

Pennsylvania's Response to U.S. Department of Transportation (USDOT) Federal Highway Administration (FHWA) Request for Information (RFI):

Development of Guidance for Electric Vehicle Charging Infrastructure Deployment (FHWA-2021-0022)

Responses developed by the Pennsylvania Department of Transportation's (PennDOT) and the Pennsylvania Department of Environmental Protection's (DEP)

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Introduction

The substitution of electric power for fossil fuels as the primary energy source of vehicular transportation constitutes one of the leading challenges facing the transportation sector for the next decade or more. Pennsylvania is no exception to the growth of the electric vehicle (EV) market the United States has seen over the last several years. With each passing year, we see more and more EVs on the road and subsequently, an increasing demand for EV charging facilities. The installation of roadside battery charging facilities has not developed at the same rapid pace as the growth in the EV market itself.

The passage of the Infrastructure Investment and Jobs Act (IIJA), also known as the Bipartisan Infrastructure Law (BIL), is the largest federal infrastructure investment in decades, and PennDOT is grateful for the Biden Administration's leadership on this meaningful, historical action. BIL provides the nation with \$7.5 billion for expansion of the EV charging network, with each of the states set to receive millions in formula funds and access to billions in discretionary grant funding. Below are PennDOT and Pennsylvania DEP's joint comments on the EV Charging Infrastructure Deployment RFI issued by FHWA for the effective rollout of those EV charging infrastructure funds.

Section 1: The distance between publicly available EV charging infrastructure.

1a. Prioritizing Current Gaps in Interstate Travel

When developing the EV charging formula program, the FHWA should prioritize locating charging infrastructure within gaps along interstates as well as within communities that do not have convenient charging access. FHWA could develop a formula for evaluating or prioritizing charging locations. For example, all communities should have a minimum number of charging plugs, charging locations, and combined maximum charging output, plus an incremental increase per unit of higher population.

Pennsylvania DEP's experience from managing a DC fast charging grant program and communicating with the public is that charging gaps of greater than 100 miles along commonly traveled roads can prevent an individual from purchasing an electric vehicle. This is because many new electric vehicles have a range of about 250 miles, which can be decreased by 30% when traveling during winter, making a 200-mile total round trip impossible without in-route or destination charging. Charging gaps of about 75 miles are not desirable but can typically be managed by EV owners. FHWA's programs should prioritize reducing the largest charging gaps as soon as possible so more individuals can purchase an electric vehicle.

1b. Varying Use-Cases and Subsequent Metrics

The Alternative Fuels Corridor program requires EV chargers every 50 miles to reach designated “ready” status. The 50-mile metric might not be the correct metric for all use cases. FHWA should provide guidance on nationwide goals for community chargers, both generally and for specific cases like high-percentage multi-unit dwellings, environmental justice communities, and other disadvantaged communities. The goal could be to have charging infrastructure within XX miles or XX time to get to a charger of where every individual lives (or works). Factors should consider population density, EV ownership, traffic volumes, existing public charging, infrastructure upgrade costs, etc. Key travel corridors outside of the interstate system should also be considered for formula funding.

The appropriate distance between publicly available EV charging infrastructure also varies considerably based on the roadway type (interstate, local, etc.), travel patterns, and home charging availability. Along interstates, the current AFC requirement of charging availability at least every 50 miles is appropriate, but the AFC program should only consider charging locations within 2 or 3 miles of interstate exits as gasoline vehicles are rarely expected to travel more than 1 mile from an exit to find a fueling station. Furthermore, the requirement to have charging at least every 50 miles along an interstate is only appropriate if most travel along the roadway is for many miles. If most vehicles using an interstate are traveling well less than 50 miles before exiting, then charging should be much more frequent unless the nearby towns and cities have a substantial amount of community charging availability.

Section 2: Connections to the electric grid.

