RFI Response: FDOT Statewide EV Infrastructure Deployment Plan

Submitted to
Florida Department of Transportation

Submitted by
Center for Sustainable Energy

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Center for Sustainable Energy®

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General Information

The Center for Sustainable Energy® (CSE) is a 501(c)(3) nonprofit with one simple mission – Decarbonize. With deep experience designing, implementing, and managing clean transportation programs across the U.S., we work with utilities, state agencies, policymakers and stakeholders using a data-driven approach to effectively and equitably accelerate the adoption of electric transportation technologies. CSE administers electric vehicle (EV) and EV charging infrastructure incentive programs in seven states with a combined program value of more than $1.5 billion. Over the course of administering this vast portfolio of incentive programs, CSE has engaged with auto makers and dealers, charging infrastructure manufacturers and network providers, technology vendors, utilities, public and private entities, community-based organizations (CBOs), tribes, air districts, local governments and businesses to ensure that considerations from all stakeholders inform our solutions.

CSE also has a deep understanding of the federal initiatives from having meaningfully participated with federal leadership in the design of proposed incentive programs for EV and EV charging infrastructure. CSE's involvement in federal EV charging infrastructure program proposals includes the design of charger eligibility requirements, charger data requirements, incentive amounts per charger, total program cost, role of pre-development in charger rollout and carve outs for rural, disadvantaged, low income, tribal and other communities. Our involvement in the design of the EV incentives includes analysis of incentive types, amounts, durations and applicable limitations.

Zach Henkin, PMP, EV Program Research Director, is an experienced and nationally recognized clean transportation executive with extensive experience developing clean transportation solutions for local, regional and state government agencies. He combines expertise in sustainability, energy and technical knowledge for electric vehicle charging and land use to seek pragmatic outcomes that benefit communities. At CSE, he leads the Transportation & Insights EV/EVI Research team.

Information Requested:

General

1. **Please describe your organization's involvement and experience with DCFC infrastructure. What are your long-term E.V. plans? How many chargers and/or charging stations are you able to build, install, and/or maintain on an annual basis?**

CSE is a national nonprofit that works with governments, utilities and the private sector to create a more sustainable future. Using software-enabled program design and administration, we've administered over $2 billion in energy and transportation programs, including the largest electric vehicle rebate program and the largest EV charging infrastructure (EVI) program in the U.S.

Through our work with the California Electric Vehicle Infrastructure Program (CALeVIP), CSE has helped California deploy over $147 million dollars of targeted incentives that have led to the construction or development of 7,295 Level 2 and 1,775 DC Fast Charging (DCFC) ports. Based on our success in helping design and administer this program, the California Energy Commission recently awarded CSE the contract to manage a new version of this

program, which will offer up to $250 million in additional funding. The first phase of CALeVIP 2 will provide $30 million in EVI incentives with a focus on developing DCFC in disadvantaged communities.

CSE also administers the $17 million Charge Ready EVI program for New York State. Our transportation planning experts have developed EVI plans in California for the City of San Francisco, the County of San Bernardino, the City of San Diego, and Kern County.

Our long-term plan is to bring the power of CSE's patent-pending Caret® software platform to the public and private stakeholders broadly. Caret allows government agencies to plan incentive programs, forecast their impacts, then quickly iterate on the details and deploy them at scale. CSE is using our Caret EV Infrastructure Planning tool to develop EV charging plans for the State of Louisiana and the County of San Diego.

2. **Where does your organization see the biggest opportunities for the utilization of NEVI funds? This could be in terms of innovative technology solutions, partnerships, and/or targeting geographic locations.**

Software-enabled planning and program administration is creating the biggest opportunity for states to leverage NEVI funds in an intelligent and effective way. Caret EV Infrastructure Planner (Caret EVI) can help states plan how to use NEVI funds to meet local goals with a clear plan that will win regulators' approval. Caret EVI uses a mix of geographic information systems (GIS) and multi-criteria decision analysis (MCDA) to offer a range of benefits for state-level policymakers:

- Caret EVI provides recommendations for locating EVI based on a grid of hexagons approximately 0.6 miles across – this is detailed enough to provide a realistic plan while still allowing planners to choose the best sites in those cells.
- The most suitable locations for EVI can be chosen based on the state's choice of key criteria – common criteria include vehicle miles traveled (VMT), proximity to existing charging, and community characteristics.
- Using MCDA, the criteria are weighted, and these weights can be quickly adjusted to allow planners to iterate through different scenarios and share the outputs with stakeholders.
- Outputs are displayed graphically as maps and charts so that results can be presented to decision-makers and community-based organizations.

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

NEVI's stated goals of filing in gaps in the existing charging network with a focus on "rural, disadvantaged, and hard-to-reach locations" while also "instilling public confidence in charging" require a careful analysis of where the existing gaps in a state's EVI network are – and where current and future traffic is likely to go.

Research by McKinsey has found that drivers are often unsatisfied with existing public charging stations – with the location being a key consideration. Charging stations need to be located so they are convenient to today's drivers while also adding charging to the harder-to-reach areas highlighted by NEVI. Another consideration: tomorrow's EV drivers are likely to be quite different from today's EV drivers.

Caret EVI can balance these competing priorities so that EVI locations are chosen that provide convenient access to those who need to charge today while also considering the needs of up-and-coming communities and anticipating the needs of future drivers.

Another key barrier that is too often neglected: Electrical system capacity. Caret EVI can consider not just the most suitable locations based on driver and community needs. It can also factor in where the grid has capacity so that stations can be quickly built without major utility upgrades.

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?**

The two most key factors to consider are proximity to existing charging infrastructure and vehicle traffic in the area. NEVI-funded charging stations should be placed in areas without existing EVI so that they fill gaps – and should be placed in areas with at least a moderate amount of vehicle traffic to ensure they are used effectively. Since most DCFCs provide a faster charging experience, pairing DCFCs with amenities that drivers can use when stopping for less than an hour makes sense in most locations.

Risk factors for DCFC include a lack of sufficient traffic and a lack of grid capacity, as siting a set of DCFC stations often requires substantial electrical system capacity. Both of these risk factors can be mitigated through intelligent, data-driven network planning using a tool such as Caret EVI

5. **Please describe your process, including market research, land use requirements, and business development opportunities for determining a DCFC site location.**

A typical EVI planning project starts with clarifying state goals, moves to data preparation, and then proceeds to analysis, feedback, and deliverables. Our typical approach is as follows:

- Project kick-off: Clarify the goals of the project and survey the plans that the agency may already have for installing EVI.
- Data preparation: During this stage, our data science team pulls together public data on typical factors such as the location of existing EVI, VMT across the road network, community characteristics in terms of amenities and use-cases, and socio-demographic characteristics. We often seek key data in this stage, including vehicle registrations and fleet composition data.
- Analysis: We create a set of factors and weights that speak to the goals that the agency has established, and then we create an initial set of maps that visualizes that plan and explores how changing factors or weights leads to different plans.
- Feedback: Once the client has reviewed the maps, we typically refine the outputs so that the client can seek input from stakeholder groups and decisions; once this feedback is received, the analysis team creates a final set of maps that responds to this input.
- Deliverables: After any final comments, the teams create a set of deliverables that includes the final maps, a report describing the process, and a set of related attachments such as tables showing the scores of different locations.

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 future will vary based on time frame and what kind of communities one considers.

Over the next 2-3 years, we expect that the future of DCFC will look largely like the present, but for a growth in demand for faster EVI as an increasing number of EVs with higher-capacity electrical systems and larger batteries become available. Most EVs available today run on 400-volt electrical systems that limit their ability to quickly charge, even from high-capacity DCFC equipment. Although some forecasts expect the majority of new EVs will offer higher-capacity 800-volt systems by 2025 (Nedelea, 2022), given that the average life-span of a vehicle is about 8 years, we anticipate that most drivers will want to pair DCFC with amenities that take about 30-minutes to an hour to make use of – for instance going grocery shopping or visiting a retail store.

However, looking out past 2025, we expect changes in EV technology and in battery technology to greatly reduce the time it takes to charge an EV – especially if solid-state batteries become a cost-effective and viable technology (Tegler, 2022). If this happens, we can expect that DCFC use-cases will split with those driving the most modern vehicles and those on longer trips, wanting DCFC stations that are more akin to gas stations for a quick "fill up" – for these use-cases amenities are less important. Still, even in the future, a substantial portion of drivers – many of them new EV converts driving less-expensive vehicles -- will want to use charging with a longer dwell time located near amenities.

It's also important to think about community characteristics. As the typical EV driver moves from a wealthier person to a lower- or moderate-income person, local charging hubs will take on greater importance – especially as many new EV drivers may lack the ability to install charging at home. For these drivers, we expect that local charging near their home or office will be important – and these charging stations can be lower-capacity DCFCs that are easier to integrate into the existing electrical system. For these use-cases, amenities will not be as necessary.

In summary, we expect disruptive technologies to become available in the next 2-3 years – however, given the long-life of most vehicles, and the changing characteristics of the average EV driver – we foresee a future in which both short dwell-time and longer dwell-time use-cases will coexist.

Partnerships and Business Models

7. **Please explain any previous partnerships regarding E.V. infrastructure your organization has had including which parties initiated the outreach and what, if any, contracting mechanisms were used. These should include public and private entities as well as utility owners.**

CSE is adept at working with a wide range of partners. Although the main funder for the CALeVIP program is the California Energy Commission, the program also includes 18 funding partners who range from cities and regional associations of governments to air districts and community choice aggregators (who function like utilities). CSE recruits the funding partners to participate in the statewide program, which enables their investments to stretch further than having independent programs of their own. As program administrator, we provide custom reports to these entities and are developing a data dashboard to allow CALeVIP partners to see key performance indicators (KPI) of interest to their constituents.

8. **Describe what makes a successful business model and partnership. Also, please describe threats that can lead to a business and partnership's failure. These can be examples from current and/or previous partnerships.**

We are agnostic in terms of the best approaches to this and can support a wide range of different agreements via our planning process.

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**.

We are agnostic in terms of the best approaches to this and can support a wide range of different agreements via our planning process.

10. **Does Florida have the workforce required to operate and maintain DCFC EVSE charging sites? If not, please describe what you think is required to develop it.**

Most large states with major engineering procurement contractors (EPCs) should have the workforce capacity to build EVI. CSE has experience working with programs such as the Electric Vehicle Infrastructure Training Program to build local capacity to construct EVI.

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.**

Our experience in California may not apply to Florida; however, we have found that DCFC projects are generally more complex than L2 projects and typically take at least a year to plan, permit, fund, construct, and energize.

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.**

Since CSE does not directly buy equipment, this doesn't apply to us.

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.**

DCFC charging equipment is in short supply, and this could delay the implementation of NEVI-funded chargers. The best approach to dealing with these delays is to have a technology-agnostic planning process with real-time data monitoring to highlight areas or partners that are lagging.

14. **Please describe how your organization mitigates cybersecurity vulnerabilities. Is this consistent with industry standards? If not, where are the differences? Do you follow national cybersecurity standards including National Institute of Standards and Technology (NIST) Cybersecurity Framework? Do you comply with Florida's 60GG-2 for ensuring the security of your infrastructure? What other technologies do you offer for an end-to-end secured operation?**

CSE handles personally identifiable information (PII) for incentive applications and thus is a highly security-focused organization that meets industry standards. For our EVI data dashboard system, we are using secure APIs to connect a cloud-based database to the Electric Vehicle Service Providers (EVSPs) data warehouse.

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.**

We are fee-structure agnostic.

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.**

We do not directly maintain EVI; however, our Caret EV Charging Knowledgebase, a platform for turning EV charger data into actionable insights, can help program administrators and partners understand average uptime for EVI in the network and highlight stations that don't achieve these benchmarks.

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

Using Caret EV Charging Knowledgebase, CSE can aggregate EVI utilization data from a wide range of EVSPs and provide a secure, cloud-based data repository for storing this data. Our Knowledgebase system also includes a data dashboard that lets users quickly see EVI utilization and downtime/uptime KPIs. Pairing EVI utilization data with our Caret EVI tool can help states refine their network plans, ensure that funded stations are available, and serve a wide range of drivers.

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.**

To ensure a convenient charging experience, FDOT should use a software-based planning tool, such as Caret EVI, that considers VMT and other factors in finding the most suitable locations for new stations. To ensure the most reliable charging experience, FDOT should use a system, similar to the Caret EV Charging Knowledgebase, that highlights stations with excessive downtime so that stations operations can be made aware of the situation and root causes are diagnosed.

Although CSE does not provide equipment, based on our experience working with California agencies, we recommend that a portion of the funded stations include distributed energy resources (DERs) that include solar panels and battery backup systems. FDOT should also consider funding a set of mobile EVI equipment that can be used in case drivers get stranded away from existing EVI.

Center for Sustainable Energy®

One simple mission — DECARBONIZE.®

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