The Alliance for Automotive Innovation (Auto Innovators)1 hereby submits comments on the U.S. Department of Transportation Federal Highway Administration’s (FHWA) request for information “Development of Guidance for Electric Vehicle Charging Infrastructure Deployment” and “Charging and Fueling Infrastructure Program” (the RFI).2 Our comments build off a recent public release of Recommended Attributes for EV Charging Stations,3 which provide key attributes needed to support the customers and vehicles of tomorrow.

Auto Innovators and its members are committed to achieving a net-zero carbon transportation future for America’s cars and light trucks. The auto industry is investing over $330 billion through 2025 to advance vehicle electrification, and in the same timespan will increase the number of EV models available from over 60 today to around 130. Additionally, with necessary conditions in place, Auto Innovators and our members support a goal of achieving 40-50% U.S. new light-duty vehicle market share of EVs by 2030, including battery electric vehicles, plug-in hybrid electric vehicles, and fuel cell electric vehicles. To meet these goals, necessary conditions must be in place—including consumer

1 Formed in 2020, the Alliance for Automotive Innovation is the singular, authoritative and respected voice of the automotive industry. Focused on creating a safe and transformative path for sustainable industry growth, the Alliance for Automotive Innovation represents the manufacturers producing nearly 99 percent of cars and light trucks sold in the U.S. The organization is directly involved in regulatory and policy matters impacting the light-duty vehicle market across the country. Members include motor vehicle manufacturers, original equipment suppliers, technology and other automotive-related companies and trade associations. The Alliance for Automotive Innovation is headquartered in Washington, DC, with offices in Detroit, MI and Sacramento, CA. For more information, visit our website at http://www.autosinnovate.org.

2 U.S. DOT FHWA Request for Information, FHWA-2021-0022. Available at: https://www.regulations.gov/document/FHWA-2021-0022-0001

affordability and awareness, manufacturing and reliable supply chains, and charging and refueling infrastructure.

Much like the federal investment in the Interstate Highway System in the mid-1950s, there is a once-in-a-generation opportunity to build a nationwide charging and hydrogen fueling infrastructure for EVs for decades to come. The Department of Transportation and Department of Energy (“the agencies”) have critical, and urgent, roles to play in the implementation of $7.5 billion for charging and hydrogen fueling infrastructure funding, provided by the Infrastructure Investment and Jobs Act (IIJA). This funding is an important down payment to jumpstart the public and private investment in a nationwide charging and hydrogen fueling network. Executive action will take time, and there should be infrastructure deployment targets set along with actions if those targets are not met. The need for EV chargers is now, and the agencies must move quickly and efficiently to ensure that chargers are available for a growing electrified fleet. The agencies should also continue to learn from other regions, i.e., California and the European Union, who are further along than the U.S. when it comes to EV charging and hydrogen fueling infrastructure. In addition to learning from other regions, we recommend that states collaborate with the agencies that managed their VW EV charging funds and leverage lessons learned from that program. We look forward to working with the administration, agencies, and states on the rollout of the $7.5 billion and provide the following comments on statutory-directed guidance.

1. The distance between publicly available EV charging infrastructure

EV customers and potential customers need to have confidence that they will be able to charge their vehicle when needed. It is difficult to put an exact number on the recommended distance between EV chargers as circumstances vary. For example, areas with more dense traffic will require chargers closer together so as to not overwhelm a single station, whereas areas with less dense traffic may be able to have chargers spaced further apart. Studies should be conducted on the alternative fuel corridors to determine the minimum space needed so that drivers are not concerned about being able to charge their vehicles on road trips or daily commutes.
The current maximum distance between DC fast chargers on alternative fuel corridors is 50 miles, which is a good starting point. However, to reach par with the convenience that ICE customers have today, that distance between chargers must decrease. A distance of 50 miles between chargers does not need to be an absolute requirement, but instead guidance, as there may be situations where the distance is not possible, or there is a better site a bit further than 50 miles. A 350 kW DC fast charging network funded through the IIJA has the potential to be the backbone of a national EV charging network, but consideration should also be given to lower power charging in and around communities.

