

REQUEST FOR PROPOSAL



Shasta Regional Transportation Agency

1255 East Street
Suite 202
Redding, CA 96001

**Battery Electric Vehicle Procurement for
Salmon Runner and North Valley Feeder
Procurement No. 2019-01**

January 16, 2019

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SECTION 1: NOTICE OF REQUEST FOR PROPOSALS

NR 1. Description of the Work to be Done

The Shasta Regional Transportation Agency (SRTA or Agency) requests Proposals for the manufacture and delivery of up to seven (7) heavy-duty battery electric transit vehicles in accordance with the terms and conditions set forth in this RFP, with options for up to an additional twenty (20) vehicles over a five-year period.

The initial seven (7) vehicles will be used to transport passengers on two service routes: a 170+ mile (one way) transit route between Redding, CA and Sacramento, CA (“Salmon Runner”) and a 144+ mile (one way) transit route between the small rural communities of Willows, Orland, Chico, and Corning, CA (“North Valley Feeder”). Vehicles must be large enough to accommodate 30+ passengers and luggage. When not in service, some of the vehicles will be stored at the northern end of the route (Redding, CA), others will be stored at the southern end of the route (Sacramento, CA), and others will be stored in Willows, CA. The Agency expects to have charging stations located at each end of the routes and charge the vehicles overnight and between service runs.

The options for up to an additional twenty (20) vehicles could be used to transport passenger on other service routes in California, could be stored in other locations in California, and could have charging stations located in the local jurisdiction of any permissible assignee of the Agency.

In addition to the battery electric vehicles, prospective Proposers are encouraged to include pricing for two vehicle charging options:

- a) charging equipment to support initial seven (7) vehicle order, with options to purchase additional charging equipment to support up to an additional twenty (20) vehicles over a five-year period.
- b) site design, charging equipment, delivery, installation and commissioning of charging equipment to support initial seven (7) vehicle order.

The Agency reserves the right to award a Contract to a qualified bidder for the vehicles only OR the vehicles and one of the charging options.

The Contract shall be a firm-fixed-price Contract.

NR 2. Obtaining Proposal Documents

Proposal documents may be obtained electronically at <http://www.srta.ca.gov/bids.aspx>. Prospective Proposers must subscribe to the Agency’s bid posting webpage at <http://www.srta.ca.gov/bids.aspx> to be notified of any addenda to the RFP, for responses to questions received, and other proposal documents.

NR 3.Proposal Due Date and Submittal Requirements

Proposals must be received by **4:00 PM PST** on Monday, **March 4, 2019**.

1. Sealed Proposals shall be submitted to the following address:

Jennifer Pollom
Shasta Regional Transportation Agency
1255 East Street
Suite 202
Redding, CA 96001

2. Envelopes or boxes containing Proposals shall be sealed and clearly labeled with the Agency's Proposal number and the RFP title: Procurement No. 2019-01 Battery Electric Vehicle Procurement for Salmon Runner and North Valley Feeder.
3. Proposers are requested to submit to the Agency one hard copy marked "Original," two additional printed copies, and three USB flash drives, each containing an electronic PDF copy of the Proposal. In case of any discrepancies, the original will be considered by the Agency in evaluating the Proposal, and the electronic version is provided for the Agency's administrative convenience only. A Proposal is deemed to be late if it is received by the Agency after the deadline stated above. Proposals received after the submission deadline may be rejected.

NR 4.Validity of Proposals

Proposals and subsequent offers shall be valid for a period of 180 days.

NR 5.Pre-Proposal Meeting Information

A Pre-Proposal Meeting will be held on Tuesday, January 22, 2019. The meeting will convene at 10 AM PST in the Agency's Salmon Room, located at 1255 East Street, Suite 202, Redding, CA 96001. Proposers may also participate via conference call. The call-in number and instructions are as follows: teleconference call-in number: 1-866-906-9888; enter participation code 8514637, and follow the automated prompts.

Prospective Proposers are requested to submit written questions to the Project Manager, identified below, in advance of the Pre-Proposal Meeting. In addition, questions may be submitted up to the date specified in "Proposed Schedule for the Procurement" in Section 2. Responses will be shared with all prospective Proposers. Prospective Proposers are reminded that any changes to the RFP will be by written addenda only available via SRTA's bid posting webpage at <http://www.srta.ca.gov/bids.aspx>, and nothing stated at the Pre-Proposal Meeting shall change or qualify in any way any of the provisions in the RFP and shall not be binding on the Agency.

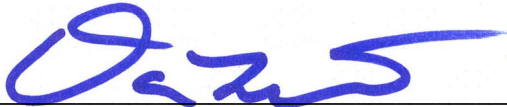
Project Manager's Contact Information:

Name: Jennifer Pollom
Title: Senior Transportation Planner
Address: 1255 East Street, Suite 202, Redding, CA 96001
Phone number: 530-262-6190
Email: srta@srta.ca.gov
Fax number: 530-262-6189
Additional contact: Daniel Little, Executive Director

Identification of Source of Funding

Financial support of this project is provided through financial assistance grants from the California State Transportation Agency's Transit and Intercity Rail Capital Program. This procurement is not federally funded.

Signed and Dated for Posting

	Executive Director	January 16, 2019
_____ Signature/Title		_____ Date

SECTION 2: INSTRUCTIONS TO PROPOSERS

IP 1. Quantities

The Work under these Contract documents consists of the manufacture and delivery of a base order of up to seven (7) heavy-duty transit vehicles, maintenance tools and diagnostic equipment specific to the vehicles, maintenance manuals, maintenance staff training, operator manuals, and operator staff training.

There will be options for the Agency or any permissible assignee of the Agency to purchase up to twenty (20) additional vehicles over a five-year period.

In addition to the battery electric vehicles, prospective Proposers are encouraged to include pricing for two vehicle charging options:

- a) charging equipment to support initial seven (7) vehicle order, with options to purchase additional charging equipment to support up to an additional twenty (20) vehicles over a five-year period.
- b) site design, charging equipment, delivery, installation and commissioning of charging equipment to support initial seven (7) vehicle order.

The Agency reserves the right to award a Contract to a qualified bidder for the vehicles only OR the vehicles and one of the charging options.

IP 2. Proposed Schedule for the Procurement

The following is the solicitation schedule for Proposers:

- RFP Issue Date: January 16, 2019
- Pre-Proposal Meeting/Teleconference: January 22, 2019
- Deadline for Written Questions: January 28, 2019
- Agency Responds to Written Questions: January 31, 2019
- Deadline for Requests for Pre-Offer Change or Approved Equal: February 8, 2019
- Agency Responds to Requests for Pre-Offer Change or Approved Equal: February 13, 2019
- Proposal Due Date: March 4, 2019
- Expected Notice of Intent to Award: April 24, 2019

IP 3. Obtaining Proposal Documents

Proposal documents may be obtained electronically at <http://www.srta.ca.gov/bids.aspx>. Prospective Proposers must subscribe to the Agency's bid posting webpage at <http://www.srta.ca.gov/bids.aspx> to be notified of any addenda to the RFP, for responses to questions received, and other proposal documents.

IP 4. Proposal Security Requirements

Not applicable.

IP 5. Pre-Proposal Meeting/Information for Proposers

A Pre-Proposal Meeting will be held on Tuesday, January 22, 2019. The meeting will convene at 10 AM PST in the Agency's Salmon Room, located at 1255 East Street, Suite 202, Redding, CA 96001. Proposers may

also participate via conference call. The call-in number and instructions are as follows: teleconference call-in number: 1-866-906-9888; enter participation code 8514637, and follow the automated prompts.

Prospective Proposers are urged to make every effort to attend this meeting.

Prospective Proposers are requested to submit written questions to the Project Manager, identified above, in advance of the Pre-Proposal Meeting. In addition, questions may be submitted up to the date specified in "Proposed Schedule for the Procurement." Responses will be shared with all prospective Proposers. Prospective Proposers are reminded that any changes to the RFP will be by written addenda only available via SRTA's bid posting webpage at <http://www.srta.ca.gov/bids.aspx>, and nothing stated at the Pre-Proposal Meeting shall change or qualify in any way any of the provisions in the RFP and shall not be binding on the Agency.

IP 6. Questions, Clarifications, and Omissions

All correspondence, communication and contact in regard to any aspect of this solicitation or offers shall be only with the Project Manager identified above, Jennifer Pollom. Unless otherwise instructed by the Project Manager, Proposers and their representatives shall not make any contact with or communicate with any member of the Agency, or its employees and consultants, other than the designated Project Manager, in regard to any aspect of this solicitation or offers.

At any time during this procurement up to the time specified in "Proposed Schedule for the Procurement," Proposers may request, in writing, a clarification or interpretation of any aspect, a change to any requirement of the RFP, or any addenda to the RFP. Requests may include suggested substitutes for specified items and for any brand names, which whenever used in this solicitation shall mean the brand name or approved equal. Such written requests shall be made to the Project Manager. The Proposer making the request shall be responsible for its proper delivery to the Agency as identified on the form Request for Pre-Offer Change or Approved Equal. Any request for a change to any requirement of the Contract documents must be fully supported with technical data, test results or other pertinent information showing evidence that the exception will result in a condition equal to or better than that required by the RFP, without a substantial increase in cost or time requirements.

All responses to Request for Pre-Offer Change or Approved Equal shall be provided to all Proposers. Any response that is not confirmed by a written addendum shall not be official or binding on the Agency.

If it should appear to a prospective Proposer that the performance of the Work under the Contract, or any of the matters relating thereto, is not sufficiently described or explained in the RFP or Contract documents, or that any conflict or discrepancy exists between different parts of the Contract or with any federal, state, local or Agency law, ordinance, rule, regulation, or other standard or requirement, then the Proposer shall submit a written request for clarification to the Agency within the time period specified above.

IP 7. Addenda to RFP

The Agency reserves the right to amend the RFP at any time in accordance with "Proposed Schedule for the Procurement." Any amendments to the RFP shall be described in written addenda available via SRTA's bid posting webpage at <http://www.srta.ca.gov/bids.aspx>. Failure of any prospective Proposer to receive the notification or addenda shall not relieve the Proposer from any obligation under the RFP therein. All addenda issued shall become part of the RFP. Prospective Proposers shall acknowledge the receipt of each individual addendum in their Proposals on the form Acknowledgement of Addenda. Failure to acknowledge in the Proposal receipt of addenda may at the Agency's sole option disqualify the Proposal.

If the Agency determines that the addenda may require significant changes in the preparation of Proposals, the deadline for submitting the Proposals may be postponed no fewer than ten (10) days from the date of issuance of addenda or by the number of days that the Agency determines will allow Proposers sufficient time to revise their Proposals. Any new Due Date shall be included in the addenda.

IP 8. DBE Requirements for Transit Vehicle Manufacturers

The procurement is not federally funded.

SRTA requests that prospective Proposers provide documentation of disadvantaged business enterprise (DBE) participation in the procurement. SRTA has a DBE goal of 4.8%.

IP 9. Buy America Certification

The procurement is not federally funded.

SRTA requests that prospective Proposers provide the Buy America certification as applicable to the proposed vehicles, i.e. SRTA would like documentation if proposed vehicles are Buy America certified.

IP 10. Conditions, Exceptions, Reservations or Understandings

Proposers are cautioned to limit exceptions, conditions, and limitations to the provisions of this RFP, as they may be determined to be so fundamental as to cause rejection of the Proposal for not responding to the requirements of the RFP.

Any and all Deviations must be explicitly, fully, and separately stated in the Proposal by completing the Form for Proposal Deviation, setting forth at a minimum the specific reasons for each Deviation so that it can be fully considered and, if appropriate, evaluated by the Agency. All Deviations shall be evaluated in accordance with the appropriate evaluation criteria and procedures and may result in the Proposer receiving a less favorable evaluation than without the Deviation.

The Form for Proposal Deviation shall be included in the Technical package.

IP 11. Protest Procedures

All protests must be in writing, stating the name and address of the protestor, a contact person, Contract number and title. Protests shall specify in detail the grounds of the protest and the facts supporting the protest.

IP 11.1 Address

All protests must be addressed as follows:

- Agency contact: Jennifer Pollom
- For special delivery or hand delivery: 1255 East Street, Suite 202, Redding, CA 96001
- For U.S. mail: 1255 East Street, Suite 202, Redding, CA 96001

Protests not properly addressed to the address shown above may not be considered by the Agency.

IP 11.2 Pre-Proposal Protests

Pre-Proposal protests are protests based upon the content of the solicitation documents. Three copies of Pre-Proposal protests must be received by the Agency's office no later than fifteen (15) calendar days prior to the

Due Date. Protests will be considered and either denied or sustained in part or in whole, in writing, in a manner that provides verification of receipt, prior to the Due Date for Proposals. A written decision specifying the grounds for sustaining all or part of or denying the protest will be transmitted to the protestor prior to the Due Date for Proposals in a manner that provides verification of receipt prior to the Due Date for Proposals. If the protest is sustained, then the Proposal Due Date may be postponed and an addendum issued to the solicitation documents or, at the sole discretion of the Agency, the solicitation may be canceled. If the protest is denied, then Proposals will be received and opened on the scheduled date.

IP 11.3 Protests on the Recommended Award

All Proposers will be notified of the recommended award. This notice will be transmitted to each Proposer at the address contained in its Proposal form in a manner that provides verification of receipt. Any Proposer whose Proposal has not lapsed may protest the recommended award on any ground not specified in “Pre-Proposal Protests,” above. Three (3) copies of a full and complete written statement specifying in detail the grounds of the protest and the facts supporting the protest must be received by the Agency at the appropriate address in “Address,” above, no later than five (5) calendar days after the date such notification is received. Prior to the issuing of the Notice of Award, a written decision stating the grounds for allowing or denying the protest will be transmitted to the protestor and the Proposer recommended for award in a manner that provides verification of receipt.

IP 11.4 FTA Review

Not applicable; the procurement is not federally funded.

IP 12. Preparation of Proposals

IP 12.1 Use of Proposal Forms

Prospective proposers are advised that the forms contained in this RFP are required to be used for submission of a Proposal.

IP 12.2 Alternate and Multiple Proposals

Not applicable.

IP 12.3 Proposal Format Requirements

Proposals shall be submitted in four separately sealed packages identified below. Each package shall be marked as specified below and shall contain all the Proposal documents for which the package is required to be marked and shall include no other documents. These same requirements shall apply to any best and final offers (BAFOs) that may be requested.

Proposers shall submit one hard copy marked “Original,” two additional printed copies, and three USB flash drives, each containing an electronic PDF copy of the Proposal. In case of any discrepancies, the original will be considered by the Agency in evaluating the Proposal, and the electronic version is provided for the Agency’s administrative convenience only.

The hard-copy Proposals shall be prepared double-sided on 8½ × 11 in. paper in at least 11-point font. The hard copies shall be contained in three-ring binders, the contents of which are identified on the outside. Use of 11 × 17 in. foldout sheets for large tables, charts or diagrams is permissible but should be limited. Elaborate formatting is not necessary. Do not provide promotional or advertising information, unless this information is requested and/or is necessary to support the technical submittal.

Package 1: Technical Proposal Requirements

1. Letter of Transmittal
2. Technical Proposal
 - a. A dimensioned drawing of the coach exterior.
 - b. A dimensioned drawing of the coach interior.
 - c. A detailed description of the propulsion system. The description shall include a written narrative, a block diagram showing major propulsion system components, an illustration showing the physical layout of propulsion components and high-voltage wire routing within the vehicle, and a detailed wiring diagram and/or electrical schematic for the high-voltage system.
 - d. A description of the ESS design, including containers, module bracing systems, thermal management systems, battery management systems, interconnections, and charger interfaces.
 - e. Written confirmation from the battery manufacturer attesting to the safety of the proposed battery system in the specified application and charging profile.
 - f. A description of all ESS maintenance requirements including any periodic charge requirements necessary for cell balancing.
 - g. The definition of “charge cycle” and the expected cycle life of the ESS. Descriptions and results of tests used to validate the life of batteries used for this application at the proposed charging rates, charge durations, and expected ambient temperatures and operating profiles.
 - h. A comprehensive statement of the warranty terms relating to the ESS, including explanation of all disclaimers within the warranty.
 - i. A list of applicable industry standards that the propulsion system, energy storage system, and high-voltage wiring meet. A description of test procedures and results used to validate the safety of the propulsion system, ESS, and high-voltage wiring.
 - j. A detailed description of the methods used to validate that the proposed vehicle will meet the Agency design operating profile under the conditions described in TS 8.2.
 - k. Results of simulated operation on the Salmon Runner and North Valley Feeder routes both in nominal and harsh conditions (described in TS 8.2) and when the vehicle is new and when the energy storage system reaches its Warrantable End of Life.
 - l. The gross energy storage capacity (kWh) of the energy storage system when the system is new and when the system reaches its Warrantable End of Life.
 - m. The usable energy storage capacity (kWh) of the energy storage system when the system is new and when the system reaches its Warrantable End of Life.
 - n. A detailed description of the methods that the agency can use to measure both the gross and usable energy capacity of the energy storage system.
 - o. Description of any required or recommended charge strategies or other bus operation strategies that are necessary to meet the Agency design operating profile. Note that the agency requires that operational impacts be minimized.
 - p. Narrative description and illustration of interior of passenger cabin, showing seat layout, wheelchair entry and securement area, bicycle racks, and overhead storage space.
 - q. Detailed description of the wheelchair loading and securement system.
 - r. Detailed description of the undercarriage luggage space.
 - s. Any required software and subscriptions required for coach components, sub-systems, features, etc. (DO NOT INCLUDE THE ACTUAL COST OF ANY SOFTWARE OR SUBSCRIPTIONS IN THIS PACKAGE).

- t. Altoona Test Report for the proposed coach, or the expected test completion date, or expected test begin date, or confirmation that there are no plans to test the proposed coach at Altoona.
 - u. Description of any EVSE proposed, including but not limited to model name/number, country of origin, name of manufacturer, installation instructions (including power and communication network requirements), operation instructions, compliance with charge standards and UL Classification, nominal efficiency, physical dimensions, number of connectors, connector cable length, maintenance requirements, and warranty terms. Proposers shall provide charge profiles (SOC versus charge time) for charge events from min SOC, 25% SOC, 50% SOC, and 75% SOC to max SOC.
 - v. Description of any automatic or “smart” charging features including programmable charging capability, networking multiple chargers, charge monitoring, remote charge management, vehicle-to-grid capability, and charge reporting. Describe whether these features are provided as a standard offering or as an option to the proposal submission. Describe any required software or subscriptions, and make clear if recurring fees are required for the continued use of any system/features (DO NOT INCLUDE THE ACTUAL COST OF ANY SOFTWARE OR SUBSCRIPTIONS IN THIS PACKAGE).
 - w. A list of all special tools and diagnostic equipment required to operate or maintain the proposed coach and any proposed charging equipment.
 - x. A detailed description of any Personal Protective Equipment (PPE) required to operate or maintain the proposed coach or any proposed charging equipment.
 - y. Description of the towing procedure.
3. CER 3 – Acknowledgement of Addenda
 4. CER 4 – Contractor Service and Parts Support Data
 5. CER 5 – Form for Proposal Deviation (without price data)
 6. CER 9.3 – Certification of Compliance with Standards, Certifications, and Regulations
 7. CER 10 – Vehicle Attribute Summary
 8. CER 11 – Charging Attribute Summary (if Proposal includes the delivery of charging equipment)
 9. A training plan, sample training curriculum, and approximate number of training hours required.
 10. A detailed description of the opportunities to reuse or recycle replaced battery cells/packs over the life of the coach.
 11. Engineering organization chart, engineering change control procedure, description of field modification process.
 12. Manufacturing facilities plant layout, other contracts, staffing
 13. Production and delivery schedule and other Contract commitments for the duration of this Contract
 14. Project Staffing and Management Plan for the duration of this Contract
 15. CER 12 – Minimum Milestone Plan

Package 2: Price Proposal Requirements

Each Price Proposal shall be on the prescribed Proposal form(s) and shall be for the entire Contract, including all Proposal items.

16. Letter of Transmittal
17. CER 6 – Pricing Schedule

The Contractor shall be liable for payment of all taxes applicable to the contract deliverables and should add these amounts to the Proposal price.

Package 3: Qualification Package Requirements

18. CER 9.1 – Proposal Form
19. CER 7 – Pre-Award Evaluation Data Form
20. Contractor’s Statement of Experience
21. A copy of the three (3) most recent financial statements audited by an independent third party or a statement from the Proposer regarding how financial information may be reviewed by the Agency
22. Letter for insurance, indicating the Contractor’s ability to obtain the insurance coverage in accordance with the RFP requirements
23. Letter from a surety for a Performance Guarantee, if required, indicating the Contractor’s ability to obtain financial guarantees in accordance with the RFP requirements
24. Form for Proposal Deviation, if applicable (without price data)
25. Federal certifications: Buy America Certification, Debarment and Suspension Certification for Prospective Contractor, Debarment and Suspension Certification (Lower-Tier Covered Transaction), Non-Collusion Affidavit, Lobbying Certification, Certificate of Compliance with Bus Testing Requirement, DBE Approval Certification, and Federal Motor Vehicle Safety Standards

Package 4: Proprietary/Confidential Information Package Requirements

The Proposer is directed to collect and submit any information it deems to be proprietary or confidential in nature in a separate marked and sealed package. If there is no confidential information, then the Proposer should include a statement to that effect. Subject package shall be submitted in accordance with the terms and conditions governing the submittal of Proposer’s Proposal to this RFP. Blanket-type identification by designating whole pages or sections as containing proprietary information, trade secrets, or confidential commercial and financial information will not ensure confidentiality. The specific proprietary information, trade secrets or confidential commercial and financial information must be clearly identified as such.

The Proposer is advised that the Agency is public and as such may be subject to certain state and/or local Public Records Act provisions regarding the release of information concerning this RFP. If a request is received by the Agency for the release of Proposer’s proprietary/confidential information, then subject request will be referred to the Proposer for review and consideration. If Proposer chooses to declare the information proprietary/confidential and withhold it from release, then it shall defend and hold harmless the Agency from any legal action arising from such a declaration.

IP 12.4 Agency Treatment of Proprietary/Confidential Information

Access to government records is governed by the Public Records Act (Gov. Code Section 6254 et. seq.). Except as otherwise required to be disclosed by the Public Records Act (Gov. Code Section 6254 et. seq.), the Agency will exempt from disclosure proprietary information identified in Package 4.

Upon a request for records from a third party regarding this Proposal, the Agency will notify the Proposer in writing. The Proposer must respond within fifteen (15) business days with the identification of any and all “proprietary, trade secret or confidential commercial or financial” information. Failure to respond within the allowed period shall be deemed an approval to release. The Proposer shall indemnify the Agency’s defense costs associated with its refusal to produce such identified information; otherwise, the requested information may be released.

The Agency shall employ sound business practices no less diligent than those used for the Agency’s own confidential information to protect the confidence of all licensed technology, software, documentation,

drawings, schematics, manuals, data and other information and material provided by Proposers and the Contractor pursuant to the Contract that contain confidential commercial or financial information, trade secrets or proprietary information as defined in or pursuant to the Public Records Act (Gov. Code Section 6254 et. seq.) against disclosure of such information and material to third parties, except as permitted by the Contract. The Contractor shall be responsible for ensuring that confidential commercial or financial information, trade secrets or proprietary information—with such determinations to be made by the Agency at its sole discretion—bears appropriate notices relating to its confidential character.

IP 12.5 Signing of Proposal Forms

Proposals shall include firm name (and, in the event that the Proposer is a joint venture, the names of the individual firms comprising the joint venture); business address; and the name, title, business address, telephone number, facsimile (fax) number and email address of the responsible individual(s) who may be contacted during the Proposal evaluation period for scheduling oral presentations and for receiving notices from the Agency. The Proposer shall submit with its Proposal a copy of the joint venture agreement.

Proposals shall be signed by those individual(s) authorized to bind the Proposer. The Proposer shall submit evidence of the official's authority to act for and bind the Proposer in all matters relating to the Proposal. (In the event that the Proposer is a joint venture or consortium, a representative of each of the members of the joint venture or consortium shall execute the Proposal. Each joint venture or consortium member is jointly and severally liable for the joint venture or consortium.)

IP 12.6 Modification or Withdrawal of Proposals

A modification of a Proposal already received will be accepted by the Agency only if the modification is received prior to the Proposal Due Date, is specifically requested by the Agency or is made with a requested BAFO. All modifications shall be made in writing and executed and submitted in the same form and manner as the original Proposal.

A Proposer may withdraw a Proposal already received prior to the Proposal Due Date by submitting to the Agency, in the same manner as the original Proposal, a written request for withdrawal executed by the Proposer's authorized representative. After the Proposal Due Date, a Proposal may be withdrawn only if the Agency fails to award the Contract within the Proposal validity period prescribed in "Duration of the Validity of Proposals," or any agreed-upon extension thereof. The withdrawal of a Proposal does not prejudice the right of a Proposer to submit another Proposal within the time set for receipt of Proposals.

IP 12.7 Ownership and Cost of Proposal Development

All proposals will become the property of the Agency.

This RFP does not commit the Agency to enter into a Contract, to pay any costs incurred in the preparation or presentation of a Proposal, nor to procure or contract for the equipment.

IP 13. Proposal Evaluation, Negotiation and Selection

Proposals will be evaluated, negotiated, selected and any award made in accordance with the criteria and procedures described below. The approach and procedures are those applicable to a competitive negotiated procurement whereby Proposals are evaluated to determine which Proposals are within a Competitive Range. Discussions and negotiations may then be carried out with Proposers within the Competitive Range, after which BAFOs may be requested.

However, the Agency may select a Proposal for award without any discussions or negotiations or request for any BAFOs. Subject to the Agency's right to reject any or all Proposals, the Proposer whose Proposal is found to be most advantageous to the Agency will be selected, based upon consideration of the criteria of "Proposal Selection Process," below.

IP 13.1 Confidentiality of Proposals

Proposals will not be publicly opened. All Proposals and evaluations will be kept strictly confidential throughout the evaluation, negotiation and selection process, except as otherwise required by applicable law. Only the members of the Selection Committee and Evaluation Team and other Agency officials, employees and agents having a legitimate interest will be provided access to the Proposals and evaluation results during this period.

IP 13.2 Duration of the Validity of Proposals

Proposals and subsequent offers shall be valid for the period stated in "Section 1: Notice of Request for Proposals." The Agency may request Proposers to extend the period of time specified herein by written agreement between the Agency and the Proposer(s) concerned.

IP 13.3 Evaluation Committee

An Evaluation Committee, which will include officers, employees, and agents of the Agency, will be established. The Evaluation Committee will carry out the detailed evaluations, including establishing any Competitive Range, carrying out negotiations, and making the selection of the Proposer, if any, that may be awarded the Contract.

The Evaluation Committee will report its recommendations and findings to SRTA's Board of Directors, which is responsible for awarding the Contract.

IP 13.4 Review of Proposals for Responsiveness and Proposers for Responsibility

Each Proposal will be reviewed to determine if the Proposal is responsive to the submission requirements outlined in this RFP and if the Proposer is responsible.

A responsive Proposal is one that follows the requirements of this RFP, includes all documentation, is submitted in the format outlined in this RFP, is of timely submission, and has the appropriate signatures as required on each document. Failure to comply with these requirements may result in the Proposal being deemed nonresponsive.

A responsible Proposer is one that demonstrates the capability to satisfy the commercial and technical requirements set forth in the Solicitation. A Proposer's failure to demonstrate that it is responsible may result in the proposal being rejected.

Any Proposal found to be nonresponsive or Proposer found to be non-responsible will not be considered further for award. Proposals that do not comply with the RFP instructions and requirements or do not include the required information may be rejected as insufficient and may not be further considered. The Agency reserves the right to request that a Proposer provide additional information and/or to clarify information. The Agency's determination regarding the responsiveness of a Proposal and the responsibility of a Proposer shall be final.

IP 13.5 Proposal Selection Process

The following describes the process by which Proposals will be evaluated and a selection made for a potential award. Any such selection of a Proposal shall be made by consideration of only the criteria set forth below.

“Qualification Requirements” specifies the requirements for determining responsible Proposers, all of which must be met by a Proposer for it to be found qualified. Final determination of a Proposer’s qualification will be made based upon all information received during the evaluation process and as a condition for award.

“Proposal Evaluation Criteria” contains all the evaluation criteria, and their relative order of importance, by which a Proposal from a qualified Proposer will be considered for selection. An award, if made, will be to a responsible Proposer for a Proposal that is found to be in the Agency’s best interests, based on price and other evaluation criteria considered. The procedures to be followed for these evaluations are provided in “Evaluation Procedures,” below.

Qualification Requirements

The following are the requirements for qualifying responsible Proposers. All of these requirements should be met; therefore, they are not listed in any particular order of importance. Any Proposal that the Evaluation Committee finds does not meet these requirements, and cannot be made to meet these requirements, may be determined by the Evaluation Committee not to be responsible and the Proposal rejected. The requirements are as follows:

1. Sufficient financial strength, resources and capability to finance the Work to be performed and to complete the Contract in a satisfactory manner, as measured by the following:
 - Proposer’ “Contractor’s Statement of Experience and Financial Condition.”
 - Proposer’s financial statements prepared in accordance with generally accepted accounting principles of the jurisdiction in which the Proposer is located, and audited by an independent certified public accountant; oral statement from the Proposer regarding how financial information may be reviewed by the Agency.
 - Proposer’s ability to secure financial guarantees, if required, as evidenced by a letter of commitment from an underwriter, surety or other guarantor confirming that the Proposer can provide the required guarantee.
 - Proposer’s ability to obtain required insurance with coverage values that meet minimum requirements, evidenced by a letter from an underwriter confirming that the Proposer can be insured for the required amount.
2. Evidence that the human and physical resources are sufficient to perform the Contract as specified and to ensure delivery of all equipment within the time specified in the Contract, to include the following:
 - Engineering, management and service organizations with sufficient personnel and requisite disciplines, licenses, skills, experience and equipment to complete the Contract as required and to satisfy any engineering or service problems that may arise during the warranty period.
 - Adequate manufacturing facilities sufficient to produce and factory-test equipment on schedule.
 - A spare parts procurement and distribution system sufficient to support equipment maintenance without delays and a service organization with skills, experience and equipment sufficient to perform all warranty and on-site Work.

3. Evidence that Proposer is qualified in accordance with the provisions of “Section 8: Quality Assurance.”
4. Evidence of satisfactory performance and integrity on contracts in making deliveries on time, meeting specifications and warranty provisions, parts availability and steps Proposer took to resolve any judgments, liens, Fleet Defects history or warranty claims. Evidence shall be by client references.

Proposal Evaluation Criteria

The following are the complete criteria by which Proposals from responsible Proposers will be evaluated and ranked for the purposes of determining any Competitive Range and to make any selection of a Proposal for a potential award. The percentages included below show the value of each criteria relative to the entire evaluation (100%). Any exceptions, conditions, reservations or understandings explicitly, fully and separately stated on the Form for Proposal Deviation, which do not cause the Agency to consider a Proposal to be outside the Competitive Range, will be evaluated according to the respective evaluation criteria and sub-criteria that they affect.

The evaluation is organized into three separate phases: Technical Evaluation, Proposer Evaluation, and Price Evaluation. Each evaluation has specific criteria and sub-criteria. Sub-criteria are listed in approximate order of importance.

1. Technical Evaluation

A. Design and Performance25%

- General Characteristics of Vehicle and Compliance with Agency Specifications
- Fuel Efficiency and Range
- Safety Features
- Adherence to Industry Charging Standards and Capability to Utilize Third-Party Charging Equipment
- Maximum Charge Rate
- Charge Management Features
- Battery Lifespan, given expected Duty Cycle and Charging Strategy
- Maturity of Propulsion System Technology (motor, energy storage, etc.)
- Operator Considerations and Design of Driver Area
- Overall Appearance (look and feel; flexibility for design)
- Passenger Boarding (floor height, kneeling, etc.)
- Passenger Amenities (seating, standing room, height of ceiling etc.)
- ADA Accessibility (w/chair ramp, aisle ways, etc.)

B. Maintainability and Product Support.....20%

- Maintenance Familiarity / Training Required
- Parts Familiarity
- Maintenance Access
- Quality of construction, i.e., welds, cabling, wiring connections, etc.
- Samples of Manuals / Parts Catalogue / Schematics
- Electronic manuals capability
- Parts Support (location, parts availability etc.)
- Technical Support (engineers, field service, etc.)

- Warranty
- Training
- Diagnostics / Tooling

2. Proposer Evaluation

- C. Overall Proposal and Response to Solicitation.....15%**
- Public Relations and Partnership Strategy
 - Ability to Meet Project Schedule
 - Understanding of the Project
 - Neatness and Organization of Proposal
- D. Experience of Firm10%**
- Prime contractor company background / Qualifications as a bus contractor
 - References and previous projects completed
 - Propulsion System Experience
 - Battery Electric Bus Experience (# of buses built, miles in revenue service, Altoona status, etc.)
 - Major Sub-Contractor background / Qualifications

3. Price Evaluation

- E. Cost of Proposed Vehicles20%**
- Cost of Buses
- F. Projected Life Cycle Costs10%**
- Maintenance
 - Energy Costs
 - Warranties
 - Contract Options

IP 13.6 Evaluation Procedures

Proposals will be analyzed for conformance with the instructions and requirements of the RFP and Contract documents. Proposals that do not comply with these instructions and do not include the required information may be rejected as insufficient or not be considered for the Competitive Range. The Agency reserves the right to request that a Proposer provide any missing information and make corrections. Submittal of a Proposal will signify that the Proposer has accepted the whole of the Contract documents, except such conditions, exceptions, reservations or understandings explicitly, fully and separately stated on the forms and according to the instructions of the Form for Proposal Deviation. Any such conditions, exceptions, reservations or understandings that do not result in the rejection of the Proposal are subject to evaluation under the criteria set forth in “Proposal Selection Process.”

Evaluations will be made in strict accordance with all the evaluation criteria specified in “Proposal Selection Process,” above. The Agency will choose the Proposal that it finds to be most advantageous to the Agency, based upon the evaluation criteria.

IP 13.7 Evaluations of Competitive Proposals

1. **Qualification of responsible Proposers.** Proposals will be evaluated to determine the responsibility of Proposers. A final determination of a Proposer’s responsibility will be made

upon the basis of initial information submitted in the Proposal, any information submitted upon request by the Agency, information submitted in a BAFO, and information resulting from Agency inquiry of Proposer's references and its own knowledge of the Proposer.

2. **Detailed evaluation of Proposals and determination of Competitive Range.** The Agency will carry out and document its evaluations in accordance with the criteria and procedures set forth in "Proposal Selection Process." Any Proposal deficiencies that may render a Proposal unacceptable will be documented. The Agency will make specific note of questions, issues, concerns and areas requiring clarification by Proposers and to be discussed in any meetings with Proposers that the Agency finds to be within the Competitive Range.

Rankings of the Proposals against the evaluation will then be made for determining which Proposals are within the Competitive Range, or may reasonably be made to be within the Competitive Range.

3. **Proposals not within the Competitive Range.** Proposers of any Proposals that have been determined by the Agency as not in the Competitive Range, and that cannot be reasonably made to be within the Competitive Range, will be notified by the Agency.
4. **Discussions with Proposers in the Competitive Range.** The Proposers whose Proposals are found by the Agency to be within the Competitive Range, or that may be reasonably made to be within the Competitive Range, will be notified and any questions or requests for clarifications provided to them in writing. Each such Proposer may be invited for an interview and discussions with the Agency to discuss answers to written or oral questions, clarifications and any facet of its Proposal.

In the event that a Proposal that has been included in the Competitive Range contains conditions, exceptions, reservations or understandings to any Contract requirements as provided in the Form for Proposal Deviation, said conditions, exceptions, reservations or understandings may be negotiated during these meetings. However, the Agency shall have the right to reject any and all such conditions and exceptions, and instruct the Proposer to amend its Proposal and remove said conditions and exceptions; and any Proposer failing to do so may cause the Agency to find such Proposal to be outside the Competitive Range.

No information, financial or otherwise, will be provided to any Proposer about any of the Proposals from other Proposers, to the extent permitted by applicable law. Proposers will not be given a specific price or specific financial requirements they must meet to gain further consideration, except that proposed prices may be considered to be too high with respect to the marketplace or unacceptable. Proposers will not be told of their rankings among the other Proposers prior to Contract award.

5. **Factory and site visits.** The Agency reserves the right to conduct factory visits of the Proposer's facilities and/or the facilities of major sub-suppliers included in the Proposal.
6. **Best and final offers.** After all interviews have been completed, the Proposers in the Competitive Range may be afforded the opportunity to amend their Proposals and make their BAFOs. The Request for BAFOs shall include the following:

- Notice that discussions and negotiations are concluded.
- A complete listing of the conditions, exceptions, deviations, reservations or understandings that have been approved.
- A common date and time for submission of written BAFOs, allowing a reasonable opportunity for preparation of the written BAFOs.
- Notice that if any modification to a BAFO is submitted, it must be received by the date and time specified for the receipt of BAFOs.
- Notice to Proposers that do not submit a notice of withdrawal or a BAFO that their immediately previous Proposal will be construed as their BAFO.

Any modification to the initial Proposal made by a Proposer in its BAFO shall be identified in its BAFO. BAFOs will be evaluated by the Agency according to the same requirements and criteria as the initial Proposals (“Proposal Selection Process”). The Agency will make appropriate adjustments to the initial scores for any sub-criteria and criteria that have been affected by any Proposal modifications made by the BAFOs. These final scores and rankings within each criterion will again be arrayed by the Agency and considered according to the relative degrees of importance of the criteria defined in “Proposal Selection Process.”

The Agency will then choose the Proposal that it finds to be most advantageous to the Agency, based upon the evaluation criteria. The results of the evaluations and the selection of a Proposal for any award will be documented.

The Agency reserves the right to make an award to a Proposer whose Proposal it judges to be most advantageous to the Agency based upon the evaluation criteria, without conducting any written or oral discussions with any Proposers or solicitation of any BAFOs.

7. **Debriefing.** Subsequent to the recommended award, the unsuccessful Proposers will be notified and may request a debriefing. Proposers will be debriefed in accordance with Agency policies, including information regarding the shortcomings of their Proposal.

IP 14. Response to Proposals

IP 14.1 Single Proposal Response

If only one Proposal is received in response to this RFP and it is found by the Agency to be acceptable, then a price or cost analysis, or both, possibly including an audit, may be performed by or for the Agency. The Proposer has agreed to such analysis by submitting a Proposal in response to this RFP.

IP 14.2 Availability of Funds

This procurement is subject to the availability of funding. The procurement is funded through the California State Transportation Agency’s Transit and Intercity Rail Capital Program and is subject to all contractual provisions required by the State of California Department of Transportation (“Caltrans” or “Department”) as set forth in Master Agreement No. 64SRTAMA, whether or not expressly set forth in this solicitation.

IP 14.3 Agency Contract Approval Process

The Evaluation Committee will report its recommendations and findings at the April 23, 2019 meeting of SRTA’s Board of Directors, which is responsible for awarding the Contract. Board packets – with recommendations and findings for the Board of Directors to consider at the meeting – are typically made publicly available the Thursday before the meeting, in this case April 18, 2019, or earlier that week.

IP 14.4 Agency Rights

The Agency reserves the right to cancel the procurement in whole or in part, at its sole discretion, at any time before the Contract is fully executed and approved on behalf of the Agency.

The Agency reserves the right to reject any or all Proposals, to undertake discussions with one or more Proposers, and to accept that Proposal or modified Proposal which, in its judgment, will be most advantageous to the Agency, considering price and other evaluation criteria. The Agency reserves the right to determine any specific Proposal that is conditional or not prepared in accordance with the instructions and requirements of this RFP to be nonresponsive. The Agency reserves the right to waive any Defects, or minor informalities or irregularities in any Proposal that do not materially affect the Proposal or prejudice other Proposers.

If there is any evidence indicating that two or more Proposers are in collusion to restrict competition or are otherwise engaged in anti-competitive practices, the Proposals of all such Proposers shall be rejected, and such evidence may be a cause for disqualification of the participants in any future solicitations undertaken by the Agency.

The Agency may reject a Proposal that includes unacceptable Deviations as provided in the Form for Proposal Deviation.

IP 14.5 Execution of Contract

The acceptance of a Proposal for award, if made, shall be evidenced in writing by a notice of award of Contract delivered to the Proposer whose Proposal is accepted. Upon notice of award of the Contract to a Proposer, the Proposer shall commence performance under the Contract by furnishing any required bonds, and by furnishing copies of the certificates of insurance required to be procured by the Contractor pursuant to the Contract documents within thirty (30) calendar days after the date of receipt of the notice of award. Failure to fulfill these requirements within the specified time is cause for termination of the Contract under "Termination for Default" in Section 3.

IP 15. Conflicts of Interests and Gratuities

Proposers are prohibited from engaging in any practice that may be considered a conflict of interest under existing Agency policies and/or state law, and to refrain from participating in any gifts, favors or other forms of compensation that may be viewed as a gratuity in accordance with existing policies and laws.

IP 16. Agency-Specific Provisions

Not applicable.

SECTION 3: GENERAL CONDITIONS

GC 1. Definitions

The following are definitions of special terms used in this document:

Agency: Shasta Regional Transportation Agency

Authorized Signer: The person who is executing this Contract on behalf of the Contractor and who is authorized to bind the Contractor.

Best and Final Offer (BAFO): The last Proposal made by a Proposer. If a BAFO is not specifically requested by the Agency, or if the Proposer does not promptly respond to a request for a BAFO, then the most recent, current Proposal is the BAFO.

Class 1 Failure (physical safety): A failure that could lead directly to passenger or operator injury and represents a severe crash situation.

Class 2 Failure (road call): A failure resulting in an en route interruption of revenue service. Service is discontinued until the bus is replaced or repaired at the point of failure.

Competitive Range: The range of proposals that are identified as the most highly rated, unless the range is further reduced for purposes of efficiency.

Contract: The Proposal and its acceptance by the Agency as manifested by the Contract documents specified in "Section 10: Contract."

Project Manager: The person who is executing this Contract on behalf of the Agency and who has complete and final authority except as limited herein.

Contractor: The successful Proposer who is awarded a Contract for providing all buses and equipment described in the Contract documents.

Days: Calendar days, unless otherwise stated.

Defect: Patent or latent malfunction or failure in manufacture, installation or design of any component or subsystem.

Deviation: Variance from a requirement or specification that does not alter the basis of a Contract or adversely affects its performance.

Due Date: The date and time by which Proposals must be received by the Agency as specified in "Section 1: Notice of Request for Proposals."

Extended Warranty: A warranty available for purchase above the standard warranty.

Fatigue Failure (Corrosion Fatigue): The mechanical degradation of a material under the joint action of corrosion and cyclic loading.

Pass-Through Warranty: A warranty provided by the Contractor but administered directly with the component Supplier.

Proposal: A promise, if accepted, to deliver equipment and services according to the underlying solicitation of the Agency documented using the prescribed form in the solicitation, including any Proposal or BAFO.

Proposer: A legal entity that makes a Proposal.

Related Defect: Damage inflicted on any component or subsystem as a direct result of a separate Defect.

Solicitation: An Agency's request for proposals.

Superior Warranty: A warranty still in effect after all contractually required warranties have expired. The remaining warranty is administered directly between the Sub-Supplier and the Agency.

Supplier: Any manufacturer, company or Agency providing units, components or subassemblies for inclusion in the bus that are installed by the Contractor. Supplier items shall require qualification by type and acceptance tests in accordance with requirements defined in "Section 8: Quality Assurance."

Subcontractor: Any manufacturer, company or Agency providing units, components or subassemblies for inclusion in the bus that are installed by a Subcontractor. Subcontractor items shall require qualification by type and acceptance tests in accordance with requirements defined in "Section 8: Quality Assurance."

Work: Any and all labor, supervision, services, materials, machinery, equipment, tools, supplies and facilities called for by the Contract and necessary to the completion thereof.

GC 2. Materials and Workmanship

The Contractor shall be responsible for all materials and workmanship in the construction of the bus and all accessories used, whether the same are manufactured by the Contractor or purchased from a Supplier. This provision excludes any equipment leased or supplied by the Agency, except insofar as such equipment is damaged by the failure of a part or component for which the Contractor is responsible, or except insofar as the damage to such equipment is caused by the Contractor during the manufacture of the buses.

GC 3. Conformance with Specifications and Drawings

Materials furnished and Work performed by the Contractor shall conform to the requirements of the Technical Specifications and other Contract documents. Notwithstanding the provision of drawings, technical specifications or other data by the Agency, the Contractor shall have the responsibility of supplying all parts and details required to make the bus complete and ready for service even though such details may not be specifically mentioned in the drawings and specifications. Items that are installed by the Agency shall not be the responsibility of the Contractor unless they are included in this Contract.

Omissions from the Contract specifications, or the inaccurate description of details of Work that are manifestly necessary to carry out the intent of the Contract specifications, or that are customarily performed, shall not relieve the Contractor from performing such omitted Work or inaccurately described details of the Work, and they shall be performed as if fully and correctly set forth and described.

GC 4. Inspection, Testing, and Acceptance

GC 4.1 General

The Agency or its relevant subcontractor(s) shall at all times have access to the Work, the Contractor and, through the Contractor, its Suppliers. The Contractor and its Suppliers shall furnish every reasonable facility for ascertaining that the materials and the workmanship are in accordance with the requirements of the Contract Documents. All Work done shall be subject to the Agency's inspection and approval in accordance with the approved Work products developed as a result of the Contract Documents.

Pre-delivery tests and inspections shall be performed at the Contractor's plant; they shall be performed in accordance with the procedures defined in "Section 8: Quality Assurance"; and they may be witnessed by the Agency or its subcontractor(s). A vehicle cannot be released for delivery until the Agency confirms that the vehicle has passed applicable pre-delivery tests and inspections.

Within thirty (30) calendar days after arrival at the designated point of delivery, the bus shall undergo the Agency tests defined in "Post-Delivery Tests." If the bus passes these tests or if the Agency does not notify the Contractor of non-acceptance within 30 calendar days after delivery, then acceptance of the bus by the Agency occurs on the 31st day after delivery. If the bus fails these tests, it shall not be accepted until the repair procedures defined in "Repairs after Non-Acceptance" have been carried out and the bus retested until it passes. Acceptance occurs earlier if the Agency notifies the Contractor of early acceptance or places the bus in revenue service.

GC 4.2 Risk of Loss

The Agency shall assume risk of loss of the bus on delivery, as defined in "Bus Delivery." Prior to this delivery, the Contractor shall have risk of loss of the bus, including any damages sustained during the delivery regardless of the status of title or any payments related to the bus. Drivers shall keep a maintenance log en route, and it shall be delivered to the Agency with the bus. If the bus is released back to the Contractor for any reason, then the Contractor has the risk of loss upon such release.

GC 5. Title and Warranty of Title

Adequate documents for registering the bus in Shasta County, California shall be provided to the Agency not fewer than 10 business days before delivery to the Agency. Upon acceptance of each bus, the Contractor warrants that the title shall pass to the Agency free and clear of all encumbrances.

GC 6. Intellectual Property Warranty

The Agency shall advise the Contractor of any impending patent suit related to this Contract against the Agency and provide all information available. The Contractor shall defend any suit or proceeding brought against the Agency based on a claim that any equipment, or any part thereof, furnished under this Contract constitutes an infringement of any patent, and the Contractor shall pay all damages and costs awarded therein, excluding incidental and consequential damages against the Agency. In case said equipment, or any part thereof, is in such suit held to constitute infringement and use of said equipment or parts is enjoined, the Contractor shall, at its own expense and at its option, either procure for the Agency the right to continue using said equipment or part, or replace same with non-infringing equipment, or modify it so it becomes non-infringing.

