June 28, 2022

The Department of Transportation
Attention: Paul Baker
Subject: DCFC EVSE
Mailing Address:605 Suwannee Street, MS20, Tallahassee, FL 32399

RE: DOT-RFI-22-9114-PB Florida

Tesla appreciates the opportunity to provide comments regarding the Florida Department of Transportation (FDOT) request for information (RFI) to solicit feedback and recommendations for the planning, coordination, and development of electric vehicle charging infrastructure within the State of Florida. FDOT indicates that the purpose of this RFI "is to collect input from potential market participants across varying sectors to obtain information on how to best support the deployment for direct current fast charge (DCFC) electric vehicle supply equipment (EVSE)" along highway corridors across the country focusing on designated alternative fuel corridors (AFC). In January, Tesla submitted comments in response to the federal RFI regarding best practices for NEVI and the community and corridor competitive funding program.[1]

Tesla brings a unique perspective to the discussion of building out DCFC along highway corridors given its experience over the last decade deploying, owning and operating the Tesla Supercharger network[2] across the world, while also being an American based manufacturer of electric vehicles (EVs), DCFC equipment, and other energy products including storage and solar PV. The Supercharger network serves quick charging needs for EV drivers on road trips with limited time to charge, and without access to charging at home or at the workplace. In the U.S., there are over 1,450 Supercharger locations and more than 15,000 Supercharger stalls capable of charge rates up to 250 KW. In October of 2021 Tesla publicly indicated that it plans to triple the global Supercharger network in the next two years.[3] Superchargers are located in all fifty States, the District of Columbia, and Puerto Rico, representing approximately 60% of the DCFC plugs operational today in the U.S. Tesla has developed and manufacturers Supercharger equipment in-house at its factory in Buffalo, NY. Globally, there are more than 3,700 Supercharger locations and over 34,000 Supercharger stalls in total across more than 40 countries.

In the comments below, Tesla responds to several of the questions in the RFI based on its own experience deploying the Supercharger network. Generally, Tesla has recommended applying several principles in developing EV charging infrastructure programs which includes 1) simplicity, 2) urgency, 3) customer experience, 4) transparency, 5) flexibility, 6) collaboration and 7) reliability. [4]Additionally, outside these principles it is important to recognize that there are several factors external to any funding program that impact the speed and scale of deployment of EV charging infrastructure. These include local permitting and utility service connection timelines.

We look forward to continuing to provide input to FDOT as the state develops, drafts and finalizes its NEVI program plan. If you have any technical questions, please reach out.

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[1] https://www.regulations.gov/comment/FHWA-2021-0022-0439
[2] Tesla also has a Destination Charging network, where it partners with hotels, workplaces, and private businesses to install Level 2 Tesla EV chargers, known as Tesla Wall Connectors, which are provided as a service for customers with multi-hour parking needs. There are 11,583 Destination Chargers across 4,586 locations throughout the US.
[3] Q3 2021 Earnings Call
[4] See Tesla Comments on Federal RFI p.2 for full recommendations.https://www.regulations.gov/comment/FHWA-2021-0022-0439

Sincerely,

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FDOT RFI Questions

General

3. What are the biggest challenges or barriers that should be addressed to expedite reaching the goals of the NEVI program?

Three key areas for more predictable EV charging infrastructure deployment include permitting, utility service connection timelines, and electricity rates. Requiring a streamlined and transparent permitting process, as discussed further below, and upfront, transparent service connection timelines as part of the funding program, could be an important lever for deploying infrastructure more predictably and quickly. This could be done in the form of grant allocation requirements or via best practices outlined in the grant solicitations. There has been a lot of progress made to streamline each of these process with the local authorities having jurisdiction (AHJs) and utilities across the country, but work remains to be done.