2. 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 with electric distribution interconnection processes, and plans for the use of renewable energy sources to power charging and energy storage.

In addition to the promise of long-term greenhouse gas emission reductions, EVs can also improve utilization of utility generation, transmission, and distribution assets. Put simply, EVs represent a flexible, smart load that can help flatten load curves, improve overall system efficiency, and promote grid utilization of renewable energy sources. Transportation electrification has the potential to provide widespread benefits and help achieve policy goals ranging from emissions reductions to renewable energy integration to stabilization and modernization of the electric grid.

Vehicle grid integration (VGI) encompasses the many ways in which an electric vehicle can provide grid services. While VGI offers a unique opportunity for the consumer and the grid, it is important to remember an EV’s primary design objective is to meet the transportation needs of the owner/operator. It is also important that federally funded EV chargers not have a VGI requirement. Innovative approaches to smart charging involving vehicle telematics provide customers with the ability to manage charging directly through their EV, which simplifies the customer experience. EV drivers regularly use OEM smartphone apps, making OEMs an effective channel for communicating with customers. OEMs are positioned to communicate VGI opportunities with customers, but VGI applications should not be required for federally funded EV chargers. While VGI technology could be a

4 https://www.fhwa.dot.gov/environment/alternative_fuel_corridors/resources/faq/
consideration for L2 and community chargers, it should not be a requirement to receive federal funding for EV chargers.

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

Customers must have convenient and reliable access to EV charging stations; this is especially important for DC fast chargers along highway corridors. Customers have grown to expect that gas stations also include amenities such as: restrooms, overhead coverings or awnings, proper lighting, etc. These expectations are no different for EV drivers, so it is important that chargers funded through the IIJA are at locations with similar amenities.

Rest areas already have many of the amenities that EV drivers want, which is why EV charging stations should be permitted at federal highway and interstate properties. By allowing EV charging stations to be installed at travel centers, customers will have the ability to charge their vehicle while taking a break from a road trip, or simply take advantage of convenient rest area locations. We encourage the agencies to provide guidance that would allow states to permit EV charging at federal highway and interstate properties.

EV charging stations at fuel retailers, small businesses, and places of interest will also allow customers the opportunity to conveniently charge without adding a separate stop. Gasoline and diesel vehicle drivers are familiar with stopping at fuel retailers to fill up, so installing EV chargers at these locations, which are already prominent along highway corridors, will help make the transition to electric seamless. Additionally, charging stations at small businesses and places of interest provide customers the opportunity to “refuel” their vehicle while they patronize places of business, thereby providing support for those businesses.

Current and potential EV drivers must be aware of charging station locations as they are driving along highway corridors; therefore, EV charging signage must be permitted on highway service signs. Proposed revisions to the U.S. DOT Manual on Uniform Traffic Control Devices would only allow EV charging signage to be included if the charging station was located at a fuel retailer. While charging signage should be included if a charger is at a fuel retailer, it should not be exclusive. Charging stations will be installed at locations other than fuel retailers, which is why it is important that signage be
included for those locations as well. Customers need to have knowledge of where they can safely and conveniently refuel their vehicle. In addition to aiding existing EV customers, it is important for potential EV buyers to have confidence that there is an EV charging network available to charge their vehicle. Proper signage is also necessary to ensure that the investment in public charging is not under-utilized.

4. The need for publicly available EV charging infrastructure in rural corridors and underserved or disadvantaged communities.

Transportation electrification offers many potential benefits, including savings on transportation costs for EV drivers, lower average cost of electricity, valuable grid services, lower GHG emissions, and improved air quality around high-traffic areas like fleet depots, ports, and freeways. Cost savings realized from EV rates and programs should be shared across participating EV drivers and other utility customers.