The Contractor's obligations under this section are discharged and the Agency shall hold the Contractor harmless with respect to the equipment or part if it was specified by the Agency and all requests for

substitutes were rejected, and the Contractor advised the Agency under “Questions, Clarifications and Omissions” of a potential infringement, in which case the Contractor shall be held harmless.

GC 7. Data Rights

GC 7.1 Proprietary Rights/Rights in Data

The term “subject data” used in this clause means recorded information, whether or not copyrighted, that is delivered or specified to be delivered under the Contract. It includes the proprietary rights of the following:

- Shop drawings and working drawings
- Technical data including manuals or instruction materials, computer or microprocessor software
- Patented materials, equipment, devices or processes
- License requirements

The Agency shall protect proprietary information provided by the Contractor to the fullest extent of the law. The Contractor shall grant a non-exclusive license to allow the Agency to utilize such information in order to maintain the vehicles. In the event that the Contractor no longer provides the information, the Agency has the right to reverse-engineer patented parts and software.

The Agency reserves a royalty-free, non-exclusive and irrevocable license to reproduce, publish or otherwise use, and to authorize others to use, the following subject data for its purposes: (1) any subject data required to be developed and first produced in the performance of the Contract and specifically paid for as such under the Contract, whether or not a copyright has been obtained; and (2) any rights of copyright to which the Contractor, Subcontractor or Supplier purchases ownership for the purpose of performance of the Contract and specifically paid for as such under the Contract. The Contractor agrees to include the requirements of this clause, modified as necessary to identify the affected parties, in each subcontract and supply order placed under the Contract.

GC 7.2 Access to Onboard Operational Data

The Agency grants to the Contractor the right to inspect, examine, download, and otherwise obtain any information or data available from components provided by the Contractor, including but not limited to any electronic control modules or other data-collection devices, to the extent necessary to enable the Contractor to perform reliability maintenance analysis, corrective action and/or other engineering type Work for the bus. This right expressly excludes access to information or data collected on any equipment not provided and installed by the Contractor.

GC 8. Changes

GC 8.1 Contractor Changes

Any proposed change in this Contract shall be submitted to the Agency for its prior approval. Oral change orders are not permitted. No change in this Contract shall be made without the prior written approval of the Project Manager. The Contractor shall be liable for all costs resulting from, and/or for satisfactorily correcting, any specification change not properly ordered by written modification to the Contract and signed by the Project Manager.

GC 8.2 Agency Changes

The Agency may obtain changes to the Contract by notifying the Contractor in writing. As soon as reasonably possible but no later than thirty (30) calendar days after receipt of the written change order to modify the

Contract, the Contractor shall submit to the Project Manager a detailed price and schedule Proposal for the Work to be performed. This Proposal shall be accepted or modified by negotiations between the Contractor and the Project Manager. At that time, a detailed modification shall be executed in writing by both parties. Disagreements that cannot be resolved within negotiations shall be resolved in accordance with “Disputes,” below. Regardless of any disputes, the Contractor shall proceed with the Work ordered.

GC 9. Legal Clauses

GC 9.1 Indemnification

GC 9.1.1 The Contractor shall, to the extent permitted by law: (1) protect, indemnify and save the Agency and its officers, employees and agents, including consultants, harmless from and against any and all liabilities, damages, claims, demands, liens, encumbrances, judgments, awards, losses, costs, expenses and suits or actions or proceedings, including reasonable expenses, costs and attorneys’ fees incurred by the Agency and its officers, employees and agents, including consultants, in the defense, settlement or satisfaction thereof, for any injury, death, loss or damage to persons or property of any kind whatsoever, arising out of or resulting from the intentional misconduct or negligent acts, errors or omissions of the Contractor in the performance of the Contract, including intentional misconduct, negligent acts, errors or omissions of its officers, employees, servants, agents, Subcontractors and Suppliers; and (2) upon receipt of notice and if given authority, shall settle at its own expense or undertake at its own expense the defense of any such suit, action or proceeding, including appeals, against the Agency and its officers, employees and agents, including consultants, relating to such injury, death, loss or damage. Each party shall promptly notify the other in writing of the notice or assertion of such claim, demand, lien, encumbrance, judgment, award, suit, action or other proceeding hereunder. The Contractor shall have sole charge and direction of the defense of such suit, action or proceeding. The Agency shall not make any admission that might be materially prejudicial to the Contractor unless the Contractor has failed to take over the conduct of any negotiations or defense within a reasonable time after receipt of the notice and authority above provided. The Agency shall at the request of the Contractor furnish to the Contractor all reasonable assistance that may be necessary for the purpose of defending such suit, action or proceeding, and shall be repaid all reasonable costs incurred in doing so. The Agency shall have the right to be represented therein by advisory council of its own selection at its own expense.

GC 9.1.2 The obligations of the Contractor under the above paragraph shall not extend to circumstances where the injury, death or damages are caused solely by the negligent acts, errors or omissions of the Agency, its officers, employees, agents or consultants, including, without limitation, negligence in: (1) the preparation of the Contract documents, or (2) the giving of directions or instructions with respect to the requirements of the Contract by written order. The obligations of the Contractor shall not extend to circumstances where the injury, death or damages are caused, in whole or in part, by the negligence of any third-party operator, not including an assignee or Subcontractor of the Contractor, subject to the right of contribution. In case of joint or concurrent negligence of the parties giving rise to a claim or loss against either one or both, each shall have full rights of contribution from the other.

GC 9.2 Suspension of Work

GC 9.2.1 The Agency may at any time and for any reason within its sole discretion issue a written order to the Contractor suspending, delaying or interrupting all or any part of the Work for a specified period of time.

GC 9.2.2 The Contractor shall comply immediately with any such written order and take all reasonable steps to minimize costs allocable to the Work covered by the suspension during the period of work stoppage. Contractor shall continue the Work that is not included in the suspension and shall continue such ancillary

activities as are not suspended. The Contractor shall resume performance of the suspended Work upon expiration of the notice of suspension, or upon direction from the Agency.

GC 9.2.3 The Contractor shall be allowed an equitable adjustment in the Contract price (excluding profit) and/or an extension of the Contract time, to the extent that cost or delays are shown by the Contractor to be directly attributable to any suspension. However, no adjustment shall be made under this section for any suspension, delay or interruption due to the fault or negligence of the Contractor, or for which an equitable adjustment is provided for, or excluded under any other term or condition of the Contract. As soon as reasonably possible but no later than forty-five (45) calendar days, or any other period of time agreed to by the parties, after receipt of the written suspension of work notice, the Contractor shall submit to the Project Manager a detailed price and schedule Proposal for the suspension, delay or interruption.

GC 9.3 Excusable Delays/Force Majeure

GC 9.3.1 If the Contractor is delayed at any time during the progress of the Work by the neglect or failure of the Agency or by a cause as described below, then the time for completion and/or affected delivery date(s) shall be extended by the Agency subject to the following cumulative conditions:

- a. The cause of the delay arises after the Notice of Award and neither was nor could have been anticipated by the Contractor by reasonable investigation before such award. Such cause may also include force majeure events such as any event or circumstance beyond the reasonable control of the Contractor, including but not limited to acts of God; earthquake, flood and any other natural disaster; civil disturbance, strikes and labor disputes; fires and explosions; war and other hostilities; embargo; or failure of third parties, including Suppliers or Subcontractors, to perform their obligations to the Contractor;
- b. The Contractor demonstrates that the completion of the Work and/or any affected deliveries will be actually and necessarily delayed;
- c. The Contractor has taken measures to avoid and/or mitigate the delay by the exercise of all reasonable precautions, efforts and measures, whether before or after the occurrence of the cause of delay; and
- d. The Contractor makes written request and provides other information to the Agency as described in paragraph GC 9.3.4 below.

A delay in meeting all the conditions of this section shall be deemed an excusable delay. Any concurrent delay that does not constitute an excusable delay shall not be the sole basis for denying a request hereunder.

GC 9.3.2 None of the above shall relieve the Contractor of any liability for the payment of any liquidated damages owing from a failure to complete the Work by the time for completion that the Contractor is required to pay pursuant to "Liquidated Damages for Late Delivery of the Bus" for delays occurring prior to, or subsequent to the occurrence of an excusable delay.

GC 9.3.3 The Agency reserves the right to rescind or shorten any extension previously granted, if subsequently the Agency determines that any information provided by the Contractor in support of a request for an extension of time was erroneous; provided, however, that such information or facts, if known, would have resulted in a denial of the request for an excusable delay. Notwithstanding the above, the Agency will not rescind or shorten any extension previously granted if the Contractor acted in reliance upon the granting of such extension and such extension was based on information that, although later found to have been erroneous, was submitted in good faith by the Contractor.

GC 9.3.4 No extension or adjustment of time shall be granted unless: (1) written notice of the delay is filed with the Agency within fourteen (14) calendar days after the commencement of the delay and (2) a written application therefore, stating in reasonable detail the causes, the effect to date and the probable future effect on the performance of the Contractor under the Contract, and the portion or portions of the Work affected, is filed by the Contractor with the Agency within thirty (30) calendar days after the commencement of the delay. No such extension or adjustment shall be deemed a waiver of the rights of either party under this Contract. The Agency shall make its determination within thirty (30) calendar days after receipt of the application.

GC 9.4 Termination

GC 9.4.1 Termination for Convenience

The performance of Work under this Contract may be terminated by the Agency in accordance with this clause in whole, or from time to time in part, whenever the Project Manager shall determine that such termination is in the best interest of the Agency. Any such termination shall be effected by delivery to the Contractor of a notice of termination specifying the extent to which performance of Work under the Contract is terminated, and the date upon which such termination becomes effective.

After receipt of a notice of termination, and except as otherwise directed by the Project Manager, the Contractor shall do the following:

- Stop Work under the Contract on the date and to the extent specified in the notice of termination.
- Place no further orders or subcontracts for materials, services or facilities, except as may be necessary for completion of such portion of the Work under the Contract as is not terminated.
- Terminate all orders and subcontracts to the extent that they relate to the performance of work terminated by the notice of termination; assign to the Agency in the manner, at the times, and to the extent directed by the Project Manager, all of the right, title and interest of the Contractor under the orders and subcontracts so terminated, in which case the Agency shall have the right, in its discretion, to settle or pay any or all claims arising out of the termination of such orders and subcontracts.
- Settle all outstanding liabilities and all claims arising out of such termination of orders and subcontracts, with the approval or ratification of the Project Manager, to the extent he or she may require, which approval or ratification shall be final for all the purposes of this clause.
- Transfer title to the Agency and deliver in the manner, at the times and to the extent, if any, directed by the Project Manager the fabricated or unfabricated parts, Work in process, completed Work, supplies and other material produced as part of, or acquired in connection with the performance of, the Work terminated, and the completed or partially completed plans, drawings, information and other property which, if the Contract had been completed, would have been required to be furnished to the Agency.
- Use its best efforts to sell, in the manner, at the times, to the extent, and at the price(s) directed or authorized by the Project Manager, any property of the types referred to above, provided, however, that the Contractor shall not be required to extend credit to any purchaser, and may acquire any such property under the conditions prescribed by and at prices approved by the Project Manager, and provided further that the proceeds of any such transfer or disposition shall be applied in reduction of any payments to be made by the Agency to the Contractor under this Contract or shall otherwise be credited to the price or cost of the Work covered by this Contract or paid in such other manner as the Project Manager may direct.
- Complete performance of such part of the Work as shall not have been terminated by the notice of termination.

- Take such action as may be necessary, or as the Project Manager may direct, for the protection or preservation of the property related to this Contract that is in the possession of the Contractor and in which the Agency has or may acquire an interest.

The Contractor shall be paid its costs, including Contract closeout costs, and profit on Work performed up to the time of termination. The Contractor shall promptly submit its termination claim to the Agency to be paid the Contractor. Settlement of claims by the Contractor under this termination for convenience clause shall be in accordance with the provisions set forth in Part 49 of the Federal Acquisition Regulations (48 CFR 49) except that wherever the word "Government" appears, it shall be deleted and the word "Agency" shall be substituted in lieu thereof.

GC 9.4.2 Termination for Default

The Agency may, by written notice of default to the Contractor, terminate the whole or any part of this Contract if the Contractor fails to make delivery of the supplies or to perform the services within the time specified herein or any extension thereof; or if the Contractor fails to perform any of the other material provisions of the Contract, or so fails to make progress as to endanger performance of this Contract in accordance with its terms, and in either of these two circumstances does not cure such failure within a period of ten (10) business days, or such longer period as the Project Manager may authorize in writing, after receipt of notice from the Project Manager specifying such failure.

If the Contract is terminated in whole or in part for default, the Agency may procure, upon such terms and in such manner as the Project Manager may deem appropriate, supplies or services similar to those so terminated. The Contractor shall be liable to the Agency for any excess costs for such similar supplies or services and shall continue the performance of this Contract to the extent not terminated under the provisions of this clause.

Except with respect to defaults of Subcontractors, the Contractor shall not be liable for any excess costs if the failure to perform the Contract arises out of a cause beyond the control and without the fault or negligence of the Contractor. If the failure to perform is caused by the default of a Subcontractor, and if such default arises out of causes beyond the control of both the Contractor and Subcontractor, and without the fault or negligence of either of them, then the Contractor shall not be liable for any excess costs for failure to perform, unless the supplies or services to be furnished by the Subcontractor were obtainable from other sources and in sufficient time to permit the Contractor to meet the required delivery schedule.

Payment for completed supplies delivered to and accepted by the Agency shall be at the Contract price. The Agency may withhold from amounts otherwise due the Contractor for such completed supplies such sum as the Project Manager determines to be necessary to protect the Agency against loss because of outstanding liens or claims of former lienholders.

If, after notice of termination of this Contract under the provisions of this clause, it is determined for any reason that the Contractor was not in default under the provisions of this clause, or that the default was excusable under the provisions of this clause, then the rights and obligations of the parties shall be the same as if the notice of termination had been issued pursuant to termination for convenience of the Agency.

GC 9.5 Compliance with Laws and Regulations

The Contractor shall at all times comply with all applicable laws, regulations, policies, procedures and directives (together, the "Law"), including without limitation all contractual provisions required by the State of California Department of Transportation ("Caltrans" or "Department") as set forth in Master Agreement

No. 64SRTAMA, including those listed directly or by reference in said agreement between the Agency and Caltrans that funds this Contract. Contractor's failure to so comply shall constitute a material breach of this Contract.

GC 9.6 Changes of Law

Changes of Law that become effective after the Proposal due date may result in price changes. If a price adjustment is indicated, either upward or downward, it shall be negotiated between the Agency and the Contractor, and the final Contract price will be adjusted upward or downward to reflect such changes in Law. Such price adjustment may be audited, where required.

GC 9.7 Governing Law and Choice of Forum

This Contract shall be governed by the laws of California without regard to conflict of law rules. The Contractor consents to the jurisdiction of the identified state, County of Shasta.

GC 9.8 Disputes

Except as otherwise provided in this Contract, any dispute concerning a question of fact arising under or related to this Contract that is not disposed of by agreement shall be decided in accordance with the following steps. However, by mutual agreement the matter may be taken immediately to any higher step in the dispute resolution process, or a mutually agreed-to alternative dispute resolution process (which may include structured negotiations, mediation or arbitration) or litigation. Pending final resolution of a dispute hereunder, the Contractor shall proceed diligently with the performance of the Contract and in accordance with the Project Manager's or Executive Director's decision, as the case may be.

1. **Notice of dispute.** All disputes shall be initiated through a written dispute notice submitted by either party to the other party within ten (10) calendar days of the determination of the dispute.
2. **Negotiation between Project Managers.** The parties shall attempt in good faith to resolve any dispute arising out of or relating to this Contract promptly by negotiation between executives who have authority to settle the controversy and who are at a higher level of management than the people with direct responsibility for administration of this Contract. Any party may give the other party written notice of any dispute not resolved in the normal course of business as provided in paragraph 1 above. Within fourteen (14) calendar days after delivery of the dispute notice, the receiving party shall submit to the other party a written response. The dispute notice and written response shall include (a) a statement of the party's position and a summary of the arguments supporting that position, (b) any evidence supporting the party's position and (c) the name of the executive who will represent that party and of any others who will accompany the executive in negotiations. Within twenty-eight (28) calendar days after delivery of the dispute notice, the Project Manager of both parties shall meet at a mutually acceptable time and place, and thereafter as they reasonably deem necessary to attempt to resolve the dispute. All reasonable requests for information by one party to the other shall be honored.

If the matter has not been resolved by these people within forty-two (42) calendar days of the dispute notice, then the dispute may be referred to more senior executives of both parties who have authority to settle the dispute and who shall likewise meet to attempt to resolve the dispute.

3. **Executive Director's decision.** Should the dispute not be resolved by negotiation between Project Managers, as provided in paragraph 2 above, the Agency's Project Manager from paragraph 2 above

shall submit a written request for decision to the Agency's Executive Director (ED) along with all documentation and minutes from the negotiations. The Executive Director shall issue a written decision within fourteen (14) days of receipt of a request.

- A. For disputes involving \$50,000 or less, the decision of the ED shall be administratively final and conclusive. For disputes involving \$50,000 or less, it is the intent of the parties that such administratively final and conclusive decision pursuant to either this paragraph or paragraph 4 shall be overturned only if determined by a court of competent jurisdiction to be fraudulent, arbitrary, capricious, unsupported by the evidence or so grossly erroneous as to imply bad faith. For disputes greater than \$50,000, the decision of the ED shall be administratively final and conclusive unless, within thirty (30) days from the date of delivery of the written decision, the Contractor appeals the decision in writing to the Agency's Executive Director or designee, who shall render a written decision within fourteen (14) days of delivery of such written appeal. Such decision by the Executive Director or his or her designee shall be administratively final and conclusive.
 - B. Within thirty (30) days of the issuance of any administratively final and conclusive decision under this paragraph, the Contractor shall notify the Agency in writing of the Contractor's agreement with the final decision. Failure to provide such written notice of agreement shall indicate an intent by the Contractor to litigate the claim.
 - C. Any dispute that is not resolved by the parties through the operation of the provisions of this paragraph, or any mutually agreed-upon alternative dispute resolution process pursuant to paragraph 4, may be submitted to any court in California.
 - D. Pending final resolution of a dispute hereunder, the Contractor shall proceed diligently with the performance of its obligations under the Contract in accordance with the written directions of the Agency.
4. **Alternative dispute resolution.** If agreed to by both parties, disputes may be resolved by a mutually agreed-to alternative dispute resolution process that may include structured negotiations different from paragraph 2 above, mediation or arbitration.
5. **Arbitration.** Disputes appealed to arbitration involving more than \$50,000 but less than \$250,000 shall be decided by a qualified and disinterested arbitrator, selected through the American Arbitration Association and mutually agreed to by both parties. The arbitrator shall conduct all proceedings in accordance with the rules of the American Arbitration Association and shall consider the Contract, equity, the prevailing law and established commercial practices in rendering a decision.

Disputes appealed to arbitration involving \$250,000 or more shall be decided by three (3) qualified and disinterested arbitrators selected through the American Arbitration Association. One arbitrator shall be selected by each of the parties, and the two selected arbitrators shall select a third arbitrator within ten (10) calendar days of their selection. The arbitrators shall conduct all proceedings in accordance with the rules of the American Arbitration Association and shall consider the Contract, equity, the prevailing law and established commercial practice in rendering a decision.

The decision of the arbitrators shall not be binding, and either party shall have the right to remedies provided by law.

GC 9.9 Maintenance of Records; Access by Agency; Right to Audit Records

The Contractor agrees to provide the Agency, the State of California, or any of their duly authorized representatives access to any books, documents, papers and records of the Contractor that are directly pertinent to or relate to this Contract (1) for the purpose of making audits, examinations, excerpts and transcriptions and (2) when conducting an audit and inspection.

1. In the event of a sole-source Contract, single Proposal, single responsive Proposal, or competitive negotiated procurement, the Contractor shall maintain and the Project Manager, Caltrans or the representatives thereof shall have the right to examine all books, records, documents and other cost and pricing data related to the Contract price, unless such pricing is based on adequate price competition, established catalog or market prices of commercial items sold in substantial quantities to the public, or prices set by law or regulation, or combinations thereof. Data related to the negotiation or performance of the Contract shall be made available for the purpose of evaluating the accuracy, completeness and currency of the cost or pricing data. The right of examination shall extend to all documents necessary for adequate evaluation of the cost or pricing data, along with the computations and projections used therein, including review of accounting principles and practices that properly reflect all direct and indirect costs anticipated for the performance of the Contract.
2. For Contract modifications or change orders, Caltrans, if applicable, or their representatives shall have the right to examine all books, records, documents and other cost and pricing data related to a Contract modification, unless such pricing is based on adequate price competition, established catalog or market prices of commercial items sold in substantial quantities to the public, or prices set by law or regulation, or combinations thereof. Data related to the negotiation or performance of the Contract modification or change order shall be made available for the purpose of evaluating the accuracy, completeness and currency of the cost or pricing data. The right of examination shall extend to all documents necessary for adequate evaluation of the cost or pricing data, along with the computations and projections used therein, either before or after execution of the Contract modification or change order for the purpose of conducting a cost analysis. If an examination made after execution of the Contract modification or change order reveals inaccurate, incomplete or out-of-date data, the Contracting Officer may renegotiate the Contract modification or change order price adjustment, and the Agency shall be entitled to any reductions in the price that would result from the application of accurate, complete or up-to-date data.

The requirements of this section are in addition to other audit, inspection and record-keeping provisions specified elsewhere in the Contract documents.

GC 9.10 Confidential Information

Access to government records is governed by the Public Records Act (Gov. Code Section 6254 et. seq.). Except as otherwise required by the Public Records Act (Gov. Code Section 6254 et. seq.), the Agency will exempt from disclosure proprietary information, trade secrets and confidential commercial and financial information submitted or disclosed during the Contract period. Any such proprietary information, trade secrets or confidential commercial and financial information that a Contractor believes should be exempted from disclosure shall be specifically identified and marked as such. Blanket-type identification by designating whole pages or sections as containing proprietary information, trade secrets or confidential commercial and financial information will not ensure confidentiality. The specific proprietary information, trade secrets or confidential commercial and financial information must be clearly identified as such.

Upon a request for records from a third party regarding the Contract, the Agency will notify the Contractor in writing. The Contractor must respond within twenty (20) days with the identification of any and all “proprietary, trade secret or confidential commercial or financial” information, and the Contractor shall indemnify the Agency’s defense costs associated with its refusal to produce such identified information; otherwise, the requested information may be released.

The Agency shall employ sound business practices no less diligent than those used for the Agency’s own confidential information to protect the confidence of all licensed technology, software, documentation, drawings, schematics, manuals, data and other information and material provided by the Contractor pursuant to the Contract that contain confidential commercial or financial information, trade secrets or proprietary information as defined in or pursuant to the Public Records Act (Gov. Code Section 6254 et. seq.) against disclosure of such information and material to third parties except as permitted by the Contract. The Contractor shall be responsible for ensuring that confidential commercial or financial information, trade secrets or proprietary information, with such determinations to be made by the Agency at its sole discretion, bears appropriate notices relating to its confidential character.

During the performance of the Work under the Contract, it may be necessary for either party (the “Discloser”) to make confidential information available to the other party (the “Recipient”). The Recipient agrees to use all such information solely for the performance of the Work under the Contract and to hold all such information in confidence and not to disclose same to any third party without the prior written consent of the Discloser. Likewise, the Recipient agrees that all information developed in connection with the Work under the Contract shall be used solely for the performance of the Work under the Contract, and shall be held in confidence and not disclosed to any third party without the prior written consent of the Discloser.

This Confidentiality section shall survive the termination or expiration of the Contract.

GC 9.11 Conflicts of Interest, Gratuities

No member, officer, or employee of the Agency or of a local public body during his or her tenure, or one year thereafter, shall have any interest, direct or indirect, in this Contract or the proceeds thereof.

GC 9.12 General Nondiscrimination Clause

In connection with the performance of Work provided for under this Contract, the Contractor agrees that it will not, on the grounds of race, religious creed, color, national origin, ancestry, physical disability, medical condition, marital status, sex, sexual orientation or age, discriminate or permit discrimination against any person or group of people in any manner prohibited by federal, state or local laws.

GC 9.13 Amendment and Waiver

GC 9.13.1 Amendment

Any modification or amendment of any provisions of any of the Contract documents shall be effective only if in writing, signed by authorized representatives of both the Agency and Contractor, and specifically referencing this Contract.

GC 9.13.2 Waiver

In the event that either party elects to waive its remedies for any breach by the other party of any covenant, term or condition of this Contract, such waiver shall not limit the waiving party’s remedies for any succeeding breach of that or of any other term, covenant or condition of this Contract.

GC 9.14 Remedies Not Exclusive

The rights and remedies of the Agency provided herein shall not be exclusive and are in addition to any other rights and remedies provided by law or under the Contract.

GC 9.15 Counterparts

This Contract may be executed in any number of counterparts. All such counterparts shall be deemed to constitute one and the same instrument, and each of said counterparts shall be deemed an original thereof.

GC 9.16 Severability

Whenever possible, each provision of the Contract shall be interpreted in a manner as to be effective and valid under applicable law. However, if any provision, or part of any provision, should be prohibited or invalid under applicable law, then such provision, or part of such provision, shall be ineffective to the extent of such prohibition or invalidity without invalidating the remainder of such provision or the remaining provisions of the Contract.

GC 9.17 Third-Party Beneficiaries

No provisions of the Contract shall in any way inure to the benefit of any third party, including the public at large, so as to constitute such person a third-party beneficiary of the Contract or of any one or more of the terms and conditions of the Contract or otherwise give rise to any cause of action in any person not a party to the Contract, except as expressly provided elsewhere in the Contract.

GC 9.18 Assignment of Contract

Neither party will assign or subcontract its rights or obligations under the Contract without prior written permission of the other party, and no such assignment or subcontract will be effective until approved in writing by the other party.

GC 9.19 Independent Parties

The Contractor is an independent contractor with respect to the performance of all Work hereunder, retaining control over the detail of its own operations, and the Contractor shall not be considered the agent, employee, partner, fiduciary or trustee of the Agency.

GC 9.20 Survival

The following sections shall survive the nominal expiration or discharge of other Contract obligations, and the Agency may obtain any remedy under law, Contract or equity to enforce the obligations of the Contractor that survive the manufacturing, warranty and final payment periods:

- “Intellectual Property Warranty”
- “Data Rights”
- “Indemnification”
- “Governing Law and Choice of Forum”
- “Disputes”
- “Confidential Information”
- “Parts Availability Guarantee”
- “Access to Records”
- “Training”

GC 10. Agency-Specific Provisions

GC 10.1 Master Agreement No. 64SRTAMA

The Contractor shall at all times comply with all applicable laws, regulations, policies, procedures and directives (together, the “Law”), including without limitation all contractual provisions required by the State of California Department of Transportation (“Caltrans” or “Department”) as set forth in Master Agreement No. 64SRTAMA, including those listed directly or by reference in said agreement between the Agency and Caltrans that funds this Contract. Contractor’s failure to so comply shall constitute a material breach of this Contract.

SECTION 4: SPECIAL PROVISIONS

SP 1. Inspection, Tests and Repairs

SP 1.1 Repair Performance

SP 1.1.1 Repairs by Contractor

After non-acceptance of a bus, the Contractor must begin Work within five (5) working days after receiving notification from the Agency of failure of acceptance tests. The Agency shall make the bus available to complete repairs timely with the Contractor repair schedule.

The Contractor shall provide, at its own expense, all spare parts, tools and space required to complete the repairs. At the Agency's option, the Contractor may be required to remove the bus from the Agency's property while repairs are being made. If the bus is removed from the Agency's property, then repair procedures must be diligently pursued by the Contractor's representatives, and the Contractor shall assume risk of loss while the bus is under its control.

SP 1.1.2 Repairs by the Agency

The Agency will not take responsibility to correct Defects, except to replace defective parts as instructed by the Contractor.

1. **Parts used.** If the Agency performs the repairs after non-acceptance of the bus, it shall correct or repair the Defect and any Related Defects using Contractor-specified parts available from its own stock or those supplied by the Contractor specifically for this repair. Reports of all repairs covered by this procedure shall be submitted by the Agency to the Contractor for reimbursement or replacement of parts monthly, or at a period to be mutually agreed upon. The Contractor shall provide forms for these reports.
2. **Contractor-supplied parts.** If the Contractor supplies parts for repairs being performed by the Agency after non-acceptance of the bus, then these parts shall be shipped prepaid to the Agency.
3. **Return of defective components.** The Contractor may request that parts covered by this provision be returned to the manufacturing plant. The total costs for this action shall be paid by the Contractor.
4. **Reimbursement for labor.** The Agency shall be reimbursed by the Contractor for labor. The amount shall be determined by the Agency for a qualified mechanic at a straight time wage rate of [insert amount per hour], which includes fringe benefits and overhead adjusted for the Agency's most recently published rate in effect at the time the Work is performed, plus the cost of towing in the bus, if such action was necessary. These wage and fringe benefits rates shall not exceed the rates in effect in the Agency's service garage at the time the Defect correction is made.
5. **Reimbursement for parts.** The Agency shall be reimbursed by the Contractor for defective parts that must be replaced to correct the Defect. The reimbursement shall include taxes where applicable and fifteen (15) percent handling costs.

SP 1.2 Pilot Bus

The Contractor shall produce one pilot vehicle for each type of vehicle with respect to the base order. This vehicle shall be one of the ultimate quantity of the base vehicle order. The pilot vehicle shall demonstrate that the vehicles fully meet all requirements of the Contract. The pilot vehicle shall be produced and delivered to the Agency for a minimum of seven (7) days prior to initiation of any production activities for the remaining vehicles unless otherwise authorized in writing by the Agency. In the event that noncompliance is identified,

the Agency shall to the extent practicable notify the Contractor of said noncompliance. No later than seven (7) days after the end of the 7-day test, the Agency shall issue a written report to the Contractor that advises the Contractor of any noncompliance issues and/or any proposed modifications or changes required on the remaining vehicles.

In the event that the pilot vehicle does not initially comply with all performance criteria contained in the Technical Specifications, the Agency shall have the right to retain a portion of any progress payment that may have been established for the pilot vehicle. The amount to be withheld shall be based on the lack of compliance and may equal up to the entire progress payment amount for the pilot vehicle. This amount shall be withheld until compliance is demonstrated. In the event that the compliance is subsequently determined to be impossible to achieve, the Agency may require all or a portion of the progress payment for the pilot vehicle to be forfeited as a penalty for the noncompliance. The amount of the penalty shall be negotiated by the parties.

SP 1.3 Configuration and Performance Approval

In order to assess the Contractor's compliance with the Technical Specifications, the Agency and the Contractor shall, at the Pre-Production Meeting, jointly develop a configuration and performance review document for review of the pilot vehicle. This document shall include appropriate performance standards for each test that is being required, and the document shall become part of the official record of the Pre-Production Meeting.

SP 1.4 First Article Inspection – Production

The purpose of a first article inspection is to confirm that any components, systems, subsystems, major assemblies, subassemblies, products, parts, apparatuses, articles and other materials comply with the Technical Specifications and other Contract documents.

Where required by the Contract documents or requested by the Agency, the Contractor shall cause first article inspections to be conducted. A first article inspection may include both a physical configuration inspection and a functional demonstration. First article inspections shall be conducted at the Contractor or Subcontractor's facility. The Contractor shall furnish to the Agency prior to each first article inspection a written inspection and demonstration plan for each item for review. The Agency's inspectors will attend each first article inspection unless the Agency provides a written waiver of its right to attend any such inspection. The results of each first article inspection shall be documented by the Contractor in a format deemed acceptable by the Agency, and all documents relating to the inspection shall be forwarded to the Agency.

SP 1.5 Post-Delivery Tests

The Agency will conduct acceptance tests on each delivered bus. These tests shall be completed within thirty (30) days after bus delivery and shall be conducted in accordance with written test plans. The purpose of these tests is to confirm that each bus fully complies with the Technical Specifications and to identify defects that have become apparent between the time of bus release and delivery to the Agency. The post-delivery tests shall include visual inspection and bus operations.

Buses that fail to pass the post-delivery tests are subject to non-acceptance. The Agency shall record details of all Defects on the appropriate test forms and shall notify the Contractor of acceptance or non-acceptance of each bus according to "Inspection, Testing and Acceptance" after completion of the tests. The Defects detected during these tests shall be repaired according to the procedures defined in "Repairs after Non-Acceptance."

SP 1.6 Repairs after Non-Acceptance

The Contractor, or its designated representative, shall perform the repairs after non-acceptance. If the Contractor fails or refuses to begin the repairs within five (5) days, then the Work may be done by the Agency's personnel with reimbursement by the Contractor.

SP 2. Deliveries

SP 2.1 Bus Delivery

Delivery of buses shall be determined by signed receipt of the Agency's designated agent(s), Shasta Regional Transportation Agency at 1255 East Street, Redding, CA 96001 or at an Agency designated agent's address, at the following point(s) of delivery and may be preceded by a cursory inspection of the bus: Redding Area Bus Authority (RABA) maintenance facility at 333 South Market Street, Redding, CA 96001; Sacramento Regional Transit (SacRT) vehicle storage yard at N and 29th Streets, Sacramento, CA 95811; Glenn Ride and Glenn County maintenance yard at 777 Colusa Street, Willows, CA 95988; or other Agency designated point of delivery address in northern California.

SP 2.2 Delivery Schedule

Buses may not be delivered prior to installation of charging equipment, and buses and installed chargers must be tested together prior to acceptance of either. The buses shall be delivered at a rate not to exceed two (2) buses per week. Delivery shall be completed within the timeframe described in the Contractor's proposed production and delivery schedule. Hours of delivery shall be between 9 AM and 3 PM PT on the following days of the week: Monday, Tuesday, Wednesday, or Thursday.

SP 2.3 Contract Deliverables

Contract deliverables associated with this Contract – beyond the seven (7) heavy-duty battery electric transit vehicles – are set forth in Table 1, along with other pertinent information. Contract deliverables shall be submitted in accordance with other sections of this RFP. Omissions of Contract deliverables described in other section of this RFP from Table 1, or the inaccurate description of details of deliverables that are manifestly necessary to carry out the intent of the Contract specifications, or that are customarily performed, shall not relieve the Contractor from delivering such omitted Contract deliverable.

Table 1
Contract Deliverables

Name/Description of Deliverable	Contractor Action	Agency Action	Quantities Required		
			Hardcopy Original	Hardcopy	Digital File
The following Deliverables Shall be Due Prior to Contract Execution					
Insurance Cert	Provide	Review	1		
Copy of Contractor's formal QA Program	Provide	Review		1	1
Crashworthiness	Provide	Review		1	1
Bonds, if applicable	Provide	Review	1		
The following Deliverables Shall be Due in Advance of or at the Pre-Production Meeting					
Template for MRL (Master Resolution List)	Provide	Review	1	1	1
Configuration and performance review document	Provide	Review			1

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Request for Change Order, if any	Provide	Review	1		1
Drawings of interior, exterior, dash, camera layout, seating layout	Provide	Review	1	1	1
Bill of Materials including Part Numbers	Provide	Review	1	1	1
List of Recommended Spare Parts	Provide	Review	1	1	1
Draft of Training Manuals and Curriculum	Provide	Review	1	1	1
Draft of Service Manuals & Parts Manuals	Provide	Review	1	1	1
List of Component Repair Manuals	Provide	Review	1	1	1
Draft Operators' Manuals	Provide	Review	1	1	1
Draft Preventative Maintenance Manuals	Provide	Review	1	1	1
Draft Diagnostic Procedures	Provide	Review	1	1	1
Draft Electrical & Pneumatic System Schematics	Provide	Review	1	1	1
Production Schedule by Workstation	Provide	Review	1	1	1
Vehicle Delivery Schedule	Provide	Review	1	1	1
Material Samples	Provide	Review	1		
The following Deliverables Shall Be Due Upon Delivery of the first Coach					
Training Classes	Provide	Attend			
Final Training Manuals and Materials	Provide	Review	1	As Req'd	1
Final Service Manuals & Parts Manuals	Provide	Review	1	12	1
Final Component Repair Manuals	Provide	Review	1	1	1
Final Operators' Manuals	Provide	Review	1	1	1
Final Preventative Maintenance Manuals	Provide	Review	1	12	1
Final Diagnostic Procedures	Provide	Review	1	1	1
Final Electrical & Pneumatic System Schematics	Provide	Review	1	1	1
As-Built Drawings	Provide	Review		1	1
Field Service Support Technician (if purchased by Agency)	Provide	Receive			
Spare Components (If purchased by Agency)	Provide	Receive		Lot	
Diagnostic Equipment	Provide	Receive		Lot	
The following Deliverables Shall Be Due Upon Delivery of each Coach					
Inspection Punch-list	Correct	Provide	1	1	1
In-Plant QA/QC Records	Provide	Review	1	1	1
Component serial numbers	Provide	Review	1	1	1
Driver's log and incident report (If drive-away service is used)	Provide	Review	1	1	1
Coach Documentation for Registration	Provide	Registration	1	1	1
Revised MRL and RFCO's	Provide	Review	1	1	1

If Contractor is Providing EVSE, then the Following Shall Be Due 60 Days Prior to Delivery of Any Coach					
Charging Equipment	Deliver	Receive		Lot	
Charging Equipment Service Manuals and Parts Manuals	Provide	Receive	1	7	1
Charging Equipment Maintenance Manual	Provide	Receive	1	7	1
Charging Equipment Operators' Manual	Provide	Receive	1	7	1
Additional Deliverables and Due Dates are Listed Below if Applicable to Contract					
Conceptual Design & Site Plan at all 3 Charging Locations			Due 30 days after contract execution		
Engineering Design & Detailed Site Plan for all 3 Charging Locations			Due 60 days after contract execution		
Chargers Commissioned			Due at Location Prior to Delivery of Any Coach to Location		

SP 3. Options and Option Pricing

The Contractor hereby grants the Agency and any permissible assignee options ("Options") to purchase up to twenty (20) additional vehicles ("Option Vehicles"). The Options shall be valid for a period of five years from the effective date of the Contract. There shall be no minimum order quantity for any permissible assignee. Subject to the Agency's right to order modifications, the Option Vehicles shall have the same specifications as the vehicles purchased under this Contract. The Agency may exercise the Options by written notice to the Contractor ("Notice of Exercise of Option") at any time on or before five years following the effective date of the Contract ("Option Date").

The price of the Option Vehicles shall be the unit price of the base order vehicles, ("Base Order Price") adjusted by multiplying the base order price by the following fraction:

$$\frac{\text{Latest Published Preliminary Index Number Prior to Notice of Exercise of Option}}{\text{Index Number on Effective Date of the Contract}}$$

The Index shall be the Producer Price Index for Truck and Bus Bodies, Series No. 1413, published by the United States Department of Labor, Bureau of Labor Statistics, or if such Index is no longer in use, then such replacement that is most comparable to the Index as may be designated by the Bureau of Labor Statistics, or as agreed by the parties.

Within thirty (30) days after delivery of the Notice of Exercise of Option to the Contractor, the Contractor shall submit a proposed delivery schedule. Along with the proposed delivery schedule, the Contractor will provide the Agency with access to its production schedule for the purpose of the parties verifying available production capacity. The production schedule shall include a reasonable time for mobilization and for coordinating with other vehicle orders, and it shall be based upon a production rate at least equal to the production rate actually realized with respect to the base order vehicles. If the parties are unable to agree on a production schedule, then the maximum term for the production of the Option Vehicles shall not exceed a total of twelve (12) months after the date of Notice to Proceed with Option Vehicle production. The Agency or any permissible assignee may issue a Notice to Proceed at any time after the Contractor submits its proposed delivery schedule. The Contractor shall not commence production of the Option Vehicles prior to issuance of the Notice to Proceed by the Agency or any permissible assignee of the Agency for the Option Vehicles incorporating the agreed production delivery schedule or the twelve (12)-month maximum term.

Except as otherwise specially provided in this Contract, all other terms of the Contract shall apply to the Option Vehicles.

SP 4. Assignability of Options

If the Agency does not exercise the option(s) as listed in “Options and Option Pricing,” then the Agency reserves the right to assign the option(s) to other grantees of California State Transportation Agency Transit and Intercity Rail Capital Program funds or other Caltrans funding programs.

SP 5. Payment

The Agency shall pay and the Contractor shall accept the amounts set forth in the price schedule as full compensation for all costs and expenses of completing the Work in accordance with the Contract, including but not limited to all labor, equipment and material required; overhead; expenses; storage and shipping; risks and obligations; taxes (as applicable); fees and profit; and any unforeseen costs.

SP 5.1 Payment Terms

Payment upon Acceptance with Retention

All payments shall be made as provided herein, less a retention of 20% plus any additional amount retained as provided below and less any amounts for liquidated damages in accordance with “Liquidated Damages for Late Delivery of the Bus.”

Buses may not be delivered prior to installation of charging equipment, and buses and installed chargers must be tested together prior to acceptance of either.

The Agency shall make payments less a retention for buses at the unit prices itemized in the price schedule within 30 calendar days after the delivery and acceptance of each bus and receipt of a proper invoice.

The Agency shall make payments less a retention for spare parts and/or equipment at the unit prices itemized in the price schedule within 30 calendar days after the delivery and acceptance of said spare parts and/or equipment and receipt of a proper invoice.

The Agency shall make payments less a retention for maintenance and operator staff training at the unit prices itemized in the price schedule within 30 calendar days after the delivery and acceptance of said maintenance and operator staff training and receipt of a proper invoice.

The Agency shall make payments less a retention for optional charging equipment at the unit prices itemized in the price schedule within 30 calendar days after the delivery and acceptance of said charging equipment and receipt of a proper invoice.

The Agency shall make payments less a retention for optional design, delivery, installation and commissioning of charging equipment at the unit prices itemized in the price schedule within 30 calendar days after the delivery and acceptance of said design, delivery, installation and commissioning and receipt of a proper invoice.

The Agency shall make a final payment for all retained funds within 60 calendar days of receipt of a final proper invoice and the following:

1. Delivery and acceptance of all Contract deliverables, including manuals and other documentation required by the Contract, excluding training.
2. Contractor provision of any certifications as required by law and/or regulations.
3. Completion of post-delivery audits required under the Contract.

SP 5.2 Performance Guarantee

The Contractor shall furnish, at its own expense, performance guarantee in the form of a cashier's check, a letter of credit in a form approved by the Agency before Proposal submission, or a performance bond from a surety duly licensed to do business in the state of California having a financial rating from A.M. Best Company of "A VIII" or better, in the amount of \$4,000,000 where there are no progress payments and payment is made upon delivery and acceptance; or in the case of progress payments set at the Agency's financial exposure for cumulative payments. The bond shall cover all of the Contractor's obligations under the Contract except for the warranty and shall remain in force until said obligations have been fulfilled. The bond amount may be reduced as follows:

1. To sixty-five (65) percent of the original amount when fifty (50) percent of the required number of buses are delivered and accepted;
2. To thirty (30) percent of the original amount when seventy-five (75) percent of the required number of buses are delivered and accepted; and
3. To zero (0) percent of the original amount when one hundred (100) percent of the required number of buses are delivered and accepted.

In the case that a surety becomes insolvent, its license is revoked or suspended, or in the case of a surety approved on the basis that it is listed as an approved federal surety and such federal approval is revoked or suspended, the Contractor, within five (5) days after notice by the Agency, shall substitute other and sufficient surety or sureties. If the Contractor fails to do so, such failure shall be an event of default.

SP 5.3 Payment of Taxes

Unless otherwise provided in this Contract, the Contractor shall pay all federal, state and local taxes, and duties applicable to and assessable against any Work, goods, services, processes and operations incidental to or involved in the Contract, including but not limited to retail sales and use, transportation, export, import, business and special taxes. The Contractor is responsible for ascertaining and paying the taxes when due. The total Contract price shall include compensation for all taxes the Contractor is required to pay by laws in effect on the Proposal Due Date. The Contractor will maintain auditable records, subject to the Agency reviews, confirming that tax payments are current at all times.

SP 6. Liquidated Damages for Late Delivery of the Bus

It is mutually understood and agreed by and between the parties to the Contract that time is of the essence with respect to the completion of the Work and that in case of any failure on the part of the Contractor to deliver the buses within the time specified in "Delivery Schedule," except for any excusable delays as provided in "Excusable Delays/Force Majeure" or any extension thereof, the Agency will be damaged thereby. The amount of said damages, being difficult if not impossible of definite ascertainment and proof, it is hereby agreed that the amount of such damages due to the Agency shall be fixed at \$8,800 per calendar day per bus not delivered and accepted by the Agency.

The Contractor hereby agrees to pay the aforementioned amounts as fixed, agreed and liquidated damages, and not by way of penalty, to the Agency and further authorizes the Agency to deduct the amount of the damages from money due the Contractor under the Contract, computed as aforesaid. If the money due the Contractor is insufficient or no money is due the Contractor, then the Contractor shall pay the Agency the difference or the entire amount, whichever may be the case, within thirty (30) days after receipt of a written demand by the Project Manager.

The payment of aforesaid fixed, agreed and liquidated damages shall be in lieu of any damages for any loss of profit, loss of revenue, loss of use, or for any other direct, indirect, special or consequential losses or damages of any kind whatsoever that may be suffered by the Agency arising at any time from the failure of the Contractor to fulfill the obligations referenced in this clause in a timely manner.

SP 7. Service and Parts

SP 7.1 Contractor Service and Parts Support

The Contractor shall state on the form Contractor Service and Parts Support Data the representatives responsible for assisting the Agency, as well as the location of the nearest distribution center, which shall furnish a complete supply of parts and components for the repair and maintenance of the buses to be supplied. The Contractor also shall state below, or by separate attachment, its policy on transportation charges for parts other than those covered by warranty.

SP 7.2 Documentation

For the initial seven (7) vehicle procurement, the Contractor shall provide an electronic copy and twelve (12) printed current maintenance manual(s) to include preventative maintenance procedures, diagnostic procedures or troubleshooting guides and major component service manuals, an electronic copy and twelve (12) printed current parts manual(s), and an electronic copy and twenty (20) printed standard operator's manual(s) as part of this Contract. If the Agency or any permissible assignee exercises the options for up to an additional twenty (20) vehicles, additional maintenance manuals, parts manuals, and operator manuals shall be provided by the Contractor at ratios similar to the initial seven (7) vehicle procurement. The Contractor also shall exert its best efforts to keep maintenance manuals, operator's manuals and parts books up to date for a period of fifteen (15) years. The supplied manuals shall incorporate all equipment ordered on the buses covered by this procurement. In instances where copyright restrictions or other considerations prevent the Contractor from incorporating major components information into the bus parts and service manuals, separate manual sets as published by the subcomponent Supplier will be provided.

SP 7.3 Parts Availability Guarantee

The Contractor hereby guarantees to provide, within reasonable periods of time, the spare parts, software and all equipment necessary to maintain and repair the buses supplied under this Contract for a period of at least twelve (12) years after the date of acceptance. Parts shall be interchangeable with the original equipment and shall be manufactured in accordance with the quality assurance provisions of this Contract. Prices shall not exceed the Contractor's then-current published catalog prices.