2a. Flexibility and Renewable Energy Support

Provide more flexibility to energy providers to invest in building out infrastructure to support EV growth and the needs of more EV infrastructure. FHWA should prioritize or incentivize EVSE projects to minimize electric strain on the electric grid and maximize the use of renewable electricity for electric vehicle charging. Green energies, such as solar to power charging stations, is one option to reduce strain on the grid. FHWA should share any best practices of where solar charging is ideal to help support EVSE. For example, the Pennsylvania Department of Conservation and Natural Resources (DCNR) provides Level 2 charging at several of the Commonwealth’s state parks. At one of these parks, Presque Isle State Park, these chargers are free to the public due in part to the power being sourced from solar on DCNR lands. FHWA should allow flexibility and reward these project aspects when the property owner, charging infrastructure, and/or electric utility will be employing such green technologies.

2b. “Make Ready” Investments and Time-of-Day Pricing

To support current and future reliability of the electric grid, “make ready” investments should be considered in eligible project costs to provide support for current and future demand on the grid. For instance, support on-site storage costs to be included as a means to reduce demand charges and excessive strain and include information regarding time-of-day pricing for charging stations to encourage use in off-peak hours (i.e. overnight or when grid demand decreases).

Please note, users of publicly available EVSE should not be penalized or inconvenienced by the use of these technologies. For example, EVSE projects could be encouraged to offer lower

charging rates during off-peak electricity demand hours, but they should not be allowed to charge unreasonably high rates during peak demand hours.

2c. Utilities and OEMs

To support utility companies and energy suppliers, please provide guidance towards a check list to share with utilities, outlining specific considerations on what should be ready to support electrification and what funding can go towards grid preparation, upgrades, and reliability.

Additionally, please include any guidance on the role original equipment manufacturers (OEMs) should play in vehicle-to-grid integration and smart charging infrastructure.

Section 3: The proximity of existing off-highway travel centers, fuel retailers, and small businesses to EV charging infrastructure acquired or funded under the Program.

3a. Locations to Consider

When identifying EVSE locations, planners should consider amenities such as food establishments, retail shopping, and other areas where individuals can spend extended periods of time while they charge (around 30 minutes to an hour). Funding should provide opportunities to add EV infrastructure at current fueling stations but also give consideration to charging at non-traditional “gas station” models, including hotels, grocery stores, malls, airports, transit stations, parks, libraries, and schools/universities. Requirements for charging infrastructure should include safe, well-lit areas that follow any and all accessibility protections (i.e. Americans with Disabilities, etc.), no matter the venue.

3b. Large Retailers and Small Businesses

FHWA should ensure that funding program guidelines do not encourage or facilitate EV infrastructure funds to be largely awarded to large retailers and/or a small number of charging equipment companies. Encouraging or allowing a state to issue a small number of large contracts for the siting and installation of EV infrastructure would likely result in large companies locating the charging stations at chain stores, leaving many small businesses out of the market. Ensuring equal access to EVSE funding opportunities for all businesses interested in hosting public chargers on their property should focus on small and diverse businesses where appropriate and support a variety of charging station business models. FHWA should provide guidance on how to properly engage with small businesses effectively so they are not overlooked.

Additionally, large retailers and some charging equipment companies have substantial investment capital that enables them to easily outbid smaller businesses with fewer resources. FHWA should encourage a minimum percentage of funds or charging station locations to be sited at small businesses.

Section 4: Considerations for publicly available EV charging infrastructure in rural corridors and underserved or disadvantaged communities.

4a. Prioritizing Low-Demand Areas and Underserved Communities

Low-traffic corridors and underserved communities are less likely to receive private investment in charging infrastructure because there is less demand for electric vehicle charging. FHWA should consider allowing higher funding percentages for these projects and/or on-going operations and maintenance expenditure funding. Charging infrastructure in low-demand areas should provide the same level of charging speed and amenities as charging in other areas. Some innovative technologies, such as battery storage, may be more appropriate for certain demand charging locations and should be encouraged.