Best Practices for Utility Engagement:
Utilities will be important partners in deploying EV charging infrastructure under the NEVI programs. Increasingly, power capacity constraints and long transformer lead times are becoming bottlenecks to accelerated EV infrastructure deployment. EV charging stations, similar to any other new commercial customer requiring electricity, go through a new service connection process with the local utility to get power at an EV charging site. As part of this process, the utility determines electrical service capacity needs as well as the project timeline and the grid's ability to serve a new customer request. There are several best practices that utilities should utilize to help facilitate accelerated EV charging deployments, including:

- Provide visibility into power capacity availability on the grid through frequently updated hosting capacity maps. Doing so enables charging station developers to quickly check if sufficient grid capacity is available to support EV charging at a specific site and leveraging already built grid infrastructure.
- Improve the feasibility study phase for new projects by not requiring projects to have to go through full multi-month design process.
- Maintain an inventory of long-lead time utility equipment commonly used in EV infrastructure installations, specifically transformers, in order to reduce station development timelines.
- Assign dedicated design and construction staff for EV infrastructure projects that are familiar with charging station technology and station requirements.

Best Practices Driving Streamlined Permitting:

- A permitting checklist of all the requirements needed for expedited review posted online and easily accessible. A checklist gives charging developers an understanding at the outset of what will be required for permitting, but also indicates that the jurisdiction has internally operationalized a process specific to EV charging and has potentially trained staff in this area. Further, such a checklist should clearly articulate permit turnaround times that are expected to be met by staff.

- Permit applications routed through one department. When permit applications are routed through one department, typically the Building Department, there is a positive impact on deployment timelines. DCFC projects are often simply “accessory to” existing parking or commercial uses and do not require the same screening as larger and more complex development projects. There are of course cases where designs are more complicated. In those cases, there is a need for more than one department to conduct those spot checks. If multiple departments are going to review an application, a concurrent, not sequential, review between departments is helpful in keeping timelines on track.
- Permit limited to ministerial electrical review. EV charging stations are typically minimal builds and are relatively simple and standardized electrical installations. Standardized EV-specific electrical permits are most appropriate for the site types. EV charging stations should not be required to go through a public-use permit process or lengthy building permit, such as those required for a new gas station.

Site Location

4. Please describe what you believe makes an ideal DCFC location including amenities as well as any risk factors that should be considered. How would you rank the relative importance of these factors?

Key determining factors for corridor DCFC site selection include access to amenities, such as restrooms and neighboring shops and retail offerings for the EV driver to utilize while charging. At the same time, a charging developer will evaluate other factors, such as vehicle sales, station and network capacity needs, customer experience, traffic patterns, and location costs, in order to determine ideal locations for DCFC stations. While distance between publicly available EV charging infrastructure is one input, it is not the primary factor in determining where to locate EV charging infrastructure. It is important to maintain some level of flexibility in identifying siting requirements for DCFC stations awarded under this program in terms of ideal location, including understanding charging network needs such as meeting needs to offer reliable charging during peak travel days, major thoroughfares and key junctions along corridors.

At the same time, we caution against utilizing any sort of arbitrary infrastructure gap assessment as a mechanism for evaluating eligible projects under this program. For instance, some programs have leveraged tools like EVI-Pro, to evaluate potential charging infrastructure requirements. These types of assessments calculate the ratio of public chargers currently available versus the needed charging infrastructure for county and charger type. While useful tools to identify general aggregate charging needs, unfortunately, this type of analysis does not accurately incorporate local charging demand for all potential charging applications, account for charging network utilization dynamics, or the numerous factors that contribute to a successful DCFC station.[5] We recommend the programs do not rely on these types of studies as a direct scoring metric when evaluating competitive solicitations.

Finally, it is important to match charging equipment to the appropriate use case at a particular location to ensure a good customer experience. Other criteria for site design such as the number of stalls or power capacity may be just as relevant as distance between stations. For example, Supercharging, has several applications and is designed accordingly to best serve those applications. Two primary examples include supporting long distance travel and urban charging.

[5] For example, a CA funding program determined Tesla's application for a station in Kettleman City, CA was unnecessary because their model determined there was sufficient existing charging in the area. Yet Tesla's existing 40-stall Kettleman City site experiences lines with dozens of owners waiting to use the stations during peak travel times.