Where the parts ordered by the Agency are not received within two (2) working days of the agreed-upon time and date and a bus procured under this Contract is out of service due to the lack of said ordered parts, then the Contractor shall provide the Agency, within eight (8) hours of the Agency's verbal or written request, the original Suppliers' and/or manufacturers' part numbers, company names, addresses, telephone numbers and contact persons' names for all the specific parts not received by the Agency.

Where the Contractor fails to honor this parts guarantee or parts ordered by the Agency are not received within thirty (30) days of the agreed-upon delivery date, then the Contractor shall provide to the Agency, within seven (7) days of the Agency's verbal or written request, the design and manufacturing documentation for those parts manufactured by the Contractor and the original Suppliers' and/or manufacturers' part numbers, company names, addresses, telephone numbers and contact persons' names for all of the specific parts not received by the Agency. The Contractor's design and manufacturing documentation provided to the Agency shall be for its sole use in regard to the buses procured under this Contract and for no other purpose.

SP 7.4 Agency-Furnished Property

In the event that equipment or other goods or materials are specified in the Technical Specifications to be furnished by the Agency to the Contractor for incorporation in the Work, the following provisions shall apply:

1. The Agency shall furnish the equipment, goods or materials in a timely manner so as not to delay Contract delivery or performance dates. If Agency-furnished property is received in a condition not suitable for the intended use, then the Contractor shall promptly notify the Agency, detailing the facts, and at the Agency's expense repair, modify, return or take such other action as directed by the Agency. The parties may conduct a joint inspection of the property before the Contractor takes possession to document its condition.
2. The Agency retains title to all Agency-furnished property. Upon receipt of the Agency-furnished property, the Contractor assumes the charge and care of the property and bears the risk of loss or damage due to action of the elements or from any other cause. The Contractor shall provide appropriate protection for all such property during the progress of the Work. Should any Agency-furnished equipment or materials be damaged, such property shall be repaired or replaced at the Contractor's expense to the satisfaction of the Agency. No extension of time will be allowed for repair or replacement of such damaged items. Should the Contractor not repair or replace such damaged items, the Agency shall have the right to take corrective measures itself and deduct the cost from any sums owed to the Contractor.
3. Warranty administration and enforcement for Agency-furnished equipment are the responsibility of the Agency, unless the parties agree to transfer warranty responsibility to the Contractor.

SP 8. Federal Motor Vehicle Safety Standards (FMVSS)

The Contractor shall submit a manufacturer's FMVSS self-certification, Federal Motor Vehicles Safety Standards, that the vehicle complies with relevant FMVSS or two manufacturer's certified statement that the contracted buses will not be subject to FMVSS regulations.

SP 9. Insurance

The Contractor shall maintain in effect during the term of this Contract, including any warranty period, at its own expense, at least the following coverage and limits of insurance:

- Statutory Workers Compensation and Employers Liability insurance and/or qualified self-insurance program covering Supplier's employees while on Agency property.
- Commercial General Liability Insurance:
 - Bodily Injury and Property Damage, including Contractual Liability covering the indemnification contained herein, \$10,000,000 combined single limits per occurrence, \$10,000,000 aggregate, where applicable.

- Product liability: \$5,000,000 per occurrence, for a period of five (5) years after acceptance of the last bus delivered under this Contract (Products Liability coverage may be effected through one or more excess liability policies).
- Automobile Liability Insurance: Bodily Injury and Property Damage, \$1,000,000 combined single limits per occurrence.

Contractor shall deliver to the Agency, within ten (10) days after receiving Notice of Award of this Contract, evidence of the above. Prior to the expiration of any insurance during the time required, the Supplier shall furnish evidence of renewal to the Agency's Project Manager.

All the Contractor's policies shall contain an endorsement naming the Agency as an additional insured and providing that written notice shall be given to the Agency's location at least thirty (30) days prior to termination, cancellation or material reduction of coverage in the policy, provided, however, that such notice may be given on ten (10) days' notice if the termination is due to nonpayment of premium.

SP 10. Software Escrow Account

Upon execution of the Contract, the Contractor shall provide the Agency a list of all OEM software comprising proprietary works ("Proprietary Software") for all major vehicle subsystems. From time to time and only upon request, information contained within the listed software may be made available to the Agency through the OEM of the vehicle subsystem. The Contractor and OEM are not obligated to provide copies of source code, as this is proprietary intellectual property; however, the Contractor is obligated to assist the Agency with any technical assistance for the duration of the life of the vehicle. It is the Agency's prerogative to evaluate the long-term viability of the Contractor and its Subcontractors and Suppliers based upon the criteria set forth in "Qualification Requirements."

SP 11. Sustainability

The Agency recognizes that being sustainable (environmentally, economically and socially responsible) involves everyone, both internal and external to the Agency. The Agency expects its Contractors to have their own sustainability policies and programs in place and to provide services in line with the principles established therein. Implementation of sustainable practices may include maximizing the use of environmentally and socially responsible materials and services, using energy-efficient and non-polluting vehicles, equipment and processes, and ensuring employee awareness of sustainability initiatives.

The Contractor will provide the Agency with a statement indicating that responsible parties have read and understand the Agency's interest in sustainability and that it agrees to use reasonable efforts to conduct its work and operations in a manner that is consistent. In addition the Contractor will provide the Agency with a copy of its corporate sustainability policy.

SP 12. Agency-Specific Provisions

This is an exceptional project during which a Contractor has the opportunity to demonstrate product capabilities and bragging rights for a first-of-its-kind public transportation service. For this reason Public Relations and Partnership Strategy play a strong role in the Proposal Evaluation Criteria. The agency is not running a local transit system; the buses will be used on intercity routes that currently do not exist.

SECTION 5: FEDERAL REQUIREMENTS

The procurement is not federally funded.

The Contractor shall at all times comply with all applicable laws, regulations, policies, procedures and directives (together, the “Law”), including without limitation all contractual provisions required by the State of California Department of Transportation (“Caltrans” or “Department”) as set forth in Master Agreement No. 64SRTAMA, including those listed directly or by reference in said agreement between the Agency and Caltrans that funds this Contract. Contractor’s failure to so comply shall constitute a material breach of this Contract.

FR 1. Access to Records

The Contractor agrees to maintain all books, records, accounts and reports required under this Contract for a period of not less than three years after the date of termination or expiration of this Contract, except in the event of litigation or settlement of claims arising from the performance of this Contract, in which case Contractor agrees to maintain same until the Agency, Caltrans, the FTA Administrator, the Comptroller General or any of their duly authorized representatives have disposed of all such litigation, appeals, claims or exceptions related thereto. Reference 49 CFR 18.39(i)(11).

The following access to records requirements apply to this Contract:

FR 1.1 Local Governments

In accordance with 49 CFR 18.36(i), the Contractor agrees to provide the Agency, and where applicable, the FTA Administrator, the Comptroller General of the United States or any of their authorized representatives access to any books, documents, papers and records of the Contractor that are directly pertinent to this Contract for the purposes of making audits, examinations, excerpts and transcriptions. Contractor also agrees, pursuant to 49 CFR 633.17 to provide, where applicable, the FTA Administrator or his authorized representatives including any PMO Contractor access to Contractor’s records and construction sites pertaining to a major capital project, defined at 49 USC 5302(a)1, which is receiving federal financial assistance through the programs described at 49 USC 5307, 5309 or 5311.

FR 1.2 State Governments

In accordance with 49 CFR 633.17, the Contractor agrees to provide the Agency, and where applicable, the FTA Administrator or his authorized representatives, including any PMO Contractor, access to the Contractor’s records and construction sites pertaining to a major capital project, defined at 49 USC 5302(a)1, which is receiving federal financial assistance through the programs described at 49 USC 5307, 5309 or 5311. By definition, a major capital project excludes contracts of less than the simplified acquisition threshold currently set at \$100,000.

The Contractor agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.

FR 2. Federal Funding, Incorporation of FTA Terms and Federal Changes

The preceding provisions include, in part, certain standard terms and conditions required by the Department of Transportation, whether or not expressly set forth in the preceding Contract provisions. All contractual provisions required by DOT, as set forth in FTA Circular 4220.1F or its successors are hereby incorporated by reference. Anything to the contrary herein notwithstanding, all FTA mandated terms shall be deemed to

control in the event of a conflict with other provisions contained in this agreement. The Contractor shall not perform any act, fail to perform any act or refuse to comply with any Agency requests that would cause the Agency to be in violation of the applicable FTA terms and conditions.

The Contractor shall at all times comply with all applicable FTA regulations, policies, procedures and directives, including without limitation those listed directly or by reference in the Master Agreement between Agency and FTA, as they may be amended or promulgated from time to time during the term of this Contract. Contractor's failure to so comply shall constitute a material breach of this Contract.

FR 3. Federal Energy Conservation Requirements

The Contractor agrees to comply with mandatory standards and policies relating to energy efficiency that are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act.

FR 4. Civil Rights Requirements

The following requirements apply to the underlying Contract:

1. **Nondiscrimination:** In accordance with Title VI of the Civil Rights Act, as amended, 42 USC § 2000d, section 303 of the Age Discrimination Act of 1975, as amended, 42 USC § 6102, section 202 of the Americans with Disabilities Act of 1990, 42 USC § 12132, and federal transit law at 49 USC § 5332, the Contractor agrees that it will not discriminate against any employee or applicant for employment because of race, color, creed, national origin, sex, age, or disability. In addition, the Contractor agrees to comply with applicable federal implementing regulations and other implementing requirements FTA may issue.
2. **Equal Employment Opportunity:** The following equal employment opportunity requirements apply to the underlying Contract:
 - (a) **Race, Color, Creed, National Origin, Sex:** In accordance with Title VII of the Civil Rights Act, as amended, 42 USC § 2000e, and federal transit laws at 49 USC § 5332, the Contractor agrees to comply with all applicable equal employment opportunity requirements of U.S. Department of Labor (U.S. DOL) regulations, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor," 41 CFR Parts 60 *et seq.*, (which implement Executive Order No. 11246, "Equal Employment Opportunity," as amended by Executive Order No. 11375, "Amending Executive Order 11246 Relating to Equal Employment Opportunity," 42 USC § 2000e note), and with any applicable federal statutes, executive orders, regulations, and federal policies that may in the future affect construction activities undertaken in the course of the Project. The Contractor agrees to take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, creed, national origin, sex, or age. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.
 - (b) **Age:** In accordance with section 4 of the Age Discrimination in Employment Act of 1967, as amended, 29 USC §§ 623 and federal transit law at 49 USC § 5332, the Contractor agrees to refrain from discrimination against present and prospective employees for reason of age. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

- (c) **Disabilities:** In accordance with section 102 of the Americans with Disabilities Act, as amended, 42 USC § 12112, the Contractor agrees that it will comply with the requirements of U.S. Equal Employment Opportunity Commission, “Regulations to Implement the Equal Employment Provisions of the Americans with Disabilities Act,” 29 CFR Part 1630, pertaining to employment of persons with disabilities. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.
3. The Contractor also agrees to include these requirements in each subcontract financed in whole or in part with federal assistance provided by FTA, modified only if necessary to identify the affected parties.

FR 5. No Government Obligation to Third Parties

1. The Agency and Contractor acknowledge and agree that, notwithstanding any concurrence by the federal government in or approval of the Solicitation or award of the underlying Contract, absent the express written consent by the federal government, the federal government is not a party to this Contract and shall not be subject to any obligations or liabilities to the Agency, Contractor, or any other party (whether or not a party to that Contract) pertaining to any matter resulting from the underlying Contract.
2. The Contractor agrees to include the above clause in each subcontract financed in whole or in part with federal assistance provided by FTA. It is further agreed that the clause shall not be modified, except to identify the Subcontractor who will be subject to its provisions.

FR 6. Program Fraud and False or Fraudulent Statements or Related Acts

1. The Contractor acknowledges that the provisions of the Program Fraud Civil Remedies Act of 1986, as amended, 31 USC §§ 3801 *et seq.* and U.S. DOT regulations, “Program Fraud Civil Remedies,” 49 CFR Part 31, apply to its actions pertaining to this Project. Upon execution of the underlying Contract, the Contractor certifies or affirms the truthfulness and accuracy of any statement it has made, it makes, it may make, or it causes to be made, pertaining to the underlying Contract or the FTA-assisted project for which this Contract Work is being performed. In addition to other penalties that may be applicable, the Contractor further acknowledges that if it makes, or causes to be made, a false, fictitious or fraudulent claim, statement, submission or certification, the federal government reserves the right to impose the penalties of the Program Fraud Civil Remedies Act of 1986 on the Contractor to the extent the federal government deems appropriate.
2. The Contractor also acknowledges that if it makes, or causes to be made, a false, fictitious, or fraudulent claim, statement, submission, or certification to the federal government under a Contract connected with a project that is financed in whole or in part with Federal assistance originally awarded by FTA under the authority of 49 USC § 5307, the government reserves the right to impose the penalties of 18 USC § 1001 and 49 USC § 5307(n)(1) on the Contractor, to the extent the federal government deems appropriate.
3. The Contractor agrees to include the above two clauses in each subcontract financed in whole or in part with federal assistance provided by FTA. It is further agreed that the clauses shall not be modified, except to identify the Subcontractor who will be subject to the provisions.

FR 7. Suspension and Debarment

This Contract is a covered transaction for purposes of 49 CFR Part 29. As such, the Contractor is required to verify that none of the Contractor, its principals, as defined at 49 CFR 29.995, or affiliates, as defined at 49 CFR 29.905, are excluded or disqualified as defined at 49 CFR 29.940 and 29.945.

The Contractor is required to comply with 49 CFR 29, Subpart C, and must include the requirement to comply with 49 CFR 29, Subpart C, in any lower-tier covered transaction it enters into.

By signing and submitting its bid or Proposal, the Bidder or Proposer certifies as follows:

The certification in this clause is a material representation of fact relied upon by the Agency. If it is later determined that the Bidder or Proposer knowingly rendered an erroneous certification, in addition to remedies available to the Agency, the federal government may pursue available remedies, including but not limited to suspension and/or debarment. The Bidder or Proposer agrees to comply with the requirements of 49 CFR 29, Subpart C, while this Proposal is valid and throughout the period of any Contract that may arise from this Proposal. The Bidder or Proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

FR 8. Disadvantaged Business Enterprise (DBE)

This Contract is subject to the requirements of Title 49, Code of Federal Regulations, Part 26, Participation by Disadvantaged Business Enterprises in Department of Transportation Financial Assistance Programs.

The Contractor shall maintain compliance with “DBE Approval Certification” throughout the period of Contract performance.

The Contractor shall not discriminate on the basis of race, color, national origin or sex in the performance of this Contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of this DOT-assisted Contract. Failure by the Contractor to carry out these requirements is a material breach of this Contract, which may result in the termination of this Contract or such other remedy as the Agency deems appropriate. Each subcontract the Contractor signs with a Subcontractor must include the assurance in this paragraph (see 49 CFR 26.13(b)).

FR 9. Clean Water Requirements

1. The Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 USC 1251 *et seq.* The Contractor agrees to report each violation to the Agency and understands and agrees that the Agency will, in turn, report each violation as required to ensure notification to FTA and the appropriate EPA Regional Office.
2. The Contractor also agrees to include these requirements in each subcontract exceeding \$100,000 financed in whole or in part with federal assistance provided by FTA.

FR 10. Clean Air Requirements

1. The Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 USC §§ 7401 *et seq.* The Contractor agrees to report each violation to the Agency and understands and agrees that the Agency will, in turn, report each violation as required to ensure notification to FTA and the appropriate EPA Regional Office.
2. The Contractor also agrees to include these requirements in each subcontract exceeding \$100,000 financed in whole or in part with federal assistance provided by FTA.

FR 11. Compliance with Federal Lobbying Policy

Contractors who apply or bid for an award of \$100,000 or more shall file the certification required by 49 CFR Part 20, “New Restrictions on Lobbying.” Each tier certifies to the tier above that it will not and has not used federal appropriated funds to pay any person or organization for influencing or attempting to influence an

officer or employee of any Agency, a member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any federal Contract, grant or any other award covered by 31 USC 1352. Each tier shall also disclose the name of any registrant under the Lobbying Disclosure Act of 1995 who has made lobbying contacts on its behalf with non-federal funds with respect to that federal Contract, grant or award covered by 31 USC 1352. Such disclosures are forwarded from tier to tier up to the recipient.

FR 12. Buy America

If applicable, the Contractor agrees to comply with 49 USC 5323(j) and 49 CFR Part 661, which provide that federal funds may not be obligated unless steel, iron and manufactured products used in FTA-funded projects are produced in the United States, unless a waiver has been granted by FTA or the product is subject to a general waiver. General waivers are listed in 49 CFR 661.7. A general public interest waiver from the Buy America requirements applies to microprocessors, computers, microcomputers, software or other such devices, which are used solely for the purpose of processing or storing data. This general waiver does not extend to a product or device that merely contains a microprocessor or microcomputer and is not used solely for the purpose of processing or storing data.

Separate requirements for rolling stock are set out at 49 USC 5323(j)(2)(C) and 49 CFR 661.11. Rolling stock must be assembled in the United States and have a 60 percent domestic content.

If applicable, a Bidder or Proposer must submit to the Agency the appropriate Buy America Certification with all offers on FTA-funded contracts, except those subject to a general waiver. Proposals that are not accompanied by a properly completed Buy America certification are subject to the provisions of 49 CFR 661.13 and may be rejected as nonresponsive.

FR 13. Testing of New Bus Models

If applicable, the Contractor agrees to comply with 49 USCA 5323(c) and FTA's implementing regulation at 49 CFR Part 665 and shall perform the following:

1. A manufacturer of a new bus model or a bus produced with a major change in components or configuration shall provide a copy of the final test report to the recipient at a point in the procurement process specified by the recipient, which will be prior to the recipient's final acceptance of the first vehicle.
2. A manufacturer who releases a report under paragraph 1 above shall provide notice to the operator of the testing facility that the report is available to the public.
3. If the manufacturer represents that the vehicle was previously tested, the vehicle being sold should have the identical configuration and major components as the vehicle in the test report, which must be provided to the recipient prior to recipient's final acceptance of the first vehicle. If the configuration or components are not identical, the manufacturer shall provide a description of the change and the manufacturer's basis for concluding that it is not a major change requiring additional testing.
4. If the manufacturer represents that the vehicle is "grandfathered" (has been used in mass transit service in the United States before Oct. 1, 1988, and is currently being produced without a major change in configuration or components), the manufacturer shall provide the name and address of the recipient of such a vehicle and the details of that vehicle's configuration and major components.

FR 14. Pre-Award and Post-Delivery Audits

Where applicable, the Contractor agrees to comply with 49 USC § 5323(l) and FTA's implementing regulation at 49 CFR Part 663 and to submit the following certifications:

1. **Buy America requirements:** The Contractor shall complete and submit a declaration certifying either compliance or noncompliance with Buy America. If the recommended Bidder/Proposer certifies compliance with Buy America, it shall submit documentation that lists (1) component and subcomponent parts of the rolling stock to be purchased identified by manufacturer of the parts, their country of origin and costs; and (2) the location of the final assembly point for the rolling stock, including a description of the activities that will take place at the final assembly point and the cost of final assembly.
2. **Solicitation specification requirements:** The Contractor shall submit evidence that it will be capable of meeting the bid specifications.
3. **Federal Motor Vehicle Safety Standards (FMVSS):** The Contractor shall submit (1) manufacturer's FMVSS self-certification, Federal Motor Vehicle Safety Standards, that the vehicle complies with relevant FMVSS or (2) manufacturer's certified statement that the contracted buses will not be subject to FMVSS regulations.

FR 15. Cargo Preference

The Contractor agrees to the following:

- To use privately owned U.S.-flag commercial vessels to ship at least fifty (50) percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners and tankers) involved, whenever shipping any equipment, material or commodities pursuant to the underlying Contract to the extent such vessels are available at fair and reasonable rates for U.S.-flag commercial vessels;
- To furnish within twenty (20) working days following the date of loading for shipments originating within the United States or within thirty (30) working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, "onboard" commercial ocean bill of lading in English for each shipment of cargo described in the preceding paragraph to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590 and to the FTA recipient (through the Contractor in the case of a Subcontractor's bill-of-lading.)
- To include these requirements in all subcontracts issued pursuant to this Contract when the subcontract may involve the transport of equipment, material or commodities by ocean vessel.

FR 16. Fly America

The Contractor agrees to comply with 49 USC 40118 (the "Fly America" Act) in accordance with the General Services Administration's regulations at 41 CFR Part 301-10, which provide that recipients and sub-recipients of federal funds and their Contractors are required to use U.S. flag air carriers for U.S. government-financed international air travel and transportation of their personal effects or property, to the extent such service is available, unless travel by foreign air carrier is a matter of necessity, as defined by the Fly America Act. The Contractor shall submit, if a foreign air carrier was used, an appropriate certification or memorandum adequately explaining why service by a U.S.-flag air carrier was not available or why it was necessary to use a foreign air carrier and shall, in any event, provide a certificate of compliance with the Fly America requirements. The Contractor agrees to include the requirements of this section in all subcontracts that may involve international air transportation.

FR 17. Contract Work Hours and Safety Standards Act

1. **Overtime requirements:** No Contractor or Subcontractor contracting for any part of the Contract Work that may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such Work to work in excess of 40 hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of 40 hours in such workweek.
2. **Violation; liability for unpaid wages; liquidated damages:** In the event of any violation of the clause set forth in paragraph 1 of this section, the Contractor and any Subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such Contractor and Subcontractor shall be liable to the United States for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph 1 of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of 40 hours without payment of the overtime wages required by the clause set forth in paragraph 1 of this section.
3. **Withholding for unpaid wages and liquidated damages:** The Agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any monies payable on account of work performed by the Contractor or Subcontractor under any such contract or any other federal contract with the same Prime Contractor, or any other federally assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same Prime Contractor, such sums as may be determined to be necessary to satisfy any liabilities of such Contractor or Subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph 2 of this section.
4. **Subcontracts:** The Contractor or Subcontractor shall insert in any subcontracts the clauses set forth in paragraphs 1 through 4 of this section and also a clause requiring the Subcontractors to include these clauses in any lower-tier subcontracts. The Prime Contractor shall be responsible for compliance by any Subcontractor or lower-tier Subcontractor with the clauses set forth in paragraphs 1 through 4 of this section.

SECTION 6: TECHNICAL SPECIFICATIONS

GENERAL

TS 1. Scope

This specification defines the requirements for the vehicles and associated equipment being procured by the Agency. Vehicles shall have a minimum expected life of twelve (12) years or 500,000 miles, whichever comes first, and are intended for the widest possible spectrum of passengers, including children, adults, the elderly and people with disabilities.

TS 2. Definitions

Alternative: An alternative specification condition to the default bus configuration. The Agency may define alternatives to the default configuration to satisfy local operating requirements. Alternatives for the default configuration will be clearly identified.

Ambient Temperature: The temperature of the surrounding air. For testing purposes, ambient temperature must be between 16 °C (50 °F) and 38 °C (100 °F).

Analog Signals: A continuously variable signal that is solely dependent upon magnitude to express information content.

Audible Discrete Frequency: An audible discrete frequency is determined to exist if the sound power level in any 1/3-octave band exceeds the average of the sound power levels of the two adjacent 1/3-octave bands by 4 decibels (dB) or more.

Battery Compartment: Low-voltage energy storage, i.e. 12/24 VDC batteries.

Battery Management System (BMS): Monitors energy, as well as temperature, cell or module voltages, and total pack voltage. The BMS adjusts the control strategy algorithms to maintain the batteries at uniform state of charge and optimal temperatures.

Braking Resistor: Device that converts electrical energy into heat, typically used as a retarder to supplement or replace the regenerative braking.

Burst Pressure: The highest pressure reached in a container during a burst test.

Capacity (fuel container): The water volume of a container in gallons (liters).

Cell: Simplest discrete component of the battery storage system, such as a battery or a capacitor.

Charging Interface: The equipment and/or coupler used to create a connection between the charging equipment and the vehicle for the purpose of recharging a vehicle's batteries.

Charging Equipment: The equipment that encompasses all the components needed to convert, control, and transfer electricity from the grid to the vehicle for the purpose of charging batteries. May include chargers, controllers, couplers, transformers, ventilation, etc. See *Electric Vehicle Supply Equipment (EVSE)*.

Charging Station: Location that houses the charging equipment connected to a utility's electric service, to provide electricity to a vehicle's battery system through a charging interface.

Code: A legal requirement.

Combination Gas Relief Device: A relief device that is activated by a combination of high pressures or high temperatures, acting either independently or together.

Composite Container for CNG: A container fabricated of two or more materials that interact to facilitate the container design criteria.

Compressed Natural Gas (CNG): Mixtures of hydrocarbon gases and vapors consisting principally of methane in gaseous form that has been compressed for use as a vehicular fuel.

Container: A pressure vessel, cylinder or cylinders permanently manifolded together, used to store CNG.

Container Appurtenances: Devices connected to container openings for safety, control or operating purposes.

Container Valve: A valve connected directly to a container outlet.

Curb Weight: Weight of vehicle, including maximum fuel, oil and coolant; and all equipment required for operation and required by this Specification, but without passengers or driver.

dBA: Decibels with reference to 0.0002 microbar as measured on the "A" scale.

DC to DC Converter: A module that converts a source of direct current from one voltage level to another.

Default Configuration Bus: The bus described if no alternatives are selected. Signing, colors, the destination sign reading list and other information must be provided by the Agency.

Defueling: The process of removing fuel from a tank.

Defueling Port. Device that allows for vehicle defueling, or the point at which this occurs.

Destroyed: Physically made permanently unusable.

Discrete Signal: A signal that can take only pre-defined values, usually of a binary 0 or 1 nature, where 0 is battery ground potential and 1 is a defined battery positive potential.

DPF: Diesel particulate filter.

Driver's Eye Range: The 95th-percentile ellipse defined in SAE J941, except that the height of the ellipse shall be determined from the seat at its reference height.

Electrical Pack: An electrical equivalent of a collection of cells or modules or physical sub-packs forming the highest-level energy storage system. Often multiple physical sub-packs are connected in series, and these may also be connected in parallel.

Electric Vehicle Supply Equipment (EVSE): The conductors, including the ungrounded, grounded and equipment grounding conductors, the electric vehicle connectors, the attachment plugs, and all other fittings, devices, power outlets or apparatuses installed specifically for the purpose of delivering energy from the premises' wiring to the electric vehicle.

End of Life: A condition reached when an energy storage system fails to meet specified capacity, power or function in specified use conditions.

Energy Density: The relationship between the weight of an energy storage device and its power output in units of watt-hours per kilogram (Wh/kg).

Energy Storage System (ESS): A component or system of components that stores energy and for which its supply of energy is rechargeable by the on-vehicle system(engine/regenerative braking/ generator)or an off-vehicle energy source.

Fill Pressure for CNG: The pressure attained at the actual time of filling. Fill pressure varies according to the gas temperatures in the container, which are dependent on the charging parameters and the ambient conditions. The maximum dispensed pressure shall not exceed 125 percent of service pressure.

Fire Resistant: Materials that have a flame spread index less than 150 as measured in a radiant panel flame test per ASTM-E 162-90.

Fireproof: Materials that will not burn or melt at temperatures less than 2000 °F.

Flow Capacity: For natural gas flow, this is the capacity in volume per unit time (normal cubic meters/minute or standard cubic feet per minute) discharged at the required flow rating pressure.

Free Floor Space: Floor area available to standees, excluding the area under seats, area occupied by feet of seated passengers, the vestibule area forward of the standee line, and any floor space indicated by manufacturer as non-standee areas, such as the floor space "swept" by passenger doors during operation. Floor area of 1.5 sq. ft. shall be allocated for the feet of each seated passenger protruding into the standee area.

Fuel Line: The pipe, tubing or hose on a vehicle, including all related fittings, through which natural gas passes.

Fusible Material: A metal, alloy or other material capable of being melted by heat.

Fuel Management System: Natural gas fuel system components that control or contribute to engine air fuel mixing and metering, and the ignition and combustion of a given air-fuel mixture. The fuel management system would include, but is not limited to, reducer/regulator valves, fuel metering equipment (e.g. carburetor, injectors), sensors (e.g., main throttle, waste gate).

GAWR (Gross Axle Weight Rated): The maximum total weight as determined by the axle manufacturer, at which the axle can be safely and reliably operated for its intended purpose.

Generator (Electric): A device that converts mechanical energy into electrical energy.

Gross Load: 150 lb for every designed passenger seating position, for the driver, and for each 1.5 sq. ft. of free floor space.

GVW (Gross Vehicle Weight): Curb weight plus gross load.

GVWR (Gross Vehicle Weight Rated): The maximum total weight as determined by the vehicle manufacturer, at which the vehicle can be safely and reliably operated for its intended purpose.

High Pressure: Those portions of the CNG fuel system that see full container or cylinder pressure.

High Voltage (HV): Greater than 50 V(AC and DC).

Hose: Flexible line.

Hybrid: A vehicle that uses two or more distinct power sources to propel the vehicle.

Hybrid System Controller (HSC): Regulates energy flow throughout hybrid system components in order to provide motive performance and accessory loads, as applicable, while maintaining critical system parameters (voltages, currents, temperatures, etc.) within specified operating ranges.

Hybrid Drive System (HDS): The mechanical and/or electromechanical components, including the engine, traction motors and energy storage system, which comprise the traction drive portion of the hybrid propulsion system.

Intermediate Pressure: The portion of a CNG system after the first pressure regulator, but before the engine pressure regulator. Intermediate pressure on a CNG vehicle is generally from 3.5 to 0.5 MPa (510 to 70 psi).

Inverter: A module that converts DC to and from AC.

Labeled: Equipment or materials to which has been attached a label, symbol or other identifying mark of an organization, which is acceptable to the authority having jurisdiction and concerned with product evaluation, which maintains periodic inspection of production labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

Leakage: Release of contents through a Defect or a crack. See *Rupture*.

Line: All tubes, flexible and hard, that carry fluids.

Liner: Inner gas-tight container or gas container to which the overwrap is applied.

Local Regulations: Regulations below the state level.

Low-Floor Bus: A bus that, between at least the front (entrance) and rear (exit) doors, has a floor sufficiently low and level so as to remove the need for steps in the aisle between the doors and in the vicinity of these doors.

Low Voltage (LV): 50 V or less (AC and DC).

Lower Explosive Limit: The lowest concentration of gas where, given an ignition source, combustion is possible.

Maximum Service Temperature: The maximum temperature to which a container/cylinder will be subjected in normal service.

Metallic Hose: A hose whose strength depends primarily on the strength of its metallic parts; it can have metallic liners or covers, or both.

Metering Valve: A valve intended to control the rate of flow of natural gas.

Module: A collection of cells forming a physical and electrical sub-assembly contained within an enclosure.

Motor (Electric): A device that converts electrical energy into mechanical energy.

Motor (Traction): An electric motor used to power the driving wheels of the bus.

Operating Pressure: The varying pressure developed in a container during service.

Pack: A collection of cells or modules described on the basis of electrical or physical attributes, to include *Electrical Pack* and *Physical Pack*.

Physical Layer: The first layer of the seven-layer International Standards Organization (ISO) Open Systems Interconnect (OSI) reference model. This provides the mechanical, electrical, functional and procedural characteristics required to gain access to the transmission medium (e.g., cable) and is responsible for transporting binary information between computerized systems.

Physical Pack: An enclosure consisting of a collection of cells or modules at a location or multiple locations. Physical packs differ from electrical packs, as they are defined by layout rather than electrical equivalent.

Pipe: Nonflexible line.

Pressure Relief Device (PRD): A pressure and/or temperature activated device used to vent the container/cylinder contents and thereby prevent rupture of an NGV fuel container/cylinder, when subjected to a standard fire test as required by fuel container/cylinder standards.

Power: Work or energy divided by time

Power Density: Power divided by mass, volume or area.

Propulsion System: System that provides propulsion for the vehicle proportional to operator commands. Includes, as applicable, engine, transmission, traction motors, the hybrid drive system,(HDS), energy storage system (ESS), and system controllers including all wiring and converter/inverter.

Real-Time Clock (RTC): Computer clock that keeps track of the current time.

Regenerative Braking: Deceleration of the bus by switching motors to act as generators, which return vehicle kinetic energy to the energy storage system.

Rejectable Damage: In terms of NGV fuel containers/cylinders, this is damage as outlined in CGA C-6.4, “Methods for External Visual Inspection of Natural Gas Vehicle Fuel Containers and Their Installations,” and in agreement with the manufacturer’s recommendations.

Retarder: Device used to augment or replace some of the functions of primary friction based braking systems of the bus.

Rupture: Sudden and unstable damage propagation in the structural components of the container resulting in a loss of contents. See *Leakage*.

Seated Load: 150 lb for every designed passenger seating position and for the driver.

Seated Load Weight (SLW): Curb weight plus seated load.

Serial Data Signals: A current loop based representation of ASCII or alphanumeric data used for transferring information between devices by transmitting a sequence of individual bits in a prearranged order of significance.

Service Pressure: The settled pressure at a uniform gas temperature of 21 °C (70 °F) and full gas content. It is the pressure for which the equipment has been constructed, under normal conditions. Also referred to as the nominal service pressure or working pressure.

Settled Pressure: The gas pressure when a given settled temperature, usually 21 °C (70 °F), is reached.

Settled Temperature: The uniform gas temperature after any change in temperature caused by filling has dissipated.

Solid State Alternator: A module that converts high-voltage DC to low-voltage DC (typically 12/24 V systems).

Sources of Ignition: Devices or equipment that because of their modes of use or operation, are capable of providing sufficient thermal energy to ignite flammable compressed natural gas-air mixtures when introduced into such a mixture, or when such a mixture comes into contact with them.

Special Tools: Tools not normally stocked by the Agency.

Specification: A particular or detailed statement, account or listing of the various elements, materials, dimensions, etc. involved in the manufacturing and construction of a product.

Standard: A firm guideline from a consensus group. Standards referenced in “Section 6: Technical Specifications” are the latest revisions unless otherwise stated.

Standee Line: A line marked across the bus aisle to designate the forward area that passengers may not occupy when the bus is moving.

State of Charge (SoC): Quantity of electric energy remaining in the battery relative to the maximum rated amp-hour (Ah) capacity of the battery expressed in a percentage. This is a dynamic measurement used for the energy storage system. A full SoC indicates that the energy storage system cannot accept further charging from the engine-driven generator or the regenerative braking system.

Stress Loops: The “pigtailed” commonly used to absorb flexing in piping.

Structure: The basic body, including floor deck material and installation, load-bearing external panels, structural components, axle mounting provisions and suspension beams and attachment points.

Thermally Activated Gas Relief Device: A relief device that is activated by high temperatures and generally contains a fusible material.

Warrantable End of Life (WEOL): WEOL is a measure of battery degradation determined as the point at which the batteries can no longer provide the energy or power required to meet the design operating profile. It is expressed as a percentage of remaining battery capacity as compared to gross capacity at the beginning of useful life. For purposes of this specification, WEOL shall be a measure of the useful and intended life of the energy storage device. WEOL shall be used as a condition for battery replacement and to potentially initiate warranty claims.

Wheelchair: A mobility aid belonging to any class of three- or four-wheeled devices, usable indoors, designed for and used by individuals with mobility impairments, whether operated manually or powered. A “common wheelchair” is such a device that does not exceed 30 in. in width and 48 in. in length measured 2 in. above the ground, and does not weigh more than 600 lb when occupied.

Zero-Emission Vehicle (ZEV): A vehicle that emits no tailpipe emissions from the onboard source of power.

TS 3. Referenced Publications

The documents or portions thereof referenced within this specification shall be considered part of the requirements of the specification. The edition indicated for each referenced document is the current edition, as of the date of the issuance of this specification. The Contractor is responsible for complying with current referenced documents.

Any inconsistency in compliance with this Technical Specification and its referenced documents shall be resolved by giving precedence in the following order: (a) federal requirements – Title 49, FMVSS, etc., (b) state requirements – In CA it would be Title 13 Vehicle Code, (c) local requirements, (d) referenced Standards, Practices and Codes, SAE, ASTM, UL, ISO, etc, (e) technical content of this Technical Specification section.

As an attachment to this RFP, CER 9.3 identifies the specifications, standards, regulations, and references used within the RFP. The form must be returned with a proposal and requires an indication of the state of compliance and an opportunity for listing other pertinent references. Please indicate “compliance” as, full, partial, N/A (not applicable). If “partial” or “N/A”, please describe.

TS 4. Legal Requirements

The Contractor shall comply with all applicable federal, state and local regulations. These shall include but not be limited to the Americans with Disabilities Act (ADA), as well as state and local accessibility, safety and security requirements. Local regulations are defined as those below the state level.

Buses shall meet all applicable Federal Motor Vehicle Safety Standards (FMVSS) regulations and shall accommodate all applicable Federal Motor Carrier Safety Administration (FMCSA) regulations in effect at the location of the Agency and the date of manufacture.

In the event of any conflict between the requirements of these specifications and any applicable legal requirement, the legal requirement shall prevail. Technical requirements that exceed the legal requirements are not considered to conflict.

TS 5. Overall Requirements

The Contractor shall ensure that the application and installation of major bus subcomponents and systems are compliant with all such subcomponent vendors' requirements and recommendations. Contractor and Agency shall identify subcomponent vendors that shall submit installation/application approval documents with the completion of a pilot or lead bus. Components used in the vehicle shall be of heavy-duty design and proven in transit service.

TS 5.1 Weight

It shall be a design goal to construct each bus as light in weight as possible without degradation of safety, appearance, comfort, traction, longevity or performance.

Buses at gross vehicle weight (GVW) shall not exceed the tire factor limits, brake test criteria, structural design criteria, the gross axle weight ratings (GAWR) of the front or rear axle, or the gross vehicle weight rating (GVWR).

TS 5.2 Capacity

The vehicle shall be designed to carry the gross vehicle weight, which shall not exceed the bus GVWR and shall not exceed the GAWR.

TS 5.3 Service Life

The minimum useful design life of the bus in transit service shall be at least 12 years or 1,200,000 miles. It shall be capable of operating at least 110,000 miles per year, including the 12th year.

TS 5.4 Maintenance and Inspection

Scheduled maintenance tasks for buses shall be related and shall be in accordance with the manufacturer's recommended preventive maintenance (PM) schedule (along with routine daily service performed during the servicing). The overall PM schedule for buses shall be based upon a minimum of a 6,000 miles interval and/or multiples of same.

The manufacturer is responsible for providing a written comprehensive 52-week and long-term rehab/replacement maintenance plan encompassing buses for their entire useful life. The plan should include times (in hours) to complete the jobs.

Test ports or connectors, as required, shall be provided for commonly checked functions on the bus, such as hydraulic, pneumatic, cooling, temperature, voltage, traction battery energy remaining (kWh), and state of charge (SoC).

The Offeror shall give prime consideration to the routine problems of maintaining the vehicle. All vehicle components and systems, both mechanical and electrical, that will require periodic physical work or inspection processes, shall be installed so that a minimum of time is consumed in gaining access to the critical repair areas. It shall not be necessary to disassemble portions of the bus structure and/or equipment, such as seats and flooring under seats, in order to gain access to these areas. Each bus shall be designed to facilitate the disassembly, reassembly, servicing or maintenance, using tools and equipment that are normally available as standard commercial items.

Requirements for the use of unique specialized tools shall be minimized. The body and structure of the bus shall be designed for ease of maintenance and repair. Individual panels or other equipment that may be damaged in normal service shall be repairable or replaceable. Ease of repair shall be related to the vulnerability of the item to damage in service.

The Contractor shall provide a list of all special tools and pricing for maintaining this equipment as a supplement to the Pricing Schedule.

Tools such as compartment door keys, bellows gauges and other tools that are required for daily maintenance and inspection shall not be included in the special tool list and shall be furnished for each bus.

TS 5.5 Interchangeability

Unless otherwise agreed, all units and components procured under this Contract, whether provided by Suppliers or manufactured by the Contractor, shall be duplicates in design, manufacture and installation to ensure interchangeability among buses in each order group in this procurement. This interchangeability shall extend to the individual components, as well as to their locations in the buses. These components shall include, but are not limited to, passenger window hardware, interior trim, lamps, lamp lenses and seat assemblies. Components with non-identical functions shall not be, or appear to be, interchangeable.

Any one component or unit used in the construction of these buses shall be an exact duplicate in design, manufacture and assembly for each bus in each order group in this Contract. Contractor shall identify and secure approval for any changes in components or unit construction provided within a Contract.

In the event that the Contractor is unable to comply with the interchangeability requirement, the Contractor must notify the Agency and obtain the Agency's prior written approval, including any changes in pricing.

Agency shall review proposed product changes on a case-by-case basis and shall have the right to require extended warranties to ensure that product changes perform at least as well as the originally supplied products.

TS 5.6 Training

The Contractor shall offer a training package as Work to be performed that includes the necessary skills level classes such that Agency Operators and Mechanics are able to operate, diagnose, repair and maintain all equipment provided within this specification. The Contractor shall describe the detail of the proposed training deliverable within their Proposal, to include, subject matter, sample curriculum and approximation of training hours required. The Agency reserves the right to review, make recommendations and approve the actual

deliverable prior to its use for training. The Agency shall have the ability to reallocate training hours from one subject matter to another to best serve the Agency's needs. The pricing schedule reflects the Agency's requirements for a minimum expectation and for purposes of bid evaluation. At minimum, the Contractor shall have at least one qualified instructor who shall be available at the Agency's property or point of delivery location in Redding, California for 22 calendar days between the hours of 6:00am and 6:00pm within the first 30 days of delivery of the first bus. Instructor(s) shall conduct schools and advise the personnel of the Agency or their designated on the proper operation and maintenance of the equipment. The Contractor also shall provide visual and other teaching aids (such as manuals, slide presentations and literature) for use by the Agency's own training staff, which become the property of the Agency.

The Contractor shall offer a training package as Work to be performed that includes the necessary skills level classes such that emergency responders are able to safely perform their duties in response to a disaster involving the proposed heavy-duty battery electric transit vehicles.

TS 5.6.1 Technical/Service Representatives

The Contractor shall have one or more competent technical service representatives as Work to be performed available on request to assist the Agency in the solution of engineering or design problems within the scope of the specifications that may arise during the warranty period. This does not relieve the Contractor of responsibilities under the provisions of "Section 7: Warranty Requirements."

The following shall be priced as an option outside of the base bid:

The Contractor shall provide a full-time, on-site technical support representative for the buses and charging equipment for the first year after bus delivery, with annual renewal options for 11 more years.

TS 5.7 Operating Environment

The bus shall be capable of satisfying the requirements of this specification while operating in ambient temperature ranges of 15 °F to 120 °F, at relative humidity between 5 and 100 percent, and at altitudes up to 3000 ft above sea level. Degradation of performance due to atmospheric conditions shall be minimized at temperatures below 15 °F, above 120 °F or at altitudes above 3000 ft. Altitude requirements above 3000 ft. will need separate discussions with the engine manufacturer to ensure that performance requirements are not compromised. Speed, gradeability and acceleration performance requirements shall be met at, or corrected to, 77 °F, 29.31 inHg, dry air per SAE J1995.

TS 5.8 Noise

The Contractor is expected to meet interior and exterior noise requirements specified in TS 5.8.1 and TS 5.8.2. Furthermore, it shall be a design goal to minimize noise. Component layout and packaging, material selection and build quality shall reflect that goal.

TS 5.8.1 Interior Noise

The combination of inner and outer panels and any material used between them shall provide sufficient sound insulation so that a sound source with a level of 80 dBA measured at the outside skin of the bus shall have a sound level of 65 dBA or less at any point inside the bus. These conditions shall prevail with all openings, including doors and windows, closed and with the propulsion/drive system and accessories switched off.

Maximum internal noise level shall not exceed 75 dBA in the operator's area near normal operator ear level and 80 dBA in all other areas in the interior of the vehicles under all normal operating conditions at locations inside the bus in adherence with the standards of ISO 5128.

TS 5.8.2 Exterior Noise

Airborne noise generated by the bus and measured from either side shall not exceed 80 dBA under full-power acceleration when operated at 0 to 35 mph at curb weight. The Contractor shall comply with the exterior noise requirements defined in local laws in the service area and SAE J366.

TS 5.9 Fire Safety

The bus shall be designed and manufactured in accordance with all applicable fire safety and smoke emission regulations.

TS 5.9.1 Materials

All materials used in the construction of the passenger compartment of the bus shall be in accordance with the Recommended Fire Safety Practices defined in FMVSS 302.

TS 5.10 Fire Suppression

No fire suppression system is required.

TS 5.11 Respect for the Environment

In the design and manufacture of the bus, the Contractor shall make every effort to reduce the amount of potentially hazardous waste. In accordance with Section 6002 of the Resource Conservation and Recovery Act, the Contractor shall use, whenever possible and allowed by the specifications, recycled materials in the manufacture of the bus.

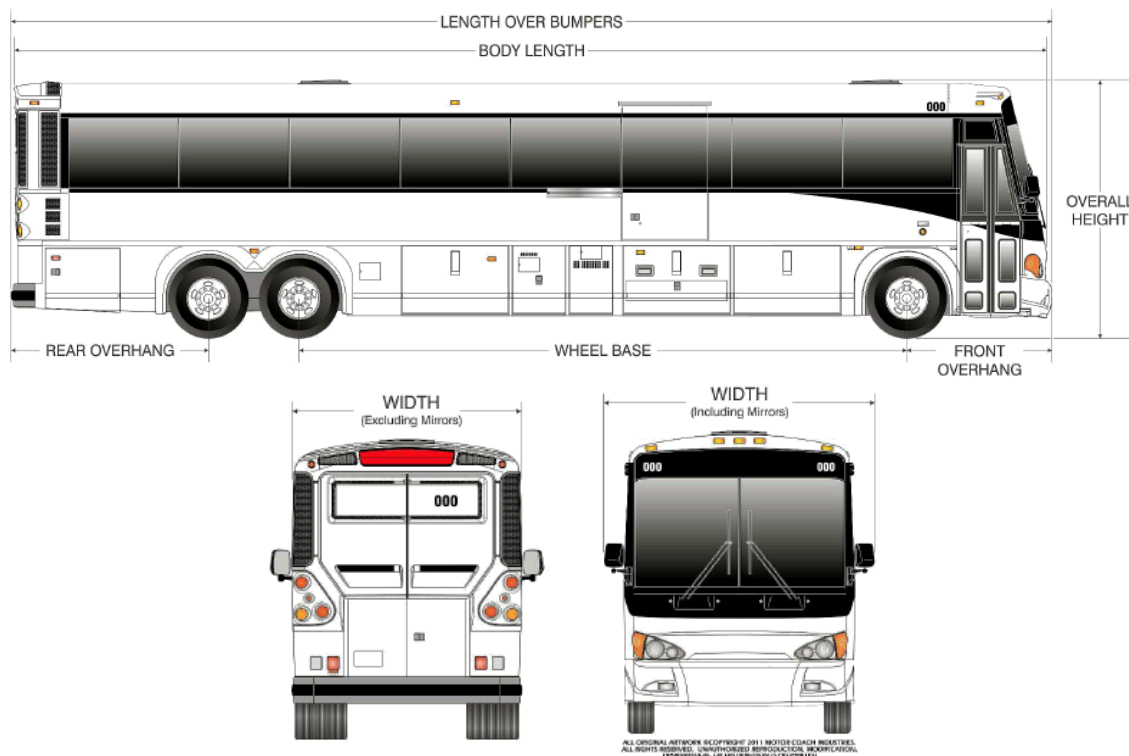
The Contractor shall provide a plan for reuse or recycling of replaced battery cells and/or battery packs.