Public investments are needed to help EV charging networks reach a sustainable scale and to ensure infrastructure is available in more challenging settings, including multifamily housing, underserved communities, and rural areas. Multifamily housing charging is an important source of charging for many customers. This National EV Charging Network funded through the IIJA is focused on corridor and surrounding community charging needs, but we encourage the agencies to identify solutions in future programs to address multifamily charging. In cities, where multifamily housing is predominant and parking options can be limited and/or costly, having the ability to charge while the vehicle is parked at home is critical. Similarly, customers in rural settings must have access to EV chargers, and special consideration should be taken as to locations that are convenient for those customers. Without EV chargers, or the capability to install chargers at these locations, limited charging access will continue to be a barrier to EV adoption.

More consideration is necessary as to the types of chargers that should be installed in rural corridors, multifamily housing, and underserved or disadvantaged communities. In some locations, where there will be longer dwell time and the vehicle will be parked for an extended period, Level 2 chargers may make more sense. On the other hand, at locations to which customers will be travelling specifically to charge their vehicle, DC fast chargers would be most appropriate.
5. The long-term operation and maintenance of publicly available EV charging infrastructure to avoid stranded assets and protect the investment of public funds in that infrastructure.

Federally funded EV chargers must have a minimum uptime requirement and offer redundancy. Non-operational chargers do not support EV customers and can negatively impact the market. It is unreasonable that a federally funded charging station be non-operational for any extended period of time. Therefore, we encourage the Agencies to adopt a standard method to measure reliability and require any federally funded charger to come with a minimum reliability standard. The practice of including reliability and/or uptime requirements for publicly funded EV charging stations is already happening. As part of a funding opportunity, New York requires that state-funded DC fast chargers must be operational at least 97 percent of the year.\(^5\) Additionally, in model state grant and procurement contract provisions, the Northeast States for Coordinated Air Use Management recommends that each DC fast charging connector be operational at least 99 percent of the time.\(^6\) Auto Innovators welcomes the opportunity to work with the Agencies on the development of such standards.

Federally funded EV charging stations must also be open 24/7 to allow access to a wide range of EV customers. Just as drivers of gasoline-powered vehicles have access to refueling stations 24 hours a day, the same must be true for EV drivers.

Additionally, communication standards should be open. For the charger-to-network, Open Charge Point Protocol (OCPP) provides interoperability and will ensure that chargers can work on different network. By using OCPP, EV charging stations will not become stranded assets if there is a change in network. OCPP also enables chargers and various cloud networks to communicate, which helps to ensure that chargers are interoperable with EVs on the road today and future models.

In terms of layout, EV charging stations should support different vehicle configurations. Locations that are selected for federal funding for EV chargers should ensure that the layout, including cord, vehicle access, signage, etc., supports a wide range of electric vehicle designs. Additionally,

\(^5\) NYSERDA, 2021. “DCFC Program – Program Opportunity Notice 4509.” Available at: https://portal.nyserda.ny.gov/servlet/servlet.FileDownload?file=00Pt000000YDm19EAD

stations should have multiple ports per site and allow for pull-through for vehicles pulling a trailer. Multiple ports per site mitigates overcrowding and offers redundancy. Station amenities such as rest rooms, overhead coverings or awnings, proper lighting, and security cameras should also be considered.

6. **Existing private, national, State, Tribal, and territorial government EV charging infrastructure programs and incentives.**

There has been a lot of work and planning by state and local governments to increase EV charging availability. It is imperative that this federal funding is in addition to, not in replacement of, that current local investment. The U.S. is behind where it needs to be in terms of charging to meet the EV goals of the auto industry and the Administration. Analysis conducted by Atlas Public Policy found that to support 100 percent EV sales by 2035, investment in public charging needs to be $39 billion. This figure assumes that all DC fast chargers are 350 kW; that cost would rise to $52 billion if 150 kW DC fast chargers were used.\(^7\) Additionally, the California Energy Commission released a report that showed California alone needs 1.2 million public chargers to support 8 million EVs by 2030, leaving a gap of nearly 1 million chargers by 2030 in the state of California.\(^8\) The $7.5 billion investment from the IIJA is a great starting point, but more is necessary.