Long-distance travel requires fast charging stations conveniently located close to highway exits. Urban fast charging is intended to make charging ubiquitous in urban metros where charging in multi-unit dwellings or workplaces remains a challenge. Charging station planning has some similarities to electric utility system planning in that Tesla builds station capacity to serve peak demand and kWh throughput requirements (i.e., miles of added range) within a geographic area while trying to minimize station congestion since congestion results in poor customer experience. Additional charging capacity and stalls at a station is akin to a utility's reserve margin and helps ensure DCFC operators can still provide a level of service customers expect in the event of an equipment malfunction, or peak station usage (such as travel holidays). As a result, Tesla's stations tend to be larger than other operators in order to meet high utilization demand and be dependable during peaks. The average Supercharger station in the US has ten stalls, and several have more than 40 stalls available to the public.

6. What do you think the DCFC site of the future looks like? Will location to amenities be as important or will micromobility be used to get to the amenities? What innovations/disrupters are coming?

The most effective future-proofing action is to maximize public and private infrastructure investment with the greatest number of chargers per station, installed in strategic locations that support a positive EV driver experience. While discussion on minimum number of chargers at a site should be use-case specific, there are some key factors that impact site design. For highway corridor charging, reliability is incredibly important. Based on Tesla's experience building out travel corridor charging infrastructure, we have found that a minimum of 8 to 12 DC fast chargers at a site is necessary. Depending on region, sites can now significantly vary in size, going well beyond 20-40 stalls. Therefore, for some corridor sites, it may be relevant to focus on going beyond the 4-charger minimum identified in the NEVI guidance and building out a larger site today.

<u>Partnerships and Business Models</u>

9. Please provide your organization's viewpoints on contracting methods for DCFC infrastructure, including leasing and/or revenue sharing agreements. Have you implemented any cost/revenue sharing models for the operation of DCFC EVSE? If yes, please share what you can about the terms of those partnerships.

FDOT has been given an important role in deploying the NEVI program while at the same time working across other state agencies and stakeholders to ensure a comprehensive deployment plan is brought forward for FL. We encourage FDOT to evaluate mechanisms by which the FL program can be cost effective while at the same time ensuring the infrastructure deployed is actually being utilized by EV drivers. This can be facilitated by utilizing competitive solicitations as the main mechanism for disbursing program funds. At the same time, the 20% match for NEVI funding that stems from the IIJA requirement of the federal funding supporting up to 80% of the total project costs is important. This match funding should be supported by the private sector EV charging providers and factored into the competitive solicitation process. The program should also allow EV charging station developers to incur eligible costs prior to award of funds once an application window for an RFP has opened as a way to accelerate station deployments. Prioritizing projects that are shovel-ready is important and those projects should not be impeded by restrictive program requirements such as requiring grant contracting to be completed prior to starting construction.

Additionally, there will be forthcoming competitive funding via the corridor and community charging program that could also enable supporting the electrification of medium and heavy-duty vehicles. At this time, we do not believe the infrastructure buildout via the NEVI program (at least in the early years) should be designed to support both light-duty and medium-and heavy-duty vehicles via the same infrastructure. However, we are supportive of separately building out a public infrastructure network to support key freight corridor charging for medium-and heavy-duty vehicles. In some instances, there may be sites that collocate light-duty charging next to medium-and heavy-duty charging at rest areas but given the different use cases of medium-and heavy-duty versus light-duty, it is important to keep light-duty infrastructure under the early years of the NEVI program dedicated to supporting mainly light-duty vehicle electrification. Overall, Tesla recommends FL evaluate mechanisms for how to also support deployment of dedicated medium-and heavy-duty EV charging infrastructure via the separate competitive funding mechanisms.

Equipment

11.On average, how long does it take to install a DCFC from start to finish? This includes site determination, design, permitting, site preparation, utilities, and installation.

DCFC project timelines can vary widely and in Florida there have been a few sites that took several years to go from start to finish. One specific site in Southern Florida was very difficult due to permitting and ended up taking 1,621 days (over four years) from internal site activation i.e. the site is ready to start moving through the process, and open to public. This site is an outlier, however there are several other sites that have taken over 1,000 days from site activation to open to public. Removing any outliers, on average, it takes about 365 days (i.e. one year) from activation to opening a site in Florida.