DIMENSIONS

TS 6. Physical Size

With exceptions such as exterior mirrors, marker and signal lights, bumpers, fender skirts, washers, wipers, ad frames, cameras, object detection systems, bicycle racks, feelers and rubrails, the bus shall have the following overall dimensions as shown in **Figure 1** at static conditions and design height.

FIGURE 1
Commuter Coach Exterior Dimensions



TS 6.1 Bus Length

Bus length shall be between 45 and 47 feet. Bus length is determined as the measurement from bumper to bumper.

TS 6.2 Bus Width

TS 6.2.1 Transit Coach

Not applicable.

TS 6.2.2 Commuter Coach

Body width shall be 102 in. (+0, -1 in.).

TS 6.3 Bus Height

Maximum overall height shall be 140 in., including all rigid, roof-mounted items such as A/C, exhaust, fuel system and cover, charging equipment, etc.

TS 6.4 Step Height

TS 6.4.1 Transit Coach

Not applicable.

TS 6.4.2 Commuter Coach

The step height shall not exceed 16.5 in. at doorway without kneeling and shall not exceed 15.5 in. at the step.

TS 6.4.3 Articulated Coach

Not applicable.

TS 6.5 Underbody Clearance

The bus shall maintain the minimum clearance dimensions as defined and shown in Figure 2 of SAE J689, regardless of load up to the gross vehicle weight rating.

TS 6.6 Ramp Clearances

The approach angle is the angle measured between a line tangent to the front tire static loaded radius arc and the initial point of structural interference forward of the front tire to the ground.

The departure angle is the angle measured between a line tangent to the rear tire static loaded radius arc and the initial point of structural interference rearward of the rear tire to the ground.

The breakover angle is the angle measured between two lines tangent to the front and rear tire static loaded radius and intersecting at a point on the underside of the vehicle that defines the largest ramp over which the vehicle can roll.

TABLE 1
Breakover Angle

Approach	8.6 deg (min.)
Front breakover	8 deg (min.)
Departure	8.6 deg (min.)

TS 6.7 Ground Clearance

Ground clearance shall be no less than 9 in., (8 in. at jacking pad) except within the axle zone and wheel area.

Axle zone clearance, which is the projected area between tires and wheels on the same axial centerline, shall be no less than 5.4 in.

Wheel area clearance shall be no less than 8 in. for parts fixed to the bus body and 6 in. for parts that move vertically with the axles.

TS 6.8 Floor Height

TS 6.8.1 Transit Coach

Not applicable.

TS 6.8.2 Commuter Coach

Height of the step above the street shall be no more than 16 in. measured at the centerline of the doorway. All floor measurements shall be with the bus at the design running height and on a level surface and with the standard installed tires.

TS 6.9 Interior Headroom

Headroom above the aisle and at the centerline of the aisle seats shall be no less than 76 3/4 in. in the forward half of the bus, tapering to no less than 74 in. forward of the rear settee. At the centerline of the window seats, headroom shall be no lower than 65 in., except for parcel racks and reading lights, if specified. Headroom at the back of the rear bench seat may be reduced to a minimum of 56 in., but it shall increase to the ceiling height at the front of the seat cushion. In any area of the bus directly over the head of a seated passenger and positioned where a passenger entering or leaving the seat is prone to strike his or her head, padding shall be provided on the overhead paneling.

VEHICLE PERFORMANCE

TS 7. Power Requirements

The system shall be sized to provide sufficient power to enable the bus to meet the defined acceleration, top speed, route, mileage, GVWR and gradeability requirements, while operating all accessories. This shall be verified using actual road test results and/or simulated vehicle performance data.

A loss of power to the bus shall not cause the driver to lose control of the bus or to lose steering or braking. The bus shall be able to be safely brought to a controlled stop.

TS 7.1 Top Speed

The bus shall be capable of achieving and maintaining a top speed of 70 mph on a straight, level road at GVWR with all accessories operating. The bus shall be capable of safely maintaining the vehicle speed according to the recommendations by the tire manufacturer.

TS 7.2 Gradeability

Gradeability requirements shall be met on grades with a dry commercial asphalt or concrete pavement at GVWR with all accessories operating.

The propulsion system shall enable the bus to achieve and maintain a speed of 40 mph on a 2.5 percent ascending grade and 10 mph on a 10 percent ascending grade continuous.

There are segments of the Agency's expected service routes where roadway grade momentarily exceeds 10 percent. The bus shall be capable of ascending these steep segments at GVWR without impacting the Agency's service schedule. Additional details regarding Agency routes and the service schedule are included in TS 8.2.

TS 7.3 Acceleration

The acceleration shall meet the requirements in **Table 2** and shall be sufficiently gradual and smooth to prevent throwing standing passengers off-balance. Acceleration measurement shall commence when the accelerator is depressed.

TABLE 2
Maximum Start Acceleration Times on a Level Surface¹

Speed (mph)	Maximum time (seconds)
10	5

20	10
30	18
40	30
50	60
Top speed	

1. Vehicle weight = GVWR

Braking application and performance shall remain consistent regardless of hybrid (or battery) system state of charge (SOC) or other variances related to regenerative braking.

TS 7.4 Operating Range

The operating range of the coach shall be designed to meet the operating profile as stated in TS 8.2 “Design Operating Profile”.

TS 8. Fuel Economy/Range (Design Operating Profile)

The bus must be able to achieve operational requirements under standard operating conditions and in agency-specific conditions. These conditions make up the Design Operating Profile. The agency-specific conditions are established to ensure that the buses will be able to meet the unique operational requirements of the transit agency.

TS 8.1 Altoona Fuel Economy Tests

Altoona Testing is not required. However, Proposers must clearly indicate within their Proposal submittal which of the following applies and provide the requested supporting material:

- a. The proposed vehicle has completed Altoona Testing (note: the Proposal must include a copy of the test report).
- b. The proposed vehicle is currently being tested at Altoona (note: the Proposal must include the expected test completion date).
- c. The proposed vehicle has not yet been tested, but the Proposer plans to test the proposed vehicle in the future (note: the Proposal must include the expected test begin date).
- d. There are no plans to have the proposed vehicle tested at Altoona.

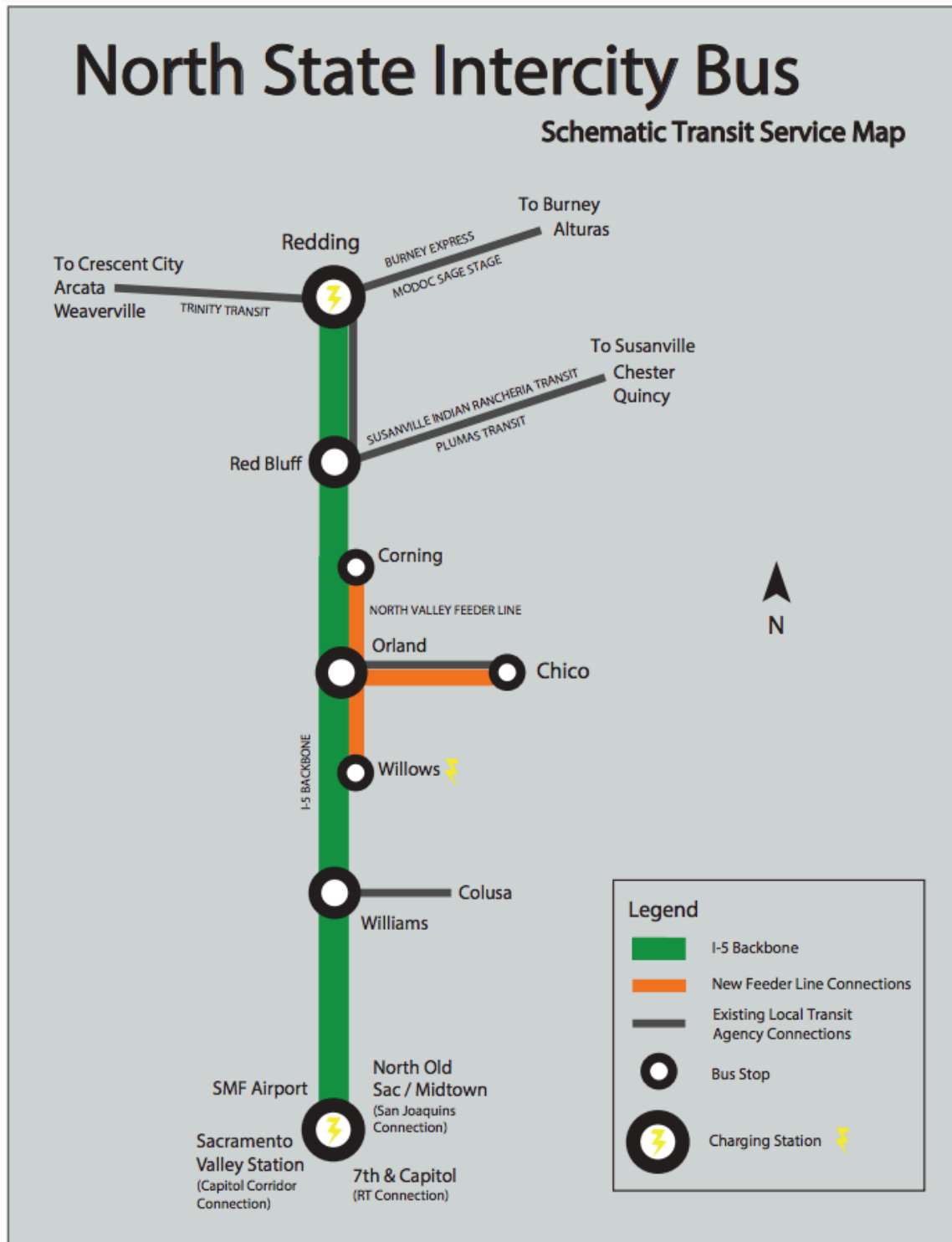
SRTA requests that prospective Proposers provide a copy of the Altoona test report if and when it becomes available.

TS 8.2 Agency Design Operating Profile (Battery Electric Bus)

The proposed vehicle must be capable of meeting the service requirements for the two routes described below (Salmon Runner and North Valley Feeder) throughout the service life of the vehicle. The proposed vehicle shall meet these service requirements while operating with a full passenger load throughout the range of environmental conditions described in TS 5.7 and maintaining a passenger cabin temperature of 70 degrees.

An illustration of the general route alignment is included in Figure 2 for reference.

Figure 2
Illustration of Salmon Runner and North Valley Feeder Route Alignments



Salmon Runner Service Requirements

The Salmon Runner is a high-speed, long-distance, intercity route between Redding, California and Sacramento, California. The one-way trip distance on this route is approximately 175 miles. The proposed vehicle must complete the one-way trip on a single charge both when the energy storage system is new and when the energy storage system reaches its Warrantable End of Life. After completing each trip, the vehicle must be capable of accepting a high enough charge rate to completely recharge in 3 hours or less. Some buses will make the one-way trip twice each day and will be charged between trips.

The following are general operating profile data:

- a. Route length: 175 miles
- b. Average route speed (nominal): 45 mph
- c. Maximum route speed: 70 mph
- d. Trip duration: less than 4 hours

For reference, the expected service schedule for Salmon Runner is shown in Figure 3.

Figure 3
Expected Salmon Runner Service Schedule

Southbound					
		Trip 1	Trip 2	Trip 3	Trip 4
Redding	Downtown Transit Center	5:01 AM	7:31 AM	10:28 AM	5:28 PM
Red Bluff	Hampton Inn & Suites/Holiday Inn Ex	5:31 AM	8:01 AM	10:58 AM	5:58 PM
Orland	CVS	6:06 AM	8:36 AM	11:33 AM	6:33 PM
Williams	SR 20 or E Street Site	6:53 AM	9:23 AM	12:20 PM	7:20 PM
Sacramento	Sacramento International Airport	7:46 AM	10:16 AM	1:13 PM	8:13 PM
	7 th & Capitol Stop	8:08 AM	10:38 AM	1:35 PM	8:35 PM
	Sacramento Valley Station	8:20 AM	10:50 AM	1:47 PM	8:47 PM
Northbound					
		Trip 1	Trip 2	Trip 3	Trip 4
Sacramento	Sacramento Valley Station	5:00 AM	11:35 AM	3:45 PM	7:30 PM
	7 th & Capitol Stop	5:12 AM	11:47 AM	3:57 PM	7:42 PM
	Sacramento International Airport	5:34 AM	12:09 PM	4:19 PM	8:04 PM
Williams	SR 20 or E Street Site	6:27 AM	1:02 PM	5:12 PM	8:57 PM
Orland	CVS	7:14 AM	1:49 PM	5:59 PM	9:44 PM
Red Bluff	Hampton Inn & Suites/Holiday Inn Ex	7:49 AM	2:24 PM	6:34 PM	10:19 PM
Redding	Downtown Transit Center (arrives)	8:19 AM	2:54 PM	7:04 PM	10:49 PM

Buses will be charged at both the northern (Redding) and southern (Sacramento) ends of the route. In Redding, chargers will be located at the Redding Area Bus Authority (RABA) maintenance facility at 333 South Market Street, Redding, California 96001. In Sacramento, chargers will be located at the Sacramento Regional Transit (SacRT) vehicle storage yard at N and 29th Streets, Sacramento, California 95811. Proposal submittals that include the option for the Agency to purchase charging systems must consider these specific charging locations. Buses will be stored at these same locations when not in use.

North Valley Feeder Service Requirements

The North Valley Feeder is a high-speed, intercity transit service between the cities of Willows, Orland, Chico, and Corning, California. The total distance of the route is approximately 140 miles. At minimum, the proposed vehicles must complete the total distance of the route on a single charge both when the energy storage system is new and when the energy storage system reaches its Warrantable End of Life.

The following are general operating profile data:

- a. Route length: 140 miles
- b. Average route speed (nominal): 35 mph
- c. Maximum route speed: 70 mph
- d. Trip duration: less than 4 hours

For reference, the expected service schedule for the North Valley Feeder is shown in Figure 4.

Figure 4
Expected North Valley Feeder Service Schedule

Southbound					
		Trip 1	Trip 2	Trip 3	Trip 4
Corning	Transportation Center	6:33 AM	9:08 AM	4:28 PM	9:23 PM
Orland	9th Street / Walker	6:57 AM	9:32 AM	4:52 PM	9:47 PM
Chico	Greyhound / Amtrak Station	7:34 AM	10:09 AM	5:29 PM	10:24 PM
Orland	9th Street / Walker	8:11 AM	10:46 AM	6:06 PM	11:01 PM
Willows	Walmart (arrives)	8:27 AM	11:02 AM	6:22 PM	11:17 PM
Northbound					
		Trip 1	Trip 2	Trip 3	Trip 4
Willows	Walmart	4:25 AM	7:00 AM	2:20 PM	7:15 PM
Orland	9th Street / Walker	4:48 AM	7:23 AM	2:43 PM	7:38 PM
Chico	Greyhound / Amtrak Station	5:25 AM	8:00 AM	3:20 PM	8:15 PM
Orland	9th Street / Walker	6:02 AM	8:37 AM	3:57 PM	8:52 PM
Corning	Transportation Center	6:26 AM	9:01 AM	4:21 PM	9:16 PM

Buses must charge at the Glenn County Maintenance Yard in Willows (777 Colusa Street, Willows, CA 95988). Proposal submittals that include the option for the Agency to purchase charging systems must consider this specific charging location. Buses will also be stored at this location when not in use.

The Proposer must validate that the proposed bus will meet the design operating profile using sound mathematical modeling and simulation or empirical methods. Detailed times series duty cycle data for a vehicle on each route is attached to this solicitation. The Proposer must use these data sets to simulate service

with the proposed vehicle and report vehicle efficiency, range, and average auxiliary loads (e.g. HVAC) on each route under the following conditions when the vehicle is new and when the energy storage system reaches its Warrantable End of Life:

Nominal Conditions:

- Ambient Temperature: 70 degrees F
- Relative Humidity: 50%
- Passenger Load: 15 passengers

Summer (Harsh) Conditions:

- Ambient Temperature: 100 degrees F
- Relative Humidity: 80%
- Passenger Load: full passenger load

Winter (Harsh) Conditions:

- Ambient Temperature: 35 degrees F
- Relative Humidity: 20%
- Passenger Load: full passenger load

The Contractor shall provide the following narratives with its Technical Proposal:

- a. A detailed description of the methods used to validate that the proposed vehicle will meet the Agency design operating profile under the conditions described above.
- b. Service simulation results on each route in nominal and harsh conditions (described above), both when the vehicle is new and when the energy storage system reaches its Warrantable End of Life.
- c. The gross energy storage capacity (kWh) of the energy storage system when the system is new and when the system reaches its Warrantable End of Life.
- d. The usable energy storage capacity (kWh) of the energy storage system when the system is new and when the system reaches its Warrantable End of Life
- e. A detailed description of the methods that the agency can use to measure both the gross and usable energy capacity of the energy storage system.
- f. Description of any required or recommended charge strategies or other bus operation strategies that are necessary to meet the Agency design operating profile. Note that the agency requires that operational impacts be minimized.
- g. Description of the flexibility and considerations necessary to place the proposed bus and its charging solution on any Agency route at the Agency's discretion.

POWERPLANT

TS 9. Engine

TS 9.1 Engine (Diesel and CNG)

Not applicable.

TS 9.2 Engine (CNG)

Not applicable.

TS 9.3 Propulsion System (Hybrid or All Electric)

TS 9.3.1 Propulsion System Description (Hybrid)

Not applicable.

TS 9.3.2 Propulsion System Description (All Electric)

The bus shall be powered by an electric propulsion system. To the greatest extent practical, the electric propulsion system shall conform to SAE J2910 and SAE J2344.

The propulsion system shall not be supplemented by any onboard range extenders, including but not limited to internal combustion engines, gas turbines and/or hydrogen fuel cells.

The OEM shall ensure that the bus structure is suitable for the electric propulsion system and can be operated safely on the Design Operating Profile (TS 8) for the service life of the bus (TS 5.3) without a structural failure. The propulsion system shall comply with applicable local, state and/or federal emissions and useful life requirements.

Labels should be posted on high-voltage devices to identify them as components conducting high voltage potential. These labels shall be applied in such a way that they can be seen when access doors are opened or closed, so as to protect both emergency and maintenance personnel.

A detailed description of the propulsion system shall be provided with the proposal. The description shall include a written narrative, a block diagram showing major propulsion system components, an illustration showing the physical layout of propulsion components and high-voltage wire routing within the vehicle, and a detailed wiring diagram and/or electrical schematic for the high-voltage system. Proposer is required to provide a list of applicable industry standards that the proposed propulsion system meets.

TS 9.3.3 Propulsion System Service

The propulsion system shall be arranged so that accessibility for all routine maintenance is ensured. No special tools, other than dollies and hoists, shall be required to remove the propulsion system or any subsystems. The Agency recognizes that properly rated test equipment and safe electrical work practices are essential when servicing high-voltage components. The contractor shall identify safe electrical work practices that are essential when servicing high-voltage components. The Contractor shall provide all specialty tools and diagnostic equipment required for maintaining the propulsion system in accordance with the Special Tools List.

TS 9.3.4 Primary Propulsion Unit and Traction Motor(s)

The propulsion system components may be arranged in a variety of configurations. The traction motor must be capable of providing and retarding mechanical motion.

TS 9.3.5 Energy Storage System and Controller

Energy Storage System

The Energy Storage System (ESS) shall be of a commercial design capable of operating in the Agency transit environment and design operating profile. The ESS shall use battery technology with a field-proven track record of safe, reliable and durable operation in similar transit applications. The ESS shall be designed, sized and selected to ensure that the vehicle performance specifications, compatibility with charging, and other related requirements are met or exceeded, bearing in mind cost/benefit and reliability variables as they relate to the characteristics of the different battery types.

The ESS shall comply with UN/DOT 38.3 and/or SAE J2464 requirements for lithium batteries or similar standards for non-lithium batteries.

The Contractor shall deliver the buses with an installed, functioning ESS charged with at least 25 kWh of usable energy. The ESS shall be fully formed, installed and tested in accordance with the battery manufacturer's recommended practices. The ESS design, including containers, module bracing systems, thermal-management systems, battery-management systems, watering/venting systems, interconnections, fusing and traction-controller and charger interfaces shall be adequately described in the proposal. The proposal shall include a description of all battery maintenance requirements including any periodic charge requirements necessary for cell balancing. The proposal shall also include a comprehensive statement of the warranty terms relating to the battery, including explanation of all disclaimers within the warranty. The charge cycle and cycle life shall be stated in the proposal, and a life-cycle cost analysis of the proposed battery system in the specified application shall be provided.

The battery system shall be capable of withstanding the current and voltage profiles necessary to accomplish daily recharge events within the defined operating profile.

Thermal management will be provided as needed to ensure optimal life and performance of the ESS over the environmental operating range. The battery thermal management system shall be adequate to maintain the battery within the battery manufacturer's recommended temperature range during operation in the specified duty cycle and climatic conditions.

Proposals shall include complete descriptions of all life-cycle testing procedures used to validate the life of batteries used for this application at the proposed charging rates, charge durations, and expected ambient temperatures and operating profiles. Proposers shall include documented results of life-cycle testing. Proposers shall include certification of battery life-cycle testing by an independent testing agency.

Energy Storage System Capacity

The ESS shall have sufficient energy storage to meet the requirements of the intended duty cycle when new and up until the degradation has reached warrantable end of life (WEOL), as defined within the warranty terms of this RFP by percent remaining capacity. As an example if the capacity when new is 300 kWh and the WEOL is at 80 percent, then the useable capacity range shall be from 300 to 240 kWh.

The ESS shall be measured periodically during the 12-year design life of the buses per the following protocol by the bus manufacturer at an interval of at least every [insert number] years. The manufacturer will propose the test method, and certify the results are true and accurate. The test will be performed according to a documented test procedure. The Agency is allowed to engage third-parties for capacity testing.

Energy Storage System Safety

The ESS shall be placed on the bus to optimize both interior space and vehicle weight distribution. The batteries shall be load distributed within the bus to equalize weight between the wheels on the same axles and to achieve appropriate weight distribution between axles so as not to adversely affect handling of the bus.

The bus body shall be designed and constructed to ensure that passengers and the operator will not be exposed to hazardous electrical current. This design will also minimize potential exposure to hazardous electrical current in the event of a vehicle accident. Analysis and test data shall be provided to the Agency. The vehicle and energy storage system shall be designed and constructed to prevent gassing or fumes from the energy storage system from entering the interior of the bus, i.e., a vent path to the exterior, preferably at or above the roof, rearward.

Written confirmation from the battery manufacturer attesting to the safety of the proposed battery system in the specified application and charging profile shall be submitted as part of the proposal, and shall include full disclosure and discussion of any and all relevant issues or prior incidents relating to safety.

Proposals shall include complete descriptions of all safety standards followed in the design and manufacture of the battery system, safety testing procedures used to validate the safety of battery operation in this application, and documented results of safety testing to confirm that standards have been met.

Both automatic and manual battery disconnect devices must be included and documented. Contactors shall be rated to interrupt the full load of the bus. Service and emergency manual disconnects must be included and their usage documented. Contractor shall provide a means to isolate the high-voltage battery during maintenance operations. Manual and automatic disconnects should open both poles of each physical battery pack.

The HV system and ESS shall include isolation protection between the HV and bus chassis system, to include automatic detection of isolation faults, alerts to the operator, diagnostic system and appropriate action to prevent personnel from HV exposure. Detection, alerting, and vehicle control shall occur in accordance with SAE J2910. Detection shall be provided at two levels, as per J2910, and detection at any level shall be alerted to the operator and maintenance personnel.

The system described above may also be an integral part of the overall emergency shutdown system, with functions to include the following:

- Offers a quick, safe and organized means for the operator, maintenance personnel and/or first responders to shut down the HV system.
- Shutting down the system shall include at least:
 - “opening” all HV contactors;
 - discharging capacitors (if used); and
 - disconnecting any devices that could provide HV, during normal operation and including during charging.
- Devices used to initiate shutdown shall be located within and outside the bus to satisfy ease of use by the mentioned personnel and be clearly marked as to location and use.
- In addition to manual use, this same functionality shall extend to the charging operation in the event of a fault sensed by the GFI, to also include termination of charge.

Battery Containers

Battery containers shall be constructed to withstand the rigors of transit service for the design life of the buses. Construction shall be of materials compatible with the battery electrolyte. All electrical connections shall be fully shielded and hand-operable. Connector and cabling design shall be such that inappropriate or unsafe connections are prevented. Vent-and-fill system components for individual packs or containers shall not require any disassembly on removal or installation of the battery packs or containers. Pack design must comprehend the protection of battery cabling and vent/watering system components during pack removal and installation. The batteries, when installed, shall be secured to the chassis to prevent any movement that may cause damage or personal harm while the vehicle is in operation.

Battery Management System

The battery management system must be designed to ISO 26262, as applicable, safety principles to control state of charge, voltage, current and temperatures on a cell-to-cell level and provide diagnostic output at the lowest field-serviceable element. The diagnostic output must be made available to the maintainer.

As a minimum, the battery management system (BMS) must perform the following functions:

- a. The BMS must be capable of monitoring the voltage level of cells within each battery pack. The BMS must be able to read and store individual battery or block voltages at a frequency of one data point per block every 15 s. The system must also monitor battery pack temperatures using no fewer than two thermocouples placed in and around each battery pack sampled at the same four-samples-per-minute frequency.
- b. The BMS must be capable of communicating when a battery fault (as defined by the battery manufacturer) has occurred and must be able to identify and communicate the faulty battery in order to perform maintenance.
- c. The BMS must be capable of engaging prudent safety interlocks when an unsafe battery condition has been detected.
- d. The BMS must be able to monitor the battery state-of charge and update a gauge viewed by the operator at least once every 15 s.
- e. The BMS must be able to communicate all data to the bus level information system for storage and communication.
- f. The BMS must be capable of maintaining cell voltage balance during the course of regular operation and charging without requiring special periodic balancing charges.
- g. The BMS must be able to monitor both the battery state-of charge and energy remaining and update gauges viewable to the operator at least once every 15 s. The energy remaining gauge should display in units of kWh and indicate the best available estimate of the absolute amount of energy remaining until the SOC gauge reaches zero.

Battery Thermal Management

Thermal management shall be provided to ensure optimal life and performance of the ESS over the environmental operating range.

Battery temperatures must never exceed the manufacturer's recommended range during operation in the design operating profile and specified ambient conditions. Battery cooling must be sufficient to prevent the temperature from exceeding the battery manufacturer's recommended maximum temperature.

Battery Charging

The bus shall support the SAE J1772 DC charging standard and utilize a Type 1 "J1772" CCS/Combo connector. Utilization of this connector and charging standard are critical to inter- and intra-agency fleet/charger interchangeability.

A Chargepoint charger with a Type 1 "J1772" CCS/Combo connector is already installed in the Agency's service area. The bus must be capable of utilizing this charger.

Roof mounted charging equipment and the capability to charge the bus with SAE J3105 compatible inverted pantograph overhead charging systems should be priced as an option outside of the base bus bid.

All charging systems provided for use with the bus and in conjunction with the battery management system must comply with the battery manufacturer's electrical and thermal limits.

The buses must be immobilized during all charging operations. Upon successful engagement of the charging interface, the bus shall be interlocked such that propulsion is rendered nontractive and the brakes applied.

TS 9.3.6 Propulsion System Controller (PSC)

The HSC regulates energy flow throughout hybrid system components in order to provide motive performance and accessory loads, as applicable, while maintaining critical system parameters (e.g., voltages, currents, temperatures, etc.) within specified operating ranges.

The controller shall monitor and process inputs and execute outputs as appropriate to control the operation of all propulsion system components.

Energy storage system SoC correction methods stated in SAE J2711 shall be used (for all-electric or hybrid only.)

TS 9.3.7 Engine (Hybrid)

Not applicable.

TS 10. Cooling Systems

The capacity of the cooling system shall be adequate to maintain design component temperatures under all operating conditions for the design life of the vehicle in the service area and environment of the agency. The Contractor shall provide evidence that the cooling system selected has the capability to handle peak heat rejection from the traction motor, energy storage system, propulsion control system, and the intermediate and low-voltage power supply with a partially clogged radiator at maximum ambient temperature plus heat reflected off the pavement. The Contractor shall submit an analysis verifying cooling system capabilities. The entire cooling system shall be equipped with an electronic detection device to indicate overheating on the driver's control panel.

Operation of required battery thermal management systems shall be automatically controlled under all normally encountered operating and charging conditions and shall be powered by an onboard source at all times. Thermal management shall be continuously monitored during all periods of charge and discharge with appropriate safety interlocks installed to react to adverse conditions.

Air intakes shall be properly positioned and configured to minimize the intake of water, road dust and debris and shall be adequately filtered.

In the event of a failure of the battery thermal management system while charging, the charge system shall be disabled and a visual alert shall be activated on the dashboard, the reset of which shall require the deliberate action of maintenance personnel. In the event of a failure of the battery thermal management system during bus operation, an audible and visual alert shall be activated on the dashboard, the reset of which shall require the deliberate action of maintenance personnel. In the event of a fire onboard a bus, thermal management fans shall be automatically turned off.

A complete description of the battery thermal management systems shall accompany the bid package. Written confirmation from the battery manufacturer attesting to the suitability of the battery thermal management system shall be submitted to the Agency concurrent with or prior to delivery of the first bus.

TS 10.1 Component Thermal Management

Under the vehicle operating temperature range, the thermal management system shall be designed such that each component will remain in its allowed operating range.

Component temperature sensors may be used for monitoring, control or component/system protection. If equipped and serviceable, component temperature sensors shall be easily accessible. Under typical failure modes or out-of-limit conditions, component temperature sensors shall not disable the bus unless there is an immediate risk of hazardous fault propagation (e.g., temperature levels in the motor area known to start fires). In the event that a component temperature sensor must disable the bus, the component/system must comply with the automatic propulsion system protection/shutdown override feature requirement of TS 9.

Motor cooling fans shall be of durable, corrosion-resistant construction and designed so a mechanic can gain access. The cooling fan and mounting bracket shall be designed to withstand the thermal fatigue and vibration associated with the installed configuration.

A means of determining satisfactory component coolant level shall be provided. A spring-loaded, push-button type valve or lever shall be provided to safely release pressure or vacuum in the cooling system with both it and the water filler no more than ± 60 in. above the ground. Both shall be accessible through the same access door.

The radiator and charge air cooler shall be of durable, corrosion-resistant construction with non-removable tanks.

TS 10.1.1 Radiator Screen

No screen in front of radiator.

TS 10.1.2 Coolant

The engine cooling system shall be equipped with a properly sized water filter with a spin-on element and an automatic system for releasing supplemental coolant additives as needed to replenish and maintain protection properties. When replacing the water filter, only the water in the filter will be lost.

TS 10.1.3 Drive Design

Control and drive of the radiator and charge air cooler fan(s) shall be the Contractor's standard design.

TS 10.1.4 Mounting

Mounting location of radiator and charge air cooler shall be the Contractor's standard design.

TS 10.2 Charge Air Cooling

Not applicable.

TS 10.3 Transmission Cooling

If a transmission is present in the bus, the transmission shall be cooled by a heat exchanger sized to maintain operating fluid within the transmission manufacturer's recommended parameters of flow, pressure and temperature. Where applicable, the transmission cooling system shall be matched to the retarder and engine cooling systems to ensure that all operating fluids remain within recommended temperature limits established

by each component manufacturer. Where applicable, the engine cooling system should provide coolant bypass flow to the transmission cooling system with the engine thermostats closed.

TS 10.4 Hybrid Drive System Cooling

The thermal management system shall maintain hybrid system components within design operating temperature limits.

TS 11. Transmission

If multiple-speed transmission is used, the transmission shall be automatic shift with torque converter, retarder and electronic controls. Gross input power, gross input torque and rated input speed shall be compatible with the propulsion system. The transmission shall be designed to operate for not less than 300,000 miles on the design operating profile without replacement or major service. The transmission should be easily removable without disturbing the engine and accessible for service.

The electronic controls shall be capable of transmitting and receiving electronic inputs and data from other drivetrain components and of broadcasting that data to other vehicle systems. Communication between electronic drivetrain components and other vehicle systems shall be made using the communications networks. Electronic controls shall be compatible with either 12 or 24 V power distribution, provide consistent shift quality, and compensate for changing conditions, such as variations in vehicle weight and engine or motor power. At a minimum, drivetrain components consisting of the motor(s), motor inverter(s), engine, transmission, retarder, ASR and anti-lock braking systems shall be powered by a dedicated and isolated ignition supply voltage to ensure that data communication among components exists when the vehicle ignition is switched to the “on” position.

The electronically controlled transmission shall have onboard diagnostic capabilities, be able to monitor functions, store and time-stamp out-of-parameter conditions in memory, and communicate faults and vital conditions to service personnel. The transmission shall contain built-in protection software to guard against severe damage. The onboard diagnostic system shall trigger a visual alarm to the driver when the electronic control unit detects a malfunction.

An electronic transmission fluid level monitoring and protection system shall be provided.

A brake pedal application of 6 to 10 psi shall be required by the driver to engage forward or reverse range from the neutral position to prevent sudden acceleration of the bus from a parked position.

The transmission shall not incorporate an automatic neutral shift function.

TS 12. Retarder (Transit Coach)

Not applicable.

TS 13. Engine Brake (Commuter Coach)

Not applicable.

TS 14. Mounting

All electrical/electronic hardware shall be serviceable. All electrical/electronic hardware mounted in the interior of the vehicle shall be resistant to tampering from passengers.

All electrical/electronic hardware mounted on the exterior of the vehicle that is not designed to be installed in an exposed environment shall be mounted in a protective enclosure. The hardware shall be mounted in such a manner as to protect it from the environment.

All electrical/electronic hardware and its mounting shall comply with the shock and vibration requirements of SAE J1455.

TS 14.1 Service

All systems requiring routine maintenance shall be arranged for ease of access and maintenance. The Contractor shall list all special tools, fixtures or facility requirements recommended for servicing. All fillers shall be easily accessible with standard funnels, pour spouts and automatic dispensing equipment.

The propulsion system shall be arranged for ease of access and maintenance. The Contractor shall list all special tools, fixtures or facility requirements recommended for servicing. The muffler, exhaust system, air cleaner, air compressor, starter, alternator, radiator, all accessories and any other component requiring service or replacement shall be easily removable and independent of the engine and transmission removal. An engine oil pressure gauge and coolant temperature gauge shall be provided in the engine compartment. These gauges shall be easily read during service and mounted in an area where they shall not be damaged during minor or major repairs.

An air cleaner with a dry filter element and a graduated air filter restriction indicator shall be provided. The location of the air intake system shall be designed to minimize the entry of dust and debris and to maximize the life of the air filter. The engine air duct shall be designed to minimize the entry of water into the air intake system. Drainage provisions shall be included to allow any water/moisture to drain prior to entry into the air filter.

Engine oil and the radiator filler caps shall be hinged to the filler neck and closed with spring pressure or positive locks to prevent leakage. All fluid fill locations shall be properly labeled with permanent metal tags to help ensure that correct fluid is added. All fillers shall be easily accessible with standard funnels, pour spouts and automatic dispensing equipment. All lubricant sumps shall be fitted with magnetic-type drain plugs or magnets in pan.

No engine bypass oil filter.

Engine oil pressure and coolant temperature gauges required in engine compartment.

TS 15. Hydraulic Systems

Hydraulic system service tasks shall be minimized and scheduled no more frequently than those of other major coach systems. All elements of the hydraulic system shall be easily accessible for service or unit replacement. Critical points in the hydraulic system shall be fitted with service ports so that portable diagnostic equipment may be connected or sensors for an off-board diagnostic system permanently attached to monitor system operation when applicable. A tamperproof priority system shall prevent the loss of power steering during operation of the bus if other devices are also powered by the hydraulic system.

The hydraulic system shall operate within the allowable temperature range as specified by the lubricant manufacturer.

No requirement for hydraulic system sensors.

TS 15.1 Fluid Lines

All lines shall be rigidly supported to prevent chafing damage, fatigue failures, degradation and tension strain. Lines should be sufficiently flexible to minimize mechanical loads on the components. Lines passing through a panel, frame or bulkhead shall be protected by grommets (or similar devices) that fit snugly to both the line and the perimeter of the hole that the line passes through to prevent chafing and wear. Pipes and fluid hoses shall not be bundled with or used to support electrical wire harnesses.

Lines shall be as short as practicable and shall be routed or shielded so that failure of a line shall not allow the contents to spray or drain onto any component operable above the auto-ignition temperature of the fluid.

All hoses, pipes, lines and fittings shall be specified and installed per the manufacturer's recommendations.

TS 15.2 Fittings and Clamps

All clamps shall maintain a constant tension at all times, expanding and contracting with the line in response to temperature changes and aging of the line material. The lines shall be designed for use in the environment where they are installed (for example, high-temperature resistant in the engine compartment, resistant to road salts near the road surface, and so on).

Compression fittings shall be standardized to prevent the intermixing of components. Compression fitting components from more than one manufacturer shall not be mixed, even if the components are known to be interchangeable.

TS 15.3 Charge Air Piping

Not applicable.

TS 16. Radiator

If liquid cooling is used, the radiator and/or heat exchanger shall be a heavy-duty metal unit, preferably constructed with a copper core. It is preferred to be of the tube type with bolted-on upper and lower tanks and with no solder-to-coolant contact. The radiator shall be accessible for cleaning. Any radiator shall be easily removable from the bus. Aluminum brazed/soldered radiator and/or heat exchanger may be used for low-temperature coolant systems only.

Radiator piping shall be stainless steel, brass tubing or painted steel rated at 1000 hours of salt spray according to ASTM B117. Where practicable, hoses shall be eliminated. Necessary hoses shall be impervious to all bus fluids. All hoses shall be secured with stainless steel clamps that provide a complete 360 deg. seal. The clamps shall maintain a constant tension at all times, expanding and contracting with the hose in response to temperature changes and aging of the hose material.

TS 17. Fluid Transfer Lines

All systems requiring lubrication shall meet or exceed component manufacturer's recommendation for installation, operation and maintenance. The fluid transfer lines shall be designed and intended for use in the environment where they are installed (for example, high-temperature resistant in the engine compartment,

resistant to road salts near the road surface and so on). Fluid lines shall not be the lowest point of the bus undercarriage.

TS 18. Fuel

Not applicable.

TS 19. Emissions and Exhaust

TS 19.1 Emissions (All-Electric)

The vehicle shall not have any EPA-regulated exhaust emissions except as noted in TS 55.1, “Auxiliary Heater.”

TS 19.2 Exhaust Emissions

Not applicable.

TS 19.3 Exhaust System (HFC)

Not applicable..

TS 19.4 Exhaust Aftertreatment

Not applicable.

TS 19.5 Particulate Aftertreatment

Not applicable.

STRUCTURE

TS 20. General

TS 20.1 Design

The structure of the vehicle shall be designed to withstand the transit service conditions typical of an urban or intercity duty cycle throughout its service life. The vehicle structural frame shall be designed to operate with minimal maintenance throughout the 12-year design operating profile. The design operating profile specified by the Agency shall be considered for this purpose.

TS 21. Altoona Testing

Altoona Testing is not required. However, Proposers must clearly indicate within their Proposal submittal which of the following applies and provide the requested supporting material:

- a. The proposed vehicle has completed Altoona Testing (note: the Proposal must include a copy of the test report).
- b. The proposed vehicle is currently being tested at Altoona (note: the Proposal must include the expected test completion date).
- c. The proposed vehicle has not yet been tested, but the Proposer plans to test the proposed vehicle in the future (note: the Proposal must include the expected test begin date).

- d. There are no plans to have the proposed vehicle tested at Altoona.

SRTA requests that prospective Proposers provide a copy of the Altoona test report if and when it becomes available.

TS 21.1 Structural Validation

The structure of the bus shall have undergone appropriate structural testing and/or analysis. At minimum, appropriate structural testing and analysis shall include Altoona testing or finite element analysis (FEA).

TS 22. Distortion

The bus, loaded to GVWR and under static conditions, shall not exhibit deflection or deformation that impairs the operation of the steering mechanism, doors, windows, passenger escape mechanisms or service doors. Static conditions shall include the vehicle at rest with any one wheel or dual set of wheels on a 6 in. curb or in a 6 in. deep hole.

TS 23. Resonance and Vibration

All structure, body and panel-bending mode frequencies, including vertical, lateral and torsional modes, shall be sufficiently removed from all primary excitation frequencies to minimize audible, visible or sensible resonant vibrations during normal service.

TS 23.1 Propulsion Compartment Bulkheads

The passenger and propulsion system compartments shall be separated by a fire-resistant bulkhead. This bulkhead shall preclude or retard propagation of a compartment fire into the passenger compartment and shall be in accordance with the Recommended Fire Safety Practices defined in FTA Docket 90A, dated Oct. 20, 1993. Only necessary openings shall be allowed in the bulkhead, and these shall be fire-resistant. Any passageways for the climate control system air shall be separated from the engine compartment by fire-resistant material. Piping through the bulkhead shall have fire-resistant fittings sealed at the bulkhead. Wiring may pass through the bulkhead only if connectors or other means are provided to prevent or retard fire propagation through the bulkhead. Engine access panels in the bulkhead shall be fabricated of fire-resistant material and secured with fire-resistant fasteners. These panels, their fasteners and the bulkhead shall be constructed and reinforced to minimize warping of the panels during a fire that will compromise the integrity of the bulkhead.

TS 23.2 Crashworthiness

The bus body and roof structure shall withstand a static load equal to 150 percent of the curb weight evenly distributed on the roof with no more than a 6 in. reduction in any interior dimension. Windows shall remain in place and shall not open under such a load. These requirements must be met without the roof-mounted equipment installed.

The bus shall withstand a 25 mph impact by a 4000 lb automobile at any side, excluding doorways, along either side of the bus and the articulated joint, if applicable, with no more than 3 in. of permanent structural deformation at seated passenger hip height. This impact shall not result in sharp edges or protrusions in the bus interior.

Exterior panels below 35 in. from ground level shall withstand a static load of 2000 lb applied perpendicular to the bus by a pad no larger than 5 sq. in. This load shall not result in deformation that prevents installation of new exterior panels to restore the original appearance of the bus.

TS 24. Corrosion

The bus flooring, sides, roof, understructure and axle suspension components shall be designed to resist corrosion or deterioration from atmospheric conditions and deicing materials for a period of 12 years or 500,000 miles, whichever comes first. It shall maintain structural integrity and nearly maintain original appearance throughout its service life, with the Agency's use of proper cleaning and neutralizing agents.

All materials that are not inherently corrosion resistant shall be protected with corrosion-resistant coatings. All joints and connections of dissimilar metals shall be corrosion resistant and shall be protected from galvanic corrosion. Representative samples of all materials and connections shall withstand a two-week (336-hour) salt spray test in accordance with ASTM Procedure B-117 with no structural detrimental effects to normally visible surfaces and no weight loss of over 1 percent.

All exposed surfaces and the interior surfaces of tubing and other enclosed members below the lower window line shall be corrosion resistant through application of a corrosion protection system.

TS 25. Towing

Each towing device shall withstand, without permanent deformation, tension loads up to 1.2 times the curb weight of the bus within 20 deg of the longitudinal axis of the bus. If applicable, the rear towing device(s) shall not provide a foothold for unauthorized riders. The method of attaching the towing device shall not require the removal or disconnection of front suspension or steering components. Removal of the bike rack is permitted for attachment of towing devices. The OEM shall provide the towing procedure.

Shop air connectors shall be provided at the front and rear of the bus and shall be capable of supplying all pneumatic systems of the bus with externally sourced compressed air. The location of these shop air connectors shall facilitate towing operations.

No glad-hand type connector shall be provided.

The front towing devices shall allow attachment of adapters for a rigid tow bar and shall permit the lifting of the bus until the front wheels are clear off the ground in order to position the bus on the towing equipment by the front wheels. These devices shall also permit common flat towing.

Two rear recovery devices/tie-downs shall permit lifting and towing of the bus for a short distance, such as in cases of an emergency, to allow access to provisions for front towing of the bus. The method of attaching the tow bar or adapter shall require the specific approval of the Agency. Any tow bar or adapter exceeding 50 lb should have means to maneuver or allow for ease of use and application. Each towing device shall accommodate a crane hook with a 1 in. throat.

TS 26. Jacking

It shall be possible to safely jack up the bus, at curb weight, with a common 10-ton floor jack with or without special adapter, when a tire or dual set is completely flat and the bus is on a level, hard surface, without crawling under any portion of the bus. Jacking from a single point shall permit raising the bus sufficiently high to remove and reinstall a wheel and tire assembly. Jacking pads located on the axle or suspension near

the wheels shall permit easy and safe jacking with the flat tire or dual set on a 6 in. high run-up block not wider than a single tire. The bus shall withstand such jacking at any one or any combination of wheel locations without permanent deformation or damage.

Jacking pads shall be painted safety yellow.

TS 27. Hoisting

The bus axles or jacking plates shall accommodate the lifting pads of a two-post (or three-post if 60 ft. articulated bus) hoist system. Jacking plates, if used as hoisting pads, shall be designed to prevent the bus from falling off the hoist. Other pads or the bus structure shall support the bus on jack stands independent of the hoist.

The vehicle shall be capable of lifting by the wheels and, as necessary to meet tire load requirements, the proper number for wheel lifts and/or adapters must be used.

TS 28. Floor

TS 28.1 Design (Transit Coach)

Not applicable.

TS 28.2 Design (Commuter Coach)

The floor shall be essentially a continuous plane, except at the wheel housings and platforms. Where the floor meets the walls of the bus, as well as other vertical surfaces such as platform risers, the surface edges shall be blended with a circular section of radius not less than $\frac{1}{4}$ in. or installed in a fully sealed butt joint. Similarly, a molding or cover shall prevent debris accumulation between the floor and wheel housings. The vehicle floor in the area of the entrance and exit doors shall have a lateral slope not exceeding 2 deg to allow for drainage.

The aisle of the bus shall be a sloped floor design and shall not exceed 5.5 deg off the horizontal or include one step not to exceed entrance door step heights. The floor shall be a continuous plane over the wheel housings. Where the floor meets the walls of the bus, as well as other vertical surfaces such as platform risers, the surface edges shall be blended with a circular section of radius not less than $\frac{1}{4}$ in. or installed in a fully sealed butt joint.

TS 28.3 Design (Articulated Transit Coach)

Not applicable.

TS 28.4 Strength

The floor deck may be integral with the basic structure or mounted on the structure securely to prevent chafing or horizontal movement and designed to last the life of the bus. Sheet metal screws shall not be used to retain the floor, and all floor fasteners shall be serviceable from one side only. Any adhesives, bolts or screws used to secure the floor to the structure shall last and remain effective throughout the life of the coach. Tapping plates, if used for the floor fasteners, shall be no less than the same thickness as a standard nut, and all floor fasteners shall be secured and protected from corrosion for the service life of the bus.

The floor deck shall be reinforced as needed to support passenger loads. At GVWR, the floor shall have an elastic deflection of no more than 0.60 in. from the normal plane. The floor shall withstand the application of 2.5 times gross load weight without permanent detrimental deformation. The floor, with coverings applied,

shall withstand a static load of at least 150 lb applied through the flat end of a ½ in. diameter rod, with 1/32 in. radius, without permanent visible deformation.

