November 12, 2024

Submitted electronically via https://www.regulations.gov

Federal Highway Administration (FHWA)
U.S. Department of Transportation
1200 New Jersey Avenue SE
Washington, DC 20590

Re: **FHWA and Joint Office Notice of Request for Information (RFI) on Medium- and Heavy-Duty Electric Charging Technologies and Infrastructure Needs [FHWA-2024-0028]**

To Whom It May Concern:

The National Rural Electric Cooperative Association (NRECA) respectfully submits the following comments to the U.S. Department of Transportation's (USDOT) Federal Highway Administration (FHWA) and the Joint Office of Energy and Transportation (Joint Office) in response to the Notice of Request for Information (RFI) on Medium- and Heavy-Duty Electric Charging Technologies and Infrastructure Needs (FHWA-2024-0028). We appreciate the opportunity to provide NRECA's perspective in response to this RFI. Electrification of the transportation sector creates both opportunities and challenges for the electric sector, and electric cooperatives will play a critical role in the success of the transformation now underway.

Electric cooperatives have been active in developing programs to meet the needs of their members as they increasingly electrify their modes of transportation, whether that be residential consumers with light duty vehicles or their commercial and industrial consumers that are electrifying fleets. The coming electrification of the medium and heavy duty fleet of vehicles in the United States pose some of the same challenges as their light duty vehicle counterparts but also pose significantly increased challenges to grid infrastructure. Close coordination with electric utilities, including America's electric cooperatives, is essential to ensure that the solutions deployed are done in a way that will maintain reliability of the grid while also not adding cost burdens to consumers that are not utilizing the charging infrastructure.

NRECA is the national trade association representing nearly 900 local electric cooperatives and other rural electric utilities. America's electric cooperatives are owned by the people that they serve and comprise a unique sector of the electric industry. From growing regions to remote farming communities, electric cooperatives power 1 in 8 Americans and serve as engines of economic development for 42 million Americans across 56 percent of the nation's landscape.

Electric cooperatives operate at cost and without a profit incentive. Each cooperative is governed by a board of directors elected from its membership. NRECA's member cooperatives include 64 generation and transmission (G&T) cooperatives and 832 distribution cooperatives. The G&Ts generate and transmit power to distribution cooperatives that provide it to the end of line co-op consumer-members.

Collectively, G&T cooperatives generate and transmit power to nearly 80% of distribution cooperatives, which in turn provide power directly to consumer-members at the end of the line.[1] The remaining distribution cooperatives receive power directly from other generation sources within the electric utility sector. Both distribution and G&T cooperatives share an obligation to serve their consumer-members by providing affordable, reliable, and safe electric service.

Overall, it is important for FHWA and the Joint Office to recognize that electrification of the transportation sector, and the increased flexibility of this newly electrified demand, will require substantial distribution infrastructure investment over time to meet increased average local electric demand and to meet increased demand in new locations (e.g., EV charging stations). Significant transmission infrastructure investment may also be required to meet increased average electric demand and changes in the spatial distribution of electric demand among load centers. According to the National Academy of Sciences, to transition the transportation sector through increased electrification, electric utilities will need to increase generation by up to 170% and see a three-fold expansion of the transmission grid by 2050. Over time, electrification of the transportation sector will require additional generation investment to ensure resource and energy adequacy to meet increased average electric demand and changing consumption profiles. Unfortunately, this investment challenge is becoming more complex due to several recent EPA actions that are jeopardizing flexible, dispatchable always available generation resources.[2] These actions would require increased reliance on intermittent energy sources. Particular attention will be needed to ensure that generation investment is adequate in amount and in operational characteristics to meet the demands of electrification while ensuring grid stability, security, and reliability.

To support the electrification of medium and heavy-duty battery electric vehicles – as contemplated in the National Zero-Emission Freight Corridor Strategy, for example – electric cooperatives and other utilities must be involved from the very beginning of planning for the charging infrastructure these vehicles will require. There are already examples of 1 MW charging stations being built to support these fleets. Electric cooperatives and other utilities need to be integrated at the very beginning of planning for such facilities by the project developers, or other relevant planning authorities where applicable, to avoid unintended consequences. Failure to do so will likely result in unrealistic expectations on the part of fleet operators and possibly delay plans for electrification as they learn of the full costs that will be required to serve this new load from their electric cooperatives or other electric utilities.

It is important to note these requests to support infrastructure buildout for medium and heavy duty vehicle electrification are being made in addition to the significant increase in large load requests that cooperatives and other utilities are experiencing. Meanwhile, utilities continue to face significant supply chain challenges, including long lead times for certain transformers and other essential equipment. The confluence of all these factors will impact the amount of time and the resources available to support infrastructure buildout for these projects.