In Florida, we will submit a utility application approximately 1-2 months after internal activation, and we get power/energization within about one month of opening. Using the previous data set with an average of 12 months from site activation to open to public, the average utility timeline in Florida from application to site energization is roughly 9 to10 months pending no other dependencies are needed that could further delay the process.

12.Are you currently able to meet the requirements of Buy America for DCFC infrastructure projects? If not, please explain your plans to meet the requirements and any potential issues.

Tesla’s Supercharger equipment is proudly manufactured at Tesla’s Gigafactory in Buffalo, New York where more than 1,500 employees produce vehicle charging equipment, solar roof modules, and power electronics supporting the deployment of clean energy products. Gigafactory New York supplies all of Tesla’s Supercharger sites in the United States including at public charging stations, and private locations such as Tesla factories, service centers, and for private fleet locations.

A Supercharger station consists of a cabinet that contains power electronics to convert AC electricity from the grid to the DC stored in the EV battery, as well as the post which delivers the DC electricity to the EV through the charge cable. The current version of Supercharger contains one cabinet and four posts. Tesla manufactures the Supercharger cabinet, including sub-component power electronics, charging cables, charge posts, and other Supercharger components at Gigafactory New York.

As indicated in Tesla’s previous comments submitted to the RFI on Buy America for EV charging, there are major steel components of Superchargers. Most notably is the steel enclosure for the cabinet. Tesla sources steel for the cabinet enclosure from steel producers in the US. However, direct current fast chargers (DCFC), including Superchargers, are manufactured products that are not predominantly steel and iron, and as such, equipment used as part of the IIJA charging investment should not be subject to Buy America requirements.

Tesla's comments on the RFI can be accessed via: https://www.regulations.gov/docket/FHWA-2021-0015.

13.Are there any components required for DCFC infrastructure that are in short supply that could delay the goals of the NEVI program? Please describe what steps you have taken or what processes you have implemented to ensure the continuity of your supply chain.

In the past year there has been an increase in longer lead times for electrical transformers. Transformers are common pieces of equipment for utilities to purchase and typically an EV service provider would not be the entity procuring transformers as that is normally done by the utility themselves. Utilities can help mitigate the impact of long lead times by increasing their inventory of transformers and dedicating some portion of that stock specifically to EV charging projects based off projected demand.

Operation, Maintenance and Data Sharing

15.What are your current or planned fee structures (time-based, energy-based, power-based, etc.) and what payment mechanism do you accept? Please explain any issues you have encountered or identified.

Tesla always strives to ensure that driving electric is less expensive than driving on gas. In general, we firmly believe that charging operators should be allowed to determine customer pricing. Transparency is key in customer pricing and ensuring customers know pricing before they ever arrive at a site. For Tesla drivers, this is achieved via the vehicle user interface. At the same time, there are many factors that go into determining pricing for a particular charging site beyond just underlying electricity rates. For Tesla's DCFC chargers in Florida, fees for charging are energy-based and billed on a $/kWh basis.

16.Describe the typical maintenance for your organization's EVSE infrastructure as well as the maintenance schedule including any required hardware and software updates. Please include the typical lifecycle for your DCFC and what performance measurements are monitored.

Tesla provides training and resources to its employees and contractors regarding its Superchargers. Maintenance is normally provided through our local service teams and these service teams go through intensive training at a central facility.

After a Supercharger site is opened to the public, day to day operations becomes the responsibility of the internal Operations Team, who manages Tesla's vast existing charging network across North America. This team performs several functions, including maintenance of lease agreements, utility energy payments, network usage and health monitoring, and coordinating service for optimal network performance.

