Alameda Contra Costa Transit District (AC Transit)

Request for Information (RFI)

No. 2021-10452

Battery Electric Bus
Charging Infrastructure Components

August 31, 2020

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To Whom it May Concern,

Alameda Contra Costa Transit District (AC Transit) is requesting information from equipment manufacturers/vendors that supply charging system components to the transit industry to charge battery electric transit buses.

AC Transit has adopted a Zero-Emissions Bus Rollout Plan for converting to 100% zero emission buses (ZEBs) by 2040. The plan includes replacement of its diesel fleet with battery electric buses (BEBs) and fuel cell electric buses (FCEBs). Initially, all ZEBs are being maintained and operated from the Oakland and Emeryville Divisions. Hydrogen fueling is currently at both sites, while AC Transit's BEB pilot program consisting of five (5) BEBs is located at Division 4.

Construction of up to twelve to sixteen (12-16) BEB plug-in chargers at the Emeryville Division (D2) is anticipated in 2021. Construction of twenty-five to fifty (25 to 50) overhead charging dispensers (overhead drop-down cord or inverted pantographs) at Oakland (D4) is anticipated in the 2022-2023 timeframe.

In anticipation of beginning the design of the BEB charging infrastructure at both divisions, AC Transit needs to gather the most up-to-date information on charging system components available on the market. Detailed information is being sought for battery chargers, overhead cord reels of cord retractor systems, overhead inverted pantographs, and charge management systems. Respondents are asked to provide information on any of these charging system components for which they manufacture or supply.

In addition to written information, AC Transit may request site visits, demonstrations, and/or presentations in the future.

AC Transit is interested in standardizing its BEB charging infrastructure between all its divisions, if possible, to enhance training, facility maintenance, and parts interchangeability. The information provided will be shared with the design team(s) responsible for designing the charging infrastructure at each of the divisions. The designs will be developed to be competitively bid and meet all applicable procurement requirements to be set forth by AC Transit Procurement at the time of bidding.

Please respond to this request no later than 5:00 p.m. (PDT), 09 Friday, October 2020. All responses are to be mailed to Dora English, Assistant Contracts Specialist, 1600 Franklin Street, 6th Floor, Oakland, CA. 94612 or submitted electronically to Ms. English at denglish@actransit.org.

Please address all questions regarding this RFI in writing to the attention of Dora English, Assistant Contracts Specialist, 1600 Franklin Street, 6th Floor, Oakland, CA. 94612 or submitted electronically to Ms. English at denglish@actransit.org, by 5:00 p.m. (PDT), Monday, 21 September 2020. Responses will be provided by COB, Monday, September 28, 2020 and sent directly to the entity submitting the question(s).

Sincerely,

Joe Callaway
Director of Capital Projects
AC Transit | Engineering and Construction

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1. INSTRUCTIONS TO RESPONDENTS

1.1 Definitions

The following definitions shall apply when used throughout this Request for Information (RFI):

a) AC Transit or District – Alameda Contra Costa Transit District

b) RFI - Request for Information

c) Response – a written document prepared by a charging system component manufacturer that addresses the requests and inquiries of the RFI.

d) Respondent – the submitter of a response to the RFI.

e) Charging system – all equipment required to charge a vehicle, including chargers, on-board equipment, dispensers, cords, charging equipment controls, and connectors where applicable.

f) Dispenser – overhead drop / retracted / reel cord, overhead inverted pantograph, at grade unit with manual plug-in cord.

1.2 Response Submission

a) Please respond to this request no later than 5:00 p.m. (PDT), Friday, 09 October 2020.

b) All responses are to be received no later than the date and time specified above at the District office at the following address:

AC Transit
Procurement Department
1600 Franklin Street, 6th Floor
Oakland, CA. 94612
Attn: Dora English, Assistant Contracts Specialist

1.3 Response Format

a) Please provide one (1) original copy of the information, along with one (1) flash drive with a PDF version.

b) Electronic submissions are permissible to the following address:

Dora English, Assistant Contracts Specialist
denglish@actransit.org

1.4 Questions and Contact Protocol

a) Please address all questions regarding this RFI electronically to the attention of Dora English, at denglish@actransit.org by 5:00 p.m. (PDT), 21 September 2020.

b) Responses will be provided in writing via email by COB, 28 September 2020 and sent directly to the entity submitting the question(s).

c) Questions received after the date given above will not be considered. Questions submitted verbally will not be considered.

d) All Respondents and representatives or partners of any Respondent are strictly prohibited from contacting any other AC Transit employees or third-party representatives of AC Transit on any matter related to the RFI.

1.5 Qualifications for Future Consideration

a) AC Transit may consider responses to this RFI as a pre-qualification of manufacturers / vendors to bid on the projects listed in the background information below.

2. BACKGROUND INFORMATION

Alameda Contra Costa Transit District (AC Transit) is a public transit agency serving the western portions of Alameda and Contra Costa Counties. The District covers a 364-square mile area and offers over 150 routes with a fleet of 637 revenue vehicles, serving twenty-two (22) cities and five (5) counties. Over 2,000 employees work for AC Transit including over 1,300 bus operators; over 40 transportation supervision/administration staff; almost 400 maintenance workers and about 300 staff in other administrative or professional positions.

AC Transit provides these services from the following four operating divisions which are supported by the Central Maintenance Facility (CMF):

- D2 - Emeryville Division (1177 47th Street, Emeryville, CA 94608)
- D3 - Richmond Division (2016 MacDonald Avenue, Richmond, CA 94801)
- D4 – East Oakland Division (1100 Seminary Avenue, Oakland, CA 94621)
- D6 – Hayward Division (1758 Sabre Street, Hayward, CA 94545)
- CMF in in Oakland (10626 E. 14th Street, Oakland, CA 94603)

In December 2018, the California Air Resources Board (CARB) adopted the Innovative Clean Transit (ICT) regulation that requires California transit agencies to begin purchasing Zero Emission Buses (ZEBs) as early as 2023, with the goal of transitioning all transit buses to zero emission technology by 2040. AC Transit has already started paving the way for this transition, due to its significant experience with ZEBs, and its commitment to continue providing safe, reliable transit service while also striving to improve air quality in the region. AC Transit's Board recently approved the AC Transit Zero-Emissions Bus Rollout Plan that sets forth a comprehensive plan to transition to a 100% ZEB fleet.

AC Transit currently has a ZEB fleet of twenty-seven (27) buses including twenty-two (22) FCEBs (including one (1) articulated bus) and five (5) BEBs. AC Transit's current fleet of five (5) BEB's are all currently operated, maintained and charged at the East Oakland Division (D4). Future BEBs are planned to be operated and maintained from both the District's Emeryville Division (D2) and East Oakland Division (D4) locations.

While the District is working towards addressing facilities needs holistically, the District must also install ZEB infrastructure incrementally at the existing divisions. With the initial BEB deployment, charging requirements were met relatively easily with a six (6) plug-in pedestal chargers and a relatively small infrastructure investment. Scaling to a large BEB deployment requires a significantly different approach to charging and substantial infrastructure upgrade and smart charging software.

Plug-in charging is feasible for a smaller installation like the current five (5) BEB deployment at D4 or even up to twelve to sixteen (12-16) BEBs as planned at D2. Plug-in chargers will not be practical for a large deployment like we are planning at D4 as dispensers installed in the yard creates a hazard. Instead a preferred approach is to use overhead pantograph or dispensers attached to overhead structures, such as gantries and deck, installed across the yard at the D4 facility. This will also require reconfiguration of bus circulation and parking at the East Oakland Division.

Division 2 BEB Charging Infrastructure

AC Transit plans to install up to twelve to sixteen (12-16) at-grade charging units with manual plug-in cords along the south wall of the existing bus yard. See *Exhibit 1*. This will be capable of charging twelve to sixteen (12-16) BEBs simultaneously. Construction is scheduled for 2021.

Division 4 BEB Charging Infrastructure

The existing five (5) BEBs in the fleet are charged with six fixed at-grade charging units with manual plug-in cords (manufactured by ChargePoint) along the west wall of the existing bus yard. AC Transit recognizes that this configuration is not scalable as the BEB fleet grows. AC Transit plans to construct a deck over a portion of its existing bus parking area as shown in *Exhibits 2, 3, and 4*. The deck will support twenty-five to fifty (25 to 50) overhead charging dispensers. Construction is scheduled for 2022-2023.

Exhibit 1: Division 2 BEB Proposed BEB Installation Site Plan

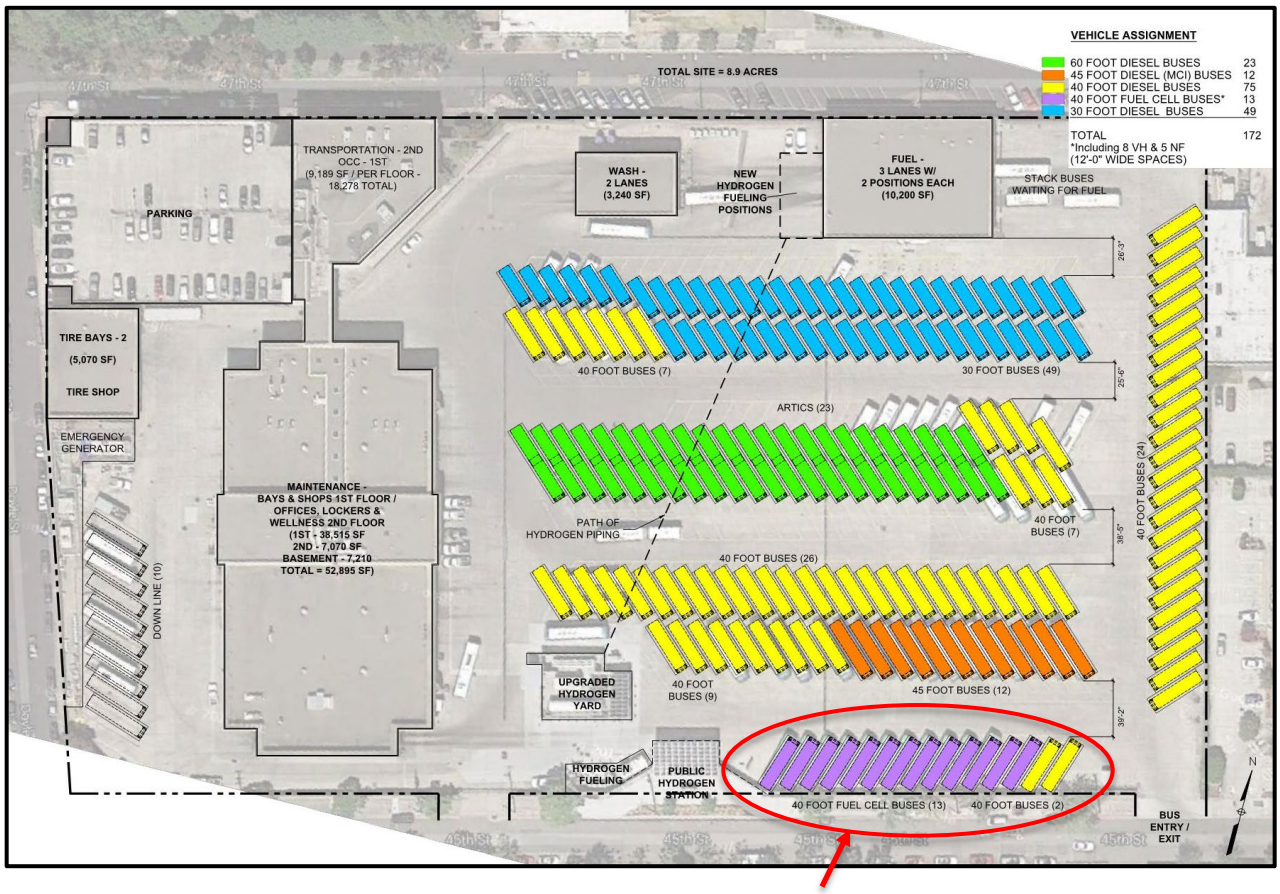


Exhibit 2: Division 4 Existing BEB Charging Installation

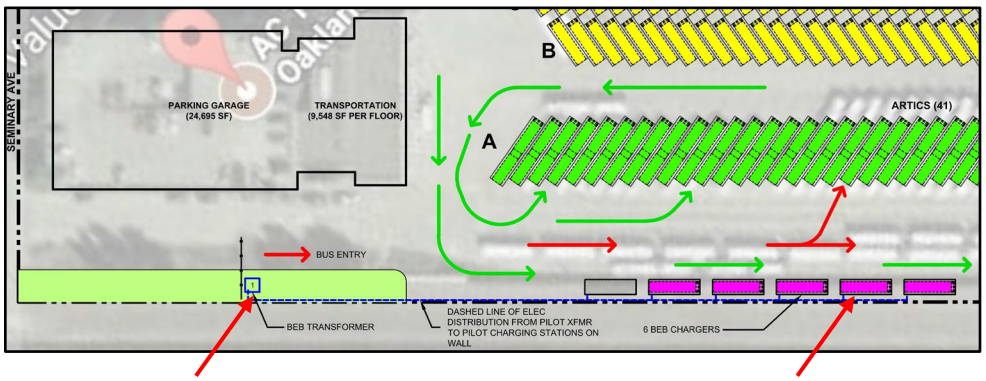


Exhibit 3: Division 4 Proposed BEB Installation Site Plan

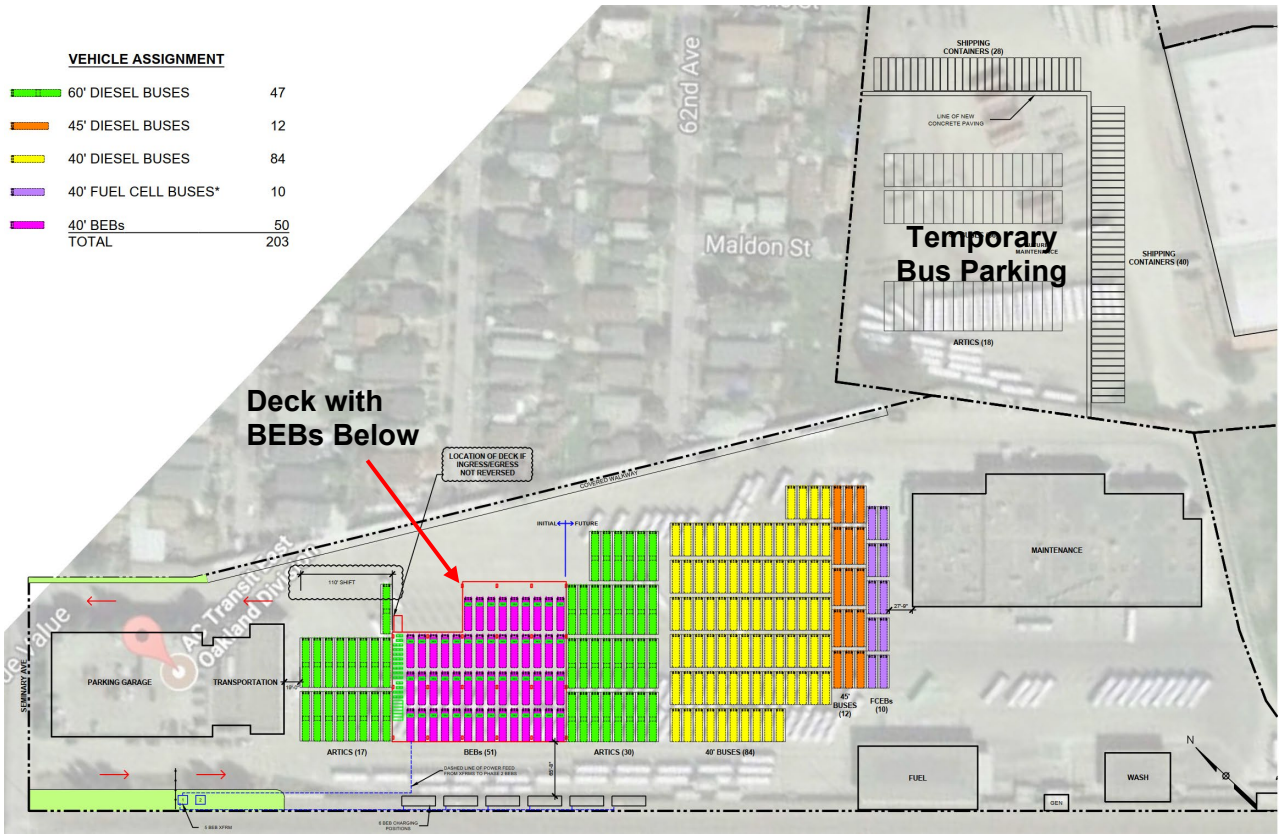
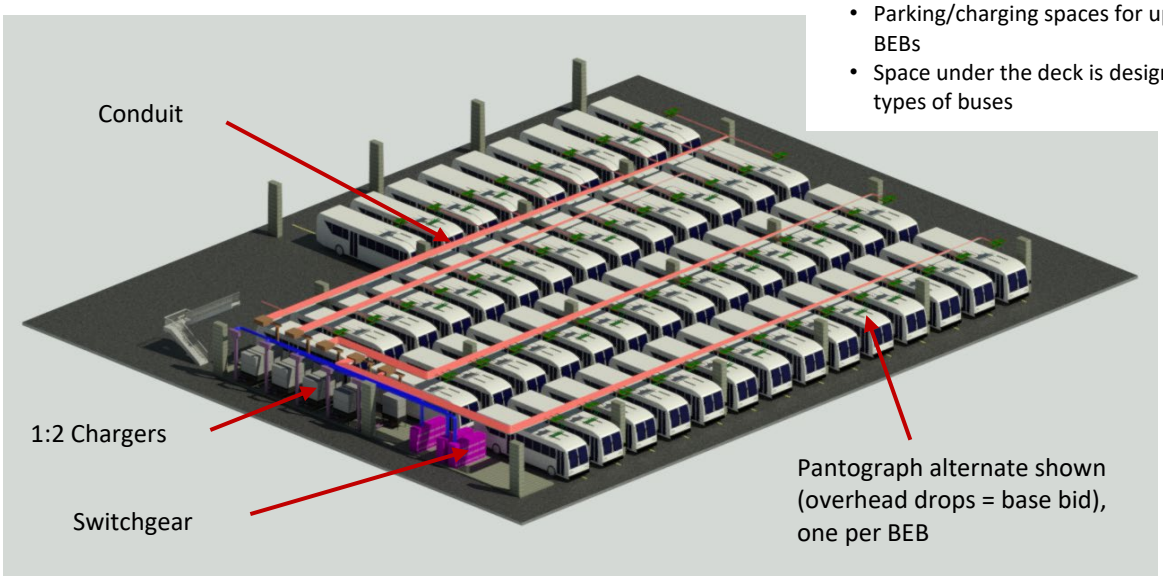


Exhibit 4: Division 4 Proposed BEB Installation Rendering



- All BEBs will park under the deck
- Parking/charging spaces for up to 50 BEBs
- Space under the deck is designed for all types of buses

3. REQUESTED INFORMATION

The following information is requested from interested charging system component manufacturers and should be included in each response to this RFI. Please attach any additional relevant information, such as product brochures, test results, real-world deployment data, and end-user references.

3.1. Contact Information

a) Please provide the following business information:
- Company name and web address
- Company headquarters street address
- Company USA or California street address

b) Please provide the following information regarding a point of contact (for additional information, coordinating site visits, and/or presentations, if necessary):
- Name and title
- Street address
- Email address
- Phone number and fax number

3.2. Business Structure Information

a) When was your company founded?

b) Is your company publicly- or privately-held? List major shareholders.

c) Describe your business structure. List any parent companies or subsidiaries.

d) What is the total number of individuals employed by your company? How many of those individuals are employed in the United States?

e) Buy America
1) Do your charging system components currently meet the Federal Transit Administration's (FTA) "Buy America" requirement for manufactured products?
2) If not, do you intend to provide a "Buy America" compliant product in the U.S. and, if so, when?
3) Where does manufacturing take place to meet Buy America compliance?

3.3. Production, Sales, and Deployment Information

The information in *Section 3.3*. will be used to understand each firm's level of experience, market penetration, currently available charger models, and technology coming to market. Ensure that the information that you provide gives a representative summary of your capabilities and offerings.

a) Provide at least [three (3)] examples of the following information for both past sales of your charging system components (past and present) to transit agencies and information on new charging system components anticipated to be available for order / coming to market in the next twelve (12) months, including both depot and en-route, rated at 125 to 175 kW or higher, by model and year:
1) The charging system component model.
2) Year the charging system component was made available or will be available for installation.
3) The total number of charging system components, per the type proposed and considered for this RFI, sold and installed to date. Please provide quantity installed worldwide and in the USA.
4) Charging hardware OEMs / Vendors. List third party data monitoring systems that have been successfully integrated with the charger system and the agencies / entities where they have been installed.

5) Compliance with Buy America regulations
6) List all battery electric bus (BEB) manufacturers and bus models using a charger interface compatible with each charging system component proposed. Note which BEB manufacturers and models on which the charging system has been tested and certified for use. Please indicate the date of certification.

Use the table on the following page to present your information for each charging system component rated at 125 to 175 kW or higher. Add additional rows if necessary.

Model	Year Available	Total # Deployed *(Worldwide/USA)*	Third Party Software Integrated	Buy America Compliance *(Y/N)*	Bus OEM Compatibility *(List Bus)*
Charging Cabinets					
Overhead Cable Retractors / Reels					
Overhead Inverted Pantographs					
Charge Management System					

3.4. Domestic Facilities

a) Please list the address for your facilities in the U.S., the activities performed, and the number of employees at each facility.

b) Specifically identify the manufacturing facilities for each of the charging system component models listed above.

3.5. Charging System Component Information

Please refer to the Background Information (*Section 2*) for discussion on planned operation of BEBs and charging requirements.

Information is being requested for each of the following charging system components provided by Respondent.

- Charging cabinets (AC and DC)
- Overhead cable retractor / reel
- Overhead inverted pantograph (for depot)
- Charge management

a) For each charging system component model offered by your company for delivery in 2021 through 2023 to charge a BEB at the depot, please describe all options for charging heavy-duty transit buses, including but not limited to the following information:

1) Utility service requirements
   - Three-phase connection or other
   - AC line-to-line voltage range (measured in VAC)
   - Full input power rating (measured in kVA)
2) Rated DC output power (measured in kW)
   - If power limit varies with output voltage, please provide drawings / schematics
   - If power limits do not apply across the charger's entire operating profile, please provide explanation
3) Rated DC output current (measured in A)
   - If current limit varies with output voltage, please provide maps
   - If current limits do not apply across the charger's entire operating profile, please provide explanation
4) Nominal efficiency
5) Idle power consumption (W or kW)
6) Nominal power factor
7) Power factor rating
8) Minimum power conversion efficiency, or efficiency map
9) Output DC voltage range (VDC)
10) Maximum charge power that can be delivered to a single charge head (or vehicle)
    - Maximum number of dispensers supported by the charger and how power is allocated between them
    - Describe the capability to power multiple chargers simultaneously, if any
    - Describe the capability to automatically cycle among multiple dispensers, if any
    - Describe any pantograph or non-plug in options, if available
11) Ability to limit the charge rate on the charger side (for the purpose of reducing utility demand charges)
12) Any capability to meter and report on the DC energy delivered to the charge ports

13) Any capability to meter and report on the AC energy consumed from or delivered to the grid
14) Any capabilities to support bidirectional power flow (vehicle to grid or V2G, if available
15) Method of providing electrical isolation to the grid and between multiple connected vehicles, if applicable
16) Cable Specifications and Features (where relevant)
    - Indicate if there a liquid-cooled cable option and explain the benefits of the liquid-cooled cable option
    - Standard charge cable length
    - Maximum charge cable length
    - Cable weight per foot
    - List options for cable management
17) Environmental rating of enclosures (IP rating)
18) Number of dispensers that can be energized by a single charger.
    * Include additional switches / control boxes needed to support shared dispensers
    * If shared dispensers can be energized simultaneously (with a splitting of the charger cabinet power output between the connected shared dispensers) or staggered charger (with power output from a shared charging cabinet being alternating between each shared dispenser connected).
19) Ability for charging system component(s) proposed to support pre-conditioning of buses (i.e. when connected overnight for depot charging, charging system can be programmed to turn on HVAC system of the BEB to allow interior temperature of the passenger cabin to hit an agency set temperature point prior to the BEB pull out and disconnection from depot charging system.
    - Indicate if pre-conditioning reduces battery state-of-charge (SOC) or does not affect the BEB SOC.
20) Layout of system and dimensions of each charging system component (i.e., charger, dispenser, pedestal). Layout and dimensions to include, but not be limited to:
    - Width
    - Height
    - Retracted height (for pantograph)
    - Extended height (for pantograph)
    - Depth
    - Weight
    - Ambient temperature limits
    - Anticipated air changes per hour for proper cooling
    - Is proposed component all-weather / suitable for installation in an exposed exterior environment.
21) Installation requirements of all equipment related to the charging system, including:
    - Mounting details
    - Mounting heights (for pantographs) to accommodate standard transit, articulated, and double decker buses
    - Electrical connections (size and location) for inputs and outputs
    - Environmental requirements for installing the component
    - Maximum distance between the charger and dispenser
    - Maximum distance between switchgear and charger
    - Minimum space required between installed charger cabinets
    - Clearances for servicing and ventilation, etc. (for both cabinets and dispensers)

22) List all available options, including information on all available subscriptions. Subscriptions may include those that support:
    - Charge management features, including the ability to centrally monitor and manage all chargers and dynamically schedule charging across vehicles and chargers to reduce overall power demand, or ensure charge completion for all buses by a set time; delay charge initiation for any bus to either a set time, state-of-charge (SOC), or sequencing trigger that would enable back-to-back charging of multiple buses. Describe charge management scheduling parameters. Describe hardware, software, and networking requirements.
    - Data logging, reporting, and notification capabilities of charging equipment. Please include all logged variables (e.g., energy drawn from the grid, energy delivered to each vehicle, charge rate throughout charging), types of reports (e.g., real time alerts, nightly exception reports, recurring reports), and methods of accessing data, alerts and reports (e.g., website, SMS, email).
23) List all standard and proprietary communication protocols supported by the equipment.
24) List all back-office vendors that have been integrated with this equipment.
25) All diagnostic capabilities of the charging equipment.
26) Any maintenance requirements and procedures (including maintenance intervals) for charging system component.
27) List of recommended replacement parts for each charging system component and approximate total cost.
28) Status of UL or other electrical code and safety certification.
29) Applicable US standards, and description of charge connector (attach pictures of charging equipment, if available).
30) Capability and plan to adapt to any US charge interface standards defined in the future.

b) Please identify any relevant features or capabilities of your charging equipment that are not listed within the features or capabilities detailed above, including anything that makes your product stand out among competing technologies.

c) Is your system currently open charge point protocol (OCPP) compliant, or is work currently being done to achieve OCCP compliance? Can third party software providers integrate with your hardware including allowing third party software to connect and generate reports based on charge management system collected data? Can your system be integrated with third party software? Please list third party software that has been successfully integrated with your charger model(s) to date. AC Transit currently utilizes Fleetwatch for fuel monitoring. Can your equipment integrate charging station data with Fleetwatch?

d) Warranty: Please provide standard warranty information as well as options for extended warranties.

e) Planning/Design/Commissioning Services: Does your company provide any services related to site planning, design, permitting, construction, installation, or commissioning of your charging system?

f) Component Service: Please provide a detailed and specific discussion of strategies to ensure maximum charger system component uptime and any uptime guarantees. Topics to discuss include available service plans, common repair parts, remote monitoring and diagnostics, redundancy, backup power supplies, etc.

g) Training: Please describe any available training for systems users, operators, and maintenance personnel. List any certifications, training, or licenses that existing personnel would require in order to perform in-house maintenance of charging equipment.

3.6. Installations / References

a) Please provide a list of agencies where your charging system components are installed. Please provide:
   1) Agency name and address
   2) Contact name, phone number, and e-mail address

Thank You for Responding to this RFI.