TS 28.5 Construction

The floor shall consist of the subfloor and the floor covering that will last the life of the bus. The floor as assembled, including the sealer, attachments and covering, shall be waterproof, non-hygroscopic and resistant to mold growth. The subfloor shall be resistant to the effects of moisture, including decay (dry rot). It shall be impervious to wood-destroying insects such as termites.

TS 28.6 Construction (Commuter Coach)

The floor deck may not be integral with the basic structure but shall be mounted on the structure securely to prevent chafing or horizontal movement. Sheet metal screws shall not be used to retain the floor. All floor fasteners shall be secured and protected from corrosion for the service life of the coach. The floor deck shall be reinforced as needed to support passenger loads. At GVWR, the floor shall have an elastic deflection of no more than 0.375 in. (10 mm) from the normal plane. The floor shall withstand the application of 3.0 times gross load weight without permanent detrimental deformation.

TS 29. Platforms

TS 29.1 Driver's Area

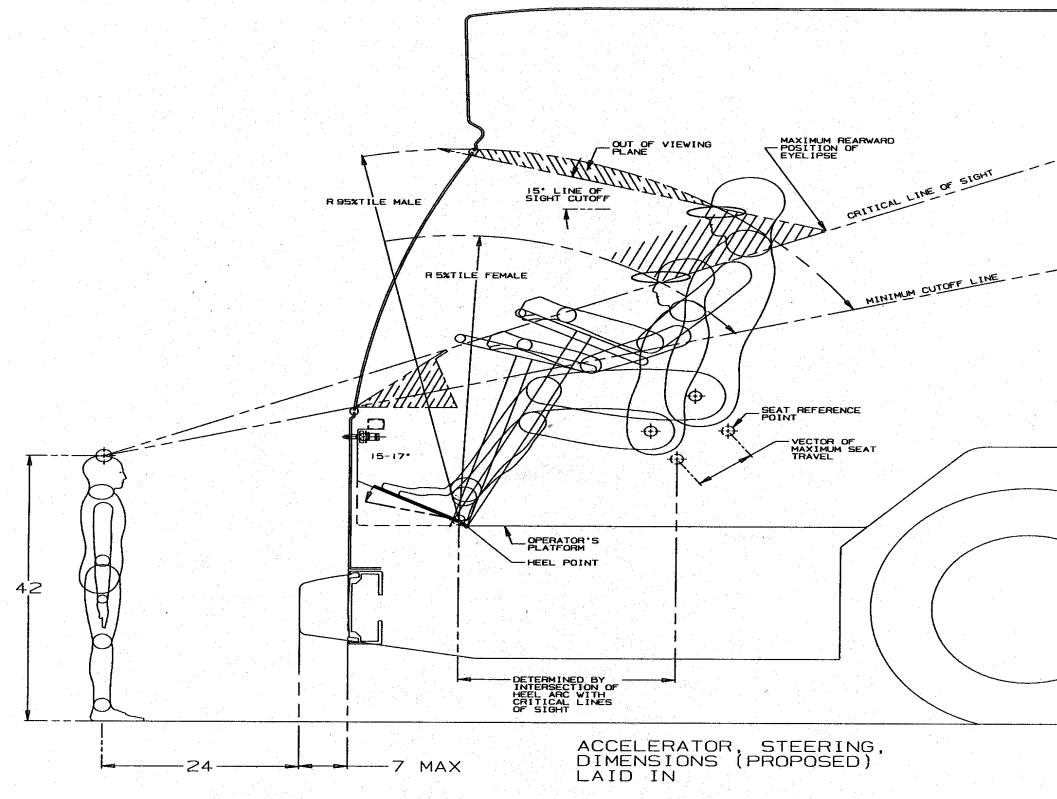
The covering of platform surfaces and risers, except where otherwise indicated, shall be the same material as specified for floor covering. Trim shall be provided along top edges of platforms unless integral nosing is provided.

No specific trim material specified.

TS 29.2 Driver's Platform

The driver's platform shall be of a height such that, in a seated position, the driver can see an object located at an elevation of 42 in. above the road surface, 24 in. from the leading edge of the bumper. Notwithstanding this requirement, the platform height shall not position the driver such that the driver's vertical upward view is less than 15 deg. A warning decal or sign shall be provided to alert the driver to the change in floor level. **Figure 5** illustrates a means by which the platform height can be determined, using the critical line of sight.

FIGURE 5
Determining Platform Height



TS 29.3 Farebox

The delivery and installation of a farebox shall be priced as an option outside of the base bus bid.

If a farebox is installed, then farebox placement should minimize impact to passenger access and minimize interference with the driver's line of sight.

If the driver's platform is higher than 12 in., then the farebox is to be mounted on a platform of suitable height to provide accessibility for the driver without compromising passengers' access.

TS 29.4 Rear Step Area to Rear Area (Transit Coach)

If the vehicle is of a bi-level floor design, then a rear step area shall be provided along the center aisle of the bus to facilitate passenger traffic between the upper and lower floor levels. This step area shall be cut into the rear platform and shall be approximately the aisle width, a minimum 12 in. deep and approximately half the height of the upper level relative to the lower level. The horizontal surface of this platform shall be covered with skid-resistant material with a visually contrasting nosing and shall be sloped slightly for drainage. A warning decal or sign shall be provided at the immediate platform area to alert passengers to the change in floor level.

TS 30. Wheel Housing

TS 30.1 Design and Construction

Sufficient clearance and air circulation shall be provided around the tires, wheels and brakes to preclude overheating when the bus is operating on the design operating profile. Wheel housings shall be constructed of corrosion-resistant and fire-resistant material.

Wheel housings, as installed and trimmed, shall withstand impacts of a 2 in. steel ball with at least 200 ft-lb of energy without penetration.

TS 30.2 Design and Construction (Transit Coach)

Not applicable.

TS 30.3 Articulated Joint (Articulated Transit Coach)

Not applicable.

TS 30.4 Raceway (Articulated Transit Coach)

Not applicable.

TS 30.5 Bellows

Replacement fabric type bellows with draft-free, no-sag bottom closure and water drains shall be provided between the lead and trailing sections to seal the bus interior and keep it free of water, dirt and drafts. Bellows hardware shall be corrosion resistant, and the underfloor area of the bellows shall be easy to clean when necessary. The passageway between the lead unit and trailing unit shall have an inside cross-section that is as nearly equal as possible to the inside cross-section of the bus bodies, with no tripping or pinching hazards created by the turntable cross-section or closeouts. The bellows shall be durable, and its supporting structure and stiffeners shall support the bellows material in a neat, sag-free manner. The Contractor shall supply information on the actual service life achieved by the type of bellows being proposed. A sample of the bellows and attaching hardware may be requested for evaluation at the Agency's option. Bellows shall be approved by the Agency.

CHASSIS

TS 31. Suspension

TS 31.1 General Requirements

The front and rear suspensions shall be pneumatic type. The basic suspension system shall last the service life of the bus without major overhaul or replacement. Adjustment points shall be minimized and shall not be subject to a loss of adjustment in service. Routine adjustments shall be easily accomplished by limiting the removal or disconnecting the components.

TS 31.2 Alignment

All axles should be properly aligned so the vehicle tracks accurately within the size and geometry of the vehicle.

TS 31.3 Springs and Shock Absorbers

TS 31.3.1 Suspension Travel

The suspension system shall permit a minimum wheel travel of 2.75 in. jounce-upward travel of a wheel when the bus hits a bump (higher than street surface), and 2.75 in. rebound-downward travel when the bus comes off a bump and the wheels fall relative to the body. Elastomeric bumpers shall be provided at the limit of jounce travel. Rebound travel may be limited by elastomeric bumpers or hydraulically within the shock absorbers. Suspensions shall incorporate appropriate devices for automatic height control so that regardless of load the bus height relative to the centerline of the wheels does not change more than ½ in. at any point from the height required. The safe operation of a bus cannot be impacted by ride height up to 1 in. from design normal ride height.

TS 31.3.2 Damping

Vertical damping of the suspension system shall be accomplished by hydraulic shock absorbers mounted to the suspension arms or axles and attached to an appropriate location on the chassis. Damping shall be sufficient to control coach motion to three cycles or fewer after hitting road perturbations. The shock absorber bushing shall be made of elastomeric material that will last the life of the shock absorber. The damper shall incorporate a secondary hydraulic rebound stop.

TS 31.3.3 Lubrication

All elements of steering, suspension and drive systems requiring scheduled lubrication shall be provided with grease fittings conforming to SAE J534. These fittings shall be located for ease of inspection and shall be accessible with a standard grease gun from a pit or with the bus on a hoist. Each element requiring lubrication shall have its own grease fitting with a relief path. The lubricant specified shall be standard for all elements on the bus serviced by standard fittings and shall be required no fewer than every 6000 miles.

TS 31.3.4 Kneeling

A kneeling system shall lower the entrance(s) of the bus a minimum of 2 in. during loading or unloading operations regardless of load up to GVWR, measured at the longitudinal centerline of the entrance door(s) by the driver. The kneeling control shall provide the following functions:

- Downward control must be held to allow downward kneeling movement.
- Release of the control during downward movement must completely stop the lowering motion and hold the height of the bus at that position.
- Upward control actuation must allow the bus to return to normal floor height without the driver having to hold the control.

The brake and throttle interlock shall prevent movement when the bus is kneeled. The bus shall kneel at a maximum rate of 1.25 in. per second at essentially a constant rate. After kneeling, the bus shall rise within 4 seconds to a height permitting the bus to resume service and shall rise to the correct operating height within 7 seconds regardless of load up to GVWR. During the lowering and raising operation, the maximum vertical acceleration shall not exceed 0.2g, and the jerk shall not exceed 0.3g per second.

An indicator visible to the driver shall be illuminated until the bus is raised to a height adequate for safe street travel. An audible warning alarm will sound simultaneously with the operation of the kneeler to alert passengers and bystanders. A warning light mounted near the curbside of the front door, a minimum 2.5 in.

diameter amber lens, shall be provided that will blink when the kneel feature is activated. Kneeling shall not be operational while the wheelchair ramp is deployed or in operation.

TS 32. Wheels and Tires

TS 32.1 Wheels

All wheels shall be interchangeable except for the middle axle of an artic where a super single tire size is used and shall be removable without a puller. Wheels shall be compatible with tires in size and load-carrying capacity. Front wheels and tires shall be balanced as an assembly per SAE J1986.

Wheels and rims shall be hub-piloted with powder-coated steel (maximum 3.5 mil) and shall resist rim flange wear.

A tire-pressure monitoring system is not required.

Standard non-locking lug nut.

TS 32.2 Tires

Tires shall be suitable for the conditions of transit service and sustained operation at the maximum speed capability of the bus. Load on any tire at GVWR shall not exceed the tire supplier's rating.

TS 33. Steering

Hydraulically assisted steering shall be provided. The steering gear shall be an integral type with the number and length of flexible lines minimized or eliminated. Engine-driven hydraulic pump shall be provided for power steering.

TS 33.1 Steering Axle (Transit Coach)

Not applicable.

TS 33.2 Steering and Tag Axles (Commuter Coach)

The front and tag axles shall be solid beam, non-driving with a load rating sufficient for the bus loaded to GVWR and shall be equipped with unitized grease type wheel bearings and seals.

All friction points on the front axle shall be equipped with replaceable bushings or inserts and, if needed, lubrication fittings easily accessible from a pit or hoist.

The steering geometry of the outside (front lock) wheel shall be within 2 deg of true Ackerman up to 50 percent lock measured at the inside (back lock) wheel. The steering geometry shall be within 3 deg of true Ackerman for the remaining 100 percent lock measured at the inside (back lock) wheel.

TS 33.3 Steering Wheel

TS 33.3.1 Turning Effort

Steering effort shall be measured with the bus at GVWR, stopped with the brakes released and the engine at normal idling speed on clean, dry, level, commercial asphalt pavement and the tires inflated to recommended pressure.

Under these conditions, the torque required to turn the steering wheel 10 deg shall be no less than 5 ft-lb and no more than 10 ft-lb. Steering torque may increase to 70 ft-lb when the wheels are approaching the steering stops, as the relief valve activates.

Power steering failure shall not result in loss of steering control. With the bus in operation, the steering effort shall not exceed 55 lb at the steering wheel rim, and perceived free play in the steering system shall not materially increase as a result of power assist failure. Gearing shall require no more than seven turns of the steering wheel lock-to-lock.

Caster angle shall be selected to provide a tendency for the return of the front wheels to the straight position with minimal assistance from the driver.

TS 33.3.2 Steering Wheel, General

The steering wheel diameter shall be approximately 18 to 20 in.; the rim diameter shall be $\frac{7}{8}$ to $1\frac{1}{4}$ in. and shaped for firm grip with comfort for long periods of time.

Steering wheel spokes and wheel thickness shall ensure visibility of the dashboard so that vital instrumentation is clearly visible at center neutral position (within the range of a 95th-percentile male, as described in SAE 1050a, Sections 4.2.2 and 4.2.3). Placement of steering column must be as far forward as possible, but either in line with or behind the instrument cluster.

TS 33.3.3 Steering Column Tilt

The steering column shall have full tilt capability with an adjustment range of no less than 40 deg from the vertical and easily adjustable by the driver and shall be accessible by a 5th percentile female and 95th percentile male. Driver's knees shall not contact wheel spokes at any adjustment.

TS 33.3.4 Steering Wheel Telescopic Adjustment

The steering wheel shall have full telescoping capability and have a minimum telescopic range of 2 in. and a minimum low-end adjustment of 29 in., measured from the top of the steering wheel rim in the horizontal position to the cab floor at the heel point.

TABLE 3
Steering Wheel Height¹ Relative to Angle of Slope

At Minimum Telescopic Height Adjustment (29 in.)		At Maximum Telescopic Height Adjustment (5 in.)	
Angle of Slope	Height	Angle of Slope	Height
0 deg	29 in.	0 deg	34 in.
15 deg	26.2 in.	15 deg	31.2 in.
25 deg	24.6 in.	25 deg	29.6 in.
35 deg	22.5 in.	35 deg	27.5 in.

1. Measured from bottom portion closest to driver.

TS 34. Drive Axle

The bus shall be driven by a heavy-duty axle with a load rating sufficient for the bus loaded to GVWR. The drive axle shall have a design life to operate for not less than 300,000 miles on the design operating profile

without replacement or major repairs. The lubricant drain plug shall be magnetic type. If a planetary gear design is employed, then the oil level in the planetary gears shall be easily checked through the plug or sight gauge. The axle and driveshaft components shall be rated for both propulsion and retardation modes with respect to duty cycle. If a planetary gear design is employed, the planetary gear drain plugs shall also be magnetic.

The drive shaft shall be guarded to prevent hitting any critical systems, including brake lines, coach floor or the ground, in the event of a tube or universal joint failure.

TS 34.1 Non-Drive Axle

The non-drive axle is the drive axle without the drive gear with a load rating sufficient for the load to GVWR.

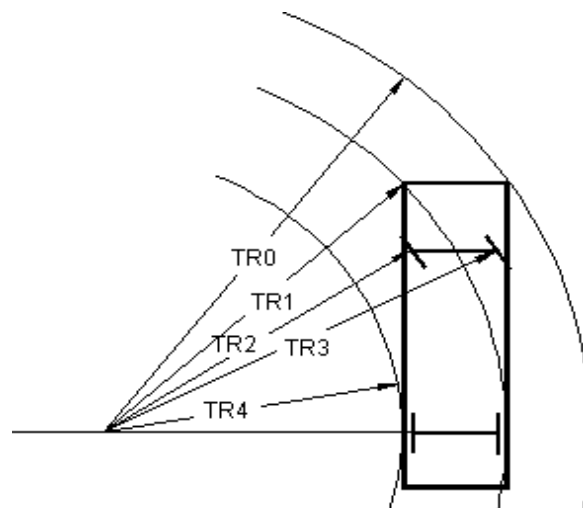
TS 35. Tag Axles (Commuter Coach)

A tag axle shall be located behind the drive axle. The tag axle shall be a solid beam type with fixed steering. The tag axle shall have single tires the same size as the tires on the front and drive axles. Tag axle weight shall not exceed 14,000 lb. With full passenger seating capacity, load on any axle shall not exceed 22,400 lb. Combined load capacity weight on the drive and tag axles shall not exceed 36,500 lb. A tag axle unloading feature will allow full or partial unloading, or dumping of air from the tag axle air spring bellows. This feature enables weight to shift to the drive axle for more traction. Manual unloading valves are located inside the RH rear curbside service door.

TS 36. Turning Radius

The maximum turning radius (TR0, Figure 6) shall be 49 ft.

Figure 6
Turning Radius



TS 37. Brakes

TS 37.1 Service Brake

Brakes shall be self-adjusting. Brake wear indicators (visible brake sensors) shall be provided on exposed push rods.

TS 37.1.1 Regenerative Braking

In addition to traditional mechanical friction service braking, the bus shall be equipped with regenerative braking designed to improve energy efficiency and extend brake lining service life. The application of regenerative braking shall cause a smooth blending of both regenerative and service brake function. Actuation of ABS and/or automatic traction control (ATC) shall override the operation of the regenerative brake.

TS 37.2 Actuation

Service brakes shall be controlled and actuated by a compressed air system. Force to activate the brake pedal control shall be an essentially linear function of the bus deceleration rate and shall not exceed 75 lb at a point 7 in. above the heel point of the pedal to achieve maximum braking. The heel point is the location of the driver's heel when his or her foot is rested flat on the pedal and the heel is touching the floor or heel pad of the pedal. The ECU for the ABS system shall be protected, yet in an accessible location to allow for ease of service.

The total braking effort shall be distributed among all wheels in such a ratio as to ensure equal friction material wear rate at all wheel locations. The manufacturer shall demonstrate compliance by providing a copy of a thermodynamic brake balance test upon request.

TS 37.3 Friction Material

The brake linings shall be made of non-asbestos material. In order to aid maintenance personnel in determining extent of wear, a provision such as a scribe line or a chamfer indicating the thickness at which replacement becomes necessary shall be provided on each brake lining. The complete brake lining wear indicator shall be clearly visible from the hoist or pit without removing backing plates.

No remote brake wear indicator shall be required.

TS 37.4 Hubs and Drums/Discs

Replaceable wheel bearing seals shall run on replaceable wear surfaces or be of an integral wear surface sealed design. Wheel bearing and hub seals and unitized hub assemblies shall not leak or weep lubricant when operating on the design operating profile for the duration of the initial manufacturer's warranty.

The bus shall be equipped with brake drums. Brake drums shall allow machining for oversized linings per manufacturer's specifications.

The brake system material and design shall be selected to absorb and dissipate heat quickly so that the heat generated during braking operation does not glaze the brake linings.

TS 37.5 Hubs and Drums (Commuter Coach)

Replaceable wheel bearing seals shall run on replaceable wear surfaces or be of an integral wear surface sealed design. Wheel bearing and hub seals and unitized hub assemblies shall not leak or weep lubricant when operating on the design operating profile for the duration of the initial manufacturer's warranty.

The bus shall be equipped with disc brakes on all axles, and the brake discs shall allow machining of each side of the disc to obtain smooth surfaces per manufacturer's specifications.

The brake system material and design shall be selected to absorb and dissipate heat quickly so that the heat generated during braking operation does not glaze the brake linings.

TS 37.6 Parking/Emergency Brake

The parking brake shall be a spring-operated system, actuated by a valve that exhausts compressed air to apply the brakes. The parking brake may be manually enabled when the air pressure is at the operating level per FMVSS 121.

TS 38. Interlocks

TS 38.1 Passenger Door Interlocks

To prevent opening mid and rear passenger doors while the bus is in motion, a speed sensor shall be integrated with the door controls to prevent the mid/rear doors from being enabled or opened unless the bus speed is less than 2 mph.

To preclude movement of the bus, an accelerator interlock shall lock the accelerator in the closed position, and a brake interlock shall engage the service brake system to stop movement of the bus when the driver's door control is moved to a mid/rear door enable or open position, or a mid or rear door panel is opened more than 3 in. from the fully closed position (as measured at the leading edge of the door panel). The interlock engagement shall bring the bus to a smooth stop and shall be capable of holding a fully loaded bus on a 6 percent grade with the transmission in gear until the interlocks are released. These interlock functions shall be active whenever the vehicle master run switch is in any run position.

All door systems employing brake and accelerator interlocks shall be supplied with supporting failure mode effects analysis (FEMA) documentation, which demonstrates that failure modes are of a failsafe type, thereby never allowing the possibility of release of interlock while an interlocked door is in an unsecured condition, unless the door master switch has been actuated to intentionally release the interlocks.

Non-adjustable brake interlock regulator.

No requirements for accelerator and brake interlocks whenever front doors are open.

TS 39. Pneumatic System

TS 39.1 General

The bus air system shall operate the air-powered accessories and the braking system with reserve capacity. New buses shall not leak down more than 5 psi over a 15-minute period of time as indicated on the dash gauge.

Provision shall be made to apply shop air to the bus air systems. A quick disconnect fitting shall be easily accessible and located in the engine compartment and near the front bumper area for towing. Retained caps shall be installed to protect fitting against dirt and moisture when not in use. Air for the compressor shall be filtered. The air system shall be protected per FMVSS 121.

TS 39.2 Air Compressor

The engine-driven air compressor shall be sized to charge the air system from 40 psi to the governor cut-off pressure in less than 4 minutes while not exceeding the fast idle speed setting of the engine.

TS 39.3 Air Lines and Fittings

Air lines, except necessary flexible lines, shall conform to the installation and material requirements of SAE J1149 for copper tubing with standard, brass, flared or ball sleeve fittings, or SAE J844 for nylon tubing if not subject to temperatures over 200 °F. The air on the delivery side of the compressor where it enters nylon housing shall not be above the maximum limits as stated in SAE J844. Nylon tubing shall be installed in accordance with the following color-coding standards:

- Green:** Indicates primary brakes and supply.
- Red:** Indicates secondary brakes.
- Brown:** Indicates parking brake.
- Yellow:** Indicates compressor governor signal.
- Black:** Indicates accessories.

Line supports shall prevent movement, flexing, tension, strain and vibration. Copper lines shall be supported to prevent the lines from touching one another or any component of the bus. To the extent practicable and before installation, the lines shall be pre-bent on a fixture that prevents tube flattening or excessive local strain. Copper lines shall be bent only once at any point, including pre-bending and installation. Rigid lines shall be supported at no more than 5 ft intervals. Nylon lines may be grouped and shall be supported at 30 in. intervals or less.

The compressor discharge line between power plant and body-mounted equipment shall be flexible convoluted copper or stainless steel line, or may be flexible Teflon hose with a braided stainless steel jacket. Other lines necessary to maintain system reliability shall be flexible Teflon hose with a braided stainless steel jacket. End fittings shall be standard SAE or JIC brass or steel, flanged, swivel-type fittings. Flexible hoses shall be as short as practicable and individually supported. They shall not touch one another or any part of the bus except for the supporting grommets. Flexible lines shall be supported at 2 ft intervals or less.

Air lines shall be clean before installation and shall be installed to minimize air leaks. All air lines shall be routed to prevent water traps to the extent possible. Grommets or insulated clamps shall protect the air lines at all points where they pass through understructure components.

TS 39.4 Air Reservoirs

All air reservoirs shall meet the requirements of FMVSS 121 and SAE J10 and shall be equipped with drain plugs and guarded or flush type drain valves. Major structural members shall protect these valves and any automatic moisture ejector valves from road hazards. Reservoirs shall be sloped toward the drain valve. All air reservoirs shall have drain valves that discharge below floor level with lines routed to eliminate the possibility of water traps and/or freezing in the drain line.

TS 39.5 Air System Dryer

An air dryer shall prevent accumulation of moisture and oil in the air system. The air dryer system shall include one or more replaceable desiccant cartridges.

No requirements for additional oil separator provision.

ELECTRICAL, ELECTRONIC AND DATA COMMUNICATION SYSTEMS

TS 40. Overview

The electrical system will consist of vehicle battery systems and components that generate, distribute and store power throughout the vehicle (e.g., generator, voltage regulator, wiring, relays and connectors).

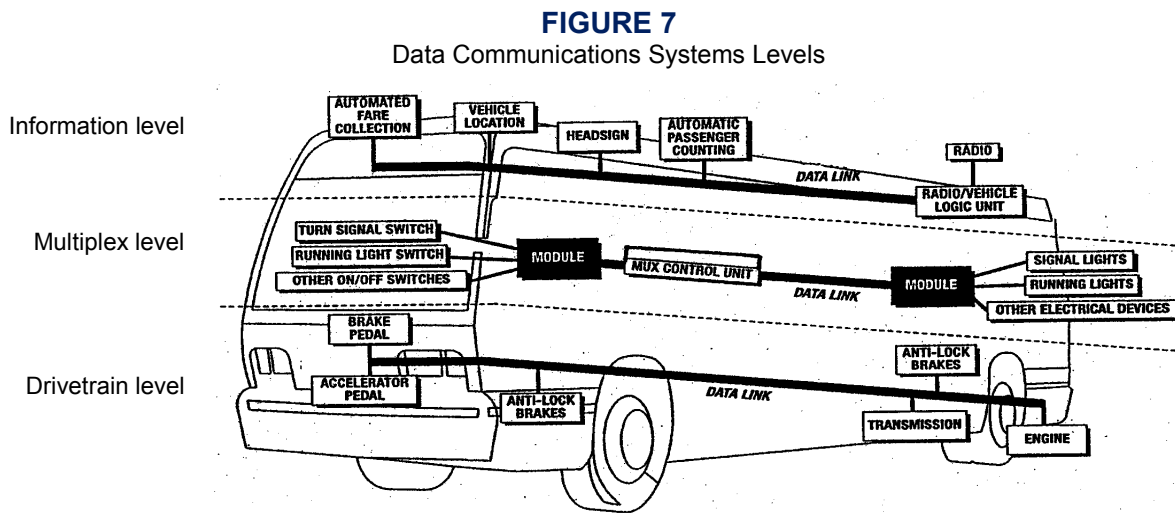
Electronic devices are individual systems and components that process and store data, integrate electronic information or perform other specific functions.

The data communication system consists of the bidirectional communications networks that electronic devices use to share data with other electronic devices and systems. Communication networks are essential to integrating electronic functions, both onboard the vehicle and off.

Information level systems that require vehicle information for their operations or provide information shall adhere to J1939 data standard.

Data communications systems are divided into three level store the use of multiple data networks (see Figure 7):

- h. **Powertrain level:** Components related to the powertrain, including the propulsion system components (engine, transmission and hybrid units) and anti-lock braking system (ABS), which may include traction control. At a minimum, powertrain components consisting of the engine, transmission, retarder, ASR and anti-lock braking systems shall be powered by a dedicated and isolated ignition supply voltage to ensure data communication between components exists when the vehicle ignition is switched to the “on” position.
- i. **Information level:** Components whose primary function is the collection, control or display of data that is not necessary to the safe drivability of the vehicle (i.e., the vehicle will continue to operate when those functions are inoperable). These components typically consist of those required for automatic vehicle location (AVL) systems, destination signs, fareboxes, passenger counters, radio systems, automated voice and signage systems, video surveillance and similar components.
- j. **Multiplex level:** Electrical or electronic devices controlled through input/output signals such as discrete, analog and serial data information (i.e., on/off switch inputs, relay or relay control outputs). Multiplexing is used to control components not typically found on the drivetrain or information levels, such as lights; wheelchair lifts; doors; heating, ventilation and air conditioning (HVAC) systems (if applicable); and gateway devices.



TS 40.1 Modular Design

Design of the electrical, electronic and data communication systems shall be modular so that each electronic device, apparatus panel, or wiring bundle is easily separable from its interconnect by means of connectors.

TS 41. Environmental and Mounting Requirements

The electrical system and its electronic components shall be capable of operating in the area of the vehicle in which they will be installed, as recommended in SAE J1455.

Electrical and electronic equipment shall not be located in an environment that will reduce the performance or shorten the life of the component or electrical system when operating within the design operating profile.

The Agency shall follow recommendations from bus manufacturers and subsystem suppliers regarding methods to prevent damage from voltage spikes generated from welding, jump-starts, shorts, etc.

All electrical/electronic hardware mounted on the interior and exterior of the vehicle that is not designed to be installed in an exposed environment shall be protected.

All electrical/electronic hardware and its mounting shall comply with the shock and vibration requirements of published industry standards (SAE, ISO, etc.).

TS 42. General Electrical Requirements

TS 42.1 Low-Voltage (SLI) Batteries

Selected or specified batteries shall have a sufficient capacity to execute start after the as-delivered bus has been parked and off for a minimum of 48 hours.

TS 42.1.1 Low-Voltage Batteries (24 V)

Four Group 31 Series deep-cycling maintenance-free battery units shall be provided. Each battery shall have a minimum of 700 cold-cranking amps. Each battery shall have a purchase date no more than one year from the date of release for shipment to the Agency.

Positive and negative terminal ends shall be the same size.

TS 42.1.2 Low-Voltage Battery Cables

The battery terminal ends and cable ends shall be color-coded with red for the primary positive, black for negative and another color for any intermediate voltage cables. Positive and negative battery cables shall not cross each other if at all possible, shall be flexible, shall be sufficiently long to reach the batteries with the tray in the extended position without stretching or pulling on any connection, and shall not lie directly on top of the batteries. Except as interrupted by the master battery switch, battery and starter wiring, where applicable, shall be continuous cables with connections secured by bolted terminals and shall conform to specification requirements of SAE J1127—Type SGR, SGT, SGX or GXL and SAE J541 as applicable.

No color code is for voltage is required.

TS 42.1.3 Jump Start

No requirements for jump-start connector.

TS 42.1.4 Battery Compartment

The battery compartment shall prevent accumulation of snow, ice and debris on top of the batteries and shall be vented and self-draining. It shall be accessible only from the outside of the vehicle. All components within the battery compartment, and the compartment itself, shall be protected from damage or corrosion from the electrolyte. The inside surface of the battery compartment's access door shall be electrically insulated, as required, to prevent the battery terminals from shorting on the door if the door is damaged in an accident or if a battery comes loose. The battery compartment temperature should not exceed manufacturer's specification.

The vehicle shall be equipped with one or more 12 VDC and 24 VDC quick disconnect switches. The battery compartment door shall conveniently accommodate operation of 12 VDC and 24 VDC quick disconnect switches.

The battery quick disconnect access door shall be identified with a decal. The decal size shall not be less than 3.5 × 5 in. (8.89 × 12.7 cm).

The door shall be flush-fitting and incorporate a spring tensioner or equal to retain the door in a closed position when not in use.

This access door shall not require any special locking devices to gain access to the switch, and it shall be accessible without removing or lifting the panel.

The batteries shall be securely mounted on a stainless steel or equivalent tray that can accommodate the size and weight of the batteries. The battery tray, if applicable, shall pull out easily and properly support the batteries while they are being serviced. The tray shall allow each battery cell to be easily serviced. A locking device shall retain the battery tray to the stowed position.

If not located in the engine compartment, the same fire-resistant properties must apply to the battery compartment. No sparking devices should be located within the battery box.

TS 42.1.5 Auxiliary Electronic Power Supply

If required, gel-pack, or any form of sealed (non-venting) batteries used for auxiliary power are allowed to be mounted on the interior of the vehicle if they are contained in an enclosed, non-airtight compartment and

accessible only to maintenance personnel. This compartment shall contain a warning label prohibiting the use of vented (flooded) lead-acid batteries.

TS 42.1.6 Master Battery Switch

The location of the master battery switch shall be clearly identified on the exterior access panel, be accessible in less than 10 seconds for deactivation, and prevent corrosion from fumes and battery acid when the batteries are washed off or are in normal service.

The master switch shall be capable of carrying and interrupting the total circuit load.

The batteries shall be equipped with a single switch for disconnecting both 12 V and 24 V power.

TS 42.1.7 Low-Voltage Generation and Distribution

The low-voltage generating systems shall maintain the charge on fully charged batteries, except in combustion engine cases, when the vehicle is at standard idle to allow-voltage generator load exceeding 70 percent of the low-voltage generator name plate rating.

Voltage monitoring and over-voltage output protection (recommended at 32 V) shall be provided. Charging profile shall be maintained within battery manufacturer's guidelines or specifications.

Dedicated power and ground shall be provided as specified by the component or system manufacturer. Cabling to the equipment must be sized to supply the current requirements with no greater than a 5 percent volt drop across the length of the cable.

TS 42.1.8 Circuit Protection

All branch circuits, except battery-to-starting-motor and battery-to-generator/alternator circuits, shall be protected by current-limiting devices such as circuit breakers, fuses or solid-state devices sized to the requirements of the circuit. The circuit breaker fuses shall be easily accessible for authorized personnel. Fuses shall be used only where it can be demonstrated that circuit breakers are not practicable. This requirement applies to inline fuses supplied by either the Contractor or a supplier. Fuse holders shall be constructed to be rugged and waterproof. All manual reset circuit breakers critical to the operation of the bus shall be mounted in a location convenient to the Agency mechanic with visible indication of open circuits. The Agency shall consider the application of automatic reset circuit breakers on a case-by-case basis. The Contractor shall show all in-line fuses in the final harness drawings. Any manually resettable circuit breakers shall provide a visible indication of open circuits.

Circuit breakers or fuses shall be sized to a minimum of 15 percent larger than the total circuit load. The current rating for the wire used for each circuit must exceed the size of the circuit protection being used.

TS 42.2 Grounds

The battery shall be grounded to the vehicle chassis/frame at one location only, as close to the batteries as possible. When using a chassis ground system, the chassis shall be grounded to the frame in multiple locations, evenly distributed throughout the vehicle to eliminate ground loops. No more than three ring terminal connections shall be made per ground stud with spacing between studs ensuring conductivity and serviceability. Electronic equipment requiring an isolated ground of the battery (i.e., electronic ground) shall not be grounded through the chassis.

TS 42.3 Low Voltage and High Voltage Wiring and Terminals

All power and ground wiring shall conform to specification requirements of SAE J1127, J1128 and J1292. All high-voltage power and ground wiring shall conform to specification requirements of SAE J1763, J1654 J2910. In the case of conflicts with the requirements below, SAE standards shall apply. Double insulations shall be maintained as close to the junction box, electrical compartment or terminals as possible. The requirement for double insulations shall be met by wrapping the harness with plastic electrical tape or by sheathing all wires and harnesses with nonconductive, rigid or flexible conduit.

The bus shall be manufactured so that high-voltage systems and cabling do not interfere with the operation of low-voltage control systems. To this end, high-voltage cabling and low-voltage control wiring must be separated as far as practical. Cabling and wiring must be installed damage-free. Additionally, parallel runs of high-voltage cabling and low-voltage control wiring shall be minimized.

Wiring shall be grouped, numbered and/or color-coded. Wiring harnesses shall not contain wires of different voltage classes unless all wires within the harness are insulated for the highest voltage presenting the harness. Kinking, grounding at multiple points, stretching, and exceeding minimum bend radius shall be prevented.

Strain-relief fittings shall be provided at all points where wiring enters electrical compartments. Grommets or other protective material shall be installed at points where wiring penetrates metal structures outside of electrical enclosures. Wiring supports shall be protective and nonconductive at areas of wire contact and shall not be damaged by heat, water, solvents or chafing.

To the extent practicable, wiring shall not be located in environmentally exposed locations under the vehicle. Wiring and electrical equipment necessarily located under the vehicle shall be insulated from water, heat, corrosion and mechanical damage. Where feasible, front-to-rear electrical harnesses should be installed above the window line of the vehicle.

All wiring harnesses over 5 ft long and containing at least five wires shall include 10 percent (minimum one wire) excess wires for spares. This requirement for spare wires does not apply to datalinks and communication cables. Wiring harness length shall allow end terminals to be replaced twice without pulling, stretching or replacing the wire. Terminals shall be crimped to the wiring according to the connector manufacturer's recommendations for techniques and tools. All cable connectors shall be locking type, keyed and sealed, unless enclosed in watertight cabinets or vehicle interior. Pins shall be removable, crimp contact type, of the correct size and rating for the wire being terminated. Unused pin positions shall be sealed with sealing plugs. Adjacent connectors shall use either different inserts or different insert orientations to prevent incorrect connections.

Terminals shall be crimped, corrosion-resistant and full ring type or interlocking lugs with insulating ferrules. When using pressure type screw terminal strips, only stranded wire shall be used. Insulation clearance shall ensure that wires have a minimum of "visible clearance" and a maximum of two times the conductor diameter or 1/16 in., whichever is less. When using shielded or coaxial cable, upon stripping of the insulation, the metallic braid shall be free from frayed strands that can penetrate the insulation of the inner wires.

Ultra-sonic and T-splices may be used with 8 AWG or smaller wire. When a T-splice is used, it shall meet these additional requirements:

- It shall include a mechanical clamp in addition to solder on the splice.
- The wire shall support no mechanical load in the area of the splice.
- The wire shall be supported to prevent flexing.

All splicing shall be staggered in the harness so that no two splices are positioned in the same location within the harness.

The instrument panel and wiring shall be easily accessible for service from the driver's seat or top of the panel. The instrument panel shall be separately removable and replaceable without damaging the instrument panel or gauges. Wiring shall have sufficient length and be routed to permit service without stretching or chafing the wires.

TS 42.4 Electrical Components

All electrical components, including switches, relays, flashers and circuit breakers, shall be heavy-duty designs with either a successful history of application in heavy-duty vehicles or design specifications for an equivalent environment.

All electric motors shall be heavy-duty brushless type where practical and have a continuous duty rating of no fewer than 40,000 hours (except cranking motors, washer pumps, auxiliary heater pumps, defroster and wiper motors). All electric motors shall be easily accessible for servicing.

TS 42.5 Electrical Compartments

All relays, controllers, flashers, circuit breakers and other electrical components shall be mounted in easily accessible electrical compartments. All compartments exposed to the outside environment shall be corrosion-resistant and sealed. The components and their functions in each electrical compartment shall be identified and their location permanently recorded on a drawing attached to the inside of the access panel or door. The drawing shall be protected from oil, grease, fuel and abrasion.

The front compartment shall be completely serviceable from the driver's seat, vestibule or from the outside. For vehicles with an internal combustion engine, "Rear start and run" controls shall be mounted in an accessible location in the engine compartment and shall be protected from the environment.

TS 43. General Electronic Requirements

If an electronic component has an internal real-time clock, it shall provide its own battery backup to monitor time when battery power is disconnected, and/or it may be updated by a network component. If an electronic component has an hour meter, it shall record accumulated service time without relying on battery backup.

All electronic component suppliers shall ensure that their equipment is self-protecting in the event of shorts in the cabling, and also in over-voltage (over 32 VDC on a 24 VDC nominal voltage rating with a maximum of 50 VDC) and reverse polarity conditions. If an electronic component is required to interface with other components, it shall not require external pull-up and/or pull-down resistors. Where this is not possible, the use of a pull-up or pull-down resistor shall be limited as much as possible and easily accessible and labeled.

TS 43.1 Wiring and Terminals

Kinking, grounding at multiple points, stretching and reducing the bend radius below the manufacturer's recommended minimum shall not be permitted.

TS 43.1.1 Discrete I/O (Inputs/Outputs)

All wiring to I/O devices, either at the harness level or individual wires, shall be labeled or color-coded in a fashion that allows unique identification at a spacing not exceeding 4 in. Wiring for each I/O device shall be bundled together. If the I/O terminals are the same voltages, then jumpers may be used to connect the common nodes of each I/O terminal.

TS 43.1.2 Shielding

All wiring that requires shielding shall meet the following minimum requirements. A shield shall be generated by connecting to a ground, which is sourced from a power distribution bus bar or chassis. A shield shall be connected at one location only, typically at one end of the cable. However, certain standards or special requirements, such as SAE J1939 or RF applications, have separate shielding techniques that also shall be used as applicable.

When using shielded or coaxial cable, upon stripping of the insulation, the metallic braid shall be free from frayed strands, which can penetrate the insulation of the inner wires. To prevent the introduction of noise, the shield shall not be connected to the common side of a logic circuit.

TS 43.1.3 Communications

The data network cabling shall be selected and installed according to the selected protocol requirements. The physical layer of all network communications systems shall not be used for any purpose other than communication among the system components, unless provided for in the network specifications.

Communications networks that use power line carriers (e.g., data modulated on a 24 V power line) shall meet the most stringent applicable wiring and terminal specifications.

TS 43.1.4 Radio Frequency (RF)

RF components, such as radios, video devices, cameras, global positioning systems (GPS), etc., shall use coaxial cable to carry the signal. All RF systems require special design consideration for losses along the cable. Connectors shall be minimized, since each connector and crimp has a loss that will contribute to attenuation of the signal. Cabling should allow for the removal of antennas or attached electronics without removing the installed cable between them. If this cannot be done, then a conduit of sufficient size shall be provided for ease of attachment of antenna and cable assembly. The corresponding component vendors shall be consulted for proper application of equipment, including installation of cables.

TS 43.1.5 Audio

Cabling used for microphone level and line level signals shall be 22 AWG minimum with shielded twisted pair. Cabling used for amplifier level signals shall be 18 AWG minimum.

TS 44. Multiplexing

TS 44.1 General

Versatility and future expansion shall be provided for by expandable system architecture. The multiplex system shall be capable of accepting new inputs and outputs through the addition of new modules and/or the

utilization no existing spare inputs and outputs. All like components in the multiplex system shall be modular and interchangeable with self-diagnostic capabilities. The modules shall be easily accessible for troubleshooting electrical failures and performing system maintenance. Multiplex input/output modules shall use solid-state devices to provide extended service life and individual circuit protection.

Ten percent of the total number of inputs and outputs, or at least one each for each voltage type utilized (0 V, 12 V, 24 V) at each module location shall be designated as spares.

TS 44.2 System Configuration

Multiplexing may either be distributed or centralized. A distributed system shall process information on multiple control modules within the network. A centralized system shall process the information on a single control module. Either system shall consist of several modules connected to form a control network.

TS 44.2.1 I/O Signals

The input/output for the multiplex system may contain four types of electrical signals: discrete, modulating, analogue, serial data.

Discrete signals shall reflect the on/off status of switches, levers, limit switches, lights, etc. Analog signals shall reflect numerical data as represented by a voltage signal (0–12 V, 10–24 V, etc.) or current signal (4–20 mA). Both types of analog signals shall represent the status of variable devices such as rheostats, potentiometers, temperature probes, etc. Serial data signals shall reflect ASCII or alphanumeric data used in the communication between other onboard components.

TS 45. Data Communications

TS 45.1 General

All data communication networks shall be either in accordance with a nationally recognized interface standard, such as those published by SAE, IEEE or ISO, or shall be published to the Agency with the following minimum information:

- k. Protocol requirements for all timing issues (bit, byte, packet, inter-packet timing, idle line timing, etc.) packet sizes, error checking and transport (bulk transfer of data to/from the device).
- l. Data definition requirements that ensure access to diagnostic information and performance characteristics.
- m. The capability and procedures for uploading new application or configuration data.
- n. Access to revision level of data, application software and firmware.
- o. The capability and procedures for uploading new firmware or application software.
- p. Evidence that applicable data shall be broadcast to the network in an efficient manner such that the overall network integrity is not compromised.

Any electronic vehicle components used on a network shall be conformance tested to the corresponding network standard.

TS 45.2 Drivetrain Level

Drivetrain components, consisting of the motor(s), motor inverter(s), engine, transmission, retarder, antilock braking system and all other related components, shall be integrated and communicate fully with respect to vehicle operation with data using SAE Recommended Communications Protocols such as J1939 and/or J1708/J1587 with forward and backward compatibilities or other open protocols. At a minimum, drivetrain

components shall be powered by a dedicated and isolated ignition supply voltage to ensure that data communication among components exists when the vehicle ignition is switched to the “on” position.

TS 45.2.1 Diagnostics, Fault Detection and Data Access

Drivetrain performance, maintenance and diagnostic data, and other electronic messages shall be formatted and transmitted on the communications networks.

The drivetrain level shall have the ability to record abnormal events in memory and provide diagnostic codes and other information to service personnel. At a minimum, this network level shall provide live/fail status, current hardware serial number, software/data revisions and uninterrupted timing functions.

TS 45.2.2 Programmability (Software)

The drivetrain-level components shall be programmable by the Agency with limitations as specified by the subsystem Supplier.

TS 45.3 Multiplex Level

TS 45.3.1 Data Access

At a minimum, information shall be made available via a communication port on the multiplex system. The location of the communication port shall be easily accessible. A hardware gateway and/or wireless communications system are options if requested by the Agency. The communication port(s) shall be located as specified by the Agency.

TS 45.3.2 Diagnostics and Fault Detection

The multiplex system shall have a proven method of determining its status (system health and input/output status) and detecting either active (online) or inactive (offline) faults through the use of onboard visual/audible indicators.

In addition to the indicators, the system shall employ an advanced diagnostic and fault detection system, which shall be accessible via either a personal computer or a handheld unit. Either unit shall have the ability to check logic function.

No requirement for mock-up board.

TS 45.3.3 Programmability (Software)

The multiplex system shall have security provisions to protect its software from unwanted changes. This shall be achieved through any or all of the following procedures:

- q. Password protection
- r. Limited distribution of the configuration software
- s. Limited access to the programming tools required to change the software
- t. Hardware protection that prevents undesired changes to the software

Provisions for programming the multiplex system shall be possible through a PC or laptop. The multiplex system shall have proper revision control to ensure that the hardware and software are identical on each vehicle equipped with the system. Revision control shall be provided by all of the following:

- u. Hardware component identification where labels are included on all multiplex hardware to identify components
- v. Hardware series identification where all multiplex hardware displays the current hardware serial number and firmware revision employed by the module
- w. Software revision identification where all copies of the software in service display the most recent revision number
- x. A method of determining which version of the software is currently in use in the multiplex system

Revision control labels shall be electronic.

TS 45.4 Electromagnetic Compatibility (EMC)

Electrical and electronic subsystems and components on all buses shall not emit electromagnetic radiation that will interfere with onboard systems, components or equipment, telephone service, radio or TV reception, or violate regulations of the Federal Communications Commission.

Electrical and electronic subsystems on the coaches shall not be affected by external sources of RFI/EMI. This includes, but is not limited to, radio and TV transmission, portable electronic devices including computers in the vicinity of or onboard the buses, AC or DC power lines, and RFI/EMI emissions from other vehicles.

As a recommendation, no vehicle component shall generate or be affected by EMI/RFI that can disturb the performance of electrical/electronic equipment as defined in SAE J1113 and UNECE Council Directive 95/54(R10).

DRIVER PROVISIONS, CONTROLS AND INSTRUMENTATION

TS 46. Driver's Area Controls

TS 46.1 General

In general, when designing the driver's area, it is recommended that SAE J833, "Human Physical Dimensions," be used.

Switches and controls shall be divided into basic groups and assigned to specific areas, in conformance with SAE J680, revised 1988, "Location and Operation of Instruments and Controls in Motor Truck Cabs," and be essentially within the hand reach envelope described in SAE J287, "Driver Hand Control Reach."

TS 46.2 Glare

The driver's work area shall be designed to minimize glare to the extent possible. Objects within and adjacent to this area shall be matte black or dark gray in color wherever possible to reduce the reflection of light onto the windshield. The use of polished metal and light-colored surfaces within and adjacent to the driver's area shall be avoided.

