

**Federal Highway Administration Request for Information:
Development of Guidance for Electric Vehicle Charging Infrastructure Deployment
Comments from the International Bridge, Tunnel and Turnpike Association
January 28, 2022**

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Introduction:

The International Bridge, Tunnel and Turnpike Association (IBTTA) appreciates the opportunity to comment on the Federal Highway Administration's (FHWA) Request for Information (RFI) published on November 29, 2021, regarding the Development of Guidance for Electric Vehicle (EV) Charging Infrastructure Deployment.

IBTTA is the worldwide association for the owners and operators of toll facilities and the businesses that serve the industry. Our mission is to advance transportation solutions through tolling and road pricing. Founded in 1932, IBTTA represents 129 toll operators in 34 states that operate 354 distinct toll facilities with more than 6,400 centerline miles. In 2019, these organizations processed 8.3 billion transactions, representing more than \$22 billion in toll revenue for investment and funding of transportation facilities and operations. IBTTA also has hundreds of members in more than 20 countries on six continents.

In many respects, the very essence of IBTTA's mission and member activities parallel the considerations that will be vital to driving successful deployment of EV charging infrastructure. The toll operator members of IBTTA operate some of the most critical assets in the nation's highway system with the highest standards in safety and reliability. These operators offer a value proposition to facility users in exchange for the toll charged to use a facility. Value is represented in facilities that are available, well maintained, convenient, and operated at high service levels, with customer choices and proven satisfaction. Tolling's user-payment approach has proven to provide reliable and sustainable sources of funding for ongoing operations and maintenance, as well as a means of transportation infrastructure financing to deliver projects in a timely and effective manner.

The IBTTA community also recognizes the harmful effects of climate change and the transportation industry's role in addressing objectives to care for the environment and manage the consequences from years of neglect. Our Task Force on Sustainability and Resilience is:

- sharing best practices from both U.S. and international operators;
- exploring ways to advance alternative fuels and renewable energy in toll facility operations, including augmenting national EV charging infrastructure;
- researching the use of performance management and metrics to drive attainment of environmental objectives and outcomes, and shape wise investment priorities; and
- seeking partnerships to establish guidelines and tools for mitigating climate change and enhancing resiliency of critical assets and systems.

IBTTA and its members have a proud record of innovation and technology deployment to enhance efficiency, safety, and service. We recognize the role that information and data are playing in transportation today, and the exponential growth we will see in the role of information in the emerging transportation solutions of the future.

EV Adoption and Market Challenges to be Addressed:

To be successful, the federal guidance and requirements must facilitate easy and expedient application and grant award processes, clear criteria and objectives, and solid measures of successful delivery. The deployment of charging infrastructure will also play an important role in addressing key challenges facing the EV market and adoption trajectory. Among the challenges to be considered are:

- **Range Anxiety.** The certainty of a convenient and affordable trip from origin to destination requires confidence that EV fueling is available well within a vehicle's distance capacity. Wise investments in charging infrastructure will need to balance today's needs with the future capabilities of tomorrow's battery and vehicle capabilities.
- **Public Charging Locations for EV drivers without Home or Workplace Charging.** The prohibitive cost of multiple charging points for multi-family buildings and the charging priorities for charging points serving multiple vehicles are key considerations. Limited private charging options in high-density urban areas suggest a need to consider public street charging alternatives and highway charging locations sited near dense population centers.
- **Demand Growth for Public Fast Charging.** As demand shifts from slow-charging home and workplace locations, where vehicles are parked for long periods of time, to public stations with shorter dwell times, fast-charging alternatives will become more critical to widespread EV adoption.
- **Increased Electric Demand.** In 2019, the International Council on Clean Transportation projected that by 2025, public and direct current fast chargers (DCFC) will make up 4% of all EV charging points in the U.S. but comprise 21% of electricity consumed by EV charging. Ensuring the capacity of the electric grid, effective vehicle-to-grid interfaces, and renewable, clean, and affordable power generation and distribution is essential as EV adoption and desire for fast charging grow.
- **Open Standards and Protocols.** Proprietary hardware, software and communications among EV automakers, EV charging manufacturers, and charging network providers complicate public charging infrastructure deployment and slow widespread EV adoption. Successful public charging deployment will be helped by promotion of standard charging protocols that advance a network of reliable and available public charging stations for all EV drivers.
- **Payment Structure and Options.** Payment channels must support user choice across a broad range of traveler socio-demographic groups and meet customer expectations for privacy and data security. A variety of payment options at public charging locations will foster EV adoption and offer the potential to lower initial capital costs and operating expenses. Federal infrastructure requirements can add complexity and cost to an installation and detract from customer experience. For instance, payment system requirements for credit card readers add hardware and O&M costs, plus processing fees for users and equity issues for unbanked travelers. Consideration of RFID payment alternatives may leverage existing on-board units used today for tolling and parking.
- **Long-Term Technological and Business Innovation.** New technologies and innovative business practices will reshape the landscape of the EV charging needs in the long term. Establishing business and functional requirements for today's systems, rather than strict technology standards, may facilitate easier transitions to future business models and technologies. Lowering federal barriers to commercial activity in interstate highways will also be critical to technological and commercial innovation. For instance, the prospect of viable in-pavement induction charging capabilities may shift the requirements away from fixed charging locations to in-journey charging over the long-term. Additionally, growing adoption of autonomous vehicles may shift charging demand locations away from homes and workplaces as vehicle ownership shifts away from private individuals to mobility service organizations offering shared assets. A review of Title 23 U.S. Code Section 1111 to remove restrictions on commercial activities along interstate highway rights of way

