 2021, the Biden Administration set a goal for 50% of new vehicle sales to be electric vehicles by 2030. Recognizing the need for more EV chargers to support this goal, \$7.5 billion was allocated by the federal Infrastructure Investment Act for EV charging infrastructure.

It is important to note that EVs are not equally accessible to everyone. Lower-income families, which tend to lack off-street parking and the ability to charge at home, face a larger barrier to EV adoption. A 2018 survey showed that 81% of the low-income EV owners who live in multi-family dwellings rely exclusively on public chargers, compared to 16% of low-income EV drivers who live in detached homes. California Assembly Bill 1796 grants tenants the right to install EV chargers at a multifamily dwelling at their own expense, but doing so usually entails higher installation costs compared to single home residents. For EVs to be truly widespread, access issues need to be addressed.

Key Factors for Success

Streetlight charging stations work best in areas with high numbers of multifamily residential units, but adding them to areas with smaller numbers of multifamily homes can have a big impact on EV adoption. In either case, usage will be boosted by adequate signage around streetlight chargers

and extensive outreach, so that people are aware they exist. Non-EV drivers need to be convinced that adequate charging infrastructure exists around them before they will buy an EV. Clear signage at charging stations can alleviate “range anxiety.”

To ensure streetlight charging stations are placed in areas with communities that need them the most, community engagement events such as public town halls are important. These events improve utilization by addressing concerns, building buy-in, and helping with site selection.

Key Obstacles

If local streetlights are not owned by the city but instead are owned by the energy utility, it may be difficult to add chargers to them. To overcome this obstacle, local jurisdictions will need to either get permission from the utility company or buy the poles back.

Once streetlight EV charges are installed, an obstacle that cities may face is non-EV vehicles parking in the spaces in front of the chargers. To avoid this, cities need to work with parking enforcement agencies to stripe off these areas to designate them as EV-only.


Another issue is accidental damage to EV chargers. In Los Angeles, some chargers are installed 10 to 15 feet above the ground to avoid vandalism, and the car connector slowly descends once someone unlocks it on their phone. However, due to impatience or misunderstanding, some people will yank on the connector, damaging it.

Finally, new and updated regulations may add challenges. For example, the California Air Resources Board made it a requirement for public Level 2 chargers in California to have credit card technology for all new installations starting July 1, 2023. Additionally, existing installations must be retrofitted with this technology by July 1, 2033. As of July 2023, no streetlight chargers in Los Angeles had credit card readers, instead relying on external partners’ apps for payment. As a result of the new regulation, installation of new streetlight chargers has been put on hold until a new solution with credit card technology is found. Compliance with the regulation will take time and add costs.

Timeline to Implementation

Installing EV charging stations onto streetlights can be done in a matter of hours, whereas a ground-mounted unit can take weeks to install. As installation is relatively inexpensive and quick, chargers can be added at scale. For example, the city of LA installed almost 750 streetlight EV chargers in a period of seven years (2016-2023).

References and Resources

- Clinton Tsurui, LA Bureau of Street Lighting, clinton.tsurui@lacity.org
-  Neighborhood EV Charging
- California Air Resources Board. [“Electric Vehicle Supply Equipment Standards Regulation Background and FAQs.”](#)
- Carpenter, Sue [“L.A. Streetlights Might One Day Charge the Electric Car You Don’t Yet Have.”](#) LAist, October 25, 2019
- Clean Transportation Funding. [“The City of LA Gets a Charge Out of Its Street Lights.”](#) March 26, 2020
- Finati, Michael. [“What Is the Future of Electric Car Charging Stations?”](#) NIP Group, May 25, 2021
- Gerdes, Justin. [“Los Angeles Completes World’s Largest LED Street Light Retrofit.”](#) Forbes, July 31, 2013

- Hsu, Chih-Wei. ["Disparities in Public Charging Infrastructure Deployment and Inequitable Electric Vehicle Ownership Cost Based on Income and Race."](#) December 2019
- Metropolitan Energy Center. ["Streetlight Charging in the Kansas City Right-of-Way."](#)
- Szymkowski, Sean. ["Streetlights That Charge Electric Cars Arrive in California City."](#) Green Car Reports, July 9, 2017
- Voelcker, John. ["Range Anxiety Is Very Real, New J.D. Power EVs Survey Finds."](#) Forbes, January 20, 2021
- Werthmann, Emmett and Vishant Kothari. ["How Utility Poles and Streetlights Can Improve Equitable Access to EV Charging in U.S. Cities."](#) The City Fix, November 20, 2021

Document last updated January 2024