The consumer-members of America's electric cooperatives should not bear the costs of charging infrastructure for medium and heavy duty battery electric vehicles that they will not benefit from. Cooperatives serve 92% of the persistent poverty counties in the United States. Since electric cooperatives serve areas with low population density, costs are borne across a base of fewer consumers

[1] See more information: https://www.electric.coop/wp-content/uploads/2024/04/2024_NCS5685_Coop_FactsAndFigures_4.22.24.pdf

and by families that spend more of their limited resources on electricity than do comparable municipal-owned or investor-owned utility customers. On average, electric cooperatives serve eight customers per mile of line and collect annual revenue of approximately $19,000 per mile; while the other utility sectors average 32 customers and $79,000 in annual revenue per mile. It is critical that the site developers bear the cost of their investments including the grid side upgrades required for them. To support these investments, the federal government could allow for grid-side upgrades (meters, transformers, switchgear, extending power lines or upgrading existing power lines several miles, etc.) to be eligible for federal funding under the available programs being utilized to support medium and heavy duty vehicle electrification.

Category 1 – Unique EV Charger and Station Needs

2. *Station Development Considerations:* What factors should be considered for the siting, location and development of a MHD EV charging station? What features and site design elements need to be considered for a station designed to support MHD EVs deployed in the next five years considering both depot and en-route charging applications? How should grid interconnectivity/capacity be considered in the site design for MHD EV stations? Should certain site design elements be standardized (*e.g.,* number of ports, physical dimensions/spacing between charging ports, pull-through charging bays, co-location with other fuels) or is flexibility needed to accommodate different MHD EV charging scenarios and site constraints?

Local electric utilities within identified transportation corridors should be consulted early in the process of developing a site. The charging stations for medium and heavy duty vehicles may require significant grid-side upgrades to serve these sites and the timelines associated with equipment required to serve these sites could be well over a year. Having conversations upfront about capacity needs and the timelines associated with the site developer's decisions on the capacity needed will save both the developer and the utility time and resources. Grid upgrade costs for charging these vehicles will vary by region, cooperative, circuit, and feeder. It is critical that charging infrastructure be developed that balances the desire for fast charge with grid reliability and reasonable infrastructure upgrade costs.

Standardizing to a few site sizes (transformer size dependent) would be ideal for equipment ordering and stocking spare equipment. For commercial sites, transformer upgrade needs will vary. Most sites will already have three-phase power available; however, in very rural locations single-phase power will need to be upgraded to three-phase. If transformers do need to be upgraded on a three-phase line, then three transformers will need to be upgraded.

Site design should include considerations for future growth, including spare or oversized conduit as well as space or land for charging station growth. Co-location with other fuel types should not be *required* since existing sites (i.e. gas stations) may not be well-suited for large electric loads unless funding is available to pay for necessary grid upgrades.

When planning for medium and heavy duty electric vehicle charging stations, it is crucial to consider the expected charging demand and load profiles of the fleets. These profiles will vary based on how the fleets are used and where they need to charge. For instance, depot-based fleets might have predictable overnight charging patterns, while en-route charging needs could be more sporadic and distributed throughout the day.

Incorporating these load profiles into the planning process has the potential to reduce the need for extensive grid upgrades. By understanding and anticipating the charging needs, more robust managed charging programs can be developed. These programs can optimize charging times to off-peak hours, balance the load on the grid, and reduce the overall infrastructure costs. Managed charging also has the potential to optimize charging and reduce peak demand charges by scheduling charging during off-peak hours, fleets can avoid higher electricity rates and reduce operational costs.

4. *Safety Considerations:* What are the safety considerations for charging MHD EVs at a public station vs. a private station, including personal safety and safe operations? What specific safety considerations are important to consider for high-power (*e.g.,* megawatt level) charging?

We believe more training and resources for first responders to deal with situations involving medium and heavy duty battery electric vehicles is needed, particularly in rural areas. FHWA, the Joint Office, and other federal partners should dedicate funding to this effort. Cooperatives can help advertise such opportunities in their service territories.

9. *Delivering Power to a Site:* What actions are currently being taken by electric utilities or can electric utilities take to ensure that necessary power is available in MHD EV charging locations? What actions are currently being taken by MHD fleet owners/operators or can MHD fleet owners/operators take to ensure that necessary power is available in MHD EV charging locations?

Utilities need to know in advance where charging stations will be located so that appropriate distribution and transmission infrastructure (as needed) can be built out. These discussions should include details regarding any future plans for expansion. There are already active charging stations with 1 MW charging capacity. From a distribution perspective, we are concerned about the impact of this growing trend on the distribution system, which was not designed for these types of loads that have very high demand for short bursts of time. The upgrades required to serve these sites as well as the demand charges that utilities typically use to cover their costs in serving these sites will likely come as a surprise to site developers. Steady, near-constant loads make efficient use of capacity on the grid. However, fast charging sites envisioned for medium and heavy duty battery electric vehicles with 1 MW or higher loads that only require charging for brief periods of the day does the opposite. It is important that site developers find ways to improve the load factors of their charging stations – the ratio between energy consumed and peak demand – so that electrification of the transportation sector is done in a sustainable way that does not harm consumers and worsen reliability of the grid.