From Pennsylvania DEP's experience managing a competitive DC fast charging grant program, when applicants are allowed to propose any charging location, they will usually cite charging stations in high-demand areas. These areas are typically in affluent suburban areas and along the busiest roadways near large urban areas. FHWA should focus federal charging program funds toward lower-demand areas where demand is not yet as high. When Pennsylvania DEP made program changes that provided slight funding and scoring benefits to project locations along interstates with large charging gaps it greatly increased the rate of applications in these areas. Please note, rural charging infrastructure needs may be different than underserved urban communities. Clarity on metrics and success factors should be provided.

Knowing a certain percent of low-income families do not own a personal vehicle, allowing State investments for EV car-shares, EV Mobility-on-Demand, EV ride-hailing services, and other EV Mobility-as-a-Service options should also be considered.

4b. Justice40 Initiative and Disadvantaged Communities

Justice40 aims to provide 40 percent of the overall benefits of federal investments to disadvantaged communities. Please include specific guidance within the program details regarding how the use of the infrastructure funding intersects with the Justice40 Initiative and how State DOTs can be sure to have clear pathways to dutifully invest to meet the target.

Additionally, to ensure that the needs of rural and disadvantaged communities are met, consideration for mandatory outreach and engagement strategies should be given to hear from impacted groups.

Section 5: The long-term operation and maintenance of publicly available EV charging infrastructure to avoid stranded assets and protect the investment of public funds in that infrastructure.

5a. Network versus Non-Networked Connections

FHWA should require that publicly available EV infrastructure funded through the EV formula program be networked and capable of changing network provider with no or minimal effort from the station owner.

5b. Data Collection

Charging station manufacturers or operators should be required to record and report station up-time metrics. These metrics could be reported to FHWA, states, or directly to the public. DEP's experience is that some charging equipment brands have lower rates of maintenance issues and better up-time ratios than others. Entities running funding programs should have this information available for consideration as they develop and award projects.

5c. Clarification on Operation and Maintenance Activities

Funding recipients should be contractually required to operate and maintain FHWA funded charging stations for a minimum duration. Please provide guidance if operation and maintenance activities should fall to the states or private charging infrastructure companies, in addition to any information on the use of formula funds to support operation and maintenance activities of EVSE.

FHWA may want to consider procedures for allowing a funding recipient to move a low utilization charging station to a different nearby location with minimal penalty to prevent stranded assets.

Section 6: Existing EV charging infrastructure programs and incentives.

6a. Incentivizing Diverse Investments with Federal and State Funds

In the near term, existing state programs and initiatives should continue, but as the EV fleet expands, private entities would see the potential customer base and develop infrastructure on their own in areas where they will see sufficient return on investment. The government should fill the gaps where commercial charging companies are not investing, such as in disadvantaged and more rural communities where private entities will not invest on their own.

Most, though not all, private and public funding initiatives to install EV charging infrastructure have thus far been concentrated in areas with higher EV charging demand. FHWA's formula program should focus on funding charging stations where past and existing programs have not spurred investment. However, areas with high rates of charging locations should not be penalized. In that vein, a variety of funding sources should be considered as an acceptable match to FHWA funds so that entities can pair multiple funding sources for cost effective projects and diversify the pool of applicants.

Section 7: Fostering enhanced, coordinated, public-private or private investment in EV charging infrastructure.

7a. Potential Use-Cases

A specific use-case for a public-private effort would be in an urban location where it may be desirable to have charging at regular intervals along curbside parking, both in downtown business districts and in urban residential streets as well. Although, it is still unclear how to allow individual residents the ability to put in a charger without being obstructive and requiring essentially a "saved" parking space for electric vehicles.

PennDOT encourages opportunities to emphasize coordination with public and private investment for EVSE at multi-unit dwelling where shared infrastructure is needed.

7b. Ownership

Please provide clarity on who owns the EV charging infrastructure once installed. Does ownership fall on the DOTs, the EV charging company, or the facility where the EVSE is installed? FHWA should allow flexibility for a variety of EVSE ownership and operational models, including alternative funding structures like public-private partnerships and sponsorship agreements.

7c. EVSE Installation at Time of Construction

Pennsylvania DEP's experience is that installing charging stations at the time of construction is much more cost effective than renovations to existing facilities. FHWA could consider streamlined processes for charging station at facilities under construction to increase the percentage of organization that take advantage of the most cost-effective time to install. Programs should not direct funds away from retrofit installations to new construction installations as this would likely negatively impact rural and underserved communities where there may be fewer facilities being constructed.

Section 8: Meeting current and anticipated market demands for EV charging infrastructure.

8a. Level 3 Charging

EV charging infrastructure along highways and in communities with low charging access should require 350kW charging speeds to ensure current and future vehicles can charge quickly. Many other locations can provide meaningful charging access with lower charging speeds. For example, many individuals spend an hour or two per week at a grocery store so a charging speed of 50-100kW at the grocery store would enable someone without home or workplace charging to own an EV. Workplace charging can be at even lower rates as many individuals spend 4-8 hours per day at a workplace. Charging speeds should be based on dwell time. The average individual should be able to receive a charge from 20% to 80% battery capacity in the amount of time they would otherwise spend at the location.

8b. Level 1 & 2 Charging

FHWA should direct a portion of its funding programs to Level 2 AC charging, and perhaps even Level 1 AC charging in some instances. Data shows that most current electric vehicle charging occurs at Level 1 and Level 2 speeds. Additionally, these levels of charging place less strain on the electric grid and can be more cost effective. For instance, a large multi-unit dwelling could cost effectively enable all of its residents to own an electric vehicle by providing a Level 1 outlet at most parking spaces and then Level 2 charging stations at the other 10-20% of spaces. Resident could then charge using Level 2 chargers after higher mileage driving days and the Level 1 charging for most of their needs.

8c. Future Expansion

FHWA should consider prioritizing or requiring funded project to prepare for future expansion. Pennsylvania DEP has found that preparing for future expansion typically adds a relatively small percentage to the cost of a charging station project but costs substantially less than completing a separate upgrade later.

Section 9: Other Factors for consideration by the Secretary in developing the EV Charging Program Guidance.

9a. Input on Discretionary Grants for Corridor and Community Charging

FHWA should not require that a state complete the construction of all necessary projects to achieve “EV-Ready” for all interstate highway miles before being allowed to proceed with EV infrastructure projects in other locations. States should be able to prove that they have sufficient plans, funds, and/or contracts in place to achieve EV-ready status and then begin other projects, such as community charging. Interstate charging availability is critical, but it should not delay or hinder progress for local charging access as most charging occurs close to home and lower-income households are much less likely to travel long distances and utilize interstate highway charging than higher-income households.

9b. Specific Guidance Concerning Distribution of Formula Funds

Please include specific guidance on ways to distribute the formula funding, including input on the following questions:

- Clarity is needed on the definition of “publicly available” EV charging infrastructure as it relates to state and local government charging infrastructure that support the adoption of EV fleet vehicles and could be used for general public charging.
- Will distribution follow the current STIP/TIP processes?
- What role should MPO/RPOs play in the roll out/planning of formula funding?
- Should state DOT’s grant formula funds out or partner with private sector charging companies?
- How much of the formula funds may go towards Administration costs of staffing and management of these formula and discretionary grant programs?
- How much of the formula funds may go towards planning efforts for formula and discretionary grant programs?
- How much formula funds may go towards public education and outreach efforts related to electrification, with flexibility on uses, resources, etc?
- How much of the formula funding may go towards supporting workforce training, education, and certification for personnel constructing, installing, and maintaining EV charging infrastructure?

Section 10: Examples of best practices relating to project development of EV charging infrastructure and other alternative fuels.

10a. Identifying Priority Locations

In PennDOT’s Alternative Fuels Deployment Plan for I-81 and I-78, the Department developed a step-by-step process to identifying priority locations (see table below). The steps are broken down into two stages, exit prioritization and site identification.

| Stage of Analysis | Steps |
|---|--|
| Exit Prioritization | 1. Identify and summarize data to support prioritization |
| | 2. Develop exit prioritization scores based on data |
| | 3. Group exits by AFC gap locations and other prioritization needs |
| Site Identification (for priority exits) | 4. Evaluate types of businesses at priority exit locations |
| | 5. Develop scenarios to address AFC designation and other planning needs |

For developing exit prioritization scores based on quantitative data, the overall scoring system can use traffic volume and jobs or even utilize weighted values for locations that fall in a environment justice community. The scoring system is flexible and should prioritize focus areas found in FHWA guidance and other state priorities. Should any other state DOTs or the public wish to view the full deployment plan, it is available on [PennDOT’s website](#) for download.

10b. Flexibility in Proposed Project Locations

Pennsylvania DEP has found that DC fast charging grant programs should provide applicants with flexibility in proposing project locations. Some state programs attempt to overly prescribe where charging stations must be installed which can result in charging equipment in lower utilization locations and/or result in more expensive projects because other locations would be more cost effective. Program rules such as “stations must be within 1 mile of an interstate exit ramp” or “the station must be located near exit XX of interstate XX” sometimes prevent applicants from proposing the best project sites.

Section 11: Additional Information for Predictable Deployment of Alternative Fuel Infrastructure.

11a. Use-Case Prioritization

FHWA should provide guidance on what use cases are being prioritized (i.e. commuter travel, evacuation/emergency situations, focus on public charging for areas with a high concentration of multi-unit dwelling). Additionally, after the alternative fuel corridors are taken from “pending” to “ready” status, please provide specific guidance on what the next priority for the states should be with these funds.

Section 12: Suggestions for the administration of competitive grants under the Charging and Fueling Infrastructure Program for corridor and community charging.

12a. Balance in Flexibility & Assistance

Program administrators should not be overly prescriptive in citing EV infrastructure project locations, as this often results in higher cost projects or equipment with low utilization. At the same

time, too much flexibility will result in project locations in areas of high EV charging demand and at large retailers/chain stores. When contracting, program administrators should ensure that they create program requirements and priorities that align with their program goals, without trying to prescribe how contractors should meet those goals.

Charging equipment companies and large businesses already deploying EV infrastructure are also used to learning about new programs and applying for government funds. Program administrators should provide ample opportunities, marketing, and technical assistance to ensure that smaller businesses and those new to EV charging are able to develop quality projects and applications.

12b. Pennsylvania's Experience

After multiple grant rounds for Pennsylvania DEP's competitive DC fast charging grant program we have expanded our scoring criteria to include; how many miles the new location would reduce an interstate charging gap, how close the station is to a limited-access highway exit, if the project is located in an EJ area, the status of the site host agreement between landowner and station operator, exceeding minimum funding match requirements, if there are any nearby current or planned DC fast charging stations, site amenities, site futureproofing, exceeding minimum plug and power requirements, cost effectiveness, the use of innovative technology, if the applicant has previously received funds from the program, and if the applicant is a small business. For more information regarding the program please review the DC Fast Charging and Hydrogen Fueling Grant program on [Driving PA Forward](#).

Potential applicants should be afforded at least three to four months after the time of program detail announcements until applications are due so they can develop their projects. The time between application submission and award announcements should be no more than a few months as applicants can lose interest and/or the site host can become unwilling to proceed with the project.

Pennsylvania DEP has found it very helpful to afford funding recipients the ability to move site locations in certain situations. This has prevented multiple projects from being withdrawn while still ensuring that the new site will serve the same purpose and be located close to the original.

12c. Final Questions for Consideration

FHWA should consider the grant platform that will be utilized for the discretionary grant programs. Will it be FHWA's www.grants.gov platform or State grant systems? Additionally, please provide any guidance on the following items:

- Procurement standards States need to follow and Buy America requirements as it pertains to EV charging infrastructure, including any exceptions or waivers that may be available during initial rollout.
- Utilizing other federal funds, such as TAP or Resiliency, to fulfill any match requirements.
- Consideration for streamlining the NEPA process versus having the States follow current regulatory requirements.
- Any performance measures States may be required to report in review of EV deployments for quality assurance.