

Infrastructure Investment and Jobs Act Oversight Summary and Recommendations

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1. Summary and Recommendations

The Infrastructure Investment and Jobs Act¹ (“IIJA” or “Act”) establishes two funding programs for new electric vehicle (EV) infrastructure investment: the National Electric Vehicle Formula Program and the Discretionary Grant Program for Charging and Fueling Infrastructure.

The National Electric Vehicle Formula Program (“NEVI Formula Program”) provides \$5 billion of funding to states² to strategically deploy publicly accessible EV charging infrastructure and establish an interconnected data network to facilitate data collection, access and reliability.³ The Discretionary Grant Program for Charging and Fueling Infrastructure (“Corridor Charging Grant Program”) provides competitive grants totaling \$2.5 billion for the strategic deployment of EV infrastructure, hydrogen infrastructure, natural gas infrastructure and propane infrastructure along Alternative Fuel Corridors (AFCs) or in certain other locations.⁴

The Department of Energy (DOE) and Department of Transportation (DOT) will jointly oversee these two programs' planning, funding, implementation, data collection and evaluation. These agencies will form the Joint Office of Energy and Transportation (Joint Office), which will guide and oversee the NEVI Formula Program.^{5,6} DOT will provide guidance and oversight for the Corridor Charging Grant Program.⁷

Eligibility for participation in the two programs varies. States are eligible for the NEVI Formula Program. Under this program, roadways eligible for electrification funds include AFCs, established by the Federal Highway Administration (FHWA) as a national network of alternative fueling and charging infrastructure

¹ Infrastructure Investment and Jobs Act, Pub. L. No. 117-58, 135 Stat. 429 (2021).

<https://www.govinfo.gov/content/pkg/PLAW-117publ58/pdf/PLAW-117publ58.pdf>.

² Funding will also go to Washington D.C. and Puerto Rico.

³ An interconnected network will facilitate data collection, access and reliability for future EV charging infrastructure deployment. Such interconnected data will demonstrate whether the type and amount of charging installed is adequate to meet consumers’ needs and whether the grid is adequate to service the charging load. All of this knowledge will improve future siting decisions and help advance the future-proofing objective.

⁴ Established by the Federal Highway Administration, Alternative Fuel Corridors (AFCs) are a national network of alternative fueling and charging infrastructure situated along national highway system corridors. These corridors are selected based on criteria that promote the build-out of a national network. AFCs cover approximately 165,722 miles of highway across 49 states and the District of Columbia, representing approximately 74% of the highway system.

⁵ The U.S. Department of Transportation Federal Highway Administration provided guidance on February 10, 2022. Additional guidance is forthcoming.

⁶ Federal Highway Administration. (2022). National Electric Vehicle Infrastructure Formula Program: Bipartisan Infrastructure Law. Program Guidance. *U.S. Department of Transportation*.

⁷ While data collection is mandatory for National Electric Vehicle Formula Program, it is not required for the Corridor Charging Grant Program. CSE recommends DOT consider establishing a feasible and incentivized data reporting protocol for the Corridor Charging Grant Program. Doing so would enable DOT and stakeholders to include the data from the Corridor Charging Grant Program in the data analysis that will form the data-driven understanding of charging usage. CSE recommends data collection within the Corridor Charging Grant Program follow the guidance for the NEVI Formula Program.

along the national highway system corridors. In 2021 the FHWA expanded the AFC to cover approximately 165,722 miles of the National Highway System.⁸ Under the NEVI Formula Program, states will be responsible for planning, implementing, operating and maintaining the EV charging infrastructure along designated AFCs and, if the state and secretary of transportation certify that sufficient charging infrastructure along AFCs exists, other roads. States can use funds to contract with private entities for the acquisition and installation of infrastructure, and the private entity may pay the nonfederal share of the project cost. States need to submit plans to the Joint Office by August 1, 2022. DOT and FHWA will review and approve by September 30, 2022. The Act also requires DOT and DOE to provide a report of the state's plans to Congress.

States are also eligible for the Corridor Charging Grant Program along with several other entities: political subdivisions of a state, metropolitan planning organizations, units of local government, special purpose districts or public authorities with a transportation function including port authorities, Indian tribes and territories of the United States. Projects eligible for this program include funding for infrastructure as well as for planning, feasibility analysis, revenue forecasting, environmental review, preliminary engineering and design work. Participation in the Corridor Charging Grant Program is determined through a competitive grant process that will be managed by the U.S. DOT.⁹

Half of the Corridor Charging Grant Program funds are reserved for community grants with priority given to applicants in rural areas, low- and moderate-income neighborhoods and communities with either a low ratio of private parking spaces to households or a high ratio of multi-unit dwellings to single-family homes. All entities eligible under the Corridor Charging Grant Program are eligible for the community grants; eligibility for the community grants also extends to state or local authorities with ownership of publicly accessible transportation facilities. Projects may include roadways with AFC designation but are not limited to AFCs, and projects may be located on any road or publicly accessible location.

Establishing principled congressional oversight of these programs will ensure appropriate, cost-effective and timely projects. The following questions and best practices should be considered.

- **Planning:** Are recipients prepared to receive funds, and how can we ensure funds are disbursed to the most promising recipients? The goals of IJA include reducing greenhouse gasses (GHGs), accelerating EV adoption and enhancing AFCs. Successful projects can achieve all three objectives. Using appropriate equipment, developing projects on time and creating multiyear plans for operation and maintenance will aid in success. Checkpoints throughout the funding process can be employed to block or advance projects based on their quality.
- **Funding Distribution:** Do roadblocks exist that unnecessarily impede the distribution of funds? Minimizing roadblocks will ensure rapid deployment of funds and add to the success of the

⁸ Federal Highway Administration. (2022). Alternative Fuel Corridors. *U.S. Department of Transportation*. https://www.fhwa.dot.gov/environment/alternative_fuel_corridors/.

⁹Infrastructure Investment and Jobs Act, Pub. L. No. 117-58, 135 Stat. 429 (2021). <https://www.govinfo.gov/content/pkg/PLAW-117publ58/pdf/PLAW-117publ58.pdf>.

program. Analyzing the timeline requirements of DOT and DOE, providing detailed and valuable guidance to site hosts and leveraging the best practices of existing EV charging infrastructure programs will ensure funds are quickly and appropriately distributed. DOE and DOT should consider creating recommended legal language regarding the disbursement and use of funds that states, eligible entities and site hosts must adopt to expedite funding.

- **Implementation:** Are DOT and DOE requiring states to use data and forecast EV and infrastructure growth when designing plans for future development? To ensure project success and advance IJA goals, chargers installed under the NEVI Formula Program should be placed in areas that optimize EV adoption along AFCs. Modeling of both EV intensity and charger usage is critical to the ability to site charging that optimizes usage.
- **Data Collection and Reporting:** What data is being used to ensure that projects built today can be scaled and pave the way for future infrastructure development? Utilization data collected from the EV charging network should be used to create charger use profiles that guide future deployment. These profiles should be updated throughout the program as data is collected, allowing the understanding of charger usage to deepen as consumers become more familiar with charging and charging technology advances. Accurate usage profiles can optimize the siting of chargers and keep pace with advances in charging technology. This data collection should include the location, frequency and duration of charger usage, power demand and energy consumption, reliability of the equipment and cost of service.

The NEVI Formula Program establishes data collection procedures for the project's entire life cycle, including development, commissioning and operation. As part of the lead-up to these project awards, recipients will need to forecast anticipated spending of NEVI Formula Program funds and review actual spending before the following year's allocation.

The Corridor Charging Grant Program will need to determine if the program's evaluation systems and criteria appropriately prioritize communities that can most effectively use the grant money to spur EV market growth. Do program rubrics lead to deployment awards that fulfill the goals of IJA? Data collection is required to answer these critical questions; and awarded applicants should be required to collect and provide the data specified for collection in connection with the NEVI Formula Program.

This document provides IJA oversight recommendations designed to optimize the value of the \$7.5 billion investment made by the Act. The recommendations are based on the Center for Sustainable Energy's deep experience in designing and operating market transformation incentive programs in the transportation sector. Collectively, these EV and EV charging incentive programs have a program value in excess of \$1.5 billion and through these programs, CSE has interacted with over half a million EV car buyers in the U.S. Based on this experience, and its EV charging expertise, CSE makes the following recommendations for oversight of the NEVI Formula and Corridor Charging Grant programs:

- Leverage best practices and lessons learned from previous large-scale EV infrastructure programs to disburse funds quickly and appropriately. Information about existing successful EV charging infrastructure projects is detailed in Section 4.1.

- Integrate EV market forecasts and modeling into decisions about siting of charging and determining if AFCs are sufficiently built out.
- Host and require attendance at information sessions designed to present options for plan design, including how to best use a data-driven approach in infrastructure planning.
- Use the application, audit and reporting processes to monitor the use of data platforms to plan EV charging strategies.
- Establish a data collection regimen that will allow administrators to understand and profile charger usage over time; this will be especially beneficial as technology and consumer behavior change.
- Compel grant recipients to regularly provide data defined in the data collection regimen.
- Leverage technology to monitor compliance with data reporting requirements, including reporting to the secretaries of transportation and energy on noncompliance and publication of such reports on a public-facing website.
- Require secretaries to forecast charging requirements based on predicted EV fleet size and an assessment of the percentage of forecasted charging needs met by programs.
- Require reporting of EV charger usage, including the number of chargers by type, utilization percentage and uptime.
- Require states to report on the method used to disburse funds.
- Require annual state reporting that details funds use, including the percentage of funds obligated to installers and details on the charger type.
- Include data collection and transmission requirements and charger uptime requirements in the grant agreement with recipients and establish the U.S. DOT as a third-party beneficiary of each agreement with enforcement rights exercisable by U.S. Department of Justice (U.S. DOJ).

2. Program Best Practices

2.1. Planning

To set the context for the discussion of oversight recommendations, this paper first summarizes a set of best practices for the planning of EV charger deployment and the execution of the deployment activities required to accomplish the plan.

The IIJA sets out a complex, nationwide program to develop electric vehicle charging infrastructure (EVI). Our research and experience as program administrators show that the planning for scaled EV charger deployment requires reliance on a combination of advanced analytics and community-based engagement, both critical for a successful program of this type.

Advanced analytics that uses geographic information science (GIS) and multi-criteria decision-making approaches can help ensure that charging stations are placed in the optimum locations to support the

needs of EV drivers and communities. Such systems translate goals, objectives, in-place charging, demographics, topographies and transit information into a map display that quantifies the number of each type of charger needed and where they should be placed.

However, along with using data, programs also need to engage with and empower community-based stakeholders throughout the planning process to ensure that EV charging stations serve local and regional needs. For recommendations on oversight of the planning process, see [3.1. Planning](#).

2.1.1. EVI Roadmap and Meeting Future EV and EV Charging Needs

The main goal of investing public funds in EV infrastructure (EVI) is to ensure the availability of public charging and remove concerns of access to charging as a barrier to potential EV adopters. Research shows that ensuring available public charging infrastructure is an important driver of EV adoption.¹⁰ However, to develop EVI that drives adoption, we need to as accurately as possible forecast the current and projected levels of EVs in any given area, properly calculate the amount and type of charging required to meet the charging needs of the vehicles anticipated and site the charging in the locations that will optimize their use.

Advanced analytical tools exist that can be used to develop projections of EV adoption and EV fleet size for each state or region. These tools consider current EV diffusion rates, the impacts of policies (including incentive policies and regulatory mandates on future EV adoption) and changes to vehicle fleet dynamics (e.g., retirement rate, changes in driving patterns, etc.). With these numbers in hand, states can turn to established formulas that forecast the amount and type of charging required to meet the anticipated demand.¹¹

Once the number and type of charging is determined, states will need a process for identifying the optimal locations to place these chargers. We recommended using geospatial data analysis techniques combined with multi-criteria decision analytics to determine optimal locations for these chargers. The system selected should consider existing EV charging, various sociodemographic factors that influence both EV adoption and charger use (e.g., income, EV adoption levels, housing types) and other geospatial data (e.g., traffic levels and property types). This approach should be used to map the siting of charging that optimizes charging usage for the particular region being analyzed. The system should facilitate collaboration across regions and states by allowing users to map their siting in the context of siting being planned by others.

