

The National Parks Michigan Mobility Challenge (NPMMC)

Area of Innovation: Multimodal Electric Charging Hubs

The Michigan Office of Future Mobility and Electrification (OFME) and the National Park Service (NPS) are exploring options for integrated multimodal electric charging hubs in and around gateway communities of NPS sites across the State of Michigan. Electric mobility devices are revolutionizing how people travel to and recreate in Michigan's great outdoors. Every year, more visitors and locals are driving electric cars and trucks (EVs), bringing electric bikes (e-bikes) and electric scooters (e-scooters), and riding electric snowmobiles (e-snowmobiles) to, in, and around NPS sites in Michigan. With the advancement of electric mobility devices, OFME and NPS recognize a need to create more capacity for the public and fleet operators to charge their electric conveyances while on travel and while recreating in Michigan's great outdoors.

What are Multimodal Electric Charging Hubs?

A multimodal charging hub is a centralized location where both fleet operators and private users can charge a wide range of electrically powered transportation devices. The centralized aspect of the hub offers easy charging access and reduces costs of both electric power and infrastructure. This challenge seeks a way to extend the benefits of vehicle electrification to Michigan communities near NPS units, as well as to meet the growing public demand for electric charging options. In addition, this pilot project will serve as a research opportunity, allowing both the State of Michigan and NPS to collect information on the requirements for future efforts.

Wanted: Innovators up to the Challenge

OFME and NPS are soliciting submissions for pilot projects that provide Michigan residents and NPS visitors with access to multimodal electric vehicle charging hubs (preferably utilizing Level 2 chargers) in recreational communities in the State of Michigan. The intent of the challenge is to create charging hubs at pilot locations that will be among the first to provide community charging for recreational visitors to NPS sites, which would include infrastructure and space for visitors and members of the community to charge and run electric vehicles. Michigan - a hub for transportation innovation and manufacturing - is in an optimal position to embrace these trends and offer its residents and visitors more accessible and sustainable transportation.

Submitters should be ready to cooperate with the joint project team throughout the pilot by sharing data, maintaining communications, and flexibly responding to the needs of the project team and the public. Ideal submissions will utilize the latest multimodal charging hub innovations, be compatible with a variety of vehicle modes, and be able to handle periods of both high and low demand. This challenge seeks to explore what technologies can support the continued expansion of electric-powered mobility options in these areas, and to evaluate and share their results.

Submissions for community charging hubs should be able to accommodate EVs as well as other electric-powered mobility devices.

Where do we want to Innovate?

Submissions may focus on one or multiple of the four (4) areas in the following locations:

- Locations in Alger County, near [Pictured Rocks National Lakeshore](#) (PIRO).
- Locations in Leelanau or Benzie Counties, near [Sleeping Bear Dunes National Lakeshore](#) (SLBE).

- Locations in Houghton County, near [Keweenaw National Historical Park](#) (KEWE).
- Locations in Monroe County, near [River Raisin National Battlefield Park](#) (RIRA).

Come Innovate with Us!

Michigan is ready to take on the challenge and welcome visitors to NPS sites across the State with emerging mobility innovations! OFME and NPS are initiating a call for submissions which may help inform how multimodal charging hubs can improve the visitor experience at Michigan NPS sites.

OFME and NPS request that any responses to this call for submissions be no longer than five (5) pages and submitted electronically to the Application Portal. The following criteria, while not required for submissions, serves as an overview of the type of information being solicited by the reviewing committee.

Location: The location(s) of proposed community electric charging hubs should be within established developed areas where the use of a variety of mobility devices is expected and safe. Locations should be on privately or publicly owned properties, lands, or rights-of-way, and be compliant with all applicable Federal, State, and local laws, policies, and regulations. Proposed locations may not be on National Park Service property. Locations must be accessible to the general public at all times (24 hours per day / 7 days per week).

In addition to the criteria outlined for proposed community electric charging hubs, it is also important to consider dynamic load balancing. This is a process used to distribute electric power across the charging stations to avoid overloading the power grid. Dynamically balancing the load ensures that each station receives the appropriate amount of power to efficiently charge electric vehicles. This technology is crucial for the sustainable and efficient operation of community electric charging hubs, especially as the number of electric vehicles on the road continues to grow. Therefore, when selecting the location for these charging hubs, it is important to consider the availability and capacity of the power grid to support the anticipated demand, as well as the need for dynamic load balancing technology to ensure smooth operation.

Ownership, Operation, and Maintenance: Submissions must include details about who will own, operate, and maintain the equipment and the terms under which access will be maintained. Submissions should be developed in collaboration with property owners and/or local governments. Please attach letters of intent from all parties with an ownership or operations role. Submissions must indicate a commitment to maintain and operate the community charging hub for a minimum of five (5) years. Submissions must also detail end-of-life procedures, including any handoff, sale, or decommissioning of the installation at the close of the pilot period.

Payments: Provide information about how payments for use will be collected, and the intended rate structure. Extra consideration will be provided to submissions that include payment options that do not require the use of a credit or debit card or access to a smartphone, as well as those which provide discounted rates for local residents or individuals with low incomes.

Proposed Technology and Design: Detail the proposed technology and design of the community charging hub. Do not provide any proprietary information. Interested applicants may refer to [the US](#)

[Access Board recommendations around accessible charging stations](#) for additional information.

Submissions should address the following elements below, at minimum:

- Power source, including any backup power sources.
 - Indicate energy usage over time, considering factors such as active vs. idle load, seasonal traveler visitation trends, and maximum load on grid at a given time.
 - Assess local grid infrastructure and determine related fees, electricity rates, and pricing structures.
 - Coordinate utility planning to ensure compatibility with the local grid.
 - Provide information on the necessary network connection and required bandwidth.
 - Calculate energy usage over time, considering factors such as active vs. idle load, seasonal traveler visitation trends, and maximum load on the grid at a given time.
 - Include a backup power source to ensure continuity of charging services.
- The number and type of plugs/connectors to be provided.
 - Indicate the maximum voltage and current for each connection, as well as the extent to which this output changes when charging more/fewer vehicles/devices.
 - When planning for energy usage, consider various factors such as active vs. idle load, seasonal traveler visitation trends, and maximum load on the grid at a given time. Also, assess the local grid infrastructure and determine electricity rates and pricing structures for successful implementation.
- Mobility devices compatible with the proposed community charging hub (EVs, e-bikes, e-scooters, e-snowmobiles, e-ATVs).
 - Include illustrations of configurations of different vehicles which could be charged simultaneously and the expected time to recharge to 80% capacity. (Note that rural drivers may need unique accommodations for their vehicles. For example, RVs, drivers with boats, or those arriving with trailers may seek out EVSE alongside pull-through parking spots where they would not need to back up their vehicles.¹)
- Conceptual design of the community charging hub, showing plans for ingress/egress, lighting, canopy/shelter, and distance from nearby buildings and streets.
- Certification for operation in typical weather conditions experienced in the proposed locations (including cold winter conditions and hot/humid summer conditions).

Cost: Submissions must include a detailed breakdown of anticipated costs to install the community charging hub(s), installation needs, a cost breakdown of operation and maintenance, as well as the amount of financial assistance requested from OFME. Include any financial commitments from property owners, local governments, or partners to support the development of the community charging hub. Superlative submissions will describe the financial sustainability of these installations over time, considering cumulative operating costs, market trends, and scalability.

Scalability: Indicate the potential for the proposed technology to be expanded to serve other areas within the region, and any economies of scale that could be realized and passed on to users if it were expanded.

¹ <https://www.transportation.gov/rural/ev/toolkit/ev-infrastructure-planning/planning-types#site-level-planning>

Evaluation: Describe how the following required information will be collected and shared with OFME to aid in the evaluation of the pilot project. Submittals must include plans to collect the following data throughout the pilot:

- Number and type of vehicles charged.
- Time and date distribution of charging.
- Total energy provided.
- Outages, maintenance periods, or other service disruptions.
- Time-to-charge and time-at-charger data.
- Raw energy costs.
- Total costs to users.
- Financial data throughout pilot.