TS 46.3 Visors/Sun Shades

Adjustable sun visor(s) shall be provided for the driver's windshield and the driver's side window. Visors shall be shaped to minimize light leakage between the visor and windshield pillars. Visors shall store out of the way and shall not obstruct airflow from the climate control system or interfere with other equipment, such as the radio handset or the destination control. Deployment of the visors shall not restrict vision of the rearview mirrors. Visor adjustments shall be made easily by hand with positive locking and releasing devices and shall not be subject to damage by over-tightening. Sun visor construction and materials shall be strong enough to resist breakage during adjustments. Visors may be transparent but shall not allow a visible light transmittance in excess of 10 percent. Visors, when deployed, shall be effective in the driver's field of view at angles more than 5 deg above the horizontal.

TS 46.4 Driver's Controls

Frequently used controls must be in easily accessible locations. These include the door control, kneel control, windshield wiper/washer controls, ramp, and lift and run switch. Any switches and controls necessary for the safe operation of the bus shall be conveniently located and shall provide for ease of operation. They shall be identifiable by shape, touch and permanent markings. Controls also shall be located so that passengers may not easily tamper with control settings.

All panel-mounted switches and controls shall be marked with easily read identifiers. Graphic symbols shall conform to SAE J2402, "Road Vehicles – Symbols for Controls, Indicators, and Tell Tales," where available and applicable. Color of switches and controls shall be dark with contrasting typography or symbols.

Mechanical switches and controls shall be replaceable, and the wiring at these controls shall be serviceable from a convenient location. Switches, controls and instruments shall be dust- and water-resistant.

All switches/controls in the driver's control area shall be mounted in an angled panel steep enough to discourage drivers from using it as a personal storage area for items like food, drinks, cell phones, etc. The final configuration of the driver controls must be approved by the Agency.

TS 46.5 Normal Bus Operation Instrumentation and Controls

The following list identifies bus controls used to operate the bus. These controls are either frequently used or critical to the operation of the bus. They shall be located within easy reach of the operator. The operator shall not be required to stand or turn to view or actuate these controls unless specified otherwise. The final configuration of the instrumentation and controls must be approved by the Agency.

Systems or components monitored by onboard diagnostics system shall be displayed in clear view of the operator and provide visual and/or audible indicators. The intensity of indicators shall permit easy determination of on/off status in bright sunlight but shall not cause a distraction or visibility problem at night. All indicators shall be illuminated using backlighting.

The indicator panel shall be located in Area 1 or Area 5, within easy view of the operator instrument panel. All indicators shall have a method of momentarily testing their operation. The audible alarm shall be tamper-resistant and shall have an outlet level between 80 and 83 dBA when measured at the location of the operator's ear.

Onboard displays visible to the operator shall be limited to indicating the status of those functions described herein that are necessary for the operation of the bus. All other indicators needed for diagnostics and their

related interface hardware shall be concealed and protected from unauthorized access. **Table 4** represents instruments and alarms. The intent of the overall physical layout of the indicators shall be in a logical grouping of systems and severity nature of the fault.

Consideration shall be provided for future additions of spare indicators as the capability of onboard diagnostic systems improves. Blank spaces shall contain LEDs.

TABLE 4
Instruments and Alarms

Device	Description	Location	Function	Visual/Audible
Master run switch	Rotary, four-position detent	Side console	Master control for bus, off, day run, night run and clearance ID lights	
System start, front	Approved momentary switch	Side console	Activates vehicle systems	
Drive selector	Touch panel switch	Side console	Provides selection of propulsion: forward, reverse and neutral	Gear selection
HVAC	Switch or switches to control HVAC	Side console	Permits selection of passenger ventilation: off, cool, heat, low fan, high fan or full auto with on/off only	
Driver's ventilation	Switch or switches to control driver ventilation	Side console or dash left wing	Permits supplemental ventilation: fan off, low or high	
Defroster fan	Switch or switches to control defroster fan	Side console or dash left wing	Permits defroster: fan off, low, medium or high	
Defroster temperature	Variable position	Side console or dash left wing	Adjusts defroster water flow and temperature	
Windshield wiper	One-variable position switch operating both wipers	Dash left wing	Variable speed control of left and right windshield wipers	
Windshield washer	Push button	Dash left wing	Activates windshield washers	
Dash panel lights	Rotary rheostat or stepping switch	Side console or dash left wing	Provides adjustment for light intensity in night run position	
Interior lights	Three-position switch	Side console	Selects mode of passenger compartment lighting: off, on or reduced lighting	
WC ramp/kneel enable	Two-position switch ¹	Side console or dash right wing	Permits operation of ramp and kneel operations at each door remote panel	Amber light
Front door ramp/kneel enable	Two-position keyed switch ¹	Front door remote or dash right wing	Permits ramp and kneel activation from front door area, key required ¹	Amber light
Front door ramp	Three-position momentary switch	Right side of steering wheel	Permits deploy and stow of front ramp	Red light
Front kneel	Three-position momentary switch	Front door remote	Permits kneeling activation and raise and normal at front door remote location	Amber or red dash indicator exterior alarm and amber light

TABLE 4
Instruments and Alarms

Device	Description	Location	Function	Visual/Audible
Rear door ramp/kneel enable	Two-position keyed switch ¹	Rear door remote	Permits ramp and kneel activation from rear door area; key required ¹	Red light
Rear door ramp	Three-position momentary switch	Rear door remote	Permits deploy and stow of rear ramp	
Rear kneel	Three-position momentary switch	Rear door remote	Permits kneeling activation and raise and normal at rear door remote location	
Silent alarm	Recessed momentary push button	Side console	Activates emergency radio alarm at dispatch and permits covert microphone and/or enables destination sign emergency message	
Video system event switch	Momentary on/off switch with plastic guard	Side console	Triggers event equipment and event light on dash	Amber light
Left remote mirror	Four-position toggle type	Side console	Permits two-axis adjustment of left exterior mirror	
Right remote mirror	Four-position toggle type	Side console	Permits two-axis adjustment of right exterior mirror	
Mirror heater	Switch or temperature activated	Side console	Permits heating of outside mirrors when required	
Passenger door control	Five-position handle type detent or two momentary push buttons	Side console, forward	Permits open/close control of front and rear passenger doors	Red light
Rear door override	Two-position switch in approved location	Side console, forward	Allows driver to override activation of rear door passenger tape switches	
System shutdown override	Momentary switch with operation protection	Side console	Permits driver to override auto system shutdown	
Hazard flashers	Two-position switch	Side console or dash right wing	Activates emergency flashers	Two green lights
Mobile data terminal	Mobile data terminal coach operator interface panel	Above right dash wing	Facilitates driver interaction with communication system and master log-on	LCD display with visual status and text messages
Farebox interface	Farebox coach operator interface panel	Near farebox	Facilitates driver interaction with farebox system	LCD display
Destination sign interface	Destination sign interface panel	In approved location	Facilitates driver interaction with destination sign system, manual entry	LCD display
Turn signals	Momentary push button (two required) raised from other switches	Left foot panel	Activates left and right turn signals	Two green lights and optional audible indicator
PA manual	Momentary push button	In approved location	Permits driver to manually activate public address microphone	

TABLE 4
Instruments and Alarms

Device	Description	Location	Function	Visual/Audible
Low-profile microphone	Low-profile discrete mounting	Steering column	Permits driver to make announcements with both hands on the wheel and focusing on road conditions	
High beam	Push button	In approved location	Permits driver to toggle between low and high beam	Blue light
Parking brake	Pneumatic PPV	Side console or dash left wing	Permits driver to apply and release parking brake	Red light
Hill holder	Two-position momentary switch	Side console	Applies brakes to prevent bus from rolling	
Master door/interlock	Multi-pole toggle, detented	Out of operator's reach	Permits driver override to disable door and brake/throttle interlock	Red light
Warning interlocks deactivated	Red indicator light	Dash panel center	Illuminates to warn driver that interlocks have been deactivated	Red light
Alarm acknowledge	Push button momentary	Approved location	Permits driver to acknowledge alarm condition	
Rear door passenger sensor disable	Two-position switch	In sign compartment or driver's barrier compartment	Permits driver to override rear door passenger sensing system	
Indicator/ alarm test button	Momentary switch or programming ¹	Dash center panel	Permits driver to activate test of sentry, indicators and audible alarms	All visuals and audibles
Auxiliary power	110 V power receptacle	Approved location	Property to specify what function to supply	
Speedometer	Speedometer, odometer, and diagnostic capability, 5-mile increments	Dash center panel	Visual indication of speed and distance traveled, accumulated vehicle mileage, fault condition display	Visual
Air pressure gauge	Primary and secondary, 5 psi increments	Dash center panel	Visual indication of primary and secondary air systems	Red light and buzzer
Fire detection	Coach operator display	Property specific or dash center	Indication of fire detection activation by zone/location	Buzzer and red light
Door obstruction	Sensing of door obstruction	Dash center	Indication of rear door sensitive edge activation	Red light and buzzer
Door ajar	Door not properly closed	Property specific or dash center	Indication of rear door not properly closed	Buzzer or alarm and red light
Low system air pressure	Monitors primary and secondary air tank pressure	Dash center	Indication of low air system pressure	Buzzer and red light

TABLE 4
Instruments and Alarms

Device	Description	Location	Function	Visual/Audible
System coolant indicator	Low coolant indicator may be supplied as audible alert and visual and/or text message	Within driver's sight	Detects low coolant condition	Amber light
Hot system indicator	Temperature indicator may be supplied as audible alert and visual and/or text message	Within driver's sight	Detects system overheat condition and initiates time delay shutdown	Red light
ABS indicator	Detects system status	Dash center	Displays system failure	Amber light
HVAC indicator	Detects system status	Dash center	Displays system failure	Amber or red light
LV charging system indicator (12/24 V)	Detect charging system status	Dash center	Detects no-charge condition and optionally detects battery high, low, imbalance, no-charge condition, and initiates time-delayed shutdown	Red light flashing or solid based on condition
HV charging system indicator (ESS)	Detects charging system status	Dash center	Indicates when bus is connected to off-board charger and ESS is accepting charge	Visual
State of charge indicator	Gauge, graduated based on SoC	Dash center	Indicates SoC of ESS	Visual
kWh Remaining Indicator	Gauge, graduated based on energy remaining in ESS	Dash center	Energy remaining gauge should display in units of kWh and indicate the best available estimate of the absolute amount of energy remaining until the SOC gauge reaches zero.	Visual
Regenerative braking indicator	Detects status	Dash center	Indicates when regenerative braking is being used	Visual

1. Indicate area by drawing. Break up switch control from indicator lights.

TS 46.6 Driver Foot Controls

Accelerator and brake pedals shall be designed for ankle motion. Foot surfaces of the pedals shall be faced with wear-resistant, nonskid, replaceable material.

TS 46.6.1 Pedal Angle

The vertical angle of the accelerator and brake pedals shall be determined from a horizontal plane regardless of the slope of the cab floor. The accelerator and brake pedals shall be positioned at an angle of 37 to 50 deg at the point of initiation of contact and extend downward to an angle of 10 to 18 deg at full throttle.

The location of the brake and accelerator pedals shall be determined by the manufacturer, based on space needs, visibility, lower edge of windshield and vertical H-point.

TS 46.6.2 Pedal Dimensions and Position

The floor-mounted accelerator pedal shall be 10 to 12 in. long and 3 to 4 in. wide. Clearance around the pedal must allow for no interference precluding operation.

The accelerator and brake pedals shall be positioned such that the spacing between them, measured at the heel of the pedals, is between 1 and 2 in. Both pedals should be located approximately on the same plane coincident to the surface of the pedals.

TS 46.7 Brake and Accelerator Pedals

Non-adjustable brake pedal.

TS 46.8 Driver Foot Switches

Floor-Mounted Foot Control Platform

The angle of the turn signal platform shall be determined from a horizontal plane, regardless of the slope of the cab floor. The turn signal platform shall be angled at a minimum of 10 deg and a maximum of 37 deg. It shall be located no closer to the seat front than the heel point of the accelerator pedal.

Turn signal controls shall be floor-mounted, foot-controlled, water-resistant, heavy-duty, momentary contact switches.

The control switches for the turn signals shall be mounted on an inclined, floor-mounted stainless steel enclosure or metal plate mounted to an incline integrated into the driver's platform, located to the left of the steering column. The location and design of this enclosure shall be such that foot room for the operator is not impeded. The inclined mounting surface shall be skid-resistant. All other signals, including high beam and public address system, shall be in approved locations.

The foot switches shall be UL-listed, heavy-duty type, of a rugged, corrosion-resistant metal construction. The foot switches for the directional signals shall be momentary type, while those for the PA system and the high beam shall be latching type. The spacing of the switches shall be such that inadvertent simultaneous deflection of switches is prevented.

TS 47. Driver's Amenities

TS 47.1 Coat Hanger

A suitable hanger shall be installed in a convenient, approved location for the driver's coat.

TS 47.2 Drink Holder

A device shall be provided to securely hold the driver's drink container, which may vary widely in diameter. It must be mounted within easy reach of the driver and must have sufficient vertical clearance for easy removal of the container. When the container is in the device, the driver's view of the road must not be obstructed, and leakage from the container must not fall on any switches, gauges or controls.

TS 47.3 Storage Box

An enclosed driver storage area shall be provided with a positive latching door and/or lock. The minimum size is 2750 cu in.

TS 48. Windshield Wipers and Washers

TS 48.1 Windshield Wipers

The bus shall be equipped with a windshield wiper for each half of the windshield. At 60 mph, no more than 10 percent of the wiped area shall be lost due to windshield wiper lift. For two-piece windshields, both wipers shall park along the center edges of the windshield glass. For single-piece windshields, wipers shall park along the bottom edge of the windshield. Windshield wiper motors and mechanisms shall be easily accessible for repairs or service. The fastener that secures the wiper arm to the drive mechanism shall be corrosion-resistant.

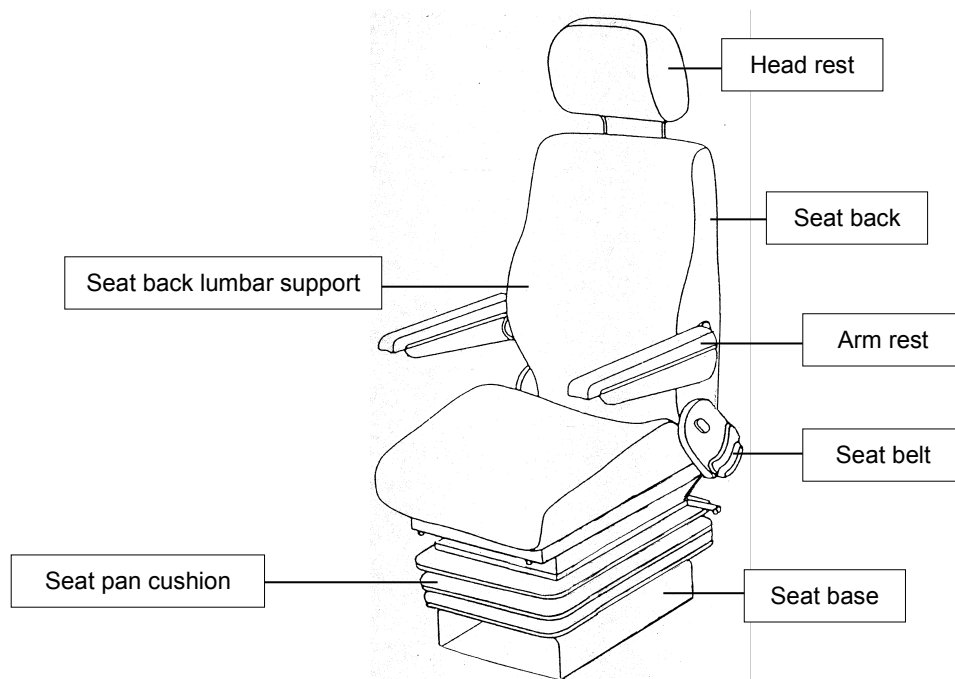
TS 48.2 Windshield Washers

The windshield washer system, when used with the wipers, shall deposit washing fluid evenly and completely wet the entire wiped area.

The windshield washer system shall have a minimum 3-gallon reservoir, located for easy refilling from outside the bus. Reservoir pumps, lines and fittings shall be corrosion-resistant and must include a means to determine fluid level.

TS 49. Driver's Seat

FIGURE 8
Driver's Seat



TS 49.1 Dimensions

The driver's seat shall be comfortable and adjustable so that people ranging in size from a 95th-percentile male to a 5th-percentile female may operate the bus.

TS 49.1.1 Seat Pan Cushion Length

Measurement shall be from the front edge of the seat pan to the rear at its intersection with the seat back. The adjustment of the seat pan length shall be no less than 16.5 in. at its minimum length and no more than 20.5 in. at its maximum length.

TS 49.1.2 Seat Pan Cushion Height

Measurement shall be from the cab floor to the top of the level seat at its center midpoint. The seat shall adjust in height from a minimum of 14 in., with a minimum 6 in. vertical range of adjustment.

TS 49.1.3 Seat Pan Cushion Slope

Measurement is the slope of the plane created by connecting the two high points of the seat, one at the rear of the seat at its intersection with the seat back and the other at the front of the seat just before it waterfalls downward at the edge. The slope can be measured using an inclinometer and shall be stated in degrees of incline relative to the horizontal plane (0 deg). The seat pan shall adjust in its slope from no less than plus 12 deg (rearward “bucket seat” incline) to no less than minus 5 deg (forward slope).

TS 49.1.4 Seat Base Fore/Aft Adjustment

Measurement is the horizontal distance from the heel point to the front edge of the seat. The minimum and maximum distances shall be measured from the front edge of the seat when it is adjusted to its minimum seat pan depth (approximately 15 in.). On all low-floor buses, the seat base shall travel horizontally a minimum of 9 in. It shall adjust no closer to the heel point than 6 in. On all high-floor buses, the seat base shall travel a minimum of 9 in. and adjust no closer to the heel point than 6 in.

TS 49.1.5 Seat Pan Cushion Width

Measurement is the horizontal distance across the seat cushion. The seat pan cushion shall be 17 to 21 in. across at the front edge of the seat cushion and 20 to 23 in. across at the side bolsters.

TS 49.1.6 Seat Suspension

The driver's seat shall be appropriately dampened to support a minimum weight of 380 lb. The suspension shall be capable of dampening adjustment in both directions.

Rubber bumpers shall be provided to prevent metal-to-metal contact.

TS 49.1.7 Seat Back

Width

Measurement is the distance between the outermost points of the front of the seat back, at or near its midpoint in height. The seat back width shall be no less than 19 in. Seat back will include dual recliner gears on both sides of the seat.

Height

Standard height seat back.

TS 49.1.8 Headrests

Adjustable headrest.

TS 49.1.9 Seat Back Lumbar Support

Measurement is from the bottom of the seat back at its intersection with the seat pan to the top of the lumbar cushioning. The seat back shall provide adjustable-depth lumbar back support with three individual operating lumbar cells within a minimum range of 7 to 11 in.

TS 49.1.10 Seat Back Angle Adjustment

The seat back angle shall be measured relative to a level seat pan, where 90 deg is the upright position and 90 deg-plus represents the amount of recline.

The seat back shall adjust in angle from a minimum of no more than 90 deg (upright) to at least 105 deg (reclined), with infinite adjustment in between.

TS 49.2 Seat Belt

The belt assembly should be an auto-locking retractor (ALR). All seat belts should be stored in automatic retractors. The belts shall be mounted to the seat frame so that the driver may adjust the seat without resetting the seat belt.

The seat and seatbelt assemblies as installed in the bus shall withstand static horizontal forces as required in FMVSS 207 and 210.

Lap seat belt only. Seatbelt webbing shall be black in color. The lap belt assembly shall be a minimum of 72 in. in length.

TS 49.3 Adjustable Armrest

No armrests.

TS 49.4 Seat Control Locations

While seated, the driver shall be able to make seat adjustments by hand without complexity, excessive effort or being pinched. Adjustment mechanisms shall hold the adjustments and shall not be subject to inadvertent changes.

TS 49.5 Seat Structure and Materials

Cushions

Cushions shall be fully padded with at least 3 in. of open-cell polyurethane (FMVSS 302) in the seating areas at the bottom and back.

TS 49.6 Pedestal

Powder-coated steel.

TS 49.7 Seat Options

Choose among the following:

- heated seat
- seat alarm
- fabric options
- seat air vent

- side bolsters adjustments
- silicone seat cushion

TS 49.8 Mirrors

TS 49.8.1 Exterior Mirrors

The bus shall be equipped with corrosion-resistant, outside rearview mirrors mounted with stable supports to minimize vibration. Mirrors shall be firmly attached to the bus to minimize vibration and to prevent loss of adjustment with a breakaway mounting system. Mirrors shall permit the driver to view the roadway along the sides of the bus, including the rear wheels. Mirrors should be positioned to prevent blind spots.

Mirrors shall retract or fold sufficiently to allow bus washing operations but avoid contact with windshield.

Exterior mirrors shall be installed without a breakaway mounting system.

The bus shall be equipped with two flat outside mirrors, each with not less than 50 sq in. of reflective surface. The mirrors shall be located so as to provide the driver a view to the rear along both sides of the bus and shall be adjustable both in the horizontal and vertical directions to view the rearward scene. The roadside rearview mirror shall be positioned so that the driver's line of sight is not obstructed.

Curbside Mirrors

The curbside rearview mirror shall be mounted so that its lower edge is no less than 76 in. above the street surface. A lower mount may be required due to mirror configuration requests.

The driver shall be able to adjust the curbside mirror remotely while seated in the driving position. The control for remote positioning of the mirror shall be a single switch or device.

Street-Side Mirrors

Standard mirror, not heated, no remote adjustment.

TS 49.8.2 Interior Mirrors

Mirrors shall be provided for the driver to observe passengers throughout the bus without leaving the seat and without shoulder movement. The driver shall be able to observe passengers in the front/entrance and rear/exit areas (if applicable), anywhere in the aisle, and in the rear seats.

WINDOWS

TS 50. General

A minimum of 12,000 sq in. of window area, including operator and door windows, shall be required on each side of the standard configuration bus.

TS 51. Windshield

Two-piece windshield is required. The windshield shall permit an operator's field of view as referenced in SAE J1050. The vertically upward view shall be a minimum of 14 deg, measured above the horizontal and excluding any shaded band. The vertically downward view shall permit detection of an object 3½ ft high no more than 2 ft in front of the bus. The horizontal view shall be a minimum of 90 deg above the line of sight. Any binocular obscuration due to a center divider may be ignored when determining the 90 deg requirement, provided that the divider does not exceed a 3 deg angle in the operator's field of view. Windshield pillars

shall not exceed 10 deg of binocular obscuration. The windshield shall be designed and installed to minimize external glare as well as reflections from inside the bus.

The windshield shall be easily replaceable by removing zip-locks from the windshield retaining moldings. Bonded-in-place windshields shall not be used. Winglets may be bonded.

TS 51.1 Glazing

The windshield glazing material shall have a ¼ in. nominal thickness laminated safety glass conforming to the requirements of ANSI Z26.1 Test Grouping AS-1 and the recommended practices defined in SAE J673.

The upper portion of the windshield above the driver's field of view shall have a dark, shaded band and marked AS-3, with a minimum luminous transmittance of 5 percent when tested in accordance to ASTM D1003.

TS 52. Driver's Side Window

The driver's side window shall be the sliding type, requiring only the rear half of the sash to latch upon closing, and shall open sufficiently to permit the seated operator to easily adjust the street-side outside rearview mirror. When in an open position, the window shall not rattle or close during braking. This window section shall slide in tracks or channels designed to last the service life of the bus. The operator's side window shall not be bonded in place and shall be easily replaceable. The glazing material shall have a single-density tint.

The driver's view, perpendicular through the operator's side window glazing, should extend a minimum of 33 in. (840 mm) to the rear of the heel point on the accelerator, and in any case must accommodate a 95th percentile male operator. The view through the glazing at the front of the assembly should begin not more than 26 in. (560 mm) above the operator's floor to ensure visibility of an under-mounted convex mirror. Driver's window construction shall maximize ability for full opening of the window.

The driver's side window glazing material shall have a ¼ in. nominal thickness laminated safety glass conforming to the requirements of ANSI Z26.1-1996 Test Grouping AS-2 and the recommended practices defined in SAE J673.

The design shall prevent sections from freezing closed in the winter. Light transmittance shall be 75 percent on the glass area below 53 in. from the operator platform floor. On the top-fixed-over-bottom-slider configuration, the top fixed area above 53 in. may have a maximum 5 percent light transmittance.

TS 53. Side Windows

TS 53.1 Configuration

Side windows shall not be bonded in place, but shall be easily replaceable without disturbing adjacent windows and shall be mounted so that flexing or vibration from engine operation or normal road excitation is not apparent. All aluminum and steel material will be treated to prevent corrosion.

Side windows shall be equipped with retractable window shades mounted on the interior of the bus.

TS 53.2 Emergency Exit (Egress) Configuration

All side windows shall be fixed in position, except as necessary to meet emergency escape requirements.

TS 53.3 Configuration

All side windows shall be fixed in position, except as necessary to meet the emergency escape requirements.

TS 53.4 Materials

Side windows glazing material shall have a minimum of 3/16 in. nominal thickness tempered safety glass. The material shall conform to the requirements of ANSI Z26.1-1996 Test Grouping 2 and the recommended practices defined in SAE J673.

Windows on the bus sides and in the rear door shall be tinted a neutral color, complementary to the bus exterior. The Agency has wrap concept art that covers the entire bus, including the windows. The maximum solar energy transmittance shall not exceed 37 percent, as measured by ASTM E424. Luminous transmittance shall be measured by ASTM D1003. Windows over the destination signs shall not be tinted.

TS 53.5 Rear Window

No requirement for rear window.

HEATING, VENTILATING AND AIR CONDITIONING

TS 54. HVAC Capacity and Performance

The HVAC climate control system shall be capable of controlling the temperature and maintaining the humidity levels of the interior of the bus as defined in the following paragraphs.

The HVAC unit may either be roof or rear-mounted. Note that a rear-mounted unit will preclude a rear window and that the term “roof-mounted unit” includes units mounted on top of or beneath the roof surface.

With the bus running at the design operating profile with corresponding door opening cycle, and carrying a number of passengers equal to 150 percent of the seated load, the HVAC system shall control the average passenger compartment temperature within arrange between 65 and 80 °F, while maintaining the relative humidity to a value of 50 percent or less. The system shall maintain these conditions while subjected to any outside ambient temperatures within a range of 10 to 95 °F and at any ambient relative humidity levels between 5 and 50 percent. Demonstrate this requirement after first reaching a stabilized interior temperature of 70 ±3 °F with full passenger and solar load.

When the bus is operated in outside ambient temperatures of 95 to 115 °F, the interior temperature of the bus shall be permitted to rise 0.5 °F for each degree of exterior temperature in excess of 95 °F.

When the bus is operated in outside ambient temperatures in the range of –10 to 10 °F, the interior temperature of the bus shall not fall below 55 °F while the bus is running on the design operating profile.

Additional testing shall be performed as necessary to ensure compliance to performance requirements stated herein.

The air conditioning portion of the HVAC system shall be capable of reducing the passenger compartment temperature from 110 to 90 °F in less than 20 minutes after system startup in a 100 °F ambient temperature. During the cooldown period, the refrigerant pressure shall not exceed safe high-side pressures, and the condenser discharge air temperature, measured 6 in. from the surface of the coil, shall be less than 45 °F above the condenser inlet air temperature. The appropriate solar load as recommended in the APTA

“Recommended Instrumentation and Performance Testing for Transit Bus Air Conditioning System,” representing 4 p.m. on Aug. 21, shall be used. There shall be no passengers on board, and the doors, windows and fresh air opening shall be closed.

TS 55. HVAC Controls and Temperature Uniformity

The HVAC system excluding the driver’s heater/defroster shall be centrally controlled with an advanced electronic/diagnostic control system with provisions for extracting/reading data. The system shall be compliant with J1939 Communication Protocol for receiving and broadcasting of data.

HVACs that use coolant pumps for driver’s defroster/heat shall be sized for the required flow and be brushless, having a minimum maintenance-free service life for both the brushless motor and the pump of at least 40,000 hours at full power.

After manual selection and/or activation of climate control system operation mode, all interior climate control system requirements for the selected mode shall be attained automatically to within ± 2 °F of specified temperature control setpoint.

The HVAC system must be able to accommodate both fixed setpoints and the following sliding scale temperature control set points. The temperature control setpoint for the system shall be 70 °F when the ambient temperature is between 40 and 80 °F. The temperature control setpoint in the cooling mode shall be allowed to rise by 0.9 °F for each degree of exterior temperature in excess of 80 °F, with a maximum allowed setpoint of 78 °F. The temperature control setpoint in the heating mode shall be allowed to decrease by 0.667 °F for each degree of exterior temperature below 40 °F, with a minimum allowed set point of 60 °F.

The sliding scale temperature control provides additional energy savings by adjusting the temperature setpoint based upon ambient temperature. The fixed setpoint allows temperature controls independent of ambient temperature. Having both control options allows the operator to apply the most appropriate control method for its operation.

Interior temperature distribution shall be uniform to the extent practicable to prevent hot and/or cold spots. After stabilization with doors closed, the temperatures between any two points in the passenger compartment in the same vertical plane, and 6 to 72 in. above the floor, shall not vary by more than 5 °F with doors closed. The interior temperatures, measured at the same height above the floor, shall not vary more than ± 5 °F from the front to the rear from the average temperature determined in accordance with APTA’s “Recommended Instrumentation and Performance Testing for Transit Bus Air Conditioning System.” Variations of greater than ± 5 °F will be allowed for limited, localized areas provided that the majority of the measured temperatures fall within the specified requirement.

TS 55.1 Auxiliary Heater

The delivery and installation of an optional heating system for low ambient temperatures shall be priced as an option outside of the base bus bid. The optional heating system will consist of one or more liquid heat exchangers, which will use heated coolant from a fuel fired coolant heater to supplement or replace heat provided by the electric grid heater. This reduces battery consumption for passenger compartment heating in low ambient conditions.

TS 55.2 Load Shedding and Derating

HVAC control must include a method to provide multistage load shedding when required to conserve battery power. The HVAC system may be operated with reduced performance to allow the bus to operate when the high voltage batteries are below critical levels.

TS 56. HVAC Air Flow

TS 56.1 Passenger Area

The cooling mode of the interior climate control system shall introduce air into the bus at or near the ceiling height at a minimum rate of 25 cubic feet per minute (cfm) per passenger based on the standard configuration bus carrying a number of passengers equal to 150 percent of the seated load. Airflow shall be evenly distributed throughout the bus, with air velocity not exceeding 100 ft per minute on any passenger. The ventilating mode shall provide air at a minimum flow rate of 20 cfm per passenger.

Airflow may be reduced to 15 cfm per passenger (150 percent of seated load) when operating in the heating mode. The fans shall not activate until the heating element has warmed sufficiently to ensure at least 70 °F air outlet temperature. The heating air outlet temperature shall not exceed 120 °F under any normal operating conditions.

The climate control blower motors and fan shall be designed such that their operation complies with the interior noise level requirements.

To be used by agencies with an operating profile where the door opening cycle results in effectively providing an adequate “fresh air” mixture.

Each seated passenger shall have access to individual air flow control.

TS 56.2 Driver’s Area

The bus interior climate control system shall deliver at least 100 cfm of air to the driver’s area when operating in the ventilating and cooling modes. Adjustable nozzles shall permit variable distribution or shutdown of the airflow. Airflow in the heating mode shall be reduced proportionally to the reduction of airflow into the passenger area. The windshield defroster unit shall meet the requirements of SAE J382, “Windshield Defrosting Systems Performance Requirements,” and shall have the capability of diverting heated air to the driver’s feet and legs. The defroster or interior climate control system shall maintain visibility through the driver’s side window.

TS 56.3 Controls for the Climate Control System (CCS)

The controls for the driver’s compartment for heating, ventilation and cooling systems shall be integrated and shall meet the following requirements:

- y. The heat/defrost system fan shall be controlled by a separate switch that has an “off” position and at least two positions for speed control. All switches and controls shall preclude the possibility of clothing becoming entangled, and shields shall be provided, if required. If the fans are approved by the Agency, an “on/off” switch shall be located to the right of or near the main defroster switch.
- z. A manually operated control valve shall control the coolant flow through the heater core.
- aa. If a cable-operated manual control valve is used, then the cable length shall be kept to a minimum to reduce cable seizing. Heater water control valves shall be “positive” type, closed or open. The method of operating remote valves shall require the concurrence of the Agency project manager.

TS 56.4 Driver's Compartment Requirements

A separate heating, ventilation and defroster system for the driver's area shall be provided and shall be controlled by the driver. The system shall meet the following requirements:

- bb. The heater and defroster system shall provide heating for the driver and heated air to completely defrost and defog the windshield, driver's side window and the front door glasses in all operating conditions. Fan(s) shall be able to draw air from the bus body interior and/or exterior through a control device and pass it through the heater core to the defroster system and over the driver's feet. A minimum capacity of 100 cfm shall be provided. The driver shall have complete control of the heat and fresh airflow for the driver's area.
- cc. The defroster supply outlets shall be located at the lower edge of the windshield. These outlets shall be durable and shall be free of sharp edges that can catch clothes during normal daily cleaning. The system shall be such that foreign objects such as coins or tickets cannot fall into the defroster air outlets. Adjustable ball vents or louvers shall be provided at the left of the driver's position to allow direction of air onto the side windows.

A ventilation system shall be provided to ensure driver comfort and shall be capable of providing fresh air in both the foot and head areas. Vents shall be controllable by the driver from the normal driving position. Decals shall be provided, indicating "operating instructions" and "open" and "closed" positions. When closed, vents shall be sealed to prevent the migration of water or air into the bus.

TS 56.5 Driver's Cooling

No dedicated evaporator.

TS 57. HVAC Air Filtration

Air shall be filtered before entering the AC system and being discharged into the passenger compartment. The filter shall meet the ANSI/ASHRAE 52.1 requirement for 5 percent or better atmospheric dust spot efficiency, 50 percent weight arrestance, and a minimum dust holding capacity of 120 g per 1000 cfm cell. Air filters shall be easily removable for service.

Air filters shall be cleanable.

TS 58. HVAC Roof Ventilators

Each ventilator shall be easily opened and closed manually. When open with the bus in motion, this ventilator shall provide fresh air inside the bus. The ventilator shall cover an opening area no less than 425 sq in. and shall be capable of being positioned as a scoop with either the leading or trailing edge open no less than 4 in., or with all four edges raised simultaneously to a height of no less than 3½ in. An escape hatch shall be incorporated into the roof ventilator. Roof ventilator(s) shall be sealed to prevent entry of water when closed.

One ventilator shall be provided in the roof of the bus.

TS 59. Maintainability

Manually controlled shutoff valves in the refrigerant lines shall allow isolation of the compressor and dehydrator filter for service. To the extent practicable, self-sealing couplings using O-ring seals shall be used to break and seal the refrigerant lines during removal of major components, such as the refrigerant compressor. Shutoff valves may be provided in lieu of self-sealing couplings. The condenser shall be located

to efficiently transfer heat to the atmosphere and shall not ingest air warmed above the ambient temperature by the bus mechanical equipment, or to discharge air into any other system of the bus. The location of the condenser shall preclude its obstruction by wheel splash, road dirt or debris. HVAC components located within 6 in. of floor level shall be constructed to resist damage and corrosion.

High and low refrigerant pressure electronic gauges to be located in the return air area.

TS 60. Entrance/Exit Area Heating

No requirements for entrance/exit area heating.

TS 61. Floor-Level Heating

TS 61.1 Transit Coach

Not applicable.

TS 61.2 Commuter Coach

Sufficient heaters shall be provided with ducting to blow warm air upward through a cavity in the wall and discharge the warm air at the base of the windows. Control of the warm wall heating shall be through the main heating system electronic control.

EXTERIOR PANELS, FINISHES AND EXTERIOR LIGHTING

TS 62. Design

The bus shall have a clean, smooth, simple design, primarily derived from bus performance requirements and passenger service criteria. The exterior and body features, including grilles and louvers, shall be shaped to facilitate cleaning by automatic bus washers without snagging washer brushes. Water and dirt shall not be retained in or on any body feature to freeze or bleed out onto the bus after leaving the washer. The body and windows shall be sealed to prevent leaking of air, dust or water under normal operating conditions and during cleaning in automatic bus washers for the service life of the bus.

Exterior panels shall be sufficiently stiff to minimize vibration, drumming or flexing while the bus is in service. When panels are lapped, the upper and forward panels shall act as a watershed. However, if entry of moisture into the interior of the vehicle is prevented by other means, then rear cap panels may be lapped otherwise. The windows, hatches and doors shall be able to be sealed. Accumulation of spray and splash generated by the bus's wheels shall be minimized on windows and mirrors.

TS 62.1 Materials

Body materials shall be selected and the body fabricated to reduce maintenance, extend durability and provide consistency of appearance throughout the service life of the bus. Detailing shall be kept simple, and add-on devices and trim shall be minimized and integrated into the basic design.

No requirement for protection against graffiti/vandalism for body material surfaces.

TS 62.2 Roof-Mounted Equipment

A nonskid, clearly marked walkway or steps shall be incorporated on the roof to provide access to equipment without damaging any system or bus paneling.

Roof mounted charging equipment and the capability to charge the bus with SAE J3105 compatible inverted pantograph overhead charging systems should be priced as an option outside of the base bus bid.

TS 63. Pedestrian Safety

Exterior protrusions along the side and front of the bus greater than ½ in. and within 80 in. of the ground shall have a radius no less than the amount of the protrusion. The exterior rearview mirrors, cameras and required lights and reflectors are exempt from the protrusion requirement. Advertising frames shall protrude no more than ⅞ in. from the body surface. Grilles, doors, bumpers and other features on the sides and rear of the bus shall be designed to minimize toeholds or handholds.

Exterior protrusions shall not cause a line-of-sight blockage for the driver.

TS 64. Repair and Replacement

TS 64.1 Side Body Panels (Transit Coach)

Not applicable.

TS 64.2 Side Body Panels (Commuter Coach)

Structural elements supporting exterior body panels shall allow side body panels below the windows to be repaired.

TS 65. Rain Gutters

Rain gutters shall be provided to prevent water flowing from the roof onto the passenger doors and driver's side window. When the bus is decelerated, the gutters shall not drain onto the windshield, driver's side window or door boarding area. Cross-sections of the gutters shall be adequate for proper operation.

TS 66. License Plate Provisions

Provisions shall be made to mount standard-size U.S./Canada license plates per SAE J686 on the front and rear of the bus. These provisions shall direct-mount or recess the license plates so that they can be cleaned by automatic bus-washing equipment without being caught by the brushes. The rear license plate provision shall be illuminated per SAE J587.

TS 66.1 Rub rails

No requirement for rub rails.

TS 67. Fender Skirts

Features to minimize water spray from the bus in wet conditions shall be included in wheel housing design. Any fender skirts shall be easily replaceable. They shall be flexible if they extend beyond the allowable body width. Wheels and tires shall be removable with the fender skirts in place.

TS 68. Wheel Covers (Transit Coach)

Wheel covers not required.

TS 68.1 Splash Aprons

Splash aprons, composed of ¼ in. minimum composition or rubberized fabric, shall be installed behind and/or in front of wheels as needed to reduce road splash and to protect underfloor components. The splash aprons shall extend downward to within 6 in. off the road surface at static conditions. Apron widths shall be no less than tire widths. Splash aprons shall be bolted to the bus understructure. Splash aprons and their attachments shall be inherently weaker than the structure to which they are attached. The flexible portions of the splash aprons shall not be included in the road clearance measurements. Splash apron shall be installed as necessary to protect the wheelchair loading device from road splash. Other splash aprons shall be installed where necessary to protect bus equipment.

TS 69. Service Compartments and Access Doors

TS 69.1 Access Doors (Transit Coach)

Not applicable.

TS 69.2 Access Doors (Commuter Coach)

Conventional doors shall be used for the engine compartment and for all auxiliary equipment compartments, including doors for checking the quantity and adding to the engine coolant, engine lubricant and transmission fluid. Access openings shall be sized for easy performance of tasks within the compartment, including tool operating space. Access doors shall be of rugged construction and shall maintain mechanical integrity and function under normal operations throughout the service life of the bus. They shall close flush with the body surface. All doors shall be hinged at the top or on the forward edge and shall be prevented from coming loose or opening during transit service or in bus washing operations. All access doors shall be retained in the open position. Latch handles shall be flush with, or recessed behind, the body contour and shall be sized to provide an adequate grip for opening. Access doors, when opened, shall not restrict access for servicing other components or systems.

If precluded by design, the manufacturer shall provide door design information specifying how the requirements are met.

TS 69.3 Access Door Latch/Locks

Access doors larger than 100 sq in. in area shall be equipped with corrosion-resistant flush-mounted latches or locks except for coolant and fuel fill access doors. All such access doors that require a tool to open shall be standardized throughout the vehicle and will require a nominal 5/16 in. square male tool to open or lock.

TS 70. Bumpers

TS 70.1 Location

Bumpers shall provide impact protection for the front and rear of the bus with the top of the bumper being 27 in., ±2 in., above the ground. Bumper height shall be such that when one bus is parked behind another, a portion of the bumper faces will contact each other.

TS 70.2 Front Bumper

No part of the bus, including the bumper, shall be damaged as a result of a 5 mph impact of the bus at curb weight with a fixed, flat barrier perpendicular to the bus's longitudinal centerline. The bumper shall return to its pre-impact shape within 10 minutes of the impact. The bumper shall protect the bus from damage as a result of 6.5 mph impacts at any point by the common carriage with contoured impact surface defined in

Figure 2 of FMVSS 301 loaded to 4000 lb parallel to the longitudinal centerline of the bus. It shall protect the bus from damage as a result of 5.5 mph impacts into the corners at a 30 deg angle to the longitudinal centerline of the bus. The energy absorption system of the bumper shall be independent of every power system of the bus and shall not require service or maintenance in normal operation during the service life of the bus. The bumper may increase the overall bus length specified by no more than 7 in.

TS 70.3 Rear Bumper

No part of the bus, including the bumper, shall be damaged as a result of a 2 mph impact with a fixed, flat barrier perpendicular to the longitudinal centerline of the bus. The bumper shall return to its pre-impact shape within 10 minutes of the impact. When using a yard tug with a smooth, flat plate bumper 2 ft wide contacting the horizontal centerline of the rear bumper, the bumper shall provide protection at speeds up to 5 mph, over pavement discontinuities up to 1 in. high, and at accelerations up to 2 mph per second. The rear bumper shall protect the bus when impacted anywhere along its width by the common carriage with contoured impact surface defined in Figure 2 of FMVSS 301 loaded to 4000 lb, at 4 mph parallel to or up to a 30 deg angle to the longitudinal centerline of the bus. The rear bumper shall be shaped to prevent unauthorized riders standing on the bumper. The bumper shall not require service or maintenance in normal operation during the service life of the bus. The bumper may increase the overall bus length specified by no more than 7 in.

TS 70.4 Bumper Material

Bumper material shall be corrosion-resistant and shall withstand repeated impacts of the specified loads without sustaining damage. These bumper qualities shall be sustained throughout the service life of the bus.

TS 71. Finish and Color

TS 71.1 Appearance

All exterior surfaces shall be smooth and free of wrinkles and dents. Exterior surfaces to be painted shall be properly prepared as required by the paint system Supplier prior to application of paint to ensure a proper bond between the basic surface and successive coats of original paint for the service life of the bus. Drilled holes and cutouts in exterior surfaces shall be made prior to cleaning, priming and painting, where possible, to prevent corrosion. The bus shall be painted prior to installation of exterior lights, windows, mirrors and other items that are applied to the exterior of the bus. Body filler materials may be used for surface dressing, but not for repair of damaged or improperly fitted panels.

Paint shall be applied smoothly and evenly with the finished surface free of visible dirt and the following other imperfections:

- blisters or bubbles appearing in the topcoat film
- chips, scratches or gouges of the surface finish
- cracks in the paint film
- craters where paint failed to cover due to surface contamination
- overspray
- peeling
- runs or sags from excessive flow and failure to adhere uniformly to the surface
- chemical stains and water spots
- dry patches due to incorrect mixing of paint activators
- buffing swirls

All exterior finished surfaces shall be impervious to diesel fuel, gasoline and commercial cleaning agents. Finished surfaces shall resist damage by controlled applications of commonly used graffiti-removing chemicals.

Proper adhesion between the basic surface and successive coats of the original paint shall be measured using an Elcometer adhesion tester as outlined in ASTM D4541-85. Adhesion shall be a minimum 300 ft-lb. The bus manufacturer shall supply test samples of the exterior surface for each step of the painting process that may be subject to adhesion testing per ASTM G4541-87 and ASTM D4145-85. ASTM D4541-93 may be used for inspection testing during assembly of the vehicle.

The exterior of the vehicle shall be wrapped by the Contractor prior to delivery. The wrap material shall be appropriate for the application and selected to maximize its durability and appearance. The Agency can provide concept art for the wrap upon request.

TS 72. Decals, Numbering and Signing

High-voltage systems shall be clearly identified with appropriate decals, numbering, and/or signage in accordance with federal, state and local requirements, codes and standards.

All decals, numbering, and/or signage shall be provided in compliance with federal and local ADA requirements.

TS 72.1 Passenger Information

ADA priority seating signs as required and defined by 49 CFR shall be provided to identify the seats designated for passengers with disabilities.

Requirements for a public information system in accordance with 49 CFR shall be provided.

TS 73. Exterior Lighting

All exterior lights shall be designed to prevent entry and accumulation of moisture or dust. Lamps, lenses and fixtures shall be interchangeable to the extent practicable. Two hazard lamps at the rear of the bus shall be visible from behind when the engine service doors are opened. Light lenses shall be designed and located to prevent damage when running the vehicle through an automatic bus washer.

Commercially available LED-type lamps shall be used at all exterior lamp locations.

All LED lamps shall be standard installation of the OEM. The entire assembly shall be specifically coated to protect the light from chemical and abrasion degradation.

Size of LED lamps used for tail, brake and turn signal lamps shall be standard installation of OEM.

The vehicle shall be outfitted with fog lights.

TS 73.1 Backup Light/Alarm

Visible and audible warnings shall inform following vehicles or pedestrians of reverse operation. Visible reverse operation warning shall conform to SAE J593. Audible reverse operation warning shall conform to SAE J994 Type C or D.

TS 73.2 Doorway Lighting

Lamps at the front and rear passenger doorways (if applicable) shall comply with ADA requirements and shall activate only when the doors open. These lamps shall illuminate the street surface to a level of no less than 1 footcandle (fc) for a distance of 3 ft outward from the outboard edge of the door threshold. The lights may be positioned above or below the lower daylight opening of the windows and shall be shielded to protect passengers' eyes from glare.

TS 73.3 Turn Signals

Turn-signal lights shall be provided on the front, rear, curb and street sides of the bus in accordance with federal regulations.

TS 73.4 Headlamps

Headlamps shall be designed for ease of replacement.

Standard OEM headlamp installation shall be provided in accordance with federal regulations.

TS 73.5 Brake Lamps

TS 73.5.1 Transit Coach

Not applicable.

TS 73.5.2 Commuter Coach

Brake lamps shall be provided in accordance with federal regulations.

Bus shall include red, high and center mount brake lamp(s) along the back side of the bus in addition to the lower brake lamps required under FMVSS. The high and center mount brake lamp(s) shall illuminate steadily with brake application.

TS 73.6 Service Area Lighting (Interior and Exterior)

LED lamps shall be provided in the engine and all other compartments where service may be required to generally illuminate the area for night emergency repairs or adjustments. These service areas shall include, but not be limited to, the engine compartment, the communication box, junction/apparatus panels and passenger door operator compartments. Lighting shall be adequate to light the space of the service areas to levels needed to complete typical emergency repairs and adjustments. The service area lamps shall be suitable for the environment in which they are mounted.