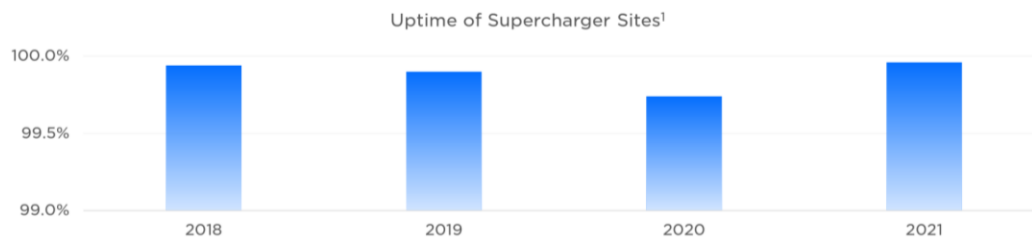
Tesla has equipment sensors that report site and post level health and automatically alert the Operations Team if a charger is not working properly. Tesla monitors all Supercharger locations 24/7, 365 days a year in real-time to ensure that chargers are available and operating correctly. The Operations Team will flag both planned and unforeseen utility outages and will keep customers updated through customer facing portals should a site become temporarily unavailable.

All Supercharger sites are serviced and maintained by a dedicated team of full-time employees. Additionally, each station receives an annual check-up from a technician that includes preventative maintenance. The maintenance plan for each Supercharger site includes both preventative annual maintenance and system checks, and response to real-time site usage.

Tesla’s 2021 Impact Report included a statistic around uptime or availability of the Supercharger network showing that the system has a near 100% reliability rating. See chart below.

Substantial coverage and 99.96% reliability

We’re aware that the chart showing Supercharger uptime looks silly, but that’s kind of the point. While coverage is important, uptime is essential. Few things are as frustrating as arriving to a charging station with a near-empty battery, realizing that none of the charging plugs are working. In 2021 alone, we opened 912 new Supercharger locations around the world for a total of nearly 3,500 charging locations with over 31,000 plugs.



[1]Uptime of Supercharger Sites reflects the average percentage of sites globally that had at least 50% daily capacity functional for the year.

Tesla builds its Supercharger sites today to be in service beyond a 5-year timeline. The majority of sites that were installed in 2012 and 2013 at the inception of the network are still in operation today, a decade later.

17. How would your EVSE share data to a FDOT sponsored central data repository? What type(s) of data can you provide?

Any data collection requirements should clearly identify the need and planned use. As has been indicated, there will be some level of data reporting for these programs. Based on discussions across the country, it is important to clearly articulate why certain data is needed and what the end goal is for utilizing this data. While some level of data collection may be able to inform future program design and best practices, it should not be so burdensome that it negates program effectiveness. There is a need to balance opportunity for insights while not implicating access to trade secret information or a customer’s personally identifiable information. Tesla cautions against any requirements for specific individual session level data as this could impact personal information, is onerous to gather, and this level of granularity is unnecessary. It is better to focus data at a site-level. Additionally, Tesla also recommends providing consistent templates across state programs for data reporting purposes.

Wherever possible, advanced metering infrastructure (AMI) capable of providing interval meter data at a site level should be the first source of data considered. Utilities across the country have made large investments for the express purpose of having this type of granular visibility into customer usage data and this data is readily accessible to those utilities and oftentimes can be provided to external third-parties (including regulators) with a customer’s approval. To the extent feasible, FDOT should work with the electric utilities who have existing metering infrastructure that already provides the site-level metering which charging stations are billed from. EV charging providers can share a list of separately metered DC fast charging meter numbers so the utility can more easily identify charging accounts if they have not been tracked on their side.

18.What should FDOT do to ensure the end-users of EVSE infrastructure have the most convenient and reliable charging experience? Please include how emergency evacuations and power outages should be addressed.

Having deployed the Supercharger network over the past decade, Tesla's primary focus has been on providing a superior customer experience. For charging, this means providing seamless, reliable and transparent charging access across the country. Additionally, Tesla has been able to streamline the user experience via the in-vehicle user interface that not only provides a seamless plug and charge experience but also provides in depth insight on our charging locations, availability and cost to charge at each site prior to the customer ever arriving to that site to charge. Bringing this seamless customer experience to EV charging will ultimately make owning an EV more attractive because the charging experience will be fundamentally better than filling up a gas vehicle. This seamless customer charging experience is enabled by flexibility to innovate as each new version of the Supercharger is deployed and leveraging being both the owner, operator and servicer of the Tesla network.

State and utility funding programs have started to evaluate uptime metrics or requirements to ensure that the infrastructure that is deployed today is well maintained and accessible to drivers 24/7 when needed. Station reliability is extremely important to customer experience, and therefore, issuing guidance on minimum reliability requirements will be critical to the success of the NEVI program. In general, when considering where to deploy Superchargers, Tesla proactively builds larger stations. These larger stations inherently have redundancy in the case of unforeseen events that take down one or more of the stalls at a site. For example, customer experience impacts are minimal or non-existent if 2 stalls are temporarily offline at a 20-stall charging station. But customer experience can be distressingly poor if 2 stalls go off-line at a 4-stall station. Having a reliable, accessible charging network is one of the elements that helps customers consistently rate the Supercharger experience as best in class. In Tesla's 2021 Impact Report, we highlighted that reliability is a key factor for our network and the chances of not being able to charge at any location at any given time are close to zero.

Tesla manufactures and deploys both energy and charging products. Tesla currently has sites across the U.S. that include on-site solar and/or storage. For example, the Las Vegas Supercharger site includes 24 Superchargers, on-site solar, power pack storage and Level 2 charging. At this time, solar and storage should not be required at any location, but it should be encouraged as part of the program. It is important to recognize the economics of locating solar and storage at certain sites may not be feasible and there may also be site size constraints with locating additional equipment on-site. There are, however, use cases where solar and storage can be beneficial, especially from a resilience perspective. Generally, we recommend leaving it up to the charging operator who is responding to the RFP and working with the local utility to determine if it is appropriate to incorporate on-site solar and storage rather than having states determine which sites are most suitable for this technology application.

<u>Strategies for Low Utilization</u>

19. FDOT is looking to provide DCFC in rural and disadvantaged communities that may have a lower return on investment and is interested in how to make these projects more desirable to potential applications. What strategies can FDOT utilize to encourage deployment of

DCFC EVSE into rural, underserved, or disadvantaged communities? When answering please include information on driving factors.
a. Guaranteed number of projects for economies of scale
b. Short term operation and maintenance agreements (5 years or less)
c. Long term operation and maintenance agreements (longer than 5 years)
d. Any others?

There are inherent unique challenges with more rural and remote DCFC deployments, however, it is important to find solutions to enable access to charging in these rural areas and ensure all Americans have access to adequate charging options and can confidently switch to an EV. Tesla has deployed a number of Superchargers in more rural areas. Some of the challenges we've seen with these deployments include limited resources to upgrade amenities, such as parking lot paving, adequate lighting, high-speed network connectivity, and sufficient 3-phase power to support DCFC. None of these challenges are insurmountable yet they take time and coordination to address. For instance, depending on the site size and location, it can sometimes be challenging to get a utility service connection for a particular site in a timely manner. There may be underlying capacity constraints that require buildout of additional sub-stations or other upstream infrastructure, which can take several years, in order to bring sufficient power to a more rural site. It is important to incorporate these considerations early on in program design for rural sites and evaluating whether it is necessary to provide longer lead times for rural sites and additional support to rural electric cooperatives to expand grid infrastructure. To the extent the state is not already doing so, Florida can also consider collaborating with the U.S. Department of Agriculture's rural development program to help build out additional infrastructure that can support both EV charging and general economic development.

It is critically important that the NEVI program direct charging investments in underserved or disadvantaged communities. Charging stations in these communities can serve as a primary charging option for local residents who do not have access to home charging, while also catalyzing economic development. Today, Tesla has many Supercharger sites in disadvantaged communities.[6] Overall, the NEVI program must ensure a certain percentage of funding goes to stations in disadvantaged communities. Additionally, we continue to support the concept of charge where you park and building out additional Level 2 infrastructure access. To that end, we've partnered with communities to donate Level 2 charging equipment to enable greater access to longer dwell time charging.

[6] For example, about 40% of Superchargers in California located in disadvantaged communities.