¹⁰ Narassimhan, E., & Johnson, C. (2018). The role of demand-side incentives and charging infrastructure on plug-in electric vehicle adoption: analysis of US States. *Environmental Research Letters*, 13(7), 074032.

¹¹ One such example of an analytical tool is EVI-Pro, the Electric Vehicle Infrastructure – Projection Tool. This is administered by the National Renewable Energy Laboratory (NREL). For more information, please see <https://www.nrel.gov/transportation/evi-pro.html>.

Finally, while perfect future-proofing of an EV charger deployment plan is not possible, it is possible—and recommended—that states develop processes and approaches that allow the program administrators to adjust the program design over time. This will allow adaptation of plans as charger use data and charger use profiles are developed and states become more knowledgeable about consumer use patterns and the optimal way to service the charging need.

As will be more fully detailed in Section 3.1, in reviewing plans submitted by the states, the secretaries should evaluate: 1) whether an EV forecast is part of the plan; 2) how the forecast is going to be performed and updated; 3) the methodology for calculating the type and amount of charging required; 4) the methodology for siting chargers, including whether a system offering GIS mapping and multi-criteria decision-making was utilized; 5) whether the system has a means of factoring in the articulated goals and objectives of the state; and 6) whether the system is capable of reforecasting siting iteratively over the program life to capture the increase in consumer familiarity with charging and improvements in charging technology. States need to submit plans to the Joint Office by August 1, 2022. DOT and FHWA will review and approve them by September 30, 2022.

2.1.2. Program Stakeholders and Engagement

Stakeholder engagement is critical to the success of large-scale EV charging infrastructure programs. For complex programs that involve multiple locations and funding partners, we recommend the following best practices.

- Use public workshops as a first step to collecting local input and engaging the public and other stakeholders. Workshops can be in person or virtual and should include maps, site plans and other information to allow attendees to visualize the changes. Public workshops and related outreach activities should occur at multiple points during the planning and deployment process. While physical documents can be used for this process, it is recommended that the conveners use interactive GIS mapping tools that allow consensus building through efficient iteration/evaluation of the various alternatives.
- Engaging with local community-based organizations (CBOs) and other community-oriented stakeholder groups is another key step to gathering information from local groups and sharing information about planned infrastructure updates. Presentations to CBOs can use the materials prepared for public workshops while providing additional opportunities for more detailed feedback.
- Along with learning from local stakeholders, program administration experience has also shown that CBOs and local stakeholders can help share marketing and outreach communications and ensure equitable access to program funds.
- Engineering procurement contractors (EPCs) and installers who will install the stations should also be engaged in the outreach process. Program administration experience shows that engaging with and educating these groups is a critical step in ensuring the rapid deployment of EVI. Engagement should include education around the standards that must be met to qualify

under the program as a charging installer. Different states have different standards regarding who is qualified to install EVI. Programs such as the Electric Vehicle Infrastructure Training Program¹² can help ensure a well-trained pipeline of professionals who can install this infrastructure.

- In assessing plans that are submitted, the secretaries should evaluate the process used to collect, evaluate and input stakeholder feedback about goals, priorities and siting locations. Consideration should also be given to whether GIS or other technology tools will be deployed to advance planning effectiveness through efficient integration and evaluation of alternative planning scenarios.

Engaging with local stakeholders is critical for the programs to meet their timelines and to maximize awareness and use of the infrastructure. For planning recommendations, see [3.1.1. Guidance Recommendations for Planning](#).

2.2. Funding Distribution

The states will likely use different approaches to distribute IIJA funds. This section will discuss some of the lessons learned in developing incentive programs for EV charging infrastructure. For more info on IIJA funding distribution, see [3.2. Funding Distribution](#).

2.2.1. Standards for Applicant Qualification

For the NEVI Formula Program, the states will each need to develop standards and requirements for program applicants that balance accessibility with qualifications. While both the NEVI Formula Program and the Corridor Charging Grant Program will undoubtedly drive a beneficial expansion of the pool of market participants engaged in the build-out of EVI, the applicants must be qualified to perform the work if the IIJA funds are to produce a successful outcome.

To ensure that applicants have the level of expertise required to deliver the charging project for which funding is sought, program administration experience shows that the application process is benefited by incorporating the following recommendations.

- Require site verification documentation, which demonstrates that an applicant has secured a site and site host to partner.
- Establish a permit milestone and require proof of building permits (or application for building permits), thereby reducing the potential for applications not converting to EVI.

¹² For more information please see <https://evitp.org/>.

- Establish a milestone for proof of networking contract with an electric vehicle service provider (EVSP).¹³
- Consider requiring a nonrefundable deposit from applicants to limit the project pool to those most likely to lead to actual deployments.

The oversight recommendations for evaluation of funding, which are based on these best practices, can be found in [3.2. Funding Distribution](#).

2.2.2. Specific Community Requirements

For NEVI Formula Program funds, states can integrate the set-aside requirements in the program with their own community-based targets. GIS mapping is one very convenient way to quickly identify locations that are both priorities to the state and eligible for funding.

2.2.3. Timeline for Implementing a Program

Program administration experience has shown that establishing and funding a six-month minimum planning phase will allow administrators to design the program components, build administrative tools and infrastructure, perform initial marketing and outreach, identify eligible electric vehicle supply equipment (EVSE) and develop the intake process for customers. Some additional program timeline aspects to consider are as follows.

- Ensure sufficient time for chargers to be built after an application is accepted and funding is reserved. Program administration experience shows that the average timelines for Level 2 and DCFC (direct current fast charger) build-out are nine and 15 months, respectively.
- Develop an approach to allow applicants to request extensions so that the program can adjust to disruptions caused by supply chain issues, labor shortages, permitting or other issues.

Standards that verify that applicants have the technical knowledge and resources to execute program responsibilities will reduce cancellations and increase the likelihood of timely attainment of goals. The oversight recommendations for the evaluation of funding, which are based on these best practices, are listed in [3.2. Funding Distribution](#).

¹³ A network is a group of chargers located across multiple locations that can communicate, be managed remotely and share data. An EVSP is a company that provides services to manage, maintain and provide transactional services for charging stations.

2.3. Implementation

Successfully implementing an EVI program of this scale requires careful attention to program administration workflows. The key considerations for implementation are discussed in [3.3. Implementation](#).

2.3.1. From Application to Deployment

The implementation plan should consider the steps involved in moving from project application to project deployment. One key decision for each state is the appropriate approach to soliciting applicants for funding. Although a first-come, first-served model is straightforward, this approach has limits. Given that interest in funds may exceed funding several times over, a method that combines a lottery-based system with the ability to rank applications based on a transparent rubric will reduce the burden on applicants and ensure high-quality applications. All of the options should be fully explained at the mandatory attendance informational session recommended in [Summary and Recommendations](#).

The following is recommended to facilitate effective program design.

- Collect initial documentation and review to validate eligibility per requirements, then reserve funding and notify the applicant so the project can proceed to development.
- Consider establishing checkpoints (i.e., 60-day permitting progress) that applicants are required to meet to ensure the project is still on track and less likely to cancel in late stages, thus resulting in unused funds that must start over with new projects. Suggested checkpoints include:
 - Require site verification documentation
 - Establish a permit milestone (60 days)
 - Require proof of building permits
 - Require proof of networking contract an EVSP
- Keep waitlisted applicants informed of positions in the queue and regularly update applicants on their status.
- Establish notification requirements for project completion, including submission of documentation such as a final inspection from the at-home jurisdiction, photos of chargers and proof of network connectivity by transmitting data.
- Keep customers and stakeholders engaged through the application process to help ensure the proponents and site hosts continue to move projects forward and make the highest and best use of program funds.

2.3.2. Equipment Requirements

Another key aspect of successful program implementation is ensuring that safe and effective EVSE is installed. The secretaries should create requirements for eligible equipment, established an eligible

equipment list, develop a process to have equipment added to this list and establish a public website that provides the updated product list eligible for funding.

Because charging equipment changes rapidly, the secretaries should also create a process to allow equipment makers to update specifications, add models and allow new vendors and technologies that meet requirements to be added to the eligible list. Program oversight should require verification in state-supplied reports that only eligible equipment has been used.

A recommended checklist for qualified equipment is provided in [4.4. Qualified EV Charging Equipment](#).

2.4 Data Collection and Reporting

Reporting requirements are an important tool to ensure states comply with program rules; however, reporting is also a time-consuming activity. We recommend that program administrators provide a set of templates that create a consistent set of data reporting and sharing requirements. This will ensure consistent reporting of key metrics and information while reducing the burden on states and other entities.

For a list of recommended data fields, see [4.3. Recommended Charging Data Fields](#).

Building in data-driven, high-quality program monitoring at the outset of the program will allow state administrators to continue to adjust and optimize program design over time. Program experience has shown that a mix of periodic reports and both internal- and external-facing dashboards are key to monitoring program performance and fully engaging consumers in the effort to electrify transportation. We recommend that each state and the secretaries maintain and regularly update dashboards with easily consumable data documenting the following metrics.

- Key performance indicators that show the real-time status of funding by program state (e.g., available, reserved, complete)
- Information on the pace of deployments relative to program goals
- Statistics on applicant activity that allows administrators and other stakeholders to see the charger types (Level 2 vs. DC fast charging), the make and model of equipment and the site types being developed

2.4.1. Location Data

The funded locations should be integrated into a database with all current active charging infrastructure as well as pending charging locations. This data should be continuously collected from all states and other agencies that are authorizing funding, stored in a searchable national repository and visualized on the Joint Office website maps. This will enable states to coordinate planning across AFCs to eliminate infrastructure gaps and ensure seamless EV traveling.

2.4.2. Utilization Data

The EV infrastructure industry is still in its relative infancy. Due to a lack of charging data, substantial uncertainty remains about the levels of usage that will occur at different charging locations and with different equipment types, how much infrastructure is needed in a region and the aggregated impact on the power grid. New Jersey and California, as well as some utilities, have begun to require collection of charging data as a condition of funding.

Requiring both NEVI Formula Program and Corridor Charging Grant Program funding recipients to report charger utilization data is critical to understanding charger use and the benefits created by charging. The data collected should encompass location data, session data that indicates the duration and energy delivered to a specific vehicle and interval data that shows the amount of power delivered during specified time frames to understand the impact on grid operations. Any personally identifying information should be removed before being submitted by the charging station operators. The data collected by the states should be anonymized to protect the business models of the charging operators.

For more information on best practices and requirements for data collection, see [3.4. Data Collection and Reporting](#).

3. IJA Oversight and Reporting Requirements

While both the NEVI Formula Program and the Corridor Charging Grant Program aim to advance charging along AFCs, the Corridor Charging Grant Program is open to several entities other than states and will award 50% of its funds to community grants. These grants will be awarded to publicly available projects that 1) are located in spaces other than AFCs, 2) reduce GHGs and 3) fill infrastructure gaps. Reporting charging allocations, project progress and data is critical to ensuring program success. The following sections contain recommendations, oversight and reporting for all stages of the process: planning, funding distribution, implementation and data collection and reporting.

3.1. Planning

3.1.1. Recommendations for Planning

For the NEVI Formula Program, the Act requires that each state must submit a charger implementation plan to the secretary of transportation within a deadline set by the secretary. The Act requires the secretary to assess how each state plan contributes to the goal of establishing a national charging

network.¹⁴ The Joint Office does not have jurisdiction over the Corridor Charging Grant Program. Guidance for this program is left to the secretary of transportation, who is directed to consult with the secretary of energy regarding best practices to be followed.

In the following sections, we list the areas of guidance required and our recommendations for that guidance.

3.1.1.1. Joint Office Guidance on the NEVI Formula Program

The secretaries of transportation and energy have 90 days after the enactment of IJJA to develop guidance for the creation of the EV charging plan to be developed by each state. The following chart outlines the categories of guidance required and a recommended approach for delivering this guidance.

IJJA Requirement	CSE Recommendations
The distance between publicly available electric vehicle charging infrastructure.	<p>FHWA guidance requires charging stations to be within 1 mile of interstate exits or highway intersections along designated corridors.¹⁵ New charging locations should be spaced a maximum distance of 50 miles apart.</p> <p>CSE recommends location data about current and pending charging locations should be recorded and mapped to a national database to inform future investments from the funded programs as well as the private sector and other programs. States should be required to share data about pending charging investments funded by the NEVI Formula and Corridor Charging Grant programs to ensure attaining the program goals for charging network completeness.</p>
Connections to the electric grid, including electric distribution upgrades; vehicle-to-grid integration, including smart charge. Management or other protocols that can minimize impacts to the grid; alignment	<p>FHWA guidance requires that EVI should be able to provide charging at any time of day or year and achieve reliability of >97%.¹⁶</p> <p>CSE recommends that the NEVI Formula and the Corridor Charging Grant programs should compel the sharing of utilization data for any funded charger. This data should be used</p>

¹⁴ Infrastructure Investment and Jobs Act, Pub. L. No. 117-58, 135 Stat. 429 (2021). <https://www.govinfo.gov/content/pkg/PLAW-117publ58/pdf/PLAW-117publ58.pdf>.

¹⁵ Exceptions may be made where there is no electrical service or business activity within 1 mile of the interstate exit or highway.

¹⁶ Additionally, FHWA guidance requires EVI to be able to mitigate adverse impacts to the electric grid, maintain cost of charging at reasonable prices compared to the competitive market, minimize demand charges or other fixed utility fees and provide high-speed charging for travelers on the interstate highway system and Alternative Fuel Corridors. Equipment that connects EV charging stations to the electric grid must be directly related to the charging of a vehicle. Other considerations should include accessibility, fire protection and other traffic safety features, the inclusion of distributed renewable energy, the use of station-level load management or smart charge management and plans for future-proofing. States should work with the Joint Office to streamline permitting and approval processes to support operations within 6 months of procurement.

<p>with electric distribution interconnection processes; and plans for the use of renewable energy sources to power charging and energy storage.</p>	<p>to create reports that indicate the hourly and daily regional load curves and overall energy consumption. This data is critical to inform the potential for using EVs as distributed energy resources in microgrids by managing charging to coincide with peaks in renewable energy production and to emphasize charging off-peak. Understanding vehicle charging patterns can also identify opportunities to use EVs to enhance resiliency by providing power to buildings during power outages. The data should also be used for reports that identify the potential to use stationary storage to support charging, which can lower the cost and carbon intensity of the energy consumed by EVs. Finally, this data should be used to create use case profiles of charger types, which can be updated over time as data is collected, and can be used to improve future planning, which can be revised.</p>
<p>The proximity of existing off-highway travel centers, fuel retailers and small businesses to electric vehicle charging infrastructure acquired or funded under the NEVI Formula Program.</p>	<p>FHWA guidance requires states to consider locations at or immediately adjacent to land uses with publicly accessible restrooms, appropriate lighting and sheltered seating areas, such as travel centers, food retailers, convenience stores, visitor centers on federal lands, small businesses with an Americans with Disabilities Act (ADA) accessible pathway between the EV charging infrastructure and the front door of the identified establishment and other comparable facilities. CSE suggests that geographic information systems and multi-criteria decision-making tools that incorporate evolving consumer use of charging should be used to both plot locations of and optimize the distance between charging. Modeling driver behavior around off-highway travel centers, fuel retailers and small businesses will assist in determining where EV infrastructure should be implemented. Existing areas where drivers typically stop are likely ideal for implementation; electrical upgrades may be needed for such sites.</p>
<p>The need for publicly available electric vehicle charging infrastructure in rural corridors and underserved or disadvantaged communities.</p>	<p>FHWA suggests the following to prioritize access of EV charging infrastructure to serve rural, underserved and disadvantaged communities.</p> <ul style="list-style-type: none"> • Identifying gaps in existing service and charging station availability to rural, underserved and disadvantaged communities • Planning to distribute NEVI Formula Program funds to benefit rural, underserved and disadvantaged communities • Targeting at least 40% of the benefits toward disadvantaged communities in accordance with the Justice40 Initiative • Engaging stakeholders from rural, tribal, underserved and disadvantaged communities <p>CSE suggests that geographic information systems and multi-criteria decision-making tools that incorporate evolving consumer use of charging, including use case profiles for rural</p>

	<p>areas and areas designated as underserved or disadvantaged, should be used to evaluate the amount and type of charging needed for rural areas and areas designated as underserved or disadvantaged. AFCs traverse several types of communities, so the placement of infrastructure along the AFCs needs to be informed by not only the distance between each charger along the AFC but also the composition of the communities that may need infrastructure. Where possible, rural corridors and underserved or disadvantaged communities should have chargers, and these chargers should be integrated into the logic determining distance between chargers on the AFC.</p>
<p>The long-term operation and maintenance of publicly available electric vehicle charging infrastructure to avoid stranded assets and to protect the investment of public funds in that infrastructure.</p>	<p>FHWA guidance requires that EVI be guaranteed by owners to be maintained in good working order, including compliance with manufacturer and FHWA requirements.</p> <ul style="list-style-type: none"> • EVI must remain in the same location for the duration of the funding and operated and maintained with a focus on public road safety, including the provision of adequate lighting, fire protection and other traffic safety features.¹⁷ • EVI should use charging network providers with demonstrated experience to provide services beyond the five-year funding period. • EVI should be capable of using open protocols and standards for network connectivity to meet interoperability requirements. <p>CSE recommends that both the NEVI Formula and the Corridor Charging Grant programs should compel the sharing of utilization data for any funded charger. The Joint Office should establish a standard data set and obligate grant recipients to provide the data for a minimum of five years. The recommended data set can be found in 4.3. Recommended Charging Data Fields. Charger utilization and maintenance data are critical to understanding charger operations, including their reliability, uptime performance and cost of operations, all of which are important in preventing the stranding of assets that are not meeting the program's goals. Maintenance records, including frequency and duration of downtime events and their causes, are needed to inform future program investments. The Joint Office should establish minimum performance requirements for uptime; and that data should be aggregated across the states into a report on equipment performance by the manufacturer. Oversight should include a review of this report to ensure that only equipment that meets the established performance standards remains on the qualified equipment list.</p>

¹⁷ Potential conflicts with nonmotorized and public transportation travel in multimodal corridors should be addressed through safe design and countermeasures.

<p>Existing private, national, state, local, tribal and territorial government electric vehicle charging infrastructure programs and incentives.</p>	<p>FHWA guidance requires that decisions involve consultation with stakeholders including state agencies and planning organizations, tribal governments, utilities, service providers, transportation authorities, communities, etc.</p> <p>CSE recommends that GIS and multi-criteria decision-making that incorporates evolving consumer use of charging should be used to both plot locations of and optimize the distance between charging stations. This mapping should include the location of any existing charging, including charging deployed by private enterprises and charging planned or deployed in connection with national, state, local, tribal and territorial government electric vehicle charging infrastructure programs.</p>
<p>Fostering enhanced, coordinated, public-private or private investment in electric vehicle charging infrastructure.</p>	<p>FHWA guidance discusses that funding can encourage additional private investment to supplement gaps. States are encouraged to engage with the private sector and develop cost-share and rebate programs to optimize funding and infrastructure.</p> <p>CSE recommends that both the NEVI Formula and Corridor Charging Grant programs should compel the sharing of location and utilization data for any funded charger. Data about current and pending charging locations should be recorded and stored in a national database to inform future investments from the funded programs as well as the private sector and other programs. This data will illuminate gaps and opportunities for commercial investment and should be accessible through a GIS mapping tool as well as through written reports. Stakeholder organizations such as municipal planning organizations, Clean Cities coalitions, air quality districts and groups representing disadvantaged and underserved communities should be part of the EV infrastructure planning process.</p>
<p>Meeting current and anticipated market demands for electric vehicle charging infrastructure, including with regard to power levels and charging speed, and minimizing the time to charge current and anticipated vehicles.</p>	<p>FHWA created guidelines, summarized in the second table in 4.4. Qualified EV Charging Equipment.</p> <p>CSE recommends that the Joint Office should establish a process for forecasting EV fleet size by type and year. The process should leverage currently available forecasting tools. These tools should include those specifically designed to forecast the adoption of new technology where, as with the case of EVs, the purchase price is not the only obstacle to adoption. Modeling of EV adoption, types of models adopted and driver behavior will assist in identifying the market changes within a state deploying the types and quantities of chargers required to meet market demand.</p>

Additional items as determined by the secretary of transportation in FHWA guidance include the following.

- **Emergency Evacuation Plans:** Support required for emergency and evacuation needs and the EV drivers that would take these routes.
- **Domestic Manufacturing:** Prioritizing domestic EVI supply consistent with Buy America requirements.
- **Cybersecurity:** Protection for the electrical grid, EVI, EVs and customers.
- **Consumer Protection:** Safeguards against defective products, excessive costs and deceptive or fraudulent business practices.
- **Environmental Siting/Permitting Considerations:** Review required under the National Environmental Policy Act (NEPA) and other environmental laws, regulations and related executive orders.
- **Resilience:** Mitigation for potential impacts of climate change and extreme weather events including the Federal Flood Risk Management Standard.
- **Terrain:** Grounds maintenance, snow removal and other seasonal needs.

The secretary of transportation, in coordination with the secretary of energy and in consultation with relevant stakeholders, has 180 days after enactment to develop a series of minimum standards and requirements for the following.

IIJA Requirement	CSE Recommendations
<p>The installation, operation and maintenance of electric vehicle charging infrastructure by qualified technicians.</p>	<p>FHWA suggests that these activities consider ENERGY STAR[®], the Americans with Disabilities Act, EV infrastructure workforce training and requirements, eligible expenses and direct costs, connector types (e.g., eligibility of adapters), interoperability between EVs, EV supply equipment, EV service providers and the grid, minimum reliability and time-of-day accessibility requirements and station design.</p> <p>The rapid expansion of the national charging infrastructure has the potential to be constrained due to a lack of certified technicians. CSE recommends that the Joint Office should create a directory of training programs where individuals can be certified in electric vehicle charging installation. Installations should only be completed by electricians who have completed EV charging installation technical training. Establishing this directory will expand the pool of organizations that can effectively install and maintain the infrastructure and improve program performance. Oversight should evaluate the completeness and timeliness of the training program directory.</p> <p>Both the NEVI Formula and the Corridor Charging Grant programs should compel the sharing of location and utilization data for any funded charger. In addition to providing the basis</p>

	<p>for the creation of usage profiles to guide future deployment, this data can be used to assess and report on operation and maintenance of chargers, including uptime, and enforce maintenance requirements.</p>
<p>The interoperability of electric vehicle charging infrastructure.</p>	<p>The charging infrastructure has adopted industry standards to enable software from multiple vendors to operate on compliant hardware equipment. Standards such as ISO 15118 enable communications between EVs and charging infrastructure that simplifies connecting to equipment and automate payment transactions between the customer and host location. These standards should be incorporated by the secretary as part of the stated requirements for equipment specifications. See 3.4.3. Qualified EV Charging Equipment Product List below for more information.</p>
<p>Any traffic control device or on-premises sign acquired, installed or operated to support zero-emission vehicle infrastructure under this Act.</p>	<p>Ubiquitous, standardized signage for charging infrastructure would materially help with reducing a primary obstacle to EV adoption—consumer range anxiety. Signage and traffic control should match state standards for highway signage and traffic control. On-site descriptions of the charging equipment and charging process will assist in educating the public about EV charging and thus advance utilization of infrastructure.</p>
<p>Any data requested by the secretary of transportation related to a project funded under the NEVI Formula Program, including the format and schedule for submitting such data.</p>	<p>FHWA guidance requires real-time data sharing protocols, publicly available location and station information sharing protocols and data to support reliability and usage analysis.</p> <p>CSE recommends that both the NEVI Formula and the Corridor Charging Grant programs should compel the sharing of location and utilization data for any funded charger. Charger utilization and maintenance data are critical to understanding their reliability, performance and cost of operations and preventing stranded assets that are not meeting the program's goals. 4.3. Recommended Charging Data Fields describes the data set that the Joint Office should require from each funded charger.</p>
<p>Network connectivity of electric vehicle charging infrastructure.</p>	<p>FHWA guidance requires clear pricing information, session starting standardization, efficient EVSE management, use and reliability monitoring, remote diagnosis and problem resolution, smart charge management, open-source network connectivity and cybersecurity.</p> <p>CSE recommends that in addition to requiring the sharing of charging location and utilization data, the secretary should require that all funded charging equipment should be connected to a wired or wireless network to enable data sharing and for the remote monitoring of charger performance, unless technically or financially infeasible. These standards are listed in 3.4.3. Qualified EV Charging Equipment Product List.</p>

<p>Information on publicly available electric vehicle charging infrastructure locations, pricing, real-time availability and accessibility through mapping applications.</p>	<p>FHWA requires that station locations are made visible through industry-leading mapping services, that real-time status is available and that detailed pricing and requirements are transparent.</p> <p>CSE recommends location data about current and pending charging locations be recorded and mapped to a national database. The minimum standards for pricing and availability the secretary should request should be consistent with Section 3.40 of the National Institute of Standards and Technology for Electric Vehicle Fueling Systems.¹⁸ This data is required to be presented on websites operated by the Joint Office.</p>
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States must submit plans about how they will use their funds on August 1, 2022, and the Joint Office must approve by September 30, 2022. The secretary of transportation will also submit a report summarizing each plan and assessing how it will help establish a national network of EV charging infrastructure. Reports will also be available on the DOT website. Each plan, at a minimum, should include the following. Full guidance regarding required plan format can be found in FHWA guidance.

- Plans should include a comprehensive charging needs assessment based on the EV fleet size forecast over time.¹⁹
- Plan should demonstrate that decisions about siting of charging infrastructure are data-driven and include multi-criteria decision-making.²⁰
- Plans should demonstrate stakeholder and public engagement.
- Plans should incorporate forecasts of the EV fleet size in the state and describe the methodology used to create the forecast.
- Plans should include a map of the currently available charging locations and demonstrate how new infrastructure will leverage existing infrastructure where possible.
- Plan should demonstrate that the designation of new AFCs has been considered.
- Siting plan should demonstrate that consumer driving behavior and other sociotechnical factors were taken into consideration.
- Plan should describe process for ensuring compliance with quality product lists and use of industry standards for sharing charger utilization data.
- Plans should demonstrate process for implementing enforceable data sharing.

¹⁸ For additional information, please see: https://www.nist.gov/system/files/documents/2019/12/03/3-40-20-hb44_final.pdf.

¹⁹ State plans should identify opportunities to build out charging infrastructure along multiple existing and new corridors and examine the opportunities available to upgrade existing AFC-pending corridors. This includes taking into consideration the current and projected future demand for both inter- and intra-state electric travel. States can use these dollars toward non-AFCs only if both the state and DOT determine AFCs in the state have been fully built out.

²⁰ State plans should include identifying potential locations for new charging infrastructure along targeted corridors and how siting strategy aligns with distances between chargers and charger speeds. Prior to approval, eligible stakeholders should have made attempts to identify potential locations for new charging infrastructure.

- Plan should describe stakeholder engagement and demonstrate that such engagement is comprehensive and that the output can be meaningfully incorporated into the siting plan.²¹
- Cost-sharing, match-funding and anticipated contracting should be specified.
- Plan should expressly commit to requiring each successful applicant to sign a grant agreement that flows down data sharing, qualified product requirements and operation and maintenance requirements and that provides for third-party beneficiary status for U.S. DOT and DOE.

If the secretary determines that a state's plan is inadequate, they must notify that state 60 days in advance of withholding funds and then give them at least 90 days to adjust their plan to regain funds.²²

Additionally, the Act requires that the secretary provide guidance on data sharing regarding the installation, maintenance and utilization of EV chargers. The recommendations for each category of guidance are listed below.

IIJA Requirement	CSE Recommendations
<p>Technical Assistance: Technical assistance related to the deployment, operation and maintenance of zero-emission vehicle charging and refueling infrastructure, renewable energy generation and vehicle-to-grid integration, including microgrids and related programs and policies.</p>	<p>The Joint Office should collect and report data indicating the average time from application submittal to full operation for each funded charger. This report should highlight the technical and logistical challenges (e.g., need for power upgrades permitting issues, etc.) during the installation process. The Joint Office should also report how it modifies its provision of technical services to match the need as revealed by the analysis and reporting of the types and duration of logistical challenges. Projects where the charging stations are sourcing their electricity from either storage or renewable energy should be identified. Similarly, charging stations with bidirectional power transfer capabilities should similarly be identified. Data collected about their use as distributed energy resources should be recorded and shared to encourage future projects to maximize their energy efficiency and greenhouse gas emissions benefits.</p>
<p>Data Sharing: Sharing installation, maintenance and utilization data to continue informing the network build-out of zero-emission vehicle charging and refueling infrastructure.</p>	<p>Both the NEVI Formula and the Corridor Charging Grant programs should compel the sharing of location and utilization data for any funded charger. The data should be able to be shared via the Open Charge Point Protocol and the periodicity of the data sharing should be submitted in 24-</p>

²¹ State plans should have an outlined strategy for continued stakeholder engagement beginning early in the process to identify community needs, corridor gaps and potential locations for new charging infrastructure. Plans and applications should be explicit in detailing which stakeholders were involved and through what means stakeholders were engaged. Plans should specifically address how the state ensured the equitable treatment and meaningful involvement of all stakeholders and how underserved and low-income communities were included. Additionally, plans and applications that would serve across multiple communities should have details to address the specific needs of each community rather than one overarching strategy.

²² The secretary of transportation has one year after the enactment of IIJA to designate national electric vehicle charging corridors to support freight and goods movement.

	<p>hour periods and in intervals of no smaller than 15 minutes. The program administrator should require the electric vehicle service provider to provide data transmittal with mandatory periodicity of the data fields as listed in 4.3. Recommended Charging Data Fields. The Joint Office should establish minimum performance requirements for uptime and that data should be aggregated across the states into a report on equipment performance by the manufacturer. Oversight should include a review of this report to ensure that only equipment that meets the established performance standards remains on the qualified equipment list.</p>
<p>Study of Charging Infrastructure: Conducting a national and regional study of zero-emission vehicle charging and refueling infrastructure needs and deployment factors to support community resilience and electric vehicle integration grants.</p>	<p>Both the NEVI Formula and the Corridor Charging Grant programs should compel the sharing of location and utilization data for any funded charger. The secretary of transportation is required to specify the list of data items to be collected for charger location, maintenance and utilization. States should be required to share this data in a standard format. The data should be formatted for sharing via the Open Charge Point Protocol or in a formatted text file. The list of mandatory data that should be shared is listed in 4.3. Recommended Charging Data Fields. The periodicity of the data sharing should be submitted in 24-hour periods and in intervals of no smaller than 15 minutes. This will enable charger performance to be compared across states and regions and will inform the creation of charging profiles that consider the local environmental factors (such as temperature and weather) on charger performance. The national study should include the development of profiles of charger use cases, such as in short dwell (e.g., at convenience stores and other retail locations) and longer dwell locations (such as parking facilities, parks and other outdoor attractions and entertainment venues). Oversight should verify that this data is comprehensive (including data from all states) and publicly available so that it can inform future program investment and encourage private sector investment.</p>
<p>Training and Certification: Development and deployment of training and certification programs for the installation and maintenance of electric vehicle charging infrastructure.</p>	<p>The rapid expansion of the national charging infrastructure has the potential to be constrained due to a lack of certified technicians. The Joint Office should create a directory of training programs in which individuals can be certified in electric vehicle charging installation. Currently, some installations are completed by electricians who may not have completed EV charging installation technical training. Establishing this directory will expand the pool of organizations that can effectively install and maintain the infrastructure and improve program performance. Oversight should evaluate the completeness and timeliness of the training program directory.</p>

<p>Promote Grid Integration: Establish and implement a program to promote renewable energy generation, storage and grid integration, including microgrids in transportation rights-of-way.</p>	<p>The collection of charger usage data is critical to this objective. See more detailed data recommendations in 3.4. Data Collection and Reporting. The charger utilization data should be used to create reports that indicate the hourly and daily regional load curves and overall energy consumption. This data is critical to inform the potential for using EVs as distributed energy resources in microgrids by managing charging to coincide with peaks in renewable energy production and to emphasize charging off-peak. Understanding vehicle charging patterns can also identify opportunities to use EVs to enhance resiliency by providing power to buildings during power outages. The data should also be used for reports that identify the potential to use stationary storage to support charging, which can lower the cost and carbon intensity of the energy consumed by EVs.</p>
<p>Charging Stations Along the Interstate Highway System: Study, plan and fund high-voltage distributed current infrastructure in the rights-of-way of the interstate system and construct high-voltage and/or medium-voltage transmission pilots in the rights-of-way of the interstate system.</p>	<p>Publishing the aggregated utilization data and the pending charging stations located along highways will inform grid operators on the potential need for expanding the distribution network. Predicting future peak power needs from EV charging can be used to install additional storage or renewable generation to prevent congestion on the distribution network and lower the overall cost of operations while increasing the energy efficiency.</p>
<p>Research to Reduce Effects of Climate Change: Research strategies and actions that the Department of Transportation can take to reduce transportation-related emissions and mitigate the effects of climate change.</p>	<p>The charger utilization data collection should be used to calculate the greenhouse gas reduction benefits of the program more precisely. This data should be used to create a report to compare program data with any federal goals for greenhouse gas reductions. See more detailed data recommendations in 3.4. Data Collection and Reporting.</p>
<p>Policy Suggestions for High-Voltage and Medium-Voltage Transmission: Development of a streamlined utility accommodations policy for high-voltage and medium-voltage transmission in the transportation rights-of-way.</p>	<p>Based on the charging data that can be used to predict the additional need for medium- and high-voltage transmission, the Joint Office should create policies for simplifying requests through state and federal authorizing agencies to grant the right-of-way adjacent to highways, which are expected to experience the greatest volumes of high-powered DC fast charging. See more detailed data recommendation in 3.4. Data Collection and Reporting.</p>

State plans will be summarized in a report that is made publicly available and submitted to the House Committee on Transportation and Infrastructure, the Senate Committee on Environment and Public Works and the House and Senate Committees on Appropriations. CSE recommends that DOT include in its summary an assessment of compliance with the recommended plan components described above.

3.1.1.2. Federal Highway Administration Guidance on the NEVI Formula Program

FHWA provided the following guidance concerning technical assistance under the NEVI Formula Program. The Joint Office will work with the FHWA to support state plan development and implementation of the NEVI Formula Program. The Joint Office will provide technical assistance to states to achieve a consistent, reliable and equitable national network of EV chargers. This technical assistance will first leverage existing tools, datasets, best practices and programs built by partners, DOE, DOT and national laboratories. These tools can be found on the [DOT website](#). Examples include:

- **Station Location Data:** Resources to help states understand where EV charging infrastructure is currently installed
- **Network and Environment Data:** Resources to aid states in understanding external factors that will support their electric charging infrastructure deployment.
- **Modeling Tools:** Resources to provide states with modeling expertise and tools to plan charging locations, design charging stations and perform financial analysis.
- **Equity and Climate Impact Tools:** Resources to help states understand climate and equity considerations.

3.1.1.3. DOT Guidance on Grants for Corridor Charging Grant Program

The secretary of transportation has 180 days after enacting the Surface Transportation Reauthorization Act of 2021 to update and redesignate AFCs. The secretary must establish the grant program in the first year after enacting the Surface Transportation Reauthorization Act of 2021. Program experience shows that the Corridor Charging Grant Program can be optimized through the inclusion of the following requirements for grant applicants.

- Demonstration that decisions about charger siting are data-driven.
- Siting should include locations in rural areas, low- and moderate-income neighborhoods and communities with limited parking or a high ratio of multi-unit dwellings.²³
- Applications incorporate forecasts of the EV market and designation of new AFCs where applicable; some applicants such as port authorities or local governments could be exempt if they do not have the means of forecasting.
- Planned charging considers currently available charging locations where applicable and utilizes such charging where possible.²⁴
- Demonstration that selected locations take into account consumer driving behavior and other sociotechnical factors.
- Demonstration of compliance with quality product lists and industry standards for sharing charger utilization data are demonstrated.

²³ At least 50% of the funds for the Corridor Charging Grant Program will be for community grants.

²⁴ An existing EVI site may already be in an optimal location but might not be large or fast enough to meet demand. Replacing existing infrastructure with faster or more capable chargers (e.g., can charge simultaneously) could capitalize on existing infrastructure.

- Description of process for comprehensive stakeholder engagement plan utilizing the 5% of grant funding allocated to this.²⁵
- Demonstration of satisfaction of cost-sharing and match-funding if applicable.

CSE also recommends that the data requirements for the NEVI Formula Program be incorporated into the Corridor Charging Grant Program.

Finally, no later than three years after the date of enactment of this grant program, the secretary of transportation must submit and make publicly available a report on the progress and implementation of this program.

We recommend that the evaluation of the Corridor Charging Grant Program follows the process outlined for the NEVI Formula Program and that the reporting tools from that program be used. Siting of projects under the Corridor Charging Grant Program should take into consideration the projects being developed under the NEVI Formula Program to avoid redundant deployment and to optimize the value of both programs. Finally, it is suggested that applications for the Corridor Charging Grant Program be aggregated within a state and interpreted as a group.

3.1.2 Reports and Compliance

While IJA requires states to produce plans for the NEVI Formula Program, additional reporting and documentation would help achieve IJA goals. We recommend the following reports be required to ensure project transparency and compliance.

Type of Report	Suggested Author	Description	Required in IJA
State Plan	States	IJA requires states to file plans for how to use funding through the years 2022 to 2026. CSE recommends that states detail their plans for administration, procurement, detailed funding uses and implementation (e.g., locations of chargers, anticipated usage).	Yes
Report on State Plans	DOT and/or Joint Office	DOT is required to prepare a report summarizing each state plan that assesses how these plans will further program goals. We suggest the report include an evaluation of the indicators that will be used to reflect the project's funding, implementation and overall timeline status.	Yes

²⁵ Entity applications should have an outlined strategy for continued stakeholder engagement beginning early in the process to identify community needs, corridor and coverage gaps and potential locations for new charging infrastructure. Plans and applications should be explicit in detailing which stakeholders were involved and through what means stakeholders were engaged. Plans should specifically address how the proposed project ensured the fair treatment and meaningful involvement of all people and how underserved and low-income communities were included. Additionally, plans and applications that would serve across multiple communities should have details to address the specific needs of each community rather than one overarching strategy.

Grant Application	Any applicant to the Competitive Formula Program	Applications for the grant program should reflect on the anticipated impact, including GHG reduction estimates, infrastructure needs and communities served.	Yes
AFC Development and Forecasting	States	We suggest a comprehensive analysis of AFCs within a state, incorporating all development contemplated under both the NEVI Formula Program and the Corridor Charging Grant Program as well as other planned development on behalf of other federal funds and state and local plans. This report will assist the DOE and DOT with future analysis needed for AFCs, whether that be within these IJJA programs or elsewhere. We suggest that this plan be submitted one year after receipt of funding or prior to first installations.	No ²⁶
Annual Reports	All recipients of funding, including state and nonstate entities	We recommend that states and other applicants be required to submit an annual report that includes a demonstration of progress and risks, data collection protocols and findings, adherence to modeling, estimated GHGs reduced and estimated impact to market (e.g., EV consumers).	No
Operation and Maintenance Plan	All recipients of funding, including state and nonstate entities	While operation and maintenance will be funded by the federal government for the first five years of the project, funding ceases after Year 5. Funding recipients must develop plans for funding operation and maintenance past the five-year mark. We suggest that recipients submit this plan to the Joint Office or DOT two years prior to the last funding year.	No
Contracting Plan	Joint Office and/or DOT	We suggest the Joint Office and/or DOT develop a legal structure that can be adopted in funding disbursement contracts between the federal government and recipients and between recipients and site hosts and contractors at the state level.	No
Diversity, Equity and Inclusion Plan	Joint Office and/or DOT	We suggest that the Joint Office and/or DOT develop guidance on how states and applicants consider diversity, equity and inclusion in their plans. Implementation and procurement plans, as well as stakeholder engagement plans, should have diversity, equity and inclusion in mind.	No
Annual Report on Progress toward Goals of IJJA	Joint Office and/or DOT	Following assessment of states' annual plans, the Joint Office and/or DOT should assess progress toward meeting goals of IJJA.	No

²⁶ FHWA guidance suggests that states review their AFCs and consider designating additional corridors.

Report on Funding Spent on Various Technologies	Joint Office and/or DOT	The Joint Office and/or DOT should identify the allocation of grant funds in the Corridor Charging Grant Program for various technologies. The Joint Office and/or DOT should ensure allocation corresponds with market demand and GHG reduction.	No
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3.2. Funding Distribution

IIJA establishes two funding paths for EV infrastructure programs. The NEVI Formula Program will provide \$5 billion for states to deploy publicly accessible infrastructure. The Corridor Charging Grant Program provides \$2.5 billion for competitive grants for deploying EVI and hydrogen, natural gas and propane fueling along AFCs.²⁷ IIJA specifies the funding for both programs with details regarding cost-sharing, mapping and analysis and data collection requirements. The following identifies funding guidelines and recommendations for funding dissemination and program tracking protocols.

3.2.1. Funding Process for the NEVI Formula Program

Through years 2022 to 2026, states²⁸ will receive their pro-rata share of the \$5 billion in accordance with their proportional share of funding received for highway programs.²⁹ Before annual distribution to states, 10% of the annual budget will be set aside for states that require additional assistance with deploying EV charging infrastructure. Projects under the NEVI Formula Program will be cost-sharing projects. The federal contribution from this \$5 billion should equate to 80% of total project cost; state funds should contribute up to 20%.³⁰ Each year, \$1 billion will be funded to states.

Each state is required to provide a plan describing how the state intends to use funds for public EV charging stations each fiscal year.³¹ If states do not submit plans or fail to follow through with plans, the secretary of transportation can withhold or withdraw funds provided through the National Vehicle Formula Program. These funds subsequently may be made available to local jurisdictions within the noncompliant states on a competitive basis.

²⁷ FHWA guidance also indicates that this funding will support the Justice40 Initiative, establishing a goal that at least 40% of climate and clean energy infrastructure are distributed to disadvantaged communities. This goal however does not necessitate that 40% of the EVI need to be located in disadvantaged communities.

²⁸ FHWA guidance indicates that states can own or lease EV charging infrastructure; however, states do not need to own EV charging stations when contracting with private entities.

²⁹ 23 U.S. Code § 104 subsection (c).

³⁰ Contracts may be made with private entities for the acquisition and installation of publicly accessible EV charging stations. Private entities may also be able to contribute to the nonfederal share of the cost of a project.

³¹ FHWA guidance indicates that the FHWA will need to certify when a state's corridor is built out. States are not allowed to receive this certification within the first year. Certification of all AFCs in a state enables the state to spend money on other activities.

Funding received through the NEVI Formula Program must be used for EV charging infrastructure open to the general public or to authorized commercial vehicle operators from more than one company. EV charging projects under the NEVI Formula Program must be located along designated AFCs. In addition, the state may use funds on any public road or in other publicly accessible locations if the state and secretary of transportation agree that AFCs are sufficiently built out.³² Specifically, funding may go to the following aspects of EV charging infrastructure.

- Acquisition and installation³³
- Mapping and analysis activities to evaluate the effectiveness of locations considering future EV adoption³⁴
- Operation and maintenance for up to five years³⁵
- Acquisition or installation of traffic control devices located in the right-of-way³⁶
- On-premises signage
- Data sharing

State plans should provide the process for allocating, reserving and accounting for funds to confirm that the grant money is being spent in accordance with the Act allocations. These state plans should provide the process for accounting by project and across the state program for the following uses of funding: analysis, development, installation, operation and maintenance and data sharing for each project. State reports following the first round should provide forecasts for future spending, including spending necessary to correct for any allocation deficiencies in connection with the first round of funding. Actual spending should be evaluated by the secretary of transportation or Joint Office prior to the disbursement of the subsequent year's funding.

Program administration experience shows that state programs should include the following.

- Timeline (minimum of six months) for planning of all program components.
- Set standards for program participation that balance making them accessible to a sufficiently broad audience of participants with sufficiently stringent qualifications for experienced professionals.
- Requirement for verification that sites have been secured.

³² Publicly accessible locations may include parking facilities at public buildings, public schools and public parks. These may also include publicly accessible parking facilities owned or managed by private entities.

³³ FHWA guidance includes in these activities development including feasibility analyses, environmental review, revenue forecasting, engineering and design and community outreach. Note renewable energy directly related to EVI that lowers cost can be eligible for funding.

³⁴ FHWA guidance requires mapping and analysis to include locations of current and future EV owners, forecasts of travel patterns and electricity required, electric service readiness, future needs for charging stations and shared mobility solutions.

³⁵ FHWA guidances suggests that states focus funding for operation and maintenance to those areas with greatest need that also address equity issues.

³⁶ FHWA guidance defines traffic control devices as consistent with the Manual on Uniform Traffic Control Devices (MUTCD). This includes signs, signals, markings and other devices to regulate, warn or guide traffic.

- Requirement that applicants produce a contract with an electric vehicle service provider.
- Provision for allowing state-level designations for disadvantaged or environmental justice communities should be adopted as available.
- Consideration of the impact on EV adoption of higher incentives in designated communities and provision of additional technical assistance in these areas.
- Establishment of realistic deadlines (nine-15 months depending on equipment type) for the deployment and full documentation following reservation of funds.
- Process for ensuring program reports include metrics to confirm that set-aside funds have been properly reserved and spent.

In addition, the secretaries should require the creation of a national map of designated communities that fills in any gaps in state-level information.

Future FHWA guidance will recommend how states and the Joint Office utilize the 10% of the annual budget set aside for states that require additional assistance. CSE recommends that Congress evaluate how these funds advance the goals of IJA in effective, high-impact ways. The Joint Office could report to Congress how the funds were used, including but not limited to a description of the additional planning and analysis, education and stakeholder engagement and deployment assistance funded by the set-aside. The Joint Office can defend their use of these funds by reporting metrics used in decision-making, and Congress could evaluate the use of these funds and timeliness of their use.

3.2.2. Funding Process for the Corridor Charging Grant Program

Starting in 2022, the Corridor Charging Grant Program provides \$2.5 billion in competitive grants for the strategic deployment of EV charging, hydrogen, natural gas and propane infrastructure³⁷ along designated AFCs.³⁸ Application evaluation includes the project's contributions toward improving AFC networks, meeting market demands, accelerating infrastructure that would otherwise not be built due to cost, stimulating the alternative vehicle market and providing access to the public.

Eligible grant recipients are a state or political subdivision of a state, a metropolitan planning organization, a local government unit, a special purpose district or public authority with a transportation function (including a port authority), an Indian tribe or a community territory of the United States. Entities owned by eligible grant recipients are also eligible for the award.

Under this grant program, grant recipients may enter into a cost-sharing agreement with the private entities³⁹ that were contracted to acquire and install infrastructure. This agreement requires that the

³⁷ Grants for propane infrastructure are limited to medium- and heavy-duty applications.

³⁸ Any affected Indian tribes are consulted before the area is decided.

³⁹ A private entity is a corporation, partnership, company or nonprofit organization.

private entity give the grant recipient part of the revenue generated by the infrastructure.⁴⁰ This revenue may only be used to install and operate eligible⁴¹ vehicle infrastructure.

In general, grant recipients may use funding in the following ways.

- Acquisition and installation
- Operation and maintenance for up to five years
- Acquisition or installation of traffic control devices located in the right-of-way⁴²
- Estimation of GHG emissions reduced through project⁴³

Furthermore, 50% of the Corridor Charging Grant Program funds may be reserved for community grants for projects expected to reduce GHGs or expand access to publicly accessible infrastructure. In addition to the eligible grant recipients of the Corridor Charging Grant Program, state or local authorities with ownership of publicly accessible transportation facilities are eligible. Projects are not limited to AFCs; projects may be located on any road or publicly accessible location.

Community grant recipients may use the funding for the following:

- Development phase activities, including planning, feasibility analysis, revenue forecasting, environmental review, preliminary engineering and design work and other preconstruction activities
- Site acquisition and installation
- Contracting with private entities for the acquisition, construction, installation, maintenance or operation of charging or fueling infrastructure
- Education and community engagement activities up to 5% of community grant

Priority for community grant applications will be given to projects that expand access to charging and fueling infrastructure in the following areas:

- Rural areas
- Low- and moderate-income neighborhoods
- Communities with a low ratio of private parking spaces to households or a high ratio of multi-unit dwellings to single-family homes

⁴⁰ Note that proportions are not specified in IIJA.

⁴¹ Eligible infrastructure includes publicly accessible electric vehicle charging infrastructure, hydrogen fueling infrastructure, propane fueling infrastructure and natural gas fueling infrastructure. This infrastructure must be situated along designated AFCs or in certain other locations that will be accessible to all drivers of electric vehicles, hydrogen vehicles, propane vehicles and natural gas vehicles.

⁴² Funds used for installing and acquiring traffic control devices must come from the initial grant amount.

⁴³ Assessments shall be completed using the Alternative Fuel Life-Cycle Environmental and Economic Transportation tool developed by Argonne National Laboratory or a successor tool.

To the extent possible, the applications should be evaluated together with the projects being funded under the NEVI Formula Program so that the two infrastructure efforts can avoid duplication. In addition, the following recommendations are made with respect to the Corridor Charging Grant Program.

- **Rural Areas:** Rural areas may be defined in several ways, using density and proximity to urban areas as variables.⁴⁴ Aligning definitions with county or utility service territory may be ideal so that recipients could stack the grant with local incentives. Furthermore, available modes of travel to various rural communities may be considered; those who rely most on vehicle travel may have a greater need for community grants.
- **Low- and Moderate-Income Neighborhoods:** Income level can be defined in many ways, often in comparison to others within a region, state or nation. For example, the federal poverty level (FPL) is often used as a metric for identifying the type of income of an individual or neighborhood.⁴⁵ The California Air Resources Board's (CARB) Clean Vehicle Rebate Project identifies low- and moderate-income participants as those 100% to 400% of the FPL.⁴⁶ Another metric is the percentage of the state median income. Adopting federal definitions that encompass state definitions could reduce complications and allow applicants to stack federal and state incentives.
- **Communities with Low Ratio of Private Parking Spaces to Households and High Ratio of Multi-Unit Dwelling to Single-Family Homes:** While the definitions of some of these variables such as private parking spaces may be difficult to quantify through existing datasets, some are readily available through census data. In addition, an alternative metric to the home ratio would be the comparison of multi-unit dwelling vehicle census to home vehicle census.

3.3. Implementation

3.3.1. Guidance for Implementation

Program experience teaches that the following criteria should be included in the secretaries' evaluation criteria for a state's implementation plan for the NEVI Formula Program and for evaluation of submissions under the Corridor Charging Grant Program.

⁴⁴ Economic Research Service. U.S. Department of Agriculture. (2019, October 23). *What is Rural?* Retrieved January 27, 2022 from <https://www.ers.usda.gov/topics/rural-economy-population/rural-classifications/what-is-rural.aspx#:~:text=According%20to%20the%20current%20delineation,not%20necessarily%20follow%20municipal%20boundaries.>

⁴⁵ Office of the Assistant Secretary for Planning and Evaluation. (n.d.) *U.S. Federal Poverty Guidelines Used to Determine Financial Eligibility for Certain Programs*. Retrieved January 27, 2022, from <https://aspe.hhs.gov/topics/poverty-economic-mobility/poverty-guidelines>.

⁴⁶ Clean Vehicle Rebate Project. (n.d.) *Income Eligibility*. Retrieved January 28, 2022, from <https://cleanvehiclerebate.org/en/income-eligibility>.

- **Charging Criteria:** Evaluation of EV charging procurement should examine how and what was selected as the final criteria for charging infrastructure, including the maximum distance between chargers, charging speeds and multi-unit dwelling density metrics. For the NEVI Formula Program, DOT should establish a qualified product list and should assess whether the state has provisions for complying with the qualified product list. For the Corridor Charging Grant Program, the evaluation of EV charging procurement should examine how and what the grant applicant selected, including applicability to location, charging speeds and multi-unit dwelling density metrics.
- **Funding Disbursement:** For the NEVI Formula Program,⁴⁷ states should be periodically evaluated on how successful they were in the following guidance from the Joint Office on efficiently and equitably disbursing funding among the approved projects.⁴⁸ Efficiency statistics could include:
 - Average time from application initiation to station reporting data.
 - Ratio of completed to canceled applications.
 - Percentage of available funding distributed.
 - Average cost per charging station installed.

For the Corridor Charging Grant Program, once the entity's application is approved and has received funding from DOT, the entity should be evaluated on how efficiently it disburses or uses funding. This evaluation should determine whether the state efficiently used its federal dollars and whether it expanded the program's impact by passing on the 20% match requirements to private entities. Reporting should be implemented to evaluate the state's compliance with the set-aside requirements in the Act.

- **Adherence for Equipment Requirements:** Compliance for equipment requirements for the funds used under the NEVI Formula Program mandate EV charging infrastructure be nonproprietary, allow for open-access payment methods and be either made publicly available or available to authorized commercial motor vehicle operators from more than one company and located along designated FHWA AFCs (unless determined otherwise).⁴⁹ States should be required to submit annual reports establishing compliance for all funded applicants. States should also be required to certify compliance with qualified product list requirements if implemented as recommended. See [4.4. Qualified EV Charging Equipment](#).
- **Signage:** The FHWA defines minimum standards for EV charging signage in two categories: wayfinding signage and station signage.⁵⁰ Compliance should gauge whether the state meets these signage requirements as specified in the Manual on Uniform Traffic Control Devices.⁵¹

⁴⁷ Program codes have been created in the Fiscal Management Information System (FMIS) for tracking purposes.

⁴⁸ FHWA guidance requires that states create a data-driven implementation plan. Aspects to consider include program benefits, job creation, EV adoption, access to EVI, benefits to underserved communities, affordability and reliability.

⁴⁹ <https://afdc.energy.gov/laws/infrastructure-investment-jobs-act>.

⁵⁰ U.S. Department of Energy. (n.d.). Signage for plug-in electric vehicle charging stations. Alternative Fuels Data Center: Signage for Plug-In Electric Vehicle Charging Stations. Retrieved January 31, 2022, from https://afdc.energy.gov/fuels/electricity_charging_station_signage.html.

⁵¹ Federal Highway Administration. (n.d.). Manual on Uniform Traffic Control Devices for streets and Highways. Manual on Uniform Traffic Control Devices. Retrieved February 1, 2022, from <https://mutcd.fhwa.dot.gov/>.

Reporting could happen through annual reports submitted by the state or through established procedures for the upkeep of highway infrastructure in the state.

- **Operation and Maintenance:** Federal funding should support the operation and maintenance of the projects for up to five years. After that, states are responsible for operation and maintenance. A full 10-year plan should be included in the state's electrification plan.
- **Documentation and Reporting:** Annual reports provided by the states to the Joint Office detailing all aspects of the projects would help the Joint Office evaluate progress and plan for future development. Reports should include but not be limited to the project's performance, usage information, data collection evaluation, risks to the project and mitigation planned and operation and maintenance plans. Prior to reporting, states should develop documentation procedures to be completed on a timely basis within state plans; and the Joint Office should approve the establishment of these protocols.
- **GHG Reductions:** Part of the intent of the Corridor Charging Grant Program is to reduce GHGs. Applications will include the estimation of GHGs reduced with the installation of the proposed project. Estimates should incorporate forecasted EV use at the charging station; and Congress should ensure that DOT is evaluating projects for practical use of forecasting models available to applicants.
- **Stakeholder Engagement:** For the Corridor Charging Grant Program, up to 5% of funds for community grants should be used for education and community engagement. Applicants should report to DOT how education and engagement were designed to meet all people within their community. Applicants should also demonstrate that their outreach included general EV awareness, directions for using charging stations and accessing funding. Engagement should happen early in the process, so communities are not surprised.

3.3.2. Considerations for Congressional Oversight of Program Implementation

Congress should monitor the Joint Office and DOT's compliance process. Program implementation should follow the guidelines to ensure that the program is implemented in accordance with the authorizing statute and in a way that has been vetted and validated by stakeholders through the outreach and engagement process. Unless noted otherwise, the following recommendations are suggested oversight areas of question that could cover both federal funding programs.

- Is DOT awarding funding and tracking progress based on the factors outlined in the state compliance recommendations: planning, outreach and engagement, implementation and ongoing efforts?
- How quickly was the funding distributed, and were there any barriers to funding disbursement?
- How much funding is still available at key program benchmarks?
- Did DOT appropriately set aside the required amount of funding for the community grant program?
- Did DOT prioritize rural and underserved communities in the community grant program? Were these areas chosen for their contribution to the IJA goal of the community grant portion of

reducing GHGs and closing gaps in public infrastructure access? What percentage of the funding went to those communities?

- Did DOT ensure appropriate cost-sharing with project partners?
- Was the maximum grant award for the Corridor Charging Grant Program kept under the \$15 million cap as required by law?

3.3.3. Considerations for Congressional Oversight of Stakeholder Engagement

Stakeholder outreach and engagement are critical components of electric vehicle infrastructure deployment. The program's success depends on meaningful engagement with states, cities, tribes and other jurisdictions, the EV business community, nonprofit environmental and transportation advocacy organizations, community-based organizations, fleets, EV drivers and many others. The following recommendations are suggested oversight areas that could cover both federal funding programs.

3.3.3.1. Outreach and Engagement

- How did DOT measure stakeholder engagement, and what is considered a success?
- Did DOT have an outlined strategy for initial stakeholder outreach and engagement beginning early in the process, and does that strategy continue throughout the program implementation and review phase?
- How did DOT ensure meaningful involvement and fair treatment of all stakeholders in the development of guidance and in assessing state plan compliance, especially those from underserved and low-income communities?

3.3.3.2. Comments and Feedback

- How did DOT assess stakeholder comments? Did they measure both the quality and the number of comments; and how did they differentiate between substantive comments and letter writing or comment campaigns?
- What metrics did DOT use to analyze collected comments, and how do those metrics compare to other related programs?
- How did DOT incorporate any feedback delivered through the comment process?

3.4. Data Collection and Reporting

3.4.1. Data Collection for the NEVI Formula Program

Under the NEVI Formula Program, the secretary of transportation is also required to develop minimum standards and requirements about publicly available electric vehicle charging infrastructure locations, pricing, real-time availability and accessibility. The Joint Office will create and maintain a public database of charging location information, which will be accessible on both the Department of Transportation and

Department of Energy websites. Additionally, the secretary of transportation is required to determine standards for charger utilization data to be collected from the states for the program.

As described per IJJA, the charging location database will include the following aspects.

- Information on the location of electric vehicle charging stations. This information will be made available on the Alternative Fuels Data Center's website and maintained by the Office of Energy Efficiency and Renewable Energy.
- Locations for potential electric vehicle charging stations as identified by entities that are eligible through this program.
- The ability to sort results by location, operational status and charger type (e.g., Level 2 and DC fast charging).

In addition to what IJJA has defined that the database will encapsulate, the Joint Office will guide other data sharing aspects and determine how and where data should be collected and shared. This includes installation, maintenance and utilization data to continue informing the network build-out of zero-emission vehicle charging and refueling infrastructure. This also includes data collection regarding EV charging stations integrating with the grid.⁵² A recommended set of charging data fields is provided in [4.3. Recommended Charging Data Fields](#).

This data will help the Joint Office achieve a host of important objectives, including: further understanding charger maintenance requirements, minimizing the stranding of assets due to lack of use or maintenance, identifying charging gaps to be filled (including in rural corridors and underserved or disadvantaged communities), calculating the charger contribution to GHG reductions, providing infrastructure data that could be used to incentivize private sector investment and providing the public with information on charger location and availability.

While additional guidance is forthcoming, the FHWA guidance suggests that states consider requiring data describing charging usage, cost and reliability. Furthermore, guidance suggests requiring charging network providers to share data describing charging station location, type of equipment available, price and status among public-facing directories including the Alternative Fuel Data Center's Station Locator.

CSE recommends that data collection should be maintained for at least the first five years of the project. The Joint Office should prepare an annual report for Congress that can be used to assess program progress in the timely dissemination of project funds and siting of charging to serve EV demand, meet goals and fill gaps. This data can also be used to determine if any agencies or funding recipients are out of compliance and to provide data to the Department of Justice to determine if any enforcement action

⁵² Measures should be implemented within one year of the date of enactment. The administrator may collaborate regarding data collection with the secretary of transportation, the secretary, the administrator of the Environmental Protection Agency, states or state entities and private entities.
<https://www.congress.gov/117/bills/hr3684/BILLS-117hr3684enr.pdf>, p. 615-616.

is required. The following data is necessary to effectively administer the program and maximize the use of public funds.

- **Total Cost of Charging Stations:** Total cost is more than what is captured by installation, materials and electricity costs. Maintenance, security or other costs should also be identified and calculated to determine appropriate use of funding and inform oversight. A full list of costs includes charging stations and related on-site infrastructure, electricity, repair, monitoring, predevelopment activities (e.g., permitting, analysis, etc.), security infrastructure (e.g., initial cost and repair) and more.
- **Types of Charging Stations:** Charging station equipment provides a wide variety of power levels (at varying costs) and offers different connectivity options to the grid. Data collected could include a description of the type of charger (e.g., power level, number of ports, serial or parallel maximum power delivery), whether the charger is networked and controllable (e.g., connected to a network of multiple chargers that receive signals or direction for how to operate), whether the charger is network-capable and whether the charger is unidirectional or bidirectional (e.g., if the car battery can provide electricity to the associated building or grid in addition to receiving a charge via the charging station).
- **Location of Charging Stations:** Geocoordinates provide information necessary to analyzing the community composition of the national charging network as well as the distance between charging stations.
- **Location Types:** Charging session durations and the amounts of energy dispensed vary significantly based on the type of location and the expected time that EV drivers will likely spend at the location. Charger utilization data informs the creation of profiles that will be used for future charging station investment decisions. Optimized siting can only be achieved when there is an understanding of the use profiles across diverse settings, including parking facilities, national parks, fueling stations, hospitality, office buildings, transit hubs, retail and other location types.
- **Usage of Charging Stations:** Charger utilization data should include both session data (recording the power delivery and energy consumption from a vehicle's charging initiation until the vehicle is unplugged) and interval data (indicating the power delivered at specified intervals throughout the 24-hour period). The combination of these two usage sets is needed to understand vehicle charging requirements and patterns as well as the performance and reliability of the charging equipment itself. Both of these factors will inform future charging infrastructure investment decisions. Data should include the type of charger used during the charging session, the number of electric vehicles using the charging station in a day, the length of each charging session and time of start and end, the quantity of energy dispensed during each charging session and the quantity of energy dispensed over periods of time.
- **Mapping Analysis:** To address forecasting for future EV charging station locations, a multi-criteria decision-making modeling technology platform should be used to identify optimal locations for siting the funded charging stations. These modeling platforms should have the

capability to include in the forecasting equation projected local EV adoption rates, EV driving patterns, distance from existing EV charging infrastructure, EV charging use profiles and the extent to which the mapping satisfies the stakeholders goals and objectives, including goals for service to rural and priority populations. The states should prepare annual reports analyzing this data to direct funding toward areas that continue to be underserved

- **Insights to Improve Program:** Data can be used for evaluating and forecasting the future needs for charging stations based on their location, equipment type and usage profile as noted. Reviewing this data annually will be increasingly important with the continual advancement of technologies such as higher capacity batteries, faster-charging equipment, grid integration of renewable energy and the use of vehicle-to-grid (V2G) technology. The Joint Office should use the data to consider revising equipment requirements or funding prioritization.
- **Downtime Events:** Information about each time an EV charging station is unavailable due to maintenance, failures, etc., should be used to understand equipment reliability. Congressional oversight should identify equipment or charging network operators that fail to meet the specified minimum performance standards and require any necessary program changes.

This data collection includes data regarding EV charging stations integrating with the grid.⁵³ For the purpose of grid integration, data may be collected from several sources associated with EV charging stations, including the following.

1. Host-owned or charging network-owned EV charging stations
2. Aggregators of charging network-owned electricity demand
3. Electric utilities offering managed charging programs
4. Individual, corporate or public owners of EVs
5. Balancing authority analyses of transformer loading congestion and distribution system congestion

Usage data will also assist in accessing grid impacts and the development of ancillary energy markets.⁵⁴

⁵³ Measures should be implemented within one year of the date of enactment. The administrator may collaborate regarding data collection with the secretary of transportation, the secretary, the administrator of the Environmental Protection Agency, states or state entities and private entities. See p. 615-616 at <https://www.congress.gov/117/bills/hr3684/BILLS-117hr3684enr.pdf>.

⁵⁴ Electric vehicles can act as batteries with bidirectional charging capabilities. They store energy from the grid but can send that energy back to buildings or the grid as needed. Individually, they can act as energy storage within microgrids or as backup power for homes, buildings or work sites. When aggregated, they can participate in the distribution or wholesale markets. By acting as batteries, electric vehicles have potential to significantly improve grid stability and functionality.

3.4.2. Data Collection for the Corridor Charging Grant Program

Data collection is mandatory for the NEVI Formula Program, but is not required for the Corridor Charging Grant Program. CSE recommends that DOT consider requiring mandatory data collection and use when feasible for the Corridor Charging Grant Program because available data would provide an objective means of assessing the value delivered by the program. CSE proposes data collection within the program follow the guidance for the NEVI Formula Program with provisions that chargers be networked and the data shared unless local circumstances necessitate an exemption.

Data collection from Corridor Charging Grant Program participants would best be facilitated by utilizing the charging network providers that currently collect and store the data in networked operations centers as part of their normal operations DOT, state or other applying entities should require the data from the charging network providers. These providers should be required to remove personally identifying information of EV drivers before the transmittal of data to the receiving federal entities.

3.4.3. Qualified EV Charging Equipment Product List

According to the IJJA, the transmission and collection of data through these programs should require the use of industry standards, which include the following.

- Open Charge Point Interface (OCPI) protocol
- Open Charge Point Protocol (OCPP)
- Open Automated Demand Response 2.0 (OpenADR 2.0)
- International Organization for Standardization standard (at time of writing, standard 15118)⁵⁵
- Institute of Electrical and Electronics Engineers standard 2030.5

Adherence to these standards will enhance the accuracy of the data collected, reduce the cost of collection and analysis and enable the timely oversight of program compliance. CSE recommends that the product qualification process include consideration of the safety and functionality of the charging stations recommended. Precertification by certifying agencies such as the Underwriters Laboratory or similar organization⁵⁶ would provide a streamlined process for oversight and is recommended before disbursement of funds is ideal.⁵⁷

⁵⁵ CSE recommends that the California Energy Commission's (CEC) ISO 15118 Charger Communication and Interoperability Protocol be considered when requiring adherence to ISO 15118. For more details, please see Docket 19-AB-2127 within the CEC proceedings.

⁵⁶ UL LLC. (n.d.). Electric Vehicle (EV) Infrastructure Services. UL. Retrieved January 31, 2022, from <https://www.ul.com/services/electric-vehicle-ev-infrastructure-services>.

⁵⁷ EV charging equipment have widely implemented OCPP. However, certification of OCPP implementations, which is key to true interoperability, has not yet caught up. Consideration of certification timelines is important when determining the implementation of such a checklist.

In addition, DOT should leverage the DOE process for qualifying EV charging stations to be compliant with federal laws through the Federal Energy Management Program and a method for identifying ENERGY STAR-qualified products. The ENERGY STAR product specifications can apply to funded DC fast charging and Level 2 charging stations.⁵⁸ Currently, certified ENERGY STAR charging products represent a small percentage of overall electric vehicle charging stations available for sale. While this list should be recommended as a reference point to program applicants, a larger list of eligible charging stations should be maintained on the Joint Office websites.

A comprehensive set of proposed requirements for a qualified product list is contained in [4.3. Recommended Charging Data Fields](#).

4. Background and Best Practices

4.1. EV Charging Infrastructure: Integral to State and Federal Goals

The enactment of the IIJA is an important step toward achieving state and federal GHG emissions goals. President Biden has stated that reducing GHG emissions is one of the priorities of his administration.⁵⁹ The administration set a goal of reducing economy-wide net emissions by 50% to 52% from 2005 levels by 2030 and targeted 2050 as the year that the U.S. will achieve net-zero emissions.⁶⁰ Transportation accounts for 29% of all GHG emissions in the U.S. as of 2019.⁶¹ President Biden recognized that EVs are a key component to reducing these emissions and has targeted 2030 as the year by which 50% of all new vehicles sold will be EVs.

President Biden's goals are reflective of the priorities of several states; many states have expressed their commitment by establishing emissions reductions targets and EV adoption goals. Currently, 24 states and the District of Columbia have emissions targets. California's goal is to reduce GHG emissions to 40% below 1990 levels by 2030. California has also instituted a Zero Emissions Vehicle Program, which has been adopted by Colorado, Connecticut, Maine, Maryland, Massachusetts, Nevada, New York, New Jersey, Oregon, Rhode Island, Vermont, Virginia and Washington. This policy requires that automotive manufacturers produce a minimum number of EVs annually as a percentage of all light-duty vehicle

⁵⁸ ENERGY STAR EV charging station requirements can be found at <https://www.energy.gov/eere/femp/purchasing-energy-efficient-electric-vehicle-supply-equipment>.

⁵⁹The United States Government. (2021, April 22). *Fact sheet: President Biden sets 2030 greenhouse gas pollution reduction target aimed at creating good-paying union jobs and securing U.S. leadership on Clean Energy Technologies*. The White House. Retrieved January 27, 2022, from <https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/22/fact-sheet-president-biden-sets-2030-greenhouse-gas-pollution-reduction-target-aimed-at-creating-good-paying-union-jobs-and-securing-u-s-leadership-on-clean-energy-technologies/>.

⁶⁰ Ibid.

⁶¹ United States Environmental Protection Agency. (2021, July 27.) Sources of Greenhouse Gas Emissions. Retrieved January 27, 2022, from <https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions>.

sales, which increases over time.⁶² Forty-five states and the District of Columbia offer some form of EV purchase incentive, either through state legislation or a specific utility operating within the state. Twenty-one states and the District of Columbia offer incentives to purchase and install electric vehicle infrastructure.⁶³ The IIJA investments add to billions of dollars in previous state, federal and utility EV investments.⁶⁴ Oversight of these new programs should include an assessment of the extent to which the secretaries and the Joint Office are informing their decisions by valuable operating experience gained to date by programs already in existence.

4.2. Prior Federal and State Funding for Electric Vehicle Charging Infrastructure

Valuable operating knowledge can be captured from earlier federal and state incentive programs for EV charging infrastructure. The following listed programs contribute to the foundational knowledge that can inform IIJA implementation.

State Incentive Programs

	Funding and Administration	Incentives	Results
California Electric Vehicle Infrastructure Project (CALeVIP) ⁶⁵	Funded through California Energy Commission funds and run by the Center for Sustainable Energy. Current program funding is set at \$250 million and may increase to \$500 million contingent upon approval of projects.	Up to \$7,500 per Level 2 charging port and up to \$80,000 per DC fast charging port. Amounts vary by county, disadvantaged community status, low-income community status and other parameters.	\$24.9 million has gone toward completing 662 Level 2 chargers and 293 DC fast chargers. \$97.2 million has gone toward applications in progress for 3,470 Level 2 chargers and 1,089 DC fast chargers.
Charge Ready NY ⁶⁶	New York State Energy Research and Development Authority (NYSERDA) has committed \$17 million, and funding has been exhausted.	Rebates of \$4,000 per Level 2 charging port installed at public parking facilities, workplaces and	Charge Ready NY has enabled the installation and use of \$17 million worth of chargers and has developed

⁶² California Air Resources Board. (n.d.). *Zero Emissions Vehicle Program: About*. Zero-Emission Vehicle Program. Retrieved January 19, 2022, from <https://ww2.arb.ca.gov/our-work/programs/zero-emission-vehicle-program/about>.

⁶³ Hartman, K., & Shields L. State Policies Promoting Hybrid and Electric Vehicles, (2021, August 20). *State Policies Promoting Hybrid and Electric Vehicles*. National Conference of States Legislatures. Retrieved January 25, 2022, from <https://www.ncsl.org/research/energy/state-electric-vehicle-incentives-state-chart.aspx>.

⁶⁴ Smith, C. (2021, June 1). More than \$2.6 Billion in Public Funding for EVs. Atlas EV Hub. Retrieved February 4, 2022, from https://www.atlasevhub.com/data_story/more-than-2-6-billion-in-public-funding-for-evs/.

⁶⁵ Center for Sustainable Energy. (2021). CALeVIP. Retrieved January 28, 2022, from <https://calevip.org/>.

⁶⁶ New York State Energy Research and Development Authority. (n.d.). Charge Ready NY. NYSERDA. Retrieved January 28, 2022, from <https://www.nyserda.ny.gov/All-Programs/ChargeNY/Charge-Electric/Charging-Station-Programs/Charge-Ready-NY>.

		multifamily apartment buildings. For equipment installed after December 10, 2020, and located within a disadvantaged community, an additional incentive of \$500 per port may be awarded.	extensive best practices for all types of customers. ⁶⁷ Additional reporting would benefit comprehensive planning for the region.
Hawaii Energy Electric Vehicle Charging Station Incentive Program ⁶⁸	\$163,000 in funding available from July 1, 2021, to June 30, 2022. The Hawaii Public Utilities Commission chose Hawaii Energy to administer this program. It is funded by the State of Hawaii's Act 75 (2021).	Level 2 stations may receive \$4,500 per new installation and \$3,000 for previously installed stations. Additional funding is available for Level 2 stations installed at affordable housing properties. DC fast charging stations may receive \$35,00 per new station installation and \$28,000 per previously installed station.	As of August 2021, 89 charging stations across the state (57 on Oahu, 13 on Hawaii, 10 on Kauai and nine on Maui) have been installed. ⁶⁹
Washington State Zero Emission Vehicle Grants	From 2017-19 WSDOT, along with matching funds, total investment of \$2.5 million. WSDOT plans to award approximately \$8 million in grants for projects to be completed between July 1, 2021, through June 30, 2023.	Grants available for nonprofit organizations, state and local government agencies for priority corridors. ⁷⁰	Between 2017-19, 15 new DC fast charging electric vehicle charging stations were installed.

⁶⁷ Best practices for charger development and implementation can be found here: <https://www.nysedda.ny.gov/All-Programs/ChargeNY/Charge-Electric/Best-Practices>.

⁶⁸ Hawaii Energy. (n.d.). Electric Vehicle Charging Stations. Retrieved January 31, 2022, from <https://hawaiienergy.com/for-business/rebates/electric-vehicle-charging-stations>.

⁶⁹ Note program reports do not specify the type of charger.

⁷⁰ For more information on priority corridors in Washington State, please visit: <https://wsdot.wa.gov/business-wsdot/grants/zero-emission-vehicle-grants#:~:text=What%20EV%20infrastructure%20grants%20are,highway%20corridors%20in%20Washington%20state>.

National Electric Vehicle Infrastructure Programs

	Funding and Administration	Results and Impacts
The American Recovery and Reinvestment Act (ARRA) of 2009	ARRA provided the Department of Energy \$400 million in funding for vehicle electrification.	More than 25,000 vehicles and charging units across the United States.
The EV Project	ARRA as part of the \$400 million Department of Energy funding allocation.	This project resulted in 14,000 Level 2 PEV chargers, 300 DC fast chargers, 5,700 all-electric Nissan LEAFs and 2,600 plug-in hybrid electric Chevrolet Volts deployed.
Clean Cities Project Awards	\$300 million in federal government investment, a significant portion of the program's cumulative funding.	1,380 alternative fuel stations, 855 of which were EV charging stations. 665 hybrid electric vehicles, 211 battery electric vehicles, 65 neighborhood electric vehicles, five plug-in electric vehicles.
ChargePoint America Program	\$37 million total with a \$15 million grant funded by the ARRA through the Transportation Electrification Initiative administered by the DOE.	4,600 shipments and installations of home, public and commercial charging ports for EVs throughout the U.S. in 10 different regions.
The Volkswagen Clean Air Act Civil Settlement⁷¹	Close to \$3 billion went into mitigation trust funds for all 50 states, Puerto Rico, the District of Columbia and federally recognized American Indian tribes. Volkswagen also required to invest \$2 billion toward zero emission vehicle (ZEV) charging infrastructure and in the promotion of ZEVs.	Of the mitigation trust funds, \$283 million out of \$597 million in awarded funding has gone toward EVs and EV charging across 35 states as of June 2020. Much funding remains to be awarded by the individual states or beneficiaries. Of the ZEV investment funding, approximately 800 total charging stations with about 3,500 ultra-fast chargers were expected to be installed or developed by December 2021. ⁷²

⁷¹ Environmental Protection Agency. (n.d.). *Volkswagen Clean Air Act Civil Settlement*. Environmental Protection Agency. Retrieved January 28, 2022, from <https://www.epa.gov/enforcement/volkswagen-clean-air-act-civil-settlement>.

⁷² For more information, please see: <https://media.electrifyamerica.com/assets/documents/original/789-SummaryQ32021QuarterlyReporttoCARB.pdf>.

4.3. Recommended Charging Data Fields

Category	Field
Sites	Site ID
Sites	Site Name
Sites	Site Type
Sites	EVSP
Sites	Street Address
Sites	City
Sites	State
Sites	ZIP
Sites	Latitude
Sites	Longitude
Sites	Number of EVSE
Sites	Number of Ports
EVSE	EVSE ID
EVSE	Site ID
EVSE	EVSE Manufacturer
EVSE	EVSE Model Number
EVSE	EVSE Maximum kW
EVSE	EVSE Number of Ports
EVSE	EVSE Power Level
Ports	Port ID
Ports	EVSE ID
Ports	Site ID
Ports	Port Maximum kW
Ports	Connector Types

Category	Field
Sessions	Session ID
Sessions	Site ID
Sessions	EVSE ID
Sessions	Port ID
Sessions	Connector Type
Sessions	Charge Duration
Sessions	Charge Session Start Date
Sessions	Charge Session Start Time
Sessions	Charge Session End Date
Sessions	Charge Session End Time
Sessions	Disconnect Reason
Sessions	Connection Duration
Sessions	Idle Duration
Sessions	Energy Consumed

Sessions	Charge Peak Demand
Sessions	Charge Average Demand
Sessions	Total Transacted Amount (Driver)
Sessions	Payment method
Sessions	Driver ID
Sessions	Vehicle Make
Sessions	Vehicle Model
Sessions	Vehicle Year
Sessions	Vehicle Type
Intervals	Interval ID
Intervals	Session ID
Intervals	Port ID
Intervals	Interval Start Date
Intervals	Interval Start Time
Intervals	Interval End Date
Intervals	Interval End Time
Intervals	Interval Energy Consumed
Intervals	Interval Peak Demand
Intervals	Interval Average Demand
Intervals	Interval Duration

Category	Field
Downtime_Events	Site ID
Downtime_Events	EVSE ID
Downtime_Events	Port ID
Downtime_Events	Downtime Reason
Downtime_Events	Event Start Date
Downtime_Events	Event Start Time
Downtime_Events	Event End Date
Downtime_Events	Event End Time

4.4. Qualified EV Charging Equipment

Qualified EV Charging Equipment (EVSE) Checklist
Manufactured or assembled in the U.S.
New equipment
Provides at least one J1772 connector (for Level 2 chargers)
Provides at least one Combined Charging System CCS-1 standard (for DC fast chargers)
Networked to a back-office system capable of storing and sharing charging session data

Uses either the Open Charge Point Interface or Direct Current Fast Charge Classes protocols for interoperability
Approved by Underwriters Lab or a similar nationally recognized testing laboratory
Compatible with Open Automated Response 2.0, Institute of Electrical and Electronics Engineers standard 2030.5 or Open Charge Point Protocol 1.6J or later for smart charging management
Compliant with or capable of being remotely update with the International Organization for Standardization standard 15118 for communicating with EVs
Is accessible to drivers of EVs regardless of membership in an electric vehicle service provider network
Accepts payments through either credit/debit cards, near-field communications, radio frequency identification (RFID) cards or mobile phone applications
Complies with the specifications and tolerances outlined in section 3.40 of the National Institute of Standards and Technology Handbook 44
At or adjacent to the charging station provides a toll-free telephone number, available 24/7, for assistance relating to the use of or payment at the station

Requirements According to FHWA Guidance
EV chargers installed as part of the NEVI Formula Program should meet current and anticipated market demands for EV charging infrastructure, with regards to power level and charging speed.
All chargers installed under this program should be DC fast chargers. Stations should have at least four Combined Charging System (CCS) ports and be capable of simultaneously charging four EVs at 150 kW per port. Total station power should not be less than 600 kW.
Maximum charge power per port should not be less than 150 kW. Design and construction practices should consider possible future upgrades that allow for 350 kW or greater charging rates.
Power sharing across ports should be allowed so long as it does not reduce any ports maximum output to less than 150 kW. For stations with ports above 150 kW, states should support station designs that facilitate power sharing across ports.
Station design, size and power level should consider the potential upgrades needed to support the electrification of medium- and heavy-duty trucks.
Stations should be designed to allow for future upgrades to increase power levels and the number of chargers. The Joint Office will publish best practices for EV charging infrastructure construction that will seek to allow flexibility in future upgrades.
Once a state's Alternative Fuel Corridors are fully built out, as determined by that state and the secretary of transportation, that state will have additional flexibility in determining the type and location of additional EV charging infrastructure installed, operated and maintained under the NEVI Formula Program.