Engine compartment lamps shall be controlled by a switch mounted near the rear start controls or in an approved location. All other service area lamps shall be controlled by switches mounted on or convenient to the lamp assemblies. Power to the service area lighting shall be programmable. Power shall latch on with activation of the switch and shall be automatically discontinued (timed out) after 30 minutes to prevent damage caused by inadvertently leaving the service area lighting switch in the "on" position after repairs are made.

INTERIOR PANELS AND FINISHES

TS 74. General Requirements

Materials shall be selected on the basis of maintenance, durability, appearance, safety, noise reduction, flammability and tactile qualities. Materials shall be strong enough to resist everyday abuse and be vandalism and corrosion resistant. Trim and attachment details shall be kept simple and unobtrusive. Interior trim shall be secured to avoid resonant vibrations under normal operational conditions.

Interior surfaces more than 10 in. below the lower edge of the side windows or windshield shall be shaped so that objects placed on them fall to the floor when the coach is parked on a level surface. Any components and other electrical components within close proximity to these surfaces shall also be resistant to this cleaning method.

No requirement for anti-graffiti/vandalism surface treatments.

TS 75. Interior Panels

Panels shall be easily replaceable and tamper-resistant. They shall be reinforced, as necessary, to resist vandalism and other rigors of transit bus service. Individual trim panels and parts shall be interchangeable to the extent practicable.

Interior panels required to meet FMVSS 302.

TS 75.1 Driver Area Barrier

TS 75.1.1 Transit Coach

Not applicable.

TS 75.1.2 Commuter Coach

A barrier or bulkhead between the driver and the street-side front passenger seat shall be provided. The barrier shall minimize glare and reflections in the windshield directly in front of the barrier from interior lighting during night operation. Location and shape must permit full seat travel and reclining possibilities that can accommodate the shoulders of a 95th-percentile male. The partition shall have a side return and stanchion to prevent passengers from reaching the driver by standing behind the driver's seat. The lower area between the seat and panel must be accessible to the driver. The partition must be strong enough in conjunction with the entire partition assembly for mounting of such equipment as flare kits, fire extinguishers (1.2 kg), microcomputer, public address amplifier, etc. The panel should be properly attached to minimize noise and rattles.

The driver's barrier shall extend from the floor area to the ceiling and from the bus wall to the first stanchion immediately behind the driver to provide security to the driver and to limit passenger conversation.

TS 75.2 Modesty Panels

Sturdy divider panels constructed of durable, unpainted, corrosion-resistant material complementing the interior shall be provided to act as both a physical and visual barrier for seated passengers.

Design and installation of modesty panels located in front of forward-facing seats shall include a handhold or grab handle along their top edge. These dividers shall be mounted on the sidewall and shall project toward the aisle no farther than passenger knee projection in longitudinal seats or the aisle side of the transverse seats.

Modesty panels shall extend from at least the window opening of the side windows, and those forward of transverse seats shall extend downward to 1 and 1½ in. above the floor. Panels forward of longitudinal seats shall extend to below the level of the seat cushion. Dividers positioned at the doorways, where applicable, shall provide no less than a 2½ in. clearance between the modesty panel and a fully open, inward opening door, or the path of a deploying flip-out ramp to protect passengers from being pinched. Modesty panels installed at doorways shall be equipped with grab rails if passenger assists are not provided by other means.

The modesty panel and its mounting shall withstand a static force of 250 lb applied to a 4 × 4 in. area in the center of the panel without permanent visible deformation.

Modesty panels shall be installed as stated.

TS 75.3 Front End

The entire front end of the bus shall be sealed to prevent debris accumulation behind the dash and to prevent the driver's feet from kicking or fouling wiring and other equipment. The front end shall be free of protrusions that are hazardous to passengers standing at the front of the standee line area of the bus during rapid decelerations. Paneling across the front of the bus and any trim around the driver's compartment shall be formed metal or composite material. Composite dash panels shall be reinforced as necessary, vandal-resistant and replaceable. All colored, painted and plated parts forward of the driver's barrier shall be finished with a surface that reduces glare. Any mounted equipment must have provision to support the weight of equipment.

TS 75.4 Rear Bulkhead

The rear bulkhead and rear interior surfaces shall be material suitable for exterior skin; painted and finished to exterior quality; or paneled with melamine-type material, composite, scratch-resistant plastic or carpeting and trimmed with stainless steel, aluminum or composite.

The rear bulkhead paneling shall be contoured to fit the ceiling, sidewalls and seat backs so that any litter or trash will tend to fall to the floor or seating surface when the bus is on a level surface. Any air vents in this area shall be louvered to reduce airflow noise and to reduce the probability of trash or liter being thrown or drawn through the grille. If it is necessary to remove the panel to service components located on the rear bulkhead, then the panel shall be hinged or shall be able to be easily removed and replaced. Grilles where access to or adjustment of equipment is required shall be heavy duty and designed to minimize damage and limit unauthorized access.

TS 75.5 Headlining

Ceiling panels shall be made of durable, corrosion resistant, easily cleanable material. Headlining shall be supported to prevent buckling, drumming or flexing and shall be secured without loose edges. Headlining materials shall be treated or insulated to prevent marks due to condensation where panels are in contact with metal members. Moldings and trim strips, as required to make the edges tamperproof, shall be stainless steel, aluminum or plastic, colored to complement the ceiling material. Headlining panels covering operational equipment that is mounted above the ceiling shall be on hinges for ease of service but retained to prevent inadvertent opening.

TS 75.6 Fastening

Interior panels shall be attached so that there are no exposed unfinished, rough edges or rough surfaces. Fasteners should be corrosion resistant. Panels and fasteners shall not be easily removable by passengers. Exposed interior fasteners should be minimized, and where required shall be tamper-resistant.

TS 75.7 Insulation

Any insulation material used between the inner and outer panels shall minimize the entry and/or retention of moisture. Insulation properties shall be unimpaired during the service life of the bus. Any insulation material used inside the engine compartment shall not absorb or retain oils or water and shall be designed to prevent casual damage that may occur during maintenance operations.

The combination of inner and outer panels on the sides, roof, wheel wells and ends of the bus, and any material used between these panels, shall provide a thermal insulation sufficient to meet the interior temperature requirements. The bus body shall be thoroughly sealed so that the driver or passengers cannot feel drafts during normal operations with the passenger doors closed.

All insulation materials shall comply with the Recommended Fire Safety Practices defined in FTA Docket 90-A, dated Oct. 20, 1993.

TS 75.8 Floor Covering

The floor covering shall have a nonskid walking surface that remains effective in all weather conditions. The floor covering, as well as transitions of flooring material to the main floor and to the entrance and exit area, shall be smooth and present no tripping hazards. Seams shall be sealed/welded per manufacturer's specifications. The color and pattern shall be consistent throughout the floor covering. The standee line shall be approximately 2 in. wide and shall extend across the bus aisle and contrast with the rest of the floor covering.

Any areas on the floor that are not intended for standees, such as areas "swept" during passenger door operation, shall be clearly and permanently marked.

The floor shall be easily cleaned and shall be arranged to minimize debris accumulation.

A one-piece center strip shall extend from the vertical wall of the rear settee between the aisle sides of transverse seats to the standee line. If the floor is of a bi-level construction, then the center strip shall be one piece at each level. The covering between the center strip and the wheel housings may be separate pieces. At the rear door, however, a separate strip as wide as the door shall extend from the center strip to the outboard edge of the rear/exit area.

The floor under the seats shall be covered with smooth surface flooring material. The floor covering shall closely fit the sidewall in a fully sealed butt joint or extend to the top of the cove.

TS 75.9 Interior Lighting

Commercially available LED-type lamps shall be used at all interior lamp locations.

The light source shall be located to minimize windshield glare, with distribution of the light focused primarily on the passengers' reading plane while casting sufficient light onto the advertising display. The lighting system may be designed to form part of or the entire air distribution duct.

The lens material shall be translucent polycarbonate. Lenses shall be designed to effectively “mask” the light source. Lenses shall be sealed to inhibit incursion of dust and insects yet be easily removable for service. Access panels shall be provided to allow servicing of components located behind light panels. If necessary, the entire light fixture shall be hinged.

The interior lighting design shall require the approval of the Agency prior to beginning the bus build.

TS 75.10 Passenger Area Lighting

The first light on each side (behind the driver and the front door) is normally turned on only when the front door is opened, in “night run” and “night park.” As soon as the door closes, these lights shall go out. These lights shall be turned on at any time if the switch is in the “on” position.

All interior lighting shall be turned off whenever the vehicle is in reverse and the engine run switch is in the “on” position.

When the master switch is in the “run” or “night/run” mode, the first light module on each side of the coach shall automatically extinguish or dim when the front door is in the closed position and illuminate when the door is opened.

TS 75.11 Driver’s Area Lighting

The driver’s area shall have a light to provide general illumination, and it shall illuminate the half of the steering wheel nearest the driver to a level of 5 to 10 fc.

TS 75.12 Seating Area Lighting (Transit Coach)

Not applicable.

TS 75.13 Seating Area Lighting (Commuter Coach)

Passenger service modules mounted on the underside of the parcel rack shall include individually controlled and adjustable LED passenger reading lights; an exit signal push button, red in color; and individual air distribution outlets. These outlets shall be adjustable from fully closed to fully open position. Separate and independent notification will be provided on the dashboard indicator panel for stop request notification from securement positions.

TS 75.14 Vestibules/Doors Lighting (Transit Coach)

Not applicable.

TS 75.15 Vestibules/Doors Lighting (Commuter Coach)

Floor surface in the aisles shall be a minimum of 2 fc, and the vestibule area in accordance with ADA requirements.

TS 75.16 Step Lighting

Step lighting for the intermediate steps between lower and upper floor levels shall be a minimum of 4 fc and shall illuminate in all vehicle run positions. The step lighting shall be low profile to minimize tripping and snagging hazards for passengers and shall be shielded as necessary to protect passengers’ eyes from glare.

TS 75.17 Ramp Lighting (Transit Coach)

Not applicable.

TS 75.18 Turntable Lighting (Articulated Coach)

Lighting in the turntable can be reduced to 7 fc.

TS 75.19 Farebox/Card Reader Lighting

TS 75.19.1 Transit Coach

Not applicable.

TS 75.19.2 Commuter Coach

Not required.

TS 76. Fare Collection

Space and structural provisions shall be made for installation of currently available fare collection devices, which shall be as far forward as practicable. Location of the fare collection device shall not restrict traffic in the vestibule, including wheelchairs if a front door loading device is used, and shall allow the driver to easily reach the farebox controls and to view the fare register. The farebox shall not restrict access to the driver's area, shall not restrict operation of driver controls, and shall not—either by itself or in combination with stanchions, transfer mounting, cutting and punching equipment, or route destination signs—restrict the driver's field of view per SAE J1050. The location and mounting of the fare collection device shall allow use, without restriction, by passengers. The farebox location shall permit accessibility to the vault for easy manual removal or attachment of suction devices. Meters and counters on the farebox shall be readable on a daily basis. The floor under the farebox shall be reinforced as necessary to provide a sturdy mounting platform and to prevent shaking of the farebox.

Transfer mounting, cutting and punching equipment shall be located in a position convenient to the driver. Contractor shall provide fare collection installation layout to the Agency for approval.

The delivery and installation of a farebox shall be priced as an option outside of the base bid.

TS 77. Interior Access Panels and Doors (Transit Coach)

Access for maintenance and replacement of equipment shall be provided by panels and doors that appear to be an integral part of the interior. Access doors shall be hinged with gas props or overcenter springs, where practical, to hold the doors out of the mechanic's way. Panels shall prevent entry of mechanism lubricant into the bus interior. All fasteners that retain access panels shall be captive in the cover.

The number of special fastener tools required for panel and access door fasteners shall be minimized.

TS 77.1 Floor Panels

Access openings in the floor shall be sealed to prevent entry of fumes and water into the bus interior. Flooring material at or around access openings shall be flush with the floor and shall be edge-bound with stainless steel or another material that is acceptable to the Agency to prevent the edges from coming loose. Access openings

shall be asymmetrical so that reinstalled flooring shall be properly aligned. Fasteners shall tighten flush with the floor.

PASSENGER ACCOMMODATIONS

TS 78. Passenger Seating

TS 78.1 Arrangements and Seat Style (Transit Coach)

Not applicable.

TS 78.2 Rearward Facing Seats (Transit Coach)

Not applicable.

TS 78.3 Turntable Seating (Articulated Coach)

Not applicable.

TS 78.4 Padded Inserts/Cushioned Seats (Transit Coach)

Not applicable.

TS 78.5 Seat Back Configuration

Seating and interior trim shall have features to improve passenger comfort. Materials shall have high resistance to tearing, flexing and wetting.

TS 78.6 Drain Hole in Seats

No requirements for drain hole provision in seat inserts.

TS 78.7 Arrangements and Seat Style (Commuter Coach)

The passenger cabin shall be configured with at least 30 passenger seats.

Each row of passenger seats shall be arranged with 2 seats on one side of the aisle and 1 seat on the other side of the aisle. Seats shall be forward facing with the exception of the following two table arrangements:

- a. Four seats around a table on the side of the aisle with 2 seats per row (2 seats facing rearward).
- b. Two seats around a table on the side of the aisle with 1 seat per row (1 seat facing rearward).

Passenger seats shall be outfitted with folding armrests, folding foot rests, and seat belts.

Passenger seats shall have the capability to recline.

Each seated passenger shall have access to a cup holder, a power outlet, USB port, a reading light, and overhead air flow control.

TS 78.8 Hip-to-Knee Room

Hip-to-knee room measured from the center of the seating position, from the front of one seat back horizontally across the highest part of the seat to a vertical surface immediately in front, shall be a minimum

of 26 in. At all seating positions in paired transverse seats immediately behind other seating positions, hip-to-knee room shall be no less than 27 in. Hip-to-knee room should be maximized for passenger comfort.

TS 78.9 Foot Room

Foot room, measured at the floor forward from a point vertically below the front of the seat cushion, shall be no less than 14 in. Seats immediately behind the wheel housings and modesty panels may have foot room reduced. Foot room should be maximized for passenger comfort.

TS 78.10 Aisles (Transit Coach)

Not applicable.

TS 78.11 Aisles (Commuter Coach)

The aisle between the seats shall be no less than 14 in. wide at seated passenger hip height.

TS 78.12 Dimensions (Transit Coach)

Not applicable.

TS 78.13 Structure and Design (Transit Coach)

Not applicable.

TS 78.14 Structure and Design (Commuter Coach)

Seats shall be commuter coach reclining seats. Seat frames shall be constructed of high-strength, fatigue-resistant, welded steel with a durable powder-coated, corrosion-resistant colored finish that complements the coach interior. The seat frame shall be wall mounted with heavy gauge steel brackets and shall be attached to the coach floor with a heavy duty stainless steel T pedestal. The seat back shall recline a minimum of 1 in. to a maximum of 5 in. (127 mm) maximum with an infinite number of stops. The reclining seat backs shall be provided with a dress-up feature to facilitate coach cleaning. Seat width shall be a minimum of 36 in. and a maximum of 40.50 in. (1029 mm). Aisle shall not be less than 14 in. (356 mm) wide.

Floor seat tracks shall be stainless steel and shall be welded to the coach frame and be nearly flush with the finished floor. The wall tracks shall be stainless steel or aluminum and shall be bolted or riveted to the sidewall.

TS 78.15 Construction and Materials (Transit Coach)

Not applicable.

TS 78.16 Construction and Materials (Commuter Coach)

Seat cushions shall be supported by steel serpentine springs. Seat covering shall be high-quality wool fabric or vinyl. Wool fabric shall be tested to a minimum of 60,000 rubs per the Wyzendeek test method.

Seat foam padding shall be polyurethane. Seat upholstery shall be able to be removed with ease for cleaning/replacement purposes.

Contractor will select seat fabric on the basis of passenger comfort, durability, ease of maintenance and pleasing texture and appearance.

TS 79. Passenger Assists (Transit Coach)

Not applicable.

TS 79.1 Assists (Transit Coach)

Not applicable.

TS 79.2 Front Doorway

Front doors, or the entry area, shall be fitted with ADA-compliant assists. Assists shall be as far outward as practicable, but shall be located no farther inboard than 6 in. from the outside edge of the entrance step and shall be easily grasped by a 5th-percentile female boarding from street level. Door assists shall be functionally continuous with the horizontal front passenger assist, the vertical assist and the assists on the wheel housing or on the front modesty panel.

TS 79.3 Vestibule (Transit Coach)

Not applicable.

TS 79.4 Rear Doorway(s) (Transit Coach)

Not applicable.

TS 79.5 Overhead (Transit Coach)

Not applicable.

TS 79.6 Longitudinal Seat Assists (Transit Coach)

Not applicable.

TS 79.7 Wheel Housing Barriers/Assists (Transit Coach)

Not applicable.

TS 80. Passenger Doors

TS 80.1 Transit Coach

Not applicable.

TS 80.1.1 Front door

Not applicable.

TS 80.1.2 Rear Door(s)

Not applicable.

TS 80.2 Commuter Coach

TS 80.2.1 Front door

Forward of the front wheels and under direct observation of the driver.

TS 80.3 Materials and Construction

Structure of the doors, their attachments, inside and outside trim panels and any mechanism exposed to the elements shall be corrosion resistant. Door panel construction shall be of corrosion-resistant metal or reinforced non-metallic composite materials. When fully opened, the doors shall provide a firm support and shall not be damaged if used as an assist by passengers during ingress or egress. Door edges shall be sealed to prevent infiltration of exterior moisture, noise, dirt and air elements from entering the passenger compartment, to the maximum extent possible based on door types.

The closing edge of each door panel shall have no less than 2 in. of soft weather stripping. The doors, when closed, shall be effectively sealed, and the hard surfaces of the doors shall be at least 4 in. apart (not applicable to single doors). The combined weather seal and window glazing elements of the front door shall not exceed 10 deg of binocular obstruction of the driver's view through the closed door.

TS 80.4 Dimensions

TS 80.4.1 Transit Coach

Not applicable.

TS 80.4.2 Commuter Coach

Minimum doorway width per ADA requirements.

TS 80.5 Door Glazing

The upper section of both front and rear doors shall be glazed for no less than 45 percent of the respective door opening area of each section. The lower section of the front door shall be glazed for no less than 25 percent of the door opening area of the section.

Door glazing shall be easily replaceable.

Zip type glazing rubber required.

The door panel glazing material shall have a nominal ¼ in. thick laminated safety glass conforming with the requirements of ANSI Z26.1 Test Grouping 2 and the recommended practices defined in SAE J673.

TS 80.6 Door Projection (Transit Coach)

TS 80.6.1 Exterior

Not applicable.

TS 80.6.2 Interior

Not applicable.

TS 80.7 Door Height Above Pavement

It shall be possible to open and close either passenger door when the bus, loaded to gross vehicle weight rating, is not knelt and parked with the tires touching an 8 in. high curb on a street sloping toward the curb so that the street-side wheels are 5 in. higher than the right-side wheels.

TS 80.8 Closing Force

Closing door edge speed shall not exceed 12 in. per second, and opening door speed shall not exceed 19 in. per second. Power doors shall not slam closed under any circumstance, even if the door is obstructed during the closing cycle. If a door is obstructed during the closing cycle, the pressure exerted on the obstruction shall not increase once initial contact has been made.

Doors closed by a return spring or counterweight-type device shall be equipped with an obstruction-sensing device that, at a minimum, alerts the driver if an obstruction is detected between the closing doors. Doors closed by a return spring or counterweight type device, when unlocked, shall be capable of being pushed to the point where the door starts to open with a force not to exceed 25 lb applied to the center edge of the forward door panel.

Whether or not the obstruction-sensing system is present or functional, it shall be possible to withdraw a 1½ in. diameter cylinder from between the center edges of a closed and locked door with an outward force not greater than 35 lb.

TS 80.8.1 Rear Door Closing Force (Transit Coach)

Not applicable.

TS 80.9 Actuators

Doors shall open or close completely in not more than 3.5 seconds from the time of control actuation and shall be subject to the closing force requirements.

Door actuators shall be adjustable so that the door opening and closing speeds can be independently adjustable to satisfy the above requirements. Actuators and the complex door mechanism shall be concealed from passengers but shall be easily accessible for servicing. The door actuators shall be rebuildable. If powered by compressed air, exhaust from the door system shall be routed below the floor of the bus to prevent accumulation of any oil that may be present in the air system and to muffle sound.

Door actuators and associated linkages shall maximize door holding forces in the fully open and fully closed positions to provide firm, non-rattling, non-fluttering door panels while minimizing the force exerted by the doors on an obstruction midway between the fully open and closed positions.

The rear door actuator(s) shall be under the complete control of the vehicle operator and shall open and close in response to the position of the driver's door control.

Doors that employ a "swing" or pantograph geometry and/or are closed by a return spring or counterweight-type device shall be equipped with a positive mechanical holding device that automatically engages and prevents the actuation mechanism from being back-driven from the fully closed position. The holding device shall be overcome only when the driver's door control is moved to an "Exit Door Enable" position and the vehicle is moving at a speed of less than 2 mph, or in the event of actuation of the emergency door release.

Locked doors shall require a force of more than 300 lb to open manually. When the locked doors are manually forced to open, damage shall be limited to the bending of minor door linkage with no resulting damage to the doors, actuators or complex mechanism.

TS 80.9.1 Actuator (Commuter Coach)

The nominal door opening and closing speed shall be in the 3 to 5 second range. The maximum door opening and closing speeds will be regulated using fixed, maintenance-free orifices and airline sizes. If required, door speeds can be decreased with the addition of a flow-restricting device. Actuators and the complete door mechanism shall be concealed from passengers but shall be easily accessible for servicing.

TS 80.9.2 Rear Door Interlocks (Transit Coach)

Not applicable.

TS 80.10 Emergency Operation

In the event of an emergency, it shall be possible to manually open doors designated as emergency exits from inside the bus using a force of no more than 25 lb after actuating an unlocking device. The unlocking device shall be clearly marked as an emergency-only device and shall require two distinct actions to actuate. The respective door emergency unlocking device shall be accessible from the doorway area. The unlocking device shall be easily reset by the operator without special tools or opening the door mechanism enclosure. Doors that are required to be classified as “emergency exits” shall meet the requirements of FMVSS 217.

TS 80.11 Door Control

The door control shall be located in the operator’s area within the hand reach envelope described in SAE J287, “Driver Hand Control Reach.” The driver’s door control shall provide tactile feedback to indicate commanded door position and resist inadvertent door actuation.

The front door shall remain in commanded state position even if power is removed or lost.

TS 80.12 Door Controller

TS 80.12.1 Transit Coach

Not applicable.

TS 80.12.2 Commuter Coach

Doors shall be operated by push-button controls, conveniently located and operable within the driver’s reach. The push buttons shall be labeled.

TS 80.13 Door Open/Close

A control or valve in the operator’s compartment shall shut off the power to, and/or dump the power from, the front door mechanism to permit manual operation of the front door with the bus shut down. A master door switch, which is not within reach of the seated operator, when set in the “off” position shall close the rear/center doors (if applicable), deactivate the door control system, release the interlocks and permit only manual operation of the rear/center doors.

TS 81. Accessibility Provisions

Space and body structural provisions shall be provided to accommodate a wheelchair loading system compliant with local and national ADA requirements to be approved by the Agency.

The vehicle shall be designed to accommodate persons with service animals. The Contractor shall consider the accessibility by persons with service animals when finalizing the vehicle design/configuration.

TS 81.1 Loading Systems

Loading systems must be described within proposal.

TS 81.2 Lift/ramp

Lift/ramp to be described within Proposal.

TS 81.3 Loading System for 30 to 60 ft Low-Floor Bus

Not applicable.

TS 81.4 Loading System for Level Boarding on a 45 to 60 ft Low-Floor BRT

For level-entry boarding in applications such as BRT, where the vertical transition from the vehicle floor and the boarding and alighting surface is no more than 3 in., a bridge plate shall be used. Bridge plates 30 in. or longer shall support a load of 600 lb, placed at the centroid of the ramp or bridge plate distributed over an area of 26 × 26 in., with a safety factor of at least 3, based on the ultimate strength of the material. Bridge plates shorter than 30 in. shall support a load of 300 lb. When deployed to boarding and alighting surface, the slope of the bridge plate shall not exceed 6:1.

The bridge plate loading system shall be located at the front door.

TS 81.5 Wheelchair Accommodations

All passenger securement devices must be stowed off the floor and out of the way when not in use.

Two forward-facing locations, as close to the wheelchair loading system as practical, shall provide parking space and securement system compliant with local and national ADA requirements for a passenger in a wheelchair.

TS 81.6 Interior Circulation

Maneuvering room inside the bus shall be compliant with 49 CFR Part 38, Subpart B, §38.29 and accommodate easy travel for a passenger in a wheelchair from the loading device and from the designated securement area. It shall be designed so that no portion of the wheelchair protrudes into the aisle of the bus when parked in the designated parking space(s). When the positions are fully utilized, an aisle space of no less than 22 in. shall be maintained. As a guide, no width dimension should be less than 34 in. Areas requiring 90 deg turns of wheelchairs should have a clearance arc dimension no less than 45 in., and in the parking area where 180 deg turns are expected, space should be clear in a full 60 in. diameter circle. A vertical clearance of 12 in. above the floor surface should be provided on the outside of turning areas for wheelchair footrests.

TS 82. Wheelchair Lifts (Commuter Coach)

The wheelchair loading system shall provide safe, comfortable and rapid ingress and egress for applicable passengers from the street level or a curb. The loading system must comply with local and national ADA and FMVSS requirements.

TS 82.1 Lift

If necessary, a travel lift and two forward-facing mobility device securement areas shall be provided. The lift assembly shall comply with all current ADA and FMVSS 403 and 404 requirements. The lift shall be installed below the floor line at the number 2 right-hand luggage bay on the curbside of the coach.

The lift shall be controlled by a dash-mounted toggle switch and a rear lift area toggle switch, and operated by up/down switches on a pendant mounted to the lift support bracket inside the number 2 baggage bay. The lift restraint belt must be buckled before the lift can be raised or lowered. The safety interlock circuit can be energized to operate the lift only if the transmission is in neutral, the park brake is applied, engine fast idle is on, the dash-mounted master switch is on, the lift secondary switch is on, and the lift restraint belt is buckled.

When not in use, the lift shall stow in the luggage bay. The lift mechanism shall include a threshold warning device to provide “passenger on platform” information and to prevent stowing the lift platform when a passenger is sensed. The outer barrier shall be automatically controlled and shall be such that it cannot be overridden by the loading system operator. A dash-mounted indicator light shall be provided and shall be illuminated when the loading system is activated. The interlock shall apply, the bus shall not move and the engine throttle/propulsion system shall be disabled whenever the wheelchair loading system is activated. If the lift door is open or ajar, the interlock shall remain engaged. Brackets, clamps, screw heads and other fasteners used on the passenger assists shall be anodized aluminum or stainless steel and shall be flush with the surface and free of rough edges.

The lift control mounted on the lift structure shall have push button up/down switches. The toggle electrical supply switch shall be located in close proximity to the controller. This toggle switch must be turned on prior to the lift operation. All lift control switches shall be permanently labeled. Decals shall not be permitted. The stow guard switch shall be red in color, and the stow/deploy switch shall be black in color. These switches shall be incorporated in a handheld pendant.

The lift shall include a hinged platform to bridge the coach floor to the lift platform. The bridge shall be hinged and locked in an upward position to act as a barrier when the lift is in use. The bridge shall also allow lift passenger ingress/egress easily from the platform. Lift travel speeds and lift operation shall be adjusted to the lift manufacturer’s specifications upon completion of the lift installation into each coach and before coach delivery. The individual handrails shall incorporate a visual aid to ensure that they are folded in the proper order.

The lift shall include an emergency system in case of driver operation malfunction. Should an emergency situation occur, the lift operator shall release the push-button switch on the controller to immediately stop the lift cycle. The emergency hand pump handles and pump shall be located in an enclosed box at the rear wall of the number 1 right-hand luggage bay door. The handle shall be stored adjacent to the pump to allow immediate usage.

TS 82.2 Lift Door

If a vehicle is equipped with a wheelchair lift, then the lift door shall be a single-leaf design that operates in a sliding track mounted both above and below the door leaf. The door shall open by sliding to the rear of the coach and shall remain on a horizontal plane throughout the opening and closing process. No pin-hinged doors shall be provided. The vehicle must be in neutral and the parking brake activated for the lift to operate. The accelerator shall be automatically disabled and the fast idle system activated when either the lift master switch is turned on or the lift door is open in order to provide maximum safety and security. These features shall be wired to the lift master switch to allow activation only when the vehicle is in neutral. The coach directional (hazard) lights will also flash on/off. After the lift operation is completed, the lift shall be properly stored and secured, with the access door closed and the lift master switch at the dash in the “off” position in order to move the coach.

The lift door shall have a window in line with the other passenger windows and shall not detract from the appearance of the coach. The door latch mechanism shall be located in the lower section of the door so that operators in the 5th percentile female range can operate the lift door.

The lift storage door shall not block the visual observation to the lift assembly while using the manual override mode of the lift. A lift door design consisting of a horizontally hinged lift platform egress door mounted within a vertical motion pantograph luggage door is a preferred design.

TS 82.3 Lift Width

The installation of the lift to the coach structure as well as the installation of the lift door into the sidewall of the coach shall not affect the structural integrity of the coach.

The parcel rack module above the wheelchair lift platform area shall be permanently removed to provide additional headroom. The modified rack shall be professionally finished at all ends.

A threshold warning module with a red warning light and an acoustic sensor shall be mounted in the ceiling structure above the wheelchair lift entrance doorway.

The heating and air ducts shall be rerouted around the lift area to ensure proper interior air conditioning/heating airflow and distribution.

A passenger chime tape switch shall be mounted on the sidewall at the two wheelchair securement positions.

Each coach shall have adequate information decals installed that detail the proper lift operation in both the normal and manual modes of operation.

TS 82.4 Lighting Requirements

Lighting for the lift areas shall be designed to meet Title 13 and ADA and FMVSS 404 standards. Lighting shall be provided to effectively illuminate the lift area. Light shall be wired through the lift master toggle switch on the driver's dash and shall automatically illuminate when this switch is in the "on" position. The lighting design shall minimize the effect of glare on passengers entering the bus through the wheelchair lift door. During lift operation, the street surface shall be illuminated to a minimum of 6 candlepower a distance of 3 ft beyond the external dimensions of the lift platform once deployed and lowered. Additional lighting shall be provided to ensure illumination of the instruction placard and the manual override pump when it is in use.

TS 82.5 Securement System

The vehicle interior shall permit the securement of two forward-facing wheelchair passengers in which the primary position shall be on the street side of the coach directly across from the lift. Securement areas shall be a minimum 30 × 48 in. as required by the ADA.

A separate three-point belt securement shall be provided to effectively secure wheelchair passengers. To further secure the passenger during the lift operation, a retractable seat belt strap shall be provided at the ingress/egress area of the lift platform. A minimum 10.5 in. high barrier shall also be provided at the rear of the lift area for additional passenger protection.

TS 82.6 Roof Ventilation/Escape Hatches

Two roof ventilators shall be provided and designed to perform as escape hatches. One ventilator/escape hatch shall be located in the roof at the front of the coach, another in the roof at the rear of the coach.

SIGNAGE AND COMMUNICATION

TS 83. Destination Signs

A destination sign system shall be furnished on the front, on the right side near the front door.

All signs shall be controlled via a single human-machine interface (HMI). In the absence of a single mobile data terminal (MDT), the HMI shall be conveniently located for the bus driver within reach of the seated driver.

The driver shall be able to access the sign while seated.

The destination sign compartments shall meet the following minimum requirements:

- Compartments shall be designed to prevent condensation and entry of moisture and dirt.
- Compartments shall be designed to prevent fogging of both compartment window and glazing on the unit itself.
- Access shall be provided to allow cleaning of inside compartment window and unit glazing.
- The front window shall have an exterior display area of no less than 8.5 in. high by 56 in. wide.

TS 84. Passenger Information and Advertising (Transit Coach)

TS 84.1 Interior Displays

Provisions shall be made on the rear of the driver's barrier or equipment box located on the wheel well for a frame to retain information such as routes and schedules.

The vehicle shall be equipped with monitors. A monitor must be viewable from each passenger seat. The monitors shall be connected to a centralized A/V media player.

TS 84.2 Exterior Displays

Provisions shall be made to integrate advertising into the exterior design of the bus. Advertising media, frames or supporting structures shall not detract from the readability of destination signs and signal lights, and shall not compromise passenger visibility. Advertising provisions shall not cause pedestrian hazards or foul automatic bus washing equipment, and shall not cover or interfere with doors, air passages, vehicle fittings or in any other manner restrict the operation or serviceability of the bus.

TS 85. Passenger Stop Request/Exit Signal

TS 85.1 Transit Coach

Not applicable.

TS 85.2 Commuter Coach

A heavy-duty "stop request" signal button shall be installed at every seat location except the rear cross seat.

TS 85.3 Signal Chime

A single “stop requested” chime shall sound when the system is first activated. A double chime shall sound anytime the system is activated from wheelchair passenger areas.

Exit signals located in the wheelchair passenger area shall be no higher than 4 ft above the floor. Instructions shall be provided to clearly indicate the function and operation of these signals.

TS 86. Communications

Provide all wiring and mounting locations for equipping the vehicle with high-speed wireless internet (“WiFi”) shall be included in the Proposal.

Providing passengers with access to high-speed wireless internet shall be priced as an option outside of the base bus bid. Any recurring fees associated with the WiFi shall be clearly described within the Proposal submittal.

TS 86.1 Camera Surveillance System

Provide all wiring and mounting locations for a multi-camera surveillance system, including the installation of cameras, recorder, microphone, etc.

TS 86.2 Public Address System

A public address system shall be provided on each bus for facilitating radio system and driver-originated announcements to passengers.

TS 86.2.1 Speakers

Premium interior loudspeakers shall be provided, semi-flush mounted, on alternate sides of the bus passenger compartment, installed with proper phasing. Speakers shall broadcast, in a clear tone, announcements that are clearly perceived from all seat positions at approximately the same volume level. Speakers shall also have the capability of broadcasting audio from centralized A/V equipment.

Total impedance seen at the input connecting end shall be 8 ohms. Mounting shall be accomplished with riv-nuts and machine screws.

TS 86.3 Automatic Passenger Counter (APC)

The delivery and installation of an infrared APC system shall be priced as an option outside of the base bus bid.

TS 86.4 Radio Handset and Control System

The delivery and installation of a two-way radio for communication between the driver and dispatch center shall be priced as an option outside of the base bus bid.

TS 86.4.1 Driver’s Speaker

Each bus shall have a recessed speaker in the ceiling panel above the driver. This speaker shall be the same component used for the speakers in the passenger compartment. It shall have 8 ohms of impedance.

TS 86.4.2 Handset

Contractor will install a handset for driver use.

TS 86.4.3 Driver Display Unit (DDU)

Contractor shall install a driver display unit as close to the driver's instrument panel as possible.

TS 86.4.4 Emergency Alarm

Contractor shall install an emergency alarm that is accessible to the driver but hidden from view.

TS 86.4.5 Automatic Vehicle Location

The vehicle shall be equipped with an automatic vehicle location (AVL) system. The Contractor shall describe any required software and any recurring fees associated with the AVL system within the Proposal submittal. The AVL system shall not be proprietary; other Agency and bus systems should be able to access and use the Global Positioning System (GPS) or other location data used by the AVL.

TS 87. Event Data Recorder (EDR)

An EDR shall be priced as an option outside of the base bus bid. EDRs shall be installed on the bus, one at the front and the other at the rear. These units are to be installed as low as possible. The EDRs shall be able to communicate over the J1939 CAN line and shall each be equipped with three-axis accelerometers. Settings are to be finalized with the Agency during pre-production. EDRs shall broadcast via the J1939 data communication link severe impact events to the vehicle monitoring system and also trigger an event in the camera system. The EDR shall also tag an event from a signal received over the J1939 CAN line from the silent alarm switch signal and the camera event button and in turn broadcast these events to the vehicle monitoring system. The EDR shall also record the following operational data: headlights on or off, turn signals and hazard lights on or off, ignition on or off, low air pressure warning, whether moving in forward or reverse or idling, and whether parking brake is on or off.

TS 88. Approved Equals

Any change, revision, or substitution of products specified within this solicitation requires written approval of the agency. Contractor must submit a written request for any changes, revisions, or substitution by the due date found in the RFP for approved equals.

TS 89. Miscellaneous Passenger Amenities

TS 89.1 Luggage Storage

Undercarriage luggage space shall be provided. The amount of undercarriage luggage space should be maximized by the Contractor and shall be described in detail within the Proposal submittal.

Interior overhead parcel storage shall be provided. A minimum 10-module parcel rack without dividers and compartment doors shall be furnished over all passenger seating positions except in the wheelchair door area. Retention cords shall run the length of the rack housing. The parcel rack edge, running along the full length of the aisle, shall incorporate a handhold for use by standees. Passenger headroom, measured from the rack end to the top of the seat headrest, shall be a minimum 17 in. (432 mm). Interior window post caps shall be ABS, thermo-formed plastic, off-white in color to provide a clean, finished appearance. The interior of the rack shall be vinyl covered aluminum to complement the interior. Parcel racks shall be supported by polycarbonate

glass filled hangers spaced approximately 40 in. (1016 mm) apart. Total capacity shall be a minimum 109 cu ft (3 m³) to allow for ample storage space for carry-on items.

Passengers using the wheelchair securement systems shall be provided identical amenities as provided for all other passengers, except that the parcel rack shall be deleted in the area of the wheelchair lift door.

TS 89.2 Bicycle Racks

The vehicle shall be equipped with a minimum of four (4) bicycle racks inside the passenger cabin.

TS 89.3 Lavatory

The vehicle shall be equipped with a full service lavatory inside the passenger cabin.

TS 89.4 Potable Water

Equipping the vehicle with a storage tank for potable water shall be priced as an option outside of the base bus bid.

TS 90. Collision Avoidance and Mitigation

TS 90.1 Passive Collision Avoidance and Mitigation System

An external speaker shall be installed that emits an audible warning to pedestrians and cyclists when the driver activates a turn signal. The Agency's maintenance staff shall have the capability of turning the speaker on or off.

Equipping the vehicle with a system that provides audible and visual warnings to the bus driver when pedestrians, cyclists, or other vehicles are at risk of being struck by the bus shall be priced as an option outside of the base bus bid. This system must also provide lane departure warnings.

TS 90.2 Active Collision Avoidance and Mitigation System

Equipping the vehicle with an active collision avoidance and mitigation system shall be priced as an option outside of the base bus bid. The active system shall have the same capabilities as the optional passive system (TS 90.1), with the following additional features:

- a. automatically apply brakes when the system senses a collision is imminent.
- b. automatically steer the vehicle to the side of the road and bring the vehicle to a stop if the system senses that the driver is incapacitated.

TS 91. Data Collection and Management System

Data is necessary to evaluate the long-term performance of the electric bus system, which encompasses both the bus and all charger systems provided by the Contractor. Contractor must provide the Agency with the tools necessary to access, read, and record the data required in the specified format for the 12-years after bus acceptance.

TS 91.1 Data Format

Regardless of the method of delivery, the data must be presented in a human readable format. For numeric data, standard engineering units such as Volts, Amps, Kilowatts shall be used and the units shall be indicated. For date/time stamps, the format shall be indicated and must include year, month, day, hour, minute, second. Either 24 or 12 hour timestamps may be used. Further subdivision of seconds is permissible.

Permissible formats are Microsoft Excel 2003 or later (xls/xlsx) or any comma separated value text format that is importable into Microsoft Excel 2003 or later without third party tools unless such tools are provided to the Agency. Database formats or proprietary formats require the prior written approval of the Agency.

TS 91.2 Method of Delivery

Data shall be viewable in real-time using tools provided by the Contractor.

Data shall be recorded and recorded data shall be made available by direct collection by the Agency using memory cards, service tools provided by the Contractor, or other similar means approved by the Agency. Alternatively, Contractor may collect the data and send report to the Agency periodically, but not less often than once a calendar month. Data must be provided for any month in which the bus is operated (whether or not in revenue service) during its service life.

TS 91.3 Frequency

Continuous data shall be logged and timestamped at a 0.1 to 1 Hz rate. Events shall be logged and timestamped as they occur.

TS 91.4 Data Required

This section specifies data that must be logged. Additional data beyond the requirement is not prohibited.

TS 91.4.1 Continuous Data

- a. Odometer distance (miles preferred, kilometers acceptable)Accumulated operating hours
- b. Status of high voltage contactors (open / closed)
- c. Charging status (depot charger connected, overhead fast charger connected, no charger connected)
- d. Vehicle speed (miles per hour preferred, kilometers per hour acceptable)
- e. Operation state (defined by Contractor, e.g. running, faulted, charging)
- f. Traction motor speed (rpm)
- g. Traction motor power (kW. Positive indicates motoring. Negative indicates regeneration.)
- h. High voltage battery pack indicated state of charge (percentage)
- i. High voltage battery pack voltage (Volts)
- j. High voltage battery pack current (Amps. Negative value indicates charge or regen condition.)
- k. Battery charge cycle count
- l. Estimated battery health
- m. PRNDL or drive/reverse switch position

- n. Parking brake switch position
- o. Day/run switch position
- p. Accelerator pedal position
- q. Brake pedal position or force
- r. Heater and/or defroster on
- s. Air conditioning on

TS 91.4.2 Event Data

- a. Bus faults, alarms, warnings, and informational messages
- b. Charge event type (depot/overhead)
- c. Charge event energy delivered to bus (kWh)
- d. Charge event duration (hh:mm:ss)
- e. Charge event faults, alarms, warning, and informational messages
- f. Door actuation

TS 92. Electric Vehicle Supply Equipment

In addition to the battery electric vehicles, prospective Proposers are encouraged to include pricing for two vehicle charging options outside of the base bus bid:

- a) charging equipment to support initial seven (7) vehicle order, with options to purchase additional charging equipment to support up to an additional twenty (20) vehicles over a five-year period.
- b) site design, charging equipment, delivery, installation and commissioning of charging equipment to support initial seven (7) vehicle order.

The Agency reserves the right to award a Contract to a qualified bidder for the vehicles only OR the vehicles and one of the charging options.

Any charging equipment proposed is required to be conventional plug-in Electric Vehicle Supply Equipment (EVSE) for charging heavy-duty transit vehicles. EVSE shall be designed, manufactured, and certified by its manufacturer for outdoor use.

The required location and quantities of chargers is as follows:

Location Name	Address	Minimum Required Quantity of Charger
RABA Maintenance Facility	333 South Market Street, Redding, CA 96001	3
SacRT Vehicle Storage Yard	N and 29th Streets, Sacramento, CA 95811	2
Glenn County Maintenance Yard	777 Colusa Street, Willows, CA 95988	2

The EVSE shall comply with the SAE J1772 DC standard and utilize a Type 1 “J1772” CCS/Combo coupler. The EVSE shall be UL Classified for the intended purpose. All electronics enclosures must be rated at NEMA 3R or above. The EVSE shall be capable of operating continuously without performance or safety

degradations for a minimum of 12-years in ambient service temperature of -4 °F to 122 °F and relative humidity of 5 to 95%.

The EVSE shall be sized to sufficient to provide a full charge (from minimum SOC to maximum SOC) in up to a maximum of 3 hours per bus in any environmental condition typically found at the Agency's location when used with the buses proposed by the Contractor. The bus shall automatically control the charge rate in order to maximize life of the batteries. The connectors shall not be energized except when mated with the bus mounted receptacle.

The Proposal submittal shall also contain a complete description of the EVSE, including but not limited to model name/number, country of origin, name of manufacturer, installation instructions (including power and communication network requirements), operation instructions, compliance with charge standards and UL Classification, nominal efficiency, physical dimensions, number of connectors, connector cable length, maintenance requirements, and warranty terms. Proposers shall provide charge profiles (SOC versus charge time) for charge events from min SOC, 25% SOC, 50% SOC, and 75% SOC to max SOC.

Proposers shall describe any automatic or "smart" charging features including programmable charging capability, networking multiple chargers, charge monitoring, remote charge management, vehicle-to-grid capability, and charge reporting. Describe whether these features are provided as a standard offering or as an option to the proposal submission. If certain features are provided as an option clearly describe costs. Describe both upfront costs and any necessary subscription service costs.

SECTION 7: WARRANTY REQUIREMENTS

WR 1. Basic Provisions

WR 1.1 Warranty Requirements

WR 1.1.1 Contractor Warranty

Warranties in this document are in addition to any statutory remedies or warranties imposed on the Contractor. Consistent with this requirement, the Contractor warrants and guarantees to the original Agency each complete bus and specific subsystems and components as follows.

WR 1.1.2 Complete Bus

The complete bus (“bumper to bumper”) is warranted to be free from Defects and Related Defects for two years or 100,000 miles, whichever comes first, beginning on the date of revenue service but not longer than 15 days after acceptance under “Inspection, Testing and Acceptance.” The warranty is based on regular operation of the bus under the operating conditions prevailing in the Agency’s locale.

WR 1.1.3 Body and Chassis Structure

Body, body structure, structural elements of the suspension and engine cradle are warranted to be free from Defects and Related Defects for two years or 100,000 miles, whichever comes first.

Primary load-carrying members of the bus structure, including structural elements of the suspension, are warranted against corrosion failure and/or Fatigue Failure sufficient to cause a Class 1 or Class 2 Failure for a period of 12 years or 500,000 miles, whichever comes first.

WR 1.1.4 Propulsion System (Diesel, CNG, Hybrid)

Not applicable.

WR 1.1.5 Propulsion System (All Electric)

Propulsion system components, including the traction motor(s), traction motor controller(s), transmission, drive motors, drive and non-drive axles, and any other propulsion system-related component, shall be warranted to be free from Defects and Related Defects for six years or 300,000 miles, whichever comes first. The propulsion system manufacturer’s standard warranty, delineating items excluded from the Extended Warranty, should be submitted in accordance with the Request for Pre-Offer Change or Approved Equal or with the Form for Proposal Deviation.

WR 1.1.6 Energy Storage System (All Electric or Hybrid)

The Energy Storage System (ESS), including the traction battery, Battery Management System, and any other ESS-related component, shall be warranted to be free from Defects and Related Defects for twelve years or 500,000 miles, whichever comes first, beginning on the date of bus acceptance under “Inspection, Testing and Acceptance,” per this RFP.

The energy capacity of the ESS shall also be warranted for 6 years or 300,000 miles, whichever comes first, to remain greater than the Warrantable End Of Life Capacity. An Extended Warranty to a maximum of 12 years or 500,000 miles may be purchased at an additional cost. The original specified energy storage capacity and Warrantable End of Life Capacity, as a percentage of the original specified energy capacity, shall be clearly defined by the Proposer. Acceptable methods for measuring or obtaining ESS energy storage capacity with respect to its original specified capacity shall be clearly identified by the manufacturer. The

manufacturer will propose the test method, and certify the results are true and accurate. The test will be performed according to a documented test procedure. The Agency is allowed to engage third-parties for capacity testing. If applicable, the proposal shall include a comprehensive statement of any additional warranty terms relating to the ESS, including explanation of all disclaimers within the warranty.

WR 1.1.7 Emission Control System (ECS)

Not applicable.