would be beneficial. Also, a solid foundation of rules governing financial and business transactions and customer experiences will ensure basic interoperability and reciprocity principles can minimize the impacts of otherwise disruptive trends.

IBTTA Responses to Specific Statutory Considerations

1. The distance between publicly available EV charging infrastructure

- Ensure that the requirements for the distance between EV charging locations are rooted in some analysis to identify areas within the states and along eligible alternative fuel corridors that are currently lacking charging infrastructure. It will be important to identify these “charging deserts” particularly to address the needs of rural areas, disadvantaged communities, and dense population centers that might not have home charging options. Addressing these shortcomings of a state’s charging system should be a priority.
- A successful program of EV deployment will require planning at the state and potentially multi-state levels. Such plans should ensure adequate collaboration between roadway operators, electric utilities, and charging infrastructure developers and networks.
- The literature reviewed by IBTTA suggests a range of thinking on the appropriate distance between charging stations. Collectively, the literature indicates that a 50-mile distance between stations may be a good basic benchmark. Ultimately, local conditions will dictate variations to any hard-and-fast guideline, especially in dense urban population centers, where distances that are considerably less would be advisable. Ultimately, growing EV adoption and higher demands for public charging will require that stations be located closer together.
- The distance of prospective new charging locations from a highway interchange is quite important. Convenience and distance/travel time to public charging locations are important criteria for driver acceptance and adoption.

2. Connections to the electric grid; vehicle-to-grid integration to minimize grid impacts; alignment with electric distribution; and plans for renewable energy use

- Incentivize least-cost approaches to mitigate electric grid impact, including:
 - Incentives for charging at different times of day to distribute loads to lower-demand periods.
 - Distribution of types of vehicles being charged (light duty, medium duty, heavy duty, buses) to distribute loads efficiently.
 - Balance of charging required (slow, accelerated, fast or ultrafast; AC vs. DC) to avoid demand spikes.
 - Pricing structures to incentivize optimal customer demands.

3. Proximity of existing off-highway demand points to funded EV charging infrastructure

- Encourage higher investment in disadvantaged areas through program incentives or set asides. Investment in public EV charging infrastructure in lower-income communities will need to increase at a disproportionately higher rate to other areas to meet projected demand because of the more limited access to home charging in those areas. A July 2021 study by the International Council on Clean Transportation estimated that more than a quarter of new EV owners will be in lower income communities by 2030, up from roughly one sixth in 2020, but more of the new EV households in lower-income communities will be without private at-home charging and therefore are more reliant upon public and workplace charging.

4. Needs for publicly available EV charging in rural, underserved, or disadvantaged areas

- Encourage higher investment in disadvantaged areas through program incentives or set asides. Investment in public EV charging infrastructure in lower-income communities will need to increase at a disproportionately higher rate to other areas to meet projected demand because of the more limited access to home charging in those areas. A July 2021 study by the International Council on Clean Transportation estimated that more than a quarter of new EV owners will be in lower income communities by 2030, up from roughly one sixth in 2020, but more of the new EV households in lower-income communities will be without private at-home charging and therefore are more reliant upon public and workplace charging.

5. O&M of EV charging infrastructure to avoid stranded assets and protect investment

- Incentivize flexible service contracts (e.g., network, data, maintenance, etc.) that permit adaptation to changes that may reduce operating costs and leverage economies of scale over time.
- Ensure flexibility to manage electric charging deployment at travel destination locations that generate revenue in a financially sustainable manner. Recent research indicates that public charging infrastructure at destination locations benefits from longer dwell times by customers and higher associated revenues, particularly at retail, food and beverage and other revenue-generating commercial destinations. Support creative partnerships that allow revenue to offset ongoing operations and maintenance costs, as well as contributions to initial capital outlays.

6. Existing EV charging infrastructure programs and incentives

- Ensure an appropriate balance of government grants for programs oriented to serve individual consumers and small fleet operators. Large fleet customers are often higher mileage travelers and will benefit from lower total costs of EV ownership as opposed to internal combustion engine (ICE) vehicles, suggesting they have more economic and business incentive for EV adoption without government assistance.
 - Currently, commercial EVs are predominantly used for local operations, where the vehicles return to a base location and rely on private charging infrastructure owned and operated by the fleet operator. To maximize the limited federal investment in EV charging infrastructure and increase the ability to influence EV adoption, prioritize applications from eligible entities that may need upfront investment capital, but offer sustainable long-term operations and maintenance models and fill EV network gaps.
- Encourage investment where the EV fleet is expected to grow in the coming years by aligning federal programs with future state mandates, including states that have established hybrid or EV fleet requirements, acquisition goals, or preferred purchasing of plug-in hybrid or battery EVs to be used in the state's fleet.
- Encourage open data exchange standards to support planning and operations by encouraging an understanding of charging patterns, driving patterns, state of charge, payment transactions, time-of-use, incentive uptake, etc. Ensure data is not inaccessible in proprietary systems but shared among utilities, EV operators, automakers, charging network operators, and transportation infrastructure operators.
- Incentivize the use of charging equipment and software platforms that are compliant with open standard communication protocols (i.e., Open Charge Point Protocol) to minimize costs of hardware-software integration and grid integration costs with utilities.

- Encourage standards for equipment, communications protocols, data formats, business processes, and cybersecurity.
 - Commit to standardization of physical connections and vehicle-to-charger communication to improve driver access to charging.
 - Facilitate information sharing between charging network operators inside and outside their networks.

7. Fostering public-private or private investment in EV charging infrastructure

- Incentives should be established to germinate the EV public charging network, but not serve as a long-term financial strategy. As EV adoption grows and demand for public charging increases, there should be a long-term rate of return that attracts private investment and operations. The initial federal funding program should encourage states to develop programs that cultivate private investments and partnerships and address long-term viability of the entire EV system.
- Title 23 U.S. Code Section 1111 should be revised to address barriers to sales of electricity along federal-aid highways to users while traveling along the rights of way of these highways. Revision of the code to allow commercial activity on federal-aid highways would allow roadway operators to construct and manage electric roads, independently or as public-private-partnerships, by creating favorable project economics with a user-payment revenue source. Charging EVs as move along roadways can reduce energy demand and smooth demand spikes resulting from vehicles charging while parked and plugged in at high-power chargers. In the long-run, in-journey lower-power-level charging on the roadways can reduce the cost of grid integration and charging infrastructure. Charging while driving on electric roads can lower the need for long-range in-vehicle energy storage, so the cost of vehicles can be reduced by shrinking battery size. Heavy-duty EV adoption may be accelerated with electric roads because battery costs, weight, size, and time to charge are all reduced.
- Encourage applicants to consider the full spectrum of transportation electrification, not just investment in chargers. As such, programs that include mobility-as-a-service providers, transportation network companies, and vehicle-sharing models should be eligible for funding.
- Encourage public-private infrastructure cost sharing and business approaches, allowing sufficient program flexibility to seek such arrangements. In particular, target agreements between transportation operators and electric utilities as a means to leverage existing power infrastructure and avoid capital outlays for key portions of the EV system.

8. Meeting current and future demands for EV charging (i.e., power levels, charging speed, charging times)

- Encourage managed charging practices that target charging during the low-demand hours on a utility grid, when providing power is least expensive. Managed charging practices may support greater integration of renewable power generation by matching the load of EV charging demand to hours when solar and wind generation is most abundant. These practices should be established with an overall objective of recognizing grid conditions and limitations, while reducing the total cost of vehicle-grid integration.
- Establish interoperability requirements to drive widespread access to the EV charging network's operational and commercial systems (e.g., smart chargers, distribution grid systems, payment systems, meters, sensors, telematics, etc.). Ensure interoperability is built on a foundation of functional and technical requirements, to remain technologically agnostic and allow for future flexibility and scalability to new technologies and innovation.

- Require project cost proposals to consider long-term costs of site selection decisions and full system costs across an asset's life, such as the grid capacity available to meet current and projected demand (e.g., the need for potential upgrades to transformers and feeders that ensure future site reliability and availability).
- Permit flexibility on power level and charging speed requirements to ensure that funded sites can balance Level 2 and fast chargers as local conditions and needs dictate.
- Allow funding to be used for on-site storage capability address grid capacity issues in corridors and communities where the grid is challenged.

9. Describe any other factors that USDOT should consider

- Flexibility in programming and funding should be a goal of the federal guidance and requirements for the EV charging infrastructure program, both in the competitive and formula grant programs. States should be given the flexibility to transfer formula funds to a state, multi-state or local public tolling agency that owns or operates a toll facility that is a public road, bridge, or tunnel.