A new approach to transportation: Pairing off-street parking with electric scooters

March 7 2024, by Nikki Forrester

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Fighting traffic and searching for parking are some of the least enjoyable aspects of driving in a city. Some studies estimate that 25% to

40% of traffic congestion in city centers is caused by people looking for parking spots. Not only does the quest for parking waste time and fuel, it also causes delays for other drivers and contributes to greenhouse gas emissions.

To find ways to reduce traffic congestion in urban areas and the associated environmental impacts, the U.S. Department of Energy's (DOE) Argonne National Laboratory teamed up with the Civic Infrastructure Collaborative (CINCO) and Millennium Parking Garages in Chicago to test a new approach to transportation that pairs off-street parking with e-scooter rentals.

"Generally, people aren't going to walk more than a quarter- to a half-mile to get to their destination," said Joshua Auld, a group manager within Argonne's Transportation and Power Systems division.

But Auld and his collaborators thought providing e-scooter rentals might entice people to park in a garage and then use the scooters to quickly and efficiently travel throughout the city.

In August 2022, Argonne and CINCO began a pilot study with Millennium Garages, a massive underground parking facility in downtown Chicago with more than 9,100 spaces.

"We wanted to see if scooters could essentially bring the garage closer to more destinations or allow somebody to park once to access multiple locations instead of having to park several times, which drives a lot of congestion," said Jamie Ponce, executive director of CINCO.

The pilot program started with eight scooters operated by Ridy, an electric scooter and bike company based in Chicago.

"When people think about scooters and cities, it's usually the public

scooter fleets where you can pick them up and drop them off anywhere," Ponce said.

But this pilot program was different. Users who parked in a Millennium Garage signed up for an e-scooter in advance on the Millennium Garages website and could then use that scooter for the entire day.

"You can leave the scooter at your office, then use it to go out to lunch, and return it to the garage when you're ready to go home. You have access to a scooter for as long as you need it," Auld said.

To evaluate the pilot program, the team collected data on user interest, distance traveled and number of trips. The CINCO team also conducted a customer survey to understand how people incorporated e-scooters into their commuting plans.

"The use rate of the scooters was pretty high. Most of them were out on a given day, even in the cold and snow," Auld said.

During the five-month 2022 pilot program, 225 unique riders embarked on 546 e-scooter trips, with an average of 4.7 trips per day. The average distance from the garage to a destination was 0.72 miles, with 90% of the stops being farther than the typical walking distance of a quarter mile.

Interest continued to grow in 2023.

"Almost 10,000 customers signed up for access to the fleet on our online form, which on eight e-scooters indicates there's a lot of interest," said Tom McCoy, director of infrastructure solutions for CINCO. In October 2023, the team decided to double the e-scooter fleet to 16 to increase use and provide availability to more customers. The e-scooter rentals were free when the program first launched. Then the team introduced a small

fee to open up capacity for first-time riders.

During the 2023 pilot study, the team grew the rider base by 77% compared to 2022, with 398 unique riders taking 1,341 e-scooter trips.

"When you integrate e-scooters with parking, customers are going more places and going farther than they would have otherwise. This approach reduces carbon emissions and sends people all over the city," McCoy noted.

The success of the pilot program also demonstrated to Millennium Garages the value of combining e-scooters and parking.

"The scooters put a smile on the parking customers' faces. We could see how excited the parking facility operations staff and ownership got about this idea of pairing conventional parking with new mobility modes," Ponce said.

The e-scooter pilot program began as part of the DOE's SMART Mobility 2.0 program, an effort to improve transportation through testing new affordable, efficient, safe and clean energy technologies. Argonne scientists helped conceptualize the idea with CINCO and conduct the data analysis for the pilot study. Now, Millennium Parking Garages is expanding its e-scooter fleet and taking on the associated operating and maintenance responsibilities.

"Millennium will be a model for other facilities that are looking to provide low-carbon mobility options for their residents, employees and customers," Ponce said. "It's a step toward answering the bigger-picture question of how to use infrastructure, technology and partnerships to make cities happier and healthier."

Provided by Argonne National Laboratory