How Duluth, Minnesota, is preparing for the EV future

May 9 2024, by Justin Daugherty

An electric vehicle charger stands ready in Duluth, Minnesota. Credit: Lora Wedge, Ecolibrium3

Nearly 33 million electric vehicles (EVs) nationwide—that is the number of vehicles the United States should be prepared to support through a national charging network by the year 2030, researchers at the National Renewable Energy Laboratory (NREL) estimated in a recent study.

Improving reliable, equitable, and widespread access to electric vehicle charging infrastructure in all communities will be critical to ensuring the continued success of the EV revolution.

That is why NREL researchers enthusiastically stepped up to the challenge when the opportunity to collaborate with the community in Duluth, Minnesota, arose in an effort to expand their local EV infrastructure.

"Attainable, local solutions to EV charging access will help us achieve expanded, nationwide impact," said NREL's Emily Kotz, transportation research project manager who led the Communities LEAP (Local Energy Action Program)-funded effort for the transportation related tasks.

"Duluth presented a great opportunity to collaborate with both the city and community-based partners like Ecolibrium3 to work together to identify strategies to improve planning for EV charging access."

Expanded charging infrastructure required in Duluth, Minnesota, to support projected EV adoption

As part of the U.S. Department of Energy's Communities LEAP, NREL partnered with a multi-stakeholder coalition in Duluth representing residents, business, government, and utilities to develop a model to address building efficiency, beneficial electrification, clean transportation, and economic development for residents.

Communities LEAP aims to facilitate community economic and environmental benefits through DOE's clean energy deployment work. Communities LEAP offers opportunities to low-income, energy-burdened communities that are also disadvantaged and/or experiencing

direct economic impacts to get assistance in accelerating their local energy transition.

Selected communities are matched with technical assistance providers to help them realize their clean energy goals. Following a successful first cohort, Communities LEAP recently announced a second cohort of communities.

This partnership came about at just the right time, said Mindy Granley, sustainability officer for the city of Duluth.

"I had been investigating the ways to start conversations with the community about EVs and needed the analysis to support those conversations," Granley said.

One aspect of that effort was to analyze the current EV charging environment in Duluth and to project the city's charging infrastructure needs heading into 2030.

"We helped Duluth identify a strategy for achieving its current EV infrastructure goals and then scaled the demand according to future projections so that the city can not only achieve its EV charging vision but provide greater mobility options for everyone in the community," Kotz said.

NREL's analysis projected that 10%–15% of privately owned light-duty vehicles in Duluth will be plug-in electric vehicles by 2030, based on modeling results for the city of Duluth and findings detailed in NREL's 2030 National Charging Network Study. That level of demand keeps pace with state and national trends and infrastructure needs, Kotz confirmed.

"We built our analysis off of NREL's extensive nationwide EV

infrastructure analysis, looking specifically at the city and then breaking it down further to the census track to understand where in the city charging infrastructure is anticipated to be needed," Kotz said.

Those projections mean that 75–85 EV charging ports are needed throughout Duluth to support multifamily housing, such as apartment complexes or townhouses, where two or more families can live at the same time. Duluth proposed and passed an ordinance that requires EV charging stations or EV-ready parking spaces for any new parking lot that supports multifamily housing. The city intends the ordinance to promote greater access and equity in EV charging infrastructure.

The ordinance aims to incrementally increase infrastructure to meet growing demand as new multifamily residences are built.

"NREL's analysis has helped us start informed conversations with the community," Granley said. "Data legitimizes having the conversation about where we need to go and how we can get there. A huge takeaway is that we now have a solid basis for outreach to businesses and local players to talk about potential needs and how we can support them in installing EV infrastructure. It has spurred policy changes and new partnerships. Knowing where to start is half the battle."

That analysis led to Duluth focusing its EV charging infrastructure expansion efforts first within multifamily housing and places with long-term residents, Granley added. "By taking this approach, we hope to make it easier for people who are less likely to have ready access to EVs or EV charging. Everyone should have the opportunity to make a greener transportation choice without being hampered by where they live," she said.

Considering equity issues and environmental justice

across EV adoption

Economic and accessibility factors are known challenges affecting EV adoption for disadvantaged and underserved communities, which is why NREL's analysis focused on neighborhoods in Duluth matching those criteria. Analysis focused on not only increasing EV adoption and meeting charging needs but also on ways to increase overall mobility access for neighborhood residents.

"As the city thinks through where to place public charging stations, community involvement and input throughout the process will be key," Kotz said. "Many of these neighborhoods have low vehicle ownership among a population that has many renters who are low income. Residents living in single-family homes with off-street parking and access to power are more likely to be early adopters.

"Where more resources and conversations are needed is how do you work with residents in multifamily housing to add EV charging stations, shared electric micromobility like e-bikes or e-scooters, and create mobility hubs to support electrification of buses and e-bikes and such."

Under the White House's Justice40 Initiative, 40% of overall benefits of certain federal investments in clean transportation, energy efficiency, and similar areas must go to disadvantaged communities like those in Duluth. Health, air quality, economics, and community energy resilience are some noted benefits of EV adoption, charger investment, and environmental justice initiatives.

"EV infrastructure is one way to bring new business to the community. Lighting and sidewalk improvements can be built in with the project, too," Kotz said. "Convenient charging infrastructure added to multifamily housing and workplaces will expand the EV market. EV car-share options are also a way to expand access in underserved areas."

Further, Kotz added that NREL's modeling can help inform important policy and infrastructure development within Duluth's underserved and disadvantaged areas, providing important considerations for transportation projects like the rebuild of a Main Street business corridor.

Better infrastructure and planning will help those experiencing barriers to EVs gain better access and mobility, said Jodi Slick, founder and CEO of Ecolibrium3, a Duluth-based organization focused on equitable and sustainable change in the city.

"As an environmental justice organization, we are working with the city and other stakeholders to make the best choices for advancing an equitable energy transition," Slick said. "Having access to NREL's expertise through Communities LEAP ensures that our work is well informed and can meet future needs."

Provided by National Renewable Energy Laboratory

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