WR 1.1.8 Subsystems

The following subsystems shall be warranted to be free from Defects and Related Defects for two years or 100,000 miles, whichever comes first:

- Brake system: Foundation brake components, including advancing mechanisms, as supplied with the axles, excluding friction surfaces.
- Destination signs: All destination sign equipment for the front, side and rear signs, power modules and operator control.
- Heating, ventilating: Roof and/or rear main unit only, excluding floor heaters and front defroster.
- AC unit and compressor: Roof and/or rear main unit only, excluding floor heaters and front defroster.
- Door systems: Door operating actuators and linkages.
- Air compressor.
- Air dryer.
- Wheelchair lift and ramp system: Lift and/or ramp parts and mechanical only.
- Starter.
- Alternator: Alternator only. Does not include the drive system.
- Charge air cooler: Charge air cooler including core, tanks and including related surrounding framework and fittings.
- Fire suppression: Fire suppression system including tank and extinguishing agent dispensing system.
- Hydraulic systems: Including radiator fan drive and power steering as applicable.
- Propulsion system cooling systems: Radiator including core, tanks and related framework, including surge tank. Transmission cooler.
- Power electronics: DC/DC converters, inverters, if supplied.
- Passenger seating excluding upholstery.
- Fuel storage and delivery system.
- Surveillance system including cameras and video recorders.

The following subsystems shall be warranted to be free from Defects and Related Defects for twelve years or 500,000 miles, whichever comes first:

- Low voltage and high voltage electrical wiring and harnesses (12 years)

WR 1.1.9 Extended Warranty

The Agency requests the option to purchase the following extended warranties:

- **Propulsion System** – extend the standard 6 year/300,000 mile warranty against Defects and Related Defects to a 12 year/500,000 mile warranty.
- **Energy Storage System (ESS)** – extend the standard 6 year/300,000 mile warranty against capacity degradation below the Warrantable End of Life Capacity to 12 year/500,000 miles.

WR 1.1.10 Serial Numbers

Upon delivery of each bus, the Contractor shall provide a complete electronic list of serialized units installed on each bus to facilitate warranty tracking. The list shall include (if supplied with the bus), but is not limited to the following:

- Engine or traction motor(s)
- Propulsion System Controller / Inverter(s)
- Energy Storage Pack(s) or Module(s)
- Power electronics: DC/DC converters, inverters
- Transmission
- Alternator
- Starter
- HVAC system and major components
- Drive axle
- Power steering unit
- Fuel cylinders (if applicable)
- Air compressor
- Wheelchair ramp (if applicable)

The Contractor shall provide updated serial numbers resulting from warranty campaigns. The format of the list shall be approved by the Agency prior to delivery of the first production bus.

WR 1.1.11 Extension of Warranty

If, during the warranty period, repairs or modifications on any bus are made necessary by defective design, materials or workmanship but are not completed due to lack of material or inability to provide the proper repair for thirty (30) calendar days, then the applicable warranty period shall be extended by the number of days equal to the delay period.

WR 1.2 Voiding of Warranty

The warranty shall not apply to the failure of any part or component of the bus that directly results from misuse, negligence, accident or repairs not conducted in accordance with the Contractor-provided maintenance manuals and with workmanship performed by adequately trained personnel in accordance with recognized standards of the industry. The warranty also shall be void if the Agency fails to conduct normal inspections and scheduled preventive maintenance procedures as recommended in the Contractor's maintenance manuals and if that omission caused the part or component failure. The Agency shall maintain documentation, auditable by the Contractor, verifying service activities in conformance with the Contractor's maintenance manuals.

WR 1.3 Exceptions and Additions to Warranty

The warranty shall not apply to the following items:

- scheduled maintenance items
- normal wear-out items
- items furnished by the Agency

Should the Agency require the use of a specific product and has rejected the Contractor's request for an alternate product, then the standard Supplier warranty for that product shall be the only warranty provided to the Agency. This product will not be eligible under "Fleet Defects," below.

The Contractor shall not be required to provide warranty information for any warranty that is less than or equal to the warranty periods listed.

WR 1.3.1 Pass-Through Warranty

Should the Contractor elect to not administer warranty claims on certain components and wish to transfer this responsibility to the sub-suppliers, or to others, the Contractor shall request this waiver.

Contractor shall state in writing that the Agency's warranty reimbursements will not be impacted. The Contractor also shall state in writing any exceptions and reimbursement including all costs incurred in transport of vehicles and/or components. At any time during the warranty period, the Contractor may request approval from the Agency to assign its warranty obligations to others, but only on a case-by-case basis approved in writing by the Agency. Otherwise, the Contractor shall be solely responsible for the administration of the warranty as specified. Warranty administration by others does not eliminate the warranty liability and responsibility of the Contractor.

WR 1.3.2 Superior Warranty

The Contractor shall pass on to the Agency any warranty offered by a component Supplier that is superior to that required herein. The Contractor shall provide a list to the Agency noting the conditions and limitations of the Superior Warranty not later than the start of production. The Superior Warranty shall not be administered by the Contractor.

WR 1.4 Fleet Defects

WR 1.4.1 Occurrence and Remedy

A Fleet Defect is defined as cumulative failures of twenty-five (25) percent of the same components in the same or similar application in a minimum fleet size of twelve (12) or more buses where such items are covered by warranty. A Fleet Defect shall apply only to the base warranty period in sections entitled "Complete Bus," "Propulsion System" and "Major Subsystems." When a Fleet Defect is declared, the remaining warranty on that item/component stops. The warranty period does not restart until the Fleet Defect is corrected.

For the purpose of Fleet Defects, each option order shall be treated as a separate bus fleet. In addition, should there be a change in a major component within either the base order or an option order, the buses containing the new major component shall become a separate bus fleet for the purposes of Fleet Defects.

The Contractor shall correct a Fleet Defect under the warranty provisions defined in "Repair Procedures." After correcting the Defect, the Agency and the Contractor shall mutually agree to and the Contractor shall promptly undertake and complete a work program reasonably designed to prevent the occurrence of the same Defect in all other buses and spare parts purchased under this Contract. Where the specific Defect can be solely attributed to particular identifiable part(s), the work program shall include redesign and/or replacement of only the defectively designed and/or manufactured part(s). In all other cases, the work program shall include inspection and/or correction of all the buses in the fleet via a mutually agreed-to arrangement. The Contractor shall update, as necessary, technical support information (parts, service and operator's manuals) due to changes resulting from warranty repairs. The Agency may immediately declare a Defect in design

resulting in a safety hazard to be a Fleet Defect. The Contractor shall be responsible to furnish, install and replace all defective units.

WR 1.4.2 Exceptions to Fleet Defect Provisions

The Fleet Defect warranty provisions shall not apply to Agency-supplied items, such as radios, fare collection equipment, communication systems and tires. In addition, Fleet Defects shall not apply to interior and exterior finishes, hoses, fittings and fabric.

WR 2. Repair Procedures

WR 2.1 Repair Performance

The Contractor is responsible for all warranty-covered repair Work. To the extent practicable, the Agency will allow the Contractor or its designated representative to perform such Work. At its discretion, the Agency may perform such Work if it determines it needs to do so based on transit service or other requirements. Such Work shall be reimbursed by the Contractor.

WR 2.2 Repairs by the Contractor

If the Agency detects a Defect within the warranty periods defined in this section, it shall, within thirty (30) days, notify the Contractor's designated representative. The Contractor or its designated representative shall, if requested, begin Work on warranty-covered repairs within five calendar days after receiving notification of a Defect from the Agency. The Agency shall make the bus available to complete repairs timely with the Contractor's repair schedule.

The Contractor shall provide at its own expense all spare parts, tools and space required to complete repairs. At the Agency's option, the Contractor may be required to remove the bus from the Agency's property while repairs are being effected. If the bus is removed from the Agency's property, then repair procedures must be diligently pursued by the Contractor's representative.

WR 2.3 Repairs by the Agency

WR 2.3.1 Parts Used

If the Agency performs the warranty-covered repairs, then it shall correct or repair the Defect and any Related Defects utilizing parts supplied by the Contractor specifically for this repair. At its discretion, the Agency may use Contractor-specified parts available from its own stock if deemed in its best interests.

WR 2.3.2 Contractor-Supplied Parts

The Agency may require that the Contractor supply parts for warranty-covered repairs being performed by the Agency. Those parts may be remanufactured but shall have the same form, fit and function, and warranty. The parts shall be shipped prepaid to the Agency from any source selected by the Contractor within fourteen (14) days of receipt of the request for said parts and shall not be subject to an Agency handling charge.

WR 2.3.3 Defective Component Return

The Contractor may request that parts covered by the warranty be returned to the manufacturing plant. The freight costs for this action shall be paid by the Contractor. Materials should be returned in accordance with the procedures outlined in "Warranty Processing Procedures."

WR 2.3.4 Failure Analysis

The Contractor shall, upon specific request of the Agency, provide a failure analysis of Fleet Defect or safety-related parts, or major components, removed from buses under the terms of the warranty that could affect fleet operation. Such reports shall be delivered within 60 days of the receipt of failed parts.

WR 2.3.5 Reimbursement for Labor and Other Related Costs

The Agency shall be reimbursed by the Contractor for labor. The amount shall be determined by the Agency for a qualified mechanic at a straight time wage rate of \$110 per hour, which includes fringe benefits and overhead adjusted for the Agency's most recently published rate in effect at the time the Work is performed, plus the cost of towing the bus if such action was necessary and if the bus was in the normal service area. These wage and fringe benefit rates shall not exceed the rates in effect in the Agency's service garage at the time the Defect correction is made.

WR 2.3.6 Reimbursement for Parts

The Agency shall be reimbursed by the Contractor for defective parts and for parts that must be replaced to correct the Defect. The reimbursement shall be at the current price at the time of repair and shall include taxes where applicable, plus 15 percent handling costs. Handling costs shall not be paid if parts are supplied by the Contractor and shipped to the Agency.

WR 2.3.7 Reimbursement Requirements

The Contractor shall respond to the warranty claim with an accept/reject decision including necessary failure analysis no later than sixty (60) days after the Agency submits the claim and defective part(s), when requested. Reimbursement for all accepted claims shall occur no later than sixty (60) days from the date of acceptance of a valid claim. The Agency may dispute rejected claims or claims for which the Contractor did not reimburse the full amount. The parties agree to review disputed warranty claims during the following quarter to reach an equitable decision to permit the disputed claim to be resolved and closed. The parties also agree to review all claims at least once per quarter throughout the entire warranty period to ensure that open claims are being tracked and properly dispositioned.

WR 2.4 Warranty after Replacement/Repairs

If any component, unit or subsystem is repaired, rebuilt or replaced by the Contractor or by the Agency with the concurrence of the Contractor, then the component, unit or subsystem shall have the unexpired warranty period of the original. Repairs shall not be warranted if Contractor-provided or authorized parts are not used for the repair, unless the Contractor has failed to respond within five days, in accordance with "Repairs by the Contractor."

If an item is declared to be a Fleet Defect, then the warranty stops with the declaration of the Fleet Defect. Once the Fleet Defect is corrected, the item(s) shall have three (3) months or remaining time and/or miles of the original warranty, whichever is greater. This remaining warranty period shall begin on the repair/replacement date for corrected items on each bus if the repairs are completed by the Contractor or on the date the Contractor provides all parts to the Agency.

WR 2.4.1 Warranty Processing Procedures

The following list represents requirements by the Contractor to the Agency for processing warranty claims. One failure per bus per claim is allowed.

- bus number and VIN

- total vehicle life mileage at time of repair
- date of failure/repair
- acceptance/in-service date
- Contractor part number and description
- component serial number
- description of failure
- all costs associated with each failure/repair (invoices may be required for third-party costs):
 - towing
 - road calls
 - labor
 - materials
 - parts
 - handling
 - troubleshooting time

WR 2.5 Forms

The Agency's forms will be accepted by the Contractor if all of the above information is included. Electronic submittal may be used if available between the Contractor and the Agency.

WR 2.6 Return of Parts

When returning defective parts to the Contractor, the Agency shall tag each part with the following:

- bus number and VIN
- claim number
- part number
- serial number (if available)

WR 2.7 Timeframe

Each claim must be submitted no more than thirty (30) days from the date of failure and/or repair, whichever is later. All defective parts must be returned to the Contractor, when requested, no more than forty-five (45) days from the date of repair.

WR 2.8 Reimbursements

Reimbursements are to be transmitted to the following address:

Shasta Regional Transportation Agency
1255 East Street
Suite 202
Redding, CA 96001

SECTION 8: QUALITY ASSURANCE

QA 1. Contractor's In-Plant Quality Assurance Requirements

QA 1.1 Quality Assurance Organization

QA 1.1.1 Organization Establishment

The Contractor shall establish and maintain an effective in-plant quality assurance organization. It shall be a specifically defined organization and should be directly responsible to the Contractor's top management.

QA 1.1.2 Control

The quality assurance organization shall exercise quality control over all phases of production, from initiation of design through manufacture and preparation for delivery. The organization shall also control the quality of supplied articles.

QA 1.1.3 Authority and Responsibility

The quality assurance organization shall have the authority and responsibility for reliability, quality control, inspection planning, establishment of the quality control system, and acceptance/rejection of materials and manufactured articles in the production of the transit buses.

QA 1.2 Quality Assurance Organization Functions

QA 1.2.1 Minimum Functions

The quality assurance organization shall include the following minimum functions:

- **Work instructions:** The quality assurance organization shall verify inspection operation instructions to ascertain that the manufactured product meets all prescribed requirements.
- **Records maintenance:** The quality assurance organization shall maintain and use records and data essential to the effective operation of its program. These records and data shall be available for review by the resident inspectors. Inspection and test records for this procurement shall be available for a minimum of one year after inspections and tests are completed.
- **Corrective action:** The quality assurance organization shall detect and promptly ensure correction of any conditions that may result in the production of defective transit buses. These conditions may occur in designs, purchases, manufacture, tests or operations that culminate in defective supplies, services, facilities, technical data or standards.

QA 1.2.2 Basic Standards and Facilities

The following standards and facilities shall be basic in the quality assurance process:

- **Configuration control:** The Contractor shall maintain drawings, assembly procedures and other documentation that completely describe a qualified bus that meets all of the options and special requirements of this procurement. The quality assurance organization shall verify that each transit bus is manufactured in accordance with these controlled drawings, procedures and documentation.
- **Measuring and testing facilities:** The Contractor shall provide and maintain the necessary gauges and other measuring and testing devices for use by the quality assurance organization to verify that the buses conform to all specification requirements. These devices shall be calibrated at established periods against certified measurement standards that have known, valid relationships to national standards.

- **Production tooling as media of inspection:** When production jigs, fixtures, tooling masters, templates, patterns and other devices are used as media of inspection, they shall be proved for accuracy at formally established intervals and adjusted, replaced or repaired as required to maintain quality.
- **Equipment use by resident inspectors:** The Contractor's gauges and other measuring and testing devices shall be made available for use by the resident inspectors to verify that the buses conform to all specification requirements. If necessary, the Contractor's personnel shall be made available to operate the devices and to verify their condition and accuracy.

QA 1.2.3 Maintenance of Control

The Contractor shall maintain quality control of purchases:

- **Supplier control:** The Contractor shall require that each Supplier maintains a quality control program for the services and supplies that it provides. The Contractor's quality assurance organization shall inspect and test materials provided by Suppliers for conformance to specification requirements. Materials that have been inspected, tested and approved shall be identified as acceptable to the point of use in the manufacturing or assembly processes. Controls shall be established to prevent inadvertent use of nonconforming materials.
- **Purchasing data:** The Contractor shall verify that all applicable specification requirements are properly included or referenced in purchase orders of articles to be used on transit buses.

QA 1.2.4 Manufacturing Control

- **Controlled conditions:** The Contractor shall ensure that all basic production operations, as well as all other processing and fabricating, are performed under controlled conditions. Establishment of these controlled conditions shall be based on the documented Work instructions, adequate production equipment and special working environments if necessary.
- **Completed items:** A system for final inspection and test of completed transit buses shall be provided by the quality assurance organization. It shall measure the overall quality of each completed bus.
- **Nonconforming materials:** The quality assurance organization shall monitor the Contractor's system for controlling nonconforming materials. The system shall include procedures for identification, segregation and disposition.
- **Statistical techniques:** Statistical analysis, tests and other quality control procedures may be used when appropriate in the quality assurance processes.
- **Inspection status:** A system shall be maintained by the quality assurance organization for identifying the inspection status of components and completed transit buses. Identification may include cards, tags or other normal quality control devices.

QA 1.2.5 Inspection System

The quality assurance organization shall establish, maintain and periodically audit a fully documented inspection system. The system shall prescribe inspection and test of materials, Work in process and completed articles. As a minimum, it shall include the following controls:

- **Inspection personnel:** Sufficient trained inspectors shall be used to ensure that all materials, components and assemblies are inspected for conformance with the qualified bus design.
- **Inspection records:** Acceptance, rework or rejection identification shall be attached to inspected articles. Articles that have been accepted as a result of approved materials review actions shall be identified. Articles that have been reworked to specified drawing configurations shall not require special identification. Articles rejected as unsuitable or scrap shall be plainly marked and controlled

to prevent installation on the bus. Articles that become obsolete as a result of engineering changes or other actions shall be controlled to prevent unauthorized assembly or installation. Unusable articles shall be isolated and then scrapped. Discrepancies noted by the Contractor or resident inspectors during assembly shall be entered by the inspection personnel on a record that accompanies the major component, subassembly, assembly or bus from start of assembly through final inspection. Actions shall be taken to correct discrepancies or deficiencies in the manufacturing processes, procedures or other conditions that cause articles to be in nonconformity with the requirements of the Contract specifications. The inspection personnel shall verify the corrective actions and mark the discrepancy record. If discrepancies cannot be corrected by replacing the nonconforming materials, then the Agency shall approve the modification, repair or method of correction to the extent that the Contract specifications are affected.

- **Quality assurance audits:** The quality assurance organization shall establish and maintain a quality control audit program. Records of this program shall be subject to review by the Agency.

QA 2. Inspection

QA 2.1 Inspection Stations

Inspection stations shall be at the best locations to provide for the Work content and characteristics to be inspected. Stations shall provide the facilities and equipment to inspect structural, electrical, hydraulic and other components and assemblies for compliance with the design requirements.

Stations shall also be at the best locations to inspect or test characteristics before they are concealed by subsequent fabrication or assembly operations. These locations shall minimally include underbody structure completion, body framing completion, body prior to paint preparation, water test, propulsion system installation completion, underbody dress-up and completion, bus prior to final paint touchup, bus prior to road test and bus final road test completion.

QA 2.2 Resident Inspectors

QA 2.2.1 Resident Inspector's Role

The Agency shall be represented at the Contractor's plant by resident inspectors. Resident inspectors may be Agency employees or outside contractors. The Agency shall provide the identity of each inspector and shall also identify their level of authority in writing. They shall monitor, in the Contractor's plant, the manufacture of transit buses built under the procurement. The presence of these resident inspectors in the plant shall not relieve the Contractor of its responsibility to meet all of the requirements of this procurement. The Agency shall designate a primary resident inspector, whose duties and responsibilities are delineated in "Pre-Production Meetings," "Authority" and "Pre-Delivery Tests," below. Contractor and resident inspector relations shall be governed by the guidelines included as Attachment A to this section.

QA 2.2.2 Pre-Production Meetings

The primary resident inspector may participate in design review and Pre-Production Meetings with the Agency. At these meetings, the configuration of the buses and the manufacturing processes shall be finalized, and all Contract documentation provided to the inspector.

No less than thirty (30) days prior to the beginning of bus manufacture, the primary resident inspector may meet with the Contractor's quality assurance manager and may conduct a pre-production audit meeting. They shall review the inspection procedures and finalize inspection checklists. The resident inspectors may begin monitoring bus construction activities two weeks prior to the start of bus fabrication.

QA 2.2.3 Authority

Records and data maintained by the quality assurance organization shall be available for review by the resident inspectors. Inspection and test records for this procurement shall be available for a minimum of one year after inspections and tests are completed.

The Contractor's gauges and other measuring and testing devices shall be made available for use by the resident inspectors to verify that the buses conform to all specification requirements. If necessary, the Contractor's personnel shall be made available to operate the devices and to verify their condition and accuracy.

Discrepancies noted by the resident inspector during assembly shall be entered by the Contractor's inspection personnel on a record that accompanies the major component, subassembly, assembly or bus from start of assembly through final inspection. Actions shall be taken to correct discrepancies or deficiencies in the manufacturing processes, procedures or other conditions that cause articles to be in nonconformity with the requirements of the Contract specifications. The inspection personnel shall verify the corrective actions and mark the discrepancy record. If discrepancies cannot be corrected by replacing the nonconforming materials, then the Agency shall approve the modification, repair or method of correction to the extent that the Contract specifications are affected.

The primary resident inspector shall remain in the Contractor's plant for the duration of bus assembly Work under this Contract. Only the primary resident inspector or designee shall be authorized to release the buses for delivery. The resident inspectors shall be authorized to approve the pre-delivery acceptance tests. Upon request to the quality assurance supervisors, the resident inspectors shall have access to the Contractor's quality assurance files related to this procurement. These files shall include drawings, assembly procedures, material standards, parts lists, inspection processing and reports, and records of Defects.

QA 2.2.4 Support Provisions

The Contractor shall provide office space for the resident inspectors in close proximity to the final assembly area. This office space shall be equipped with desks, outside and interplant telephones, Internet access, file cabinet and chairs.

QA 2.2.5 Compliance with Safety Requirements

At the time of the Pre-Production Meeting, the Contractor shall provide all safety and other operational restrictions that govern the Contractor's facilities. These issues will be discussed and the parties will agree which rules/restrictions will govern the Agency's inspector(s) and any other Agency representatives during the course of the Contract.

QA 3. Acceptance Tests

QA 3.1 Responsibility

Fully documented tests shall be conducted on each production bus following manufacture to determine its acceptance to the Agency. These acceptance tests shall include pre-delivery inspections and testing by the Contractor and inspections and testing by the Agency after the buses have been delivered.

QA 3.2 Pre-Delivery Tests

The Contractor shall conduct tests at its plant on each bus following completion of manufacture and before delivery to the Agency. These pre-delivery tests shall include visual and measured inspections, as well as

testing the total bus operation and, if electric drive, charging operation. The tests shall be conducted and documented in accordance with written test plans approved by the Agency.

Additional tests may be conducted at the Contractor's discretion to ensure that the completed buses have attained the required quality and have met the requirements in "Section 6: Technical Specifications." The Agency may, prior to commencement of production, demand that the Contractor demonstrate compliance with any requirement in that section if there is evidence that prior tests have been invalidated by the Contractor's change of Supplier or change in manufacturing process. Such demonstration shall be by actual test, or by supplying a report of a previously performed test on similar or like components and configuration. Any additional testing shall be recorded on appropriate test forms provided by the Contractor and shall be conducted before acceptance of the bus.

The pre-delivery tests shall be scheduled and conducted with thirty (30) days notice so that they may be witnessed by the resident inspectors, who may accept or reject the results of the tests. The results of pre-delivery tests, and any other tests, shall be filed with the assembly inspection records for each bus. The underfloor equipment shall be available for inspection by the resident inspectors, using a pit or bus hoist provided by the Contractor. A hoist, scaffold or elevated platform shall be provided by the Contractor to easily and safely inspect bus roofs. Delivery of each bus shall require written authorization of the primary resident inspector. Authorization forms for the release of each bus for delivery shall be provided by the Contractor. An executed copy of the authorization shall accompany the delivery of each bus.

QA 3.2.1 Visual and Measured Inspections

Visual and measured inspections shall be conducted with the bus in a static condition. The purpose of the inspection testing includes verification of overall dimension and weight requirements, that required components are included and are ready for operation, and that components and subsystems designed to operate with the bus in a static condition do function as designed.

QA 3.2.2 Total Bus Operation

Total bus operation shall be evaluated during road tests. The purpose of the road tests is to observe and verify the operation of the bus as a system and to verify the functional operation of the subsystems that can be operated only while the bus is in motion.

Each bus shall be driven for a minimum of fifteen (15) miles during the road tests. If requested, computerized diagnostic printouts or electronic files showing the performance of each bus shall be produced and provided to the Agency. Observed Defects shall be recorded on the test forms. The bus shall be retested when Defects are corrected and adjustments are made. This process shall continue until Defects or required adjustments are no longer detected.

Attachment A: New Bus Manufacturing Inspection Guidelines

Pre-Production Meeting

Responsibilities

Agency

- Provides conformed copy of technical requirements.
- Recommended staff to be involved may include the following:
 - Project manager
 - Executive director
 - Technical engineer
 - Contract administrator
 - Quality assurance administrator
 - Warranty administrator
- Process for inspector's role (to deal with Agency) for negotiated changes after freeze date.
- Contractual requirements:
 - Milestones
 - Documentation
 - Title requirements
 - Deliverables
 - Payments
 - Reliability tracking

Manufacturer

- Identifies any open issues.
- Recommended staff to be involved may include the following:
 - Project manager
 - Technical engineer(s)
 - Contract administrator
 - Quality assurance administrator
 - Warranty administrator
- Production flow (buses/week, shifts).
- Delivery schedule and offsite component build-up schedule.
- Bus QA documentation (including supplier application approvals and/or any certifications required for the specific production).
- Communication flow/decision making.

Inspector

- Agree on decisions inspectors can and cannot make.
- Primary contact for problems, etc.
- Production flow process (description of manufacturing by station).
- Factory hours (manage inspection schedule based on production hours).
- Plant rules.
- Safety requirements.
- Orientation requirements.
- Work environment.
- Inspector's office space (per contract).

As a result of the pre-production meeting, documentation should be produced detailing final production requirements and the planned configuration of the bus.

Build Schedule

The bus manufacturer's contract administrator shall supply a fleet build production schedule based on the dates in the Notice to Proceed, and a description of the manufacturer's schedule for plant operations.

The production schedule should contain specific milestone dates, such as the following:

- First vehicle on production line (date on which any work will begin)
- First vehicle off production line
- First vehicle through manufacturer's quality assurance inspections
- First vehicle shipped to the Agency
- Last vehicle on production line
- Last vehicle off production line
- Last vehicle shipped to the Agency

Plant Tour

The Agency will review the entire process from start to finish and review the work completed at each line station, including quality control measures.

Prototype/Pilot Vehicle Production

The Contractor shall conduct tests at its plant on each bus following completion of manufacture and before delivery to the Agency. These pre-delivery tests shall include visual and measured inspections, as well as testing the total bus operation. The tests shall be conducted and documented in accordance with written test plans approved by the Agency. The underfloor equipment shall be available for inspection by the resident inspectors, using a pit or bus hoist provided by the Contractor. A hoist, scaffold or elevated platform shall be provided by the Contractor to easily and safely inspect bus roofs. Delivery of each bus shall require written authorization of the primary resident inspector. Authorization forms for the release of each bus for delivery shall be provided by the Contractor. An executed copy of the authorization shall accompany the delivery of each bus.

Additional tests may be conducted at the Agency's discretion to ensure that the completed buses have attained the required quality and have met the requirements in "Section 6: Technical Specifications." The Agency may, prior to commencement of production, demand that the Contractor demonstrate compliance with any requirement in that section if there is evidence that prior tests have been invalidated by the Contractor's change of Supplier or change in manufacturing process. Such demonstration shall be by actual test, or by supplying a report of a previously performed test on similar or like components and configuration. Any additional testing shall be recorded on appropriate test forms provided by the Contractor and shall be conducted before acceptance of the bus.

The pre-delivery tests shall be scheduled and conducted with 30 days' notice so that they may be witnessed by the resident inspectors, who may accept or reject the results of the tests. The results of pre-delivery tests, and any other tests, shall be filed with the assembly inspection records for each bus.

Visual and Measured Inspections

Visual and measured inspections shall be conducted with the bus in a static condition. The purpose of the inspection testing includes verification of overall dimension and weight requirements, that required components are included and are ready for operation, and that components and subsystems designed to operate with the bus in a static condition do function as designed.

Total Bus Operation

Total bus operation shall be evaluated during road tests. The purpose of the road tests is to observe and verify the operation of the bus as a system and to verify the functional operation of the subsystems that can be operated only while the bus is in motion.

Each bus shall be driven for a minimum of 15 miles during the road tests. If requested, computerized diagnostic printouts showing the performance of each bus shall be produced and provided to the Agency. Observed defects shall be recorded on the test forms. The bus shall be retested when defects are corrected and adjustments are made. This process shall continue until defects or required adjustments are no longer detected.

Post-Delivery Tests

The Agency shall conduct acceptance tests on each delivered bus. These tests shall be completed within 30 days after bus delivery and shall be conducted in accordance with the Agency's written test plans. The purpose of these tests is to identify defects that have become apparent between the time of bus release and delivery to the Agency. The post-delivery tests shall include visual inspection and bus operations. No post-delivery test shall apply new criteria that are different from criteria applied in a pre-delivery test.

Buses that fail to pass the post-delivery tests are subject to non-acceptance. The Agency shall record details of all defects on the appropriate test forms and shall notify the Contractor of acceptance or non-acceptance of each bus, after completion of the tests. The defects detected during these tests shall be repaired according to procedures defined in the contract.

Prototype/Pilot Vehicle Acceptance

In order to assess the Contractor's compliance with the Technical Specifications, the Agency and the Contractor shall, at the Pre-Production Meeting, jointly develop a Configuration and Performance Review document for review of the pilot vehicle. This document shall become part of the official record of the Pre-Production Meeting.

Potential dimensional/performance tests that may be included in the Configuration and Performance Review include the following:

- Complete electrical system audit
- Dimensional requirements audit
- Seating capacity
- Water test
- Water runoff test
- Function test of systems/subsystems and components
- Sound/noise level tests
- Vehicle top speed
- Acceleration tests

- Brake stop tests
- Airflow tests
- PA function tests
- Air/brake system audit
- Individual axle weight
- Standee capacity
- Body deflection tests
- Silent alarm function test
- Interior lighting
- Exterior lighting
- Gradeability test
- Kneeling system function
- HVAC pull down/heat
- Speedometer
- Outside air infiltration (smoke)
- Wheelchair ramps
- Propulsion system performance qualification
 - This test shall be jointly conducted by the Contractor and the propulsion system manufacturer (including but not limited to charge air cooler performance, air to boil test, loss of coolant, fuel system, electrical inputs and protection systems).
- Transmission performance qualifications
 - This test shall be jointly conducted by the Contractor and the transmission manufacturer (including but not limited to retarder operation, heat exchanger, interface with ABS and electrical inputs).

Buy America Audit

A post-delivery Buy America audit is required for federally funded bus procurements (see 49 CFR Part 663 for additional information). The on-site resident inspectors are to monitor the production processes to verify compliance with final assembly requirements identified by the Buy America pre-award audit. This audit is to verify compliance with final assembly requirements and final documentation of Buy America compliance and must be completed prior to title transfer.

Resident Inspection Process for Serial Production

At the discretion of the Agency, a decision is made to perform resident inspection using the Agency's personnel, a contract inspector, or a combination of both. The decision is based on factors such as the availability of personnel, knowledge/expertise in bus build project management, the size of the bus order, etc.

Inspector Responsibilities

The resident inspection process for the serial production of the buses begins following the completion and acceptance of the prototype or pilot vehicle if required, or according to the serial bus production schedule. Resident inspectors should represent the Agency for all build-related issues (quality, conformance, etc.). Resident inspectors can also address contractual type issues but should only do so under the consult of the Agency's contracts administrator. Resident inspectors are sent to the manufacturer's facility according to a Resident Inspection Schedule. Typically, one or two inspectors arrive on site at the manufacturing facility about one week prior to actual production to setup the resident inspection process and to begin preliminary quality assurance inspections for items such as power plant build-up and wire harness production, and to inspect incoming parts, fasteners, fluids, etc., that will be used in the production of the buses. During the

serial production of the buses, the resident inspectors should monitor the production of each bus, verifying the quality of materials, components, sub-assemblies and manufacturing standards. In addition, the configuration of each vehicle should be audited using the vehicle manufacturer's Build Specification and other documents to ensure contract compliance and uniformity.

Inspector Rotation/Scheduling

During the resident inspection phase, a single inspector or multiple inspectors could be used. If it is decided to use multiple inspectors, then the inspectors could be rotated on a biweekly to monthly basis as required. During the rotation of inspectors, a sufficient period of overlap should be provided to guarantee the consistency of the resident inspection process.

Resident Inspector Orientation

A resident inspector orientation by the bus manufacturer should take place upon the arrival of the initial inspection team. The orientation should include expectations for the use of personal protective equipment (safety shoes, safety glasses, etc.), daily check-in and check-out requirements, lines of communication, use of production documents such as speed memos and line movement charts, inspector/production meetings, inspector office arrangements, and anything else pertinent to the inspection team's involvement during the build. Many of the above items should already be formalized during the Pre-Production Meeting.

Audits, Inspections and Tests

The resident inspection process monitors the production of each vehicle. Inspection stations should be strategically placed to test or inspect components or other installations before they are concealed by subsequent fabrication or assembly operations. These locations typically are placed for the inspection of underbody structure, body framing, electrical panels and harnesses, air and hydraulic line routings, installation of insulation, power plant build-up and installation, rust inhibitor/undercoating application, floor installation, front suspension alignment, and other critical areas.

Vehicle Inspections

Each bus is subjected to a series of inspections after the bus reaches the point of final completion on the assembly line. Typically, the vehicle manufacturer performs its own quality assurance inspections following assembly line completion before releasing each bus to the resident inspectors. The inspections for each vehicle are documented, signed off upon passing and included in the vehicle record.

These are the typical inspections performed on each bus by the resident inspectors:

- Water test inspection
- Road test inspection
- Interior inspection (including functionality)
- Hoist/undercarriage inspection
- Exterior inspection (including roof)
- Electrical inspection
- Wheelchair ramp/lift inspection

Water Test Inspection

The water test inspection checks the integrity of the vehicle's body seams, window frame seals and other exterior component closeouts for their ability to keep rainwater, road splash, melting snow and slush, and other exterior water from entering the inside of the vehicle. The vehicle's interior is inspected for signs of

moisture and water leaks. To perform the leak inspection, interior ceiling and side panels are removed, and access doors are opened. If any moisture or water is detected, then the source of the leak will be located and repaired by the manufacturer, and the vehicle will be tested again.

Road Test Inspection

The road test inspection checks all the vehicle's systems and subsystems while the vehicle is in operation. Typically, the road test inspection is performed immediately following the water test inspection to reveal any standing water that may be present due to a leak, but was not noticed during the "static" water test. Objectionable vibrations, air leakage and other factors that affect ride quality are recorded and reported to the vehicle manufacturer for resolution. Vehicle stability, performance, braking and interlock systems, HVAC, and other critical areas are checked to ensure that the vehicle is complete and ready to provide safe and reliable service.

The following tests may be performed and recorded during the road test:

- Acceleration test
- Top speed test
- Gradeability test
- Service brake test
- Parking brake test
- Turning effort test
- Turning radius test
- Shift quality
- Quality of retarder or regenerative braking action

During the road test, a vehicle may be taken to a weigh station to record the vehicle's front axle weight, rear axle weight and total vehicle (curb) weight.

Interior Inspection

The interior inspection checks the fit and finish of the interior installations.

In addition, the inspection also verifies the installation and function of systems and subsystems according to the Build Specification. All systems and functions accessed from the interior are inspected for functionality, appearance and safety.

Examples of systems/functions inspected include the following:

- Interior and exterior lighting controls
- Front and rear door systems
- Flooring installation
- Passenger and operator's seat systems
- Wheelchair securement and ramp systems
- Fire suppression system
- Electrical installations (multiplex, tell-tale wiring, panels, etc.)
- Window systems and emergency escape portals
- Operator dash/side panel controls/indicators

Hoist/Undercarriage Inspection

The hoist/undercarriage inspection checks the installation of components, wiring, air lines, presence of fluid leaks, etc., located under the vehicle. Typically, this inspection is performed following the road test. The vehicle is lifted onto a hoist or pulled over a pit for the inspection. Areas inspected are the front suspension, air bags, airline routings, electrical connections and routings, drivetrain components, linkages and any other system or component that may be prone to early failure due to inadequate installation techniques. All lines, cables, hoses, etc., are inspected for proper securement and protection to prevent rubbing, chafing or any other condition that could result in a failure. The engine/powerplant and HVAC compartments are also inspected during this time.

Exterior Inspection

The exterior inspection checks the fit and finish of components installed on the exterior of the vehicle. Access panels are opened and accessories are inspected for proper installation. In addition, vehicle paint, graphics and proper decals are also inspected. Acceptable paint finish quality (orange peel, adhesion, etc.) should be agreed on with the vehicle manufacturer prior to production to ensure consistency of inspections.

Electrical Inspection

The vehicle's main electrical panels and other subpanels are inspected for proper components, to include relays, fuses, modules, terminal strips, decals, etc. In addition, electrical harnesses are inspected for proper wiring and termination techniques, bulkhead protection, looming and other items that could result in future electrical failure. Onboard vehicle compartment schematics are verified for accuracy.

Wheelchair Ramp Inspection

The wheelchair ramp assembly is inspected for proper installation and performance. Clearances critical to the operation of the ramp are verified, and the ramp's electrical systems are inspected to ensure appropriate wire routings and protection. The successful integration of the ramp assembly into the vehicle is verified, and the vehicle interlocks are checked during automatic and manual ramp operation.

Audits

During serial production of the bus's quality assurance inspection, tests may be performed to ensure that the manufacturer's quality standards are being followed. These inspection audits could be on items such as torque wrench calibrations, proper techniques for fastener installations, proper use and type of adhesives, use of correct installation drawings on the production line, etc.

Communications

The lines of communications, formal and informal, should be discussed and outlined in the Pre-Production Meeting. As previously discussed, resident inspectors should represent the Agency for all bus-build related issues (quality, conformance, etc.). Resident inspectors can relay communications addressing contractual type issues but should do so only under the consult of the Agency's Project Manager. Actual personnel contacts for the manufacturing facility should be established during resident inspector orientation. These contacts could include quality assurance, production, material handling, engineering and buy-off area personnel.

Documentation

The following documents/reports are typically generated during the bus build process:

- Vehicle build specification
- Sales order

- Pre-Production Meeting notes
- Prototype and production correspondence (vehicle build file)
- Manufacturer's vehicle record (Warranty file)
 - Vehicle line documents
 - Serialization documents (Warranty file)
 - Alignment verification
 - Brake testing
 - HVAC testing and checkout
 - Manufacturer's QA checklist and signoff
 - Weight slip (prototype and Warranty file)
 - Prototype performance tests document (vehicle build file)
 - Acceleration Test
 - Top Speed Test
 - Gradeability Test
 - Interior Noise Test A – Stationary
 - Interior Noise Test B – Dynamic
 - Exterior Noise Test A – Pull Away
 - Exterior Noise Test B – Pass-By
 - Exterior Noise Test C – Curb Idle
 - Turning Radius Test
 - Turning Effort Test
 - Parking Brake Test
 - Service Brake Test
- Vehicle acceptance inspections—production (Warranty file)
 - Water Test Inspection Report
 - Road Test Inspection Report
 - Interior Inspection Report
 - Hoist/Undercarriage Inspection Report
 - Exterior Inspection Report
 - Electrical Inspection Report
 - Wheelchair Inspection Report
- Speed Memos (Warranty file)
- Agency Vehicle Inspection record(Warranty file)
- Release for delivery documentation (Warranty file)
- Post-Production Acceptance – Certificate of Acceptance(Accounting)
- Post-Delivery Inspection Report – (Fleet Management & Warranty files)

Vehicle Release for Delivery

Upon satisfactory completion of all inspection, audit and test criteria, and resolution of any outstanding issues affecting the purchase of any or all buses, proper documentation (the Release for Delivery) is signed by the designated resident inspector authorizing the bus manufacturer to deliver the vehicle to the Agency's facility, where it will undergo a post-delivery inspection process and final acceptance. The satisfactory sign-off of the Release for Delivery should complete the resident inspector's duties for each bus. In final preparation for delivery, the bus manufacturer may request the resident inspector to do a final walk-through of the bus after it has been cleaned and prepped for shipping.

Post-Delivery and Final Acceptance

The Agency shall conduct acceptance tests on each delivered bus. These tests shall be completed within 15 days after bus delivery and shall be conducted in accordance with the Agency's written test plans. The purpose of these tests is to identify defects that have become apparent between the time of bus release and delivery to the Agency. The post-delivery tests shall include visual inspection, along with a verification of system(s) functionality and overall bus operations. No post-delivery test shall apply new criteria that are different from criteria applied in a pre-delivery test.

Buses that fail to pass the post-delivery tests are subject to non-acceptance. The Agency shall record details of all defects on the appropriate test forms and shall notify the Contractor of acceptance or non-acceptance of each bus within five days after completion of the tests. The defects detected during these tests shall be repaired according to procedures defined in the contract after non-acceptance.

Certificate of Acceptance

- **Accepted**
- **Not accepted:** In the event that the bus does not meet all requirements for acceptance. The Agency must identify reasons for non-acceptance and work with the OEM to develop a timeline of addressing the problem for a satisfactory resolution and redelivery.
- **Conditional acceptance:** In the event that the bus does not meet all requirements for acceptance, the Agency may conditionally accept the bus and place it into revenue service pending receipt of Contractor furnished materials and/or labor necessary to address the identified issue(s).

SECTION 9: FORMS AND CERTIFICATIONS

CER 1. Proposer's Checklist

Shasta Regional Transportation Agency
Procurement No. 2019-01
Battery Electric Vehicle Procurement for Salmon Runner and North Valley Feeder

The Proposer's Checklist is a separate Microsoft Excel Workbook.

- See file "CER 1 Proposers Checklist.xlsx"

CER 2. Request for Pre-Offer Change or Approved Equal

This form must be used for requested clarifications, changes, substitutes or approval of items equal to items specified with a brand name and must be submitted as far in advance of the Due Date, as specified in “Questions, Clarifications and Omissions.”

Shasta Regional Transportation Agency
Procurement No. 2019-01
Battery Electric Vehicle Procurement for Salmon Runner and North Valley Feeder

Request #:	
Proposer:	
RFP Section:	
Page:	
Questions/clarification or approved equal:	
Agency action:	☐ Approved ☐ See addendum
	☐ Denied ☐ See response below
Agency response:	

Procurement No. 2019-01

CER 3. Acknowledgement of Addenda

Failure to acknowledge receipt of all addenda may cause the Proposal to be considered nonresponsive to the Solicitation. Acknowledged receipt of each addendum must be clearly established and included with the Proposal.

The undersigned acknowledges receipt of the following addenda to the documents:

Addendum No.:	Dated:
Addendum No.:	Dated:
Addendum No.:	Dated:
Addendum No.:	Dated:

Proposer:
Name:
Title:
Phone:
Street address:
City, state, ZIP:

Authorized signature	Date
----------------------	------

CER 4. Contractor Service and Parts Support Data

Location of nearest Technical Service Representative to Agency

Name:

Address:

Telephone:

Describe technical services readily available from said representative:

Location of nearest Parts Distribution Center to Agency:

Name:

Address:

Telephone:

Describe the extent of parts available at said center:

Policy for delivery of parts and components to be purchased for service and maintenance:

Regular method of shipment:

Cost to Agency:

CER 5. Form for Proposal Deviation

This form shall be completed for each condition, exception, reservation or understanding (i.e., Deviation) in the Proposal according to “Conditions, Exceptions, Reservations or Understandings.” One copy without any price/cost information is to be placed in the Technical Proposal as specified in “Technical Proposal Requirements,” and a separate copy with any price/cost information placed in the Price Proposal as specified in “Price Proposal Requirements.”

Shasta Regional Transportation Agency

Procurement No. 2019-01

Battery Electric Vehicle Procurement for Salmon Runner and North Valley Feeder

Deviation No.:	Contractor:	RFP section:	Page:
Complete description of Deviation:			
Rationale (pros and cons):			

CER 6. Pricing Schedule

Shasta Regional Transportation Agency
Procurement No. 2019-01
Battery Electric Vehicle Procurement for Salmon Runner and North Valley Feeder

Form CER 6 is a separate Microsoft Excel Workbook form that is to be completed and included in the Price Package.

- See file “CER 6 Pricing Schedule.xlsx”

CER 7. Pre-Award Evaluation Data Form

Shasta Regional Transportation Agency
Procurement No. 2019-01

Battery Electric Vehicle Procurement for Salmon Runner and North Valley Feeder

1. Name of firm:

2. Address:

3. ☐ Individual ☐ Partnership ☐ Corporation ☐ Joint Venture

4. Date organized:

State in which incorporated:

5. Names of officers or partners:

a.

b.

c.

d.

e.

6. How long has your firm been in business under its present name?

7. Attach as **SCHEDULE ONE** a list of similar current contracts that demonstrates your available capacity, including the quantity and type of bus, name of contracting party, percentage completed and expected completion date.

8. Attach as **SCHEDULE TWO** a list of at least three similar contracts that demonstrates your technical proficiency, each with the name of the contracting party and number and they type of buses completed within the last five years.

9. Have you been terminated or defaulted, in the past five years, on any Contract you were awarded?

☐ Yes ☐ No

If yes, then attach as **SCHEDULE THREE** the full particulars regarding each occurrence.

10. Attach as **SCHEDULE FOUR** Proposer's last three (3) financial statements prepared in accordance with generally accepted accounting principles of the jurisdiction in which the Proposer is located, and audited by an independent certified public accountant; or a statement from the Proposer regarding how financial information may be reviewed by the Agency (This may require execution of an acceptable nondisclosure agreement between the Agency and the Proposer.)

11. Attach as **SCHEDULE FIVE** a list of all principal Subcontractors and the percentage and character of Work (Contract amount) that each will perform on this Contract.

12. If the Contractor or Subcontractor is a joint venture, submit **PRE-AWARD EVALUATION DATA** forms for each member of the joint venture.

The above information is confidential and will not be divulged to any unauthorized personnel.

The undersigned certifies to the accuracy of all information:

Name and title:

Company:

Authorized signature

Date

Contractor's Statement of Experience and Financial Condition

CONFIDENTIAL Contractor's Statement of Experience and Financial Condition
(Updated January 2019)

To be submitted to the Shasta Regional Transportation Agency (SRTA)

Submitted by:

Name of Firm

Address:

Street or P.O. Box

City

State

ZIP Code

Contractor Primary Point of Contact: _____

Telephone: _____

Email: _____

(Area Code) xxx-xxxx

Contract No.: _____

Contract Bid Amount: _____

Project CIP No.: _____

Bid Date: _____

Submittal Date: _____

All pages of the questionnaires and financial statements should be marked "CONFIDENTIAL".

Shasta Regional Transportation Agency 1255 East Street, Suite 202 Redding, CA 96001

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INSTRUCTIONS FOR SUBMITTING

Contractor's Statement of Experience and Financial Condition (CSOEFC)

SOLICITATION TYPE

SRTA requires a CSOEFC for all contracts where the estimated cost exceeds \$500,000. SRTA may require a CSOEFC for projects where the estimated cost is under \$500,000.

With this solicitation – where applicable – all references to “invitation for bid” should be treated as a reference to this solicitation; all references to “bidder” should be treated as a reference to “proposer”; all references to a “bid” as a reference to a “proposal”; and all references to “construction” as a reference to “bus manufacturing”.

FREQUENCY OF SUBMISSION

A new CSOEFC will be required each time a bidder responds to an invitation for bid for a SRTA project containing a requirement for submission of a CSOEFC. It shall be the contractor's responsibility to ensure that the CSