



Electric Vehicle Supply Equipment & M2M I-94 Corridor Project

Interstate 94 (I-94) is a major highway connecting the Great Lakes and intermountain regions of the United States. Gaps in alternative fuel infrastructure between Port Huron, Michigan and Billings, Montana prohibited acceleration of alternative fueled vehicle deployment. GTI Energy led a project, *US Fuels Across America's Highways - Michigan to Montana* (M2M Project), funded through a \$4.9 million U.S. Department of Energy grant that was facilitated by partnerships with Clean Cities Coalitions and deployment partners along the 1,500-mile M2M route. With M2M grant support, electric vehicle charging infrastructure was installed to expand the availability and use of electric vehicles as an alternative fuel along I-94.

The Need Addressed:

The main goal of this project is not to install infrastructure in every gap that was identified; it was to create necessary teams to guide the creation of an alternative fuel corridor, deploy selected stations and vehicles, and provide education/training to establish a sustainable alternative fuel and advanced vehicle market. One of our findings was that charging station infrastructure redundancy is critical to establishing a robust and sustainable corridor. Fleets and municipalities, especially those in critical locations, often mentioned that having redundant fueling sites is necessary for the wide- spread adoption of alternative fuels. Therefore, station locations cannot be just limited to "filling gaps," new sites were determined by the needs of the end users and the impact on overall adoption. This led to several challenges that were noted and overcome.

Solution Chosen:

The project included deployment of DC fast chargers (DCFC). Other funding partners supported installation of level 2 (L2) chargers at several DCFC locations. The advantage in having both types of chargers were evident from the start of project. L2 is an asset for fleet vehicles that need overnight charging or have significant dwell times. Sites along the corridor require faster charging. L2 chargers have significant use cases for longer dwell times like along streets or in parking areas with overnight or work-day parking. However, for public retail locations and along highways, DCFC is a greater amenity and provides a greater positive impact to all parties involved including drivers and retailers, while L2 provides a backup and alternative charging port for vehicles unable to utilize fast charging.

Key Participants:

- Energy Hunters: installed DCFC stations in Jamestown-ND, Barnesville-MN, Ashby-MN
- Ozinga: installed DCFC station in Sturtevant-WI
- ZEF Energy: installed sites in Alexandria-MN, Fergus Falls-MN, Moorhead-MN, St Cloud-MN, Dickinson-ND, Hudson-WI, Tomah-WI, Eau Claire-WI, and Black River Falls-WI
- Local utilities in North Dakota, Minnesota, and Wisconsin
- Local site hosts/city champions
- Minnesota Clean Cities Coalition, North Dakota Clean Cities, Wisconsin Clean Cities Coalition

Outcomes and Lesson Learned

All three companies working to install the DCFC at various sites noted that each host site had different expectations and preparation requirements. The need for a quality site plan with a check list and timeline was vital to the success of each installation. While locating a host site, many conversations need take place simultaneously. Specifically, partners need to involve a local site champion, the utility, the manufacturer/installer, and a team to support the install including electricians, civil engineer, local trades people, etc. Working with the utility from the beginning is key as the utility knows the site and its capabilities.

Site hosts and partnerships need to have a clear plan on long term costs and sustainability of the project. According to one partner, a large cost continues to be maintenance and “future proofing” of sites. Other partners mentioned the cost of local labor and shipping need to be considered to ensure product parts arrived in a timely manner and do not delay the project timeline.

Another step in this complex process is understanding the timeline of the project. While this project was completed during the COVID-19 pandemic, continued challenges with supply chain issues continued to impact schedules. In post-COVID-19 scheduling, the following timeline was the “norm”: 40-60 weeks for transformers to be updated/worked on with utilities, and 20-30 weeks for DCFC equipment to be ordered and received. When partners have established targets, remain motivated to stay on task and budget, the following timeline is possible: 2-3 weeks for site selection, 3-6 weeks for site planning, drawings and permits pulled, 2-4 weeks for equipment delivery and installation. Three-four months overall in an ideal world when equipment is available and funding sources are allocated. Under current conditions, six to twelve months to secure sites, bring partners together, and complete installation and commissioning.

In closing, this project has led to a corridor with a variety of DCFC and L2 chargers with an array of powers for charging stations depending on location. Partnerships continue to flourish and expand. With NEVI plans being developed and implemented in each of the states along I-94 from Michigan to Montana, this EV Corridor is expected to grow.

Project at a Glance

Vehicles: BEV and PHEV

Fuel: Electricity

Infrastructure: Level 2 and DC fast chargers

Motivation: Enabling EV charging infrastructure along Alternative Fuel Corridor

Related Links:

- Electric Vehicle Charging Stations: https://afdc.energy.gov/fuels/electricity_stations.html
- Infrastructure Development: https://afdc.energy.gov/fuels/electricity_infrastructure.html
- Electric Vehicle Basics: <https://afdc.energy.gov/vehicles/electric.html>
- Electric Vehicle Emissions (https://afdc.energy.gov/vehicles/electric_emissions.htm)
- Michigan to Montana Project Website <https://m2m94corridor.com/>