Utilities may require some type of deposit or guarantee from developer/guarantee to reimburse the utility for equipment purchased and installed if the charging station is not built. In areas with grid constraints, available funding should be permitted to cover costs for grid upgrades to support these sites, sometimes referred to as “make ready.” The charging sites for these vehicles should have energy management systems behind constrained delivery points.

Additionally, distributed energy resources (DER) and storage integration can serve as a temporary power solution. By incorporating DERs such as solar panels and battery storage systems, charging stations can temporarily be powered until necessary upgrades, such as substations, can be completed. Additionally, integrating storage solutions can provide backup power during outages and further support

the sustainability of the charging infrastructure. DER and storage can also be used to optimize charging operations for fleets by managing energy use more efficiently and reducing operational costs. It is important to note that utility franchise rights vary by state and may have implications for utilizing these options to provide power to EV charging stations.

10. *Demand Response and Managed Charging:* What demand response or managed charging strategies are needed and/or have been employed successfully for MHD charging locations?

This is an important topic to electric cooperatives as it can directly impact the upgrades needed for a site or the associated costs of the site. All equipment should be networked for insights into charging and energy usage to inform strategies. Sites should set an upper limit for a bank of chargers, even if the individual chargers support higher output. This model has already been used for light duty vehicle charging sites. Newly developed private (depot) charging should have a managed charging requirement. For all charging (public and private), there should be emergency curtailment abilities in case of system emergencies (for example, Energy Emergency Alert (EEA) Level 1 or 2). Exceptions could be made along evacuation routes. Utility integration with telematics should be considered as this technology matures.

11. *Role of Onsite Energy Storage and Generation:* What role is on-site energy storage and generation playing or could play in supporting MHD EV charging needs? What actions are needed to enable the utilization of cost-effective energy storage and generation?

Onsite storage and generation may minimize grid impacts during peak times and would also allow operators to take advantage of lower cost grid energy during off-peak times. Developers should discuss the trade-offs with their utilities during site design. Storage installations located offsite in partnership with utilities could provide grid benefits beyond just at the charging site. Also, in partnership with your utility, DER and batteries may provide a temporary solution until critical upgrades, like substations, are completed.

12. *Grid Interaction:* What scenarios or use cases would be ideal for exporting power from charging sites back to the grid? What actions are needed to enable cost-effective exportable power?

Grid interaction from on-site batteries, generators, and even the vehicles themselves has the potential to provide benefits to the grid during peak times and emergencies, but must be managed in a coordinated manner with utilities. Standardized interconnections and tariffs would enable further grid integration. Vehicle-to-grid (V2G) technology should be *permitted*, but <u>not</u> required, due to the early stages of the technology. It is most likely going to be beneficial in applications for charging school buses and some other transit fleets where charging schedules are more predictable.

Category 4: Workforce, Supply Chain, and Manufacturing

28. *Workforce Needs for MHD EV Charging Infrastructure:* What are the workforce needs associated with manufacturing, installing, and/or maintaining MHD EV chargers? What are the current gaps in workforce development for MHD EV charging infrastructure deployment? Who are the critical stakeholders and what is needed to promote workforce development for MHD EV

charging infrastructure? Do training programs exist for workers on the installation of EV chargers with power levels beyond those available today for light-duty vehicles? If yes, please provide details of the program and the availability of a qualified workforce.

Maintaining a local skilled workforce in sufficient quantity near these charging sites will be critical to broader EV adoption. Spare parts and maintenance technicians will be critical for fleet uptime. Distributing this equipment and staff is valuable in emergency scenarios. Training and certification programs should be established to build out a competent workforce to maintain these charging sites.

Cooperatives stand ready to support transportation electrification in their communities, including the influx of charging infrastructure to support medium and heavy duty fleets. These loads require careful coordination and planning and should include the utilities serving these charging sites as early in the planning process as possible. The costs associated with serving these new loads in rural areas may be particularly high as the grid has not been built out to serve 1 MW or higher loads in these areas. These costs may be significant and should not be shouldered by the electric cooperatives serving this new load. Again, electric cooperatives are consumer-owned and operate at cost on a not-for-profit basis. They also serve 92% of the nation's persistent poverty counties. Affordability is critical to electric cooperatives and the consumer-members they serve, and any new costs imposed on an electric cooperative are ultimately borne by the consumers at the end of the line. Site developers must pay for the infrastructure needed to serve these sites and available funding programs should permit necessary grid side upgrades to serve these loads, also known as "make ready."

Thank you for considering our perspective on this topic. Please reach out to me with any questions at stephanie.crawford@nreca.coop.

Sincerely,

Stephanie Crawford

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