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

EV charging infrastructure deployment can be accelerated through public-private partnerships and collaboration across government entities, industries, and stakeholder groups. By working together, infrastructure deployment can be accelerated, the benefits of transportation electrification fully realized, and the cost of this transition minimized.

The IIJA directs the agencies to create an Electric Vehicle Working Group to identify and report on barriers, opportunities, and EV needs. Such federal leadership is critical to address the conditions

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needed for a successful transition to widespread electrification. As our association represents not only manufacturers producing nearly 99 percent of the light-duty vehicles sold in the U.S., but also suppliers and automotive technology companies, we are well-suited to participate as a stakeholder in the Working Group.

8. Meeting current and anticipated market demands for EV charging infrastructure, including with regard to power levels and charging speed, and minimizing the time to charge current and anticipated vehicles.

It is important that publicly funded chargers installed in the near term will meet the needs of EV customers in the long term. To do so, publicly funded DC fast chargers installed on corridors and at transit hubs must be capable of 350 kW and charging connectors should be SAE J1772 and SAE CCS compliant. Below are the recommendations that were included in our EV Charging Station Attributes.9

DC Fast Charging Rate

Federally and state-funded DC fast chargers on corridors and at transit hubs must be capable of charging at a rate of 350 kW. It is imperative that customers have a convenient refueling experience. As more and more electric vehicles come to market with larger batteries, charging speed is going to become increasingly important. EV charging at 350 kW is needed for corridor charging not only to reduce the recharge time of each EV, but also to increase the throughput of EVs to allow more EVs to charge from the same connector. Additionally, it is more cost-effective to have charging sites made capable of 350 kW charging during construction as opposed to after the charger has been installed.10 By requiring a minimum of 350 kW capability, the Agencies can help future-proof for new vehicle and charging technologies.

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Connectors

Auto Innovators supports requirements in the IIJA that EV charging connectors should be SAE J1772 and SAE CCS connectors. Federally funded EV chargers should not limit use to a single vehicle manufacturer or proprietary technology, which is why we supported language in the IIJA that would exclude those chargers from funding eligibility.

Additionally, states and public utility commissions should consider funding make-ready EV charging infrastructure while federally funded chargers are being installed. Make-ready infrastructure should not qualify for federal funding, as the goal of the IIJA funded chargers is to build out a network of actual chargers, but states could consider funding make-ready infrastructure alongside actual chargers. Make-ready infrastructure reduces cost for future EV charging installation, and state funded make-ready charging can complement federally funded chargers and accelerate future deployment.

9. Any other factors, as determined by the Secretary.

Recommendations made in our EV Charging Station Attributes, and not already contained in these comments include: 11

Payment Methods

Federally funded EV chargers must accept credit cards via a credit card reader but can also accept other payment methods. Credit card payments are the most common form of payment for refueling gasoline-powered vehicles. Therefore, to make charging an electric vehicle as similar as possible to refueling a gasoline-powered vehicle, charging stations must, at a minimum, accept credit cards. Limiting charging to an exclusive mobile payment system may exclude groups of users who do not choose or do not have access to a device that supports mobile payment capabilities.

Network and Communication Requirements

Federally funded public DC fast chargers must be networked. It is important that drivers know that a charger will be capable of charging their vehicle before they arrive at the station. Therefore, stations must be able to communicate to drivers to inform them if a station is operational and whether the vehicle can be charged at the site. The Agencies should consider options to facilitate customer access to this information.

Electric vehicles can provide grid services through VGI, as long as they support customer needs to charge in an expeditious manner. There is a lot of progress on VGI through smart charging, vehicle telematics, time-of-use rates, and bidirectional charging, but it is too early in the market to define specific VGI communication standards, especially for corridor charging given customer travel needs.

Standardized Approach to Communicate Pricing

To help customers understand how much it will cost to charge their vehicle, EV charging pricing should be communicated in a standard $/kWh value. Gasoline customers go to a station understanding exactly how much a gallon of gasoline will cost, and the same should be true for electric vehicle customers. Other alternatives may be necessary in some states, as not all states have clarified that charging per kWh is permitted.12

FHWA also requests comments to inform the Charging and Fueling Infrastructure Program for corridor and community charging.

12 Standardized approaches to communicate EV charging pricing is an active topic within the National Institute of Standards and Technology and the National Council of Weights and Measures. Some states have not allowed electricity to be sold to EV drivers in a $/kWh; federal guidance to these states would be beneficial.
10. Please provide examples of best practices relating to project development of EV charging infrastructure and hydrogen, propane, and natural gas fueling infrastructure at the State, Tribal, and local levels.

Our comments above on the Guidance for Electric Vehicle Charging Infrastructure are the same recommendations for EV chargers funded through the Charging and Fueling Infrastructure Program. In addition to our EV charging comments above, below are comments specific to hydrogen refueling.

Focus on the customer

The grant applicant / project developer should clearly state the targeted end customer(s) of the hydrogen fuel, whether light-duty or commercial or public fleet, and spell out what customer(s) should experience in terms of reliability, uptime, and number of back-to-back fills. The grant applicant should provide an overview of the long-term operations of the station(s), including spare parts, personnel, and expected uptime. The grant applicant should also provide an overview of the project’s hydrogen distribution and sourcing strategy.

Hydrogen fueling protocol

Globally, there is a single fueling protocol as it relates to hydrogen and light-duty vehicles. As such, the hydrogen fueling stations supported by the Discretionary Grant Program should adhere to the hydrogen refueling guidelines of SAE J2601_20200513 or the latest revision (SAE J2601”). The same SAE J2601 hydrogen refueling protocols for light-duty vehicles also apply to larger and commercial heavy-duty vehicles. Auto Innovators also recommends that projects that focus on hydrogen fueling for commercial and heavy-duty vehicles also include plans, where appropriate, to co-locate hydrogen fueling stations for light-duty vehicles.

Hydrogen refueling station size

Many of the earlier hydrogen refueling stations developed in California have one fueling position or dispenser. The newer stations developed over the past two years (circa 2020) have multiple fueling positions and dispensers. Auto Innovators recommends that, where space permits, larger capacity hydrogen refueling stations with multiple fueling positions be developed. This

13 Available at: https://www.sae.org/standards/content/j2601_202005/
futureproofs the project location to accommodate growing vehicle sales. Smaller capacity
stations or single dispenser stations make sense where space is constrained.

**Hydrogen refueling station network redundancy, reliability, coverage, distribution capability, and production capability**

Hydrogen refueling station network redundancy, reliability, coverage, distribution capability, and production capability are critical to ensuring an appropriate customer experience. Auto Innovators recommends that grant applications be evaluated by the extent to which the contemplated hydrogen refueling station project (1) enhances existing network redundancy, reliability, and coverage, or (2) if creating a new network, addresses the topics of redundancy, reliability, i.e., by creating a multiple fueling station location network.

**Distance to another hydrogen refueling station**

Light-duty hydrogen refueling stations within a metro area network should be no more than 5-10 miles from each other, and light-duty connector stations should be no more than 100 miles from each other.¹⁴

**Hydrogen distribution strategy**

Grant applicants should provide an overview of their distribution strategy for the project, e.g., gaseous hydrogen tube trailers, liquid hydrogen trailers, pipeline supply, and/or onsite hydrogen generation.

**Hydrogen sourcing strategy**

Grant applicants should provide an overview of the project’s hydrogen sourcing strategy and backup supply, if first choice supply is disrupted.

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Alt Fuel Vehicle Refueling Hubs

Alt Fuel Vehicle Refueling Hubs that provide multiple types of fuels, e.g., DC Fast Charging and hydrogen refueling, can help lower overall project costs by up to 10% and share in fixed costs such as demand or capacity charges.\textsuperscript{15}

Hydrogen refueling in rural corridors, and underserved or disadvantaged communities

Auto Innovators recognizes that different consumers have different needs, and that the infrastructure, energy policies, consumer preferences, and natural environments that vehicles operate in vary from region to region, from state to state, and from urban to suburban to rural. Hydrogen refueling stations can support rural corridors as they can be designed to support both light-duty and heavy-duty FCEVs, and high-density urban environments.

Point of sale and telemetry

All public hydrogen refueling stations should have a point of sale. The station should also be able to provide telemetry information such as (1) operational status and (2) hydrogen available for dispensing, and broadcast such data whereby the information can be accessed by retail and commercial consumers.

Hydrogen distribution assets

The Discretionary Grant Program should also fund the procurement of (1) gaseous hydrogen tube trailers, (2) liquid hydrogen trailers, and (3) liquid hydrogen to gaseous hydrogen transfilling facilities, in addition to hydrogen refueling station equipment and related construction costs. Auto Innovators recommends that investments in hydrogen distribution assets be linked to a hydrogen fueling station project. Experience in California has shown that redundancy and reliability extend beyond the hydrogen refueling station to the entire supply chain.

Pro forma station economics

Hydrogen refueling station economics tend to be challenging in the earlier years, given the lower capacity utilization and the ramp up of vehicles. The Discretionary Grant Program should also

\textsuperscript{15} \url{https://www.nrel.gov/docs/fy21osti/77799.pdf}
cover operational losses for the project for a period of three (3) years. The coverage of losses in the early years also facilitates refueling station development in rural communities and connector locations.

11. What topics do you suggest that we address in guidance on project development of EV charging infrastructure and hydrogen, propane, and natural gas fueling infrastructure at the State, Tribal, and local levels to allow for the predictable deployment of that infrastructure?

In addition to our EV charging comments above, states, Tribal, and local governments should work with project developers and consortiums who have a track record of success and/or the financial capability to see projects to completion. The project developer should clearly identify the end use customer and how the project will meet the customer’s needs. For hydrogen fueling stations, Auto Innovators recommends that project developers or grant applicants establish a consortium that includes an initial baseload customer for a station (e.g., local transit agency with fuel cell electric buses, local government or commercial fleet with light-duty FCEVs, light-duty FCEV rental fleet, heavy-duty fuel cell electric truck operator, etc.)

12. Please provide any suggestions to inform the administration of competitive grants under the Charging and Fueling Infrastructure Program for corridor and community charging.

Our comments above on the Guidance for Electric Vehicle Charging Infrastructure are the same for EV chargers as part of the Charging and Fueling Infrastructure Program. As was stated above, it is imperative that funding for EV charging and hydrogen fueling infrastructure included in the IIJA is allocated efficiently and quickly, and that states rapidly begin installing charging and hydrogen refueling stations.

Auto Innovators also recommends that the discretionary grant program include a quantifiable scoring metric. This scoring metric will provide transparency as to what programs are being chosen for grants and encourage that those projects scoring the highest have an opportunity to move forward.

Additionally, and possibly as part of the scoring metric, states that are funding EV charging and hydrogen fueling could be given a higher percentage of federal funds. This would help encourage states not to use federal dollars as a substitute for state-funded programs. To meet our shared EV goals, state
and federally funded infrastructure is necessary, and federal funds should be additive, not substitutive for state-funded programs.

Conclusion

Auto Innovators appreciates the opportunity to provide these comments and is eager to work with the agencies to ensure that the deployment of federally funded EV charging and hydrogen refueling stations is efficient and equitable. This is a pivotal and transformative time in the auto industry as we transition to electrification, and the funding provided in the IIJA is a good jumpstart to expand EV charging across the nation. We look forward to working with the Administration and all stakeholders to achieve a cleaner transportation future.

Respectfully Submitted,

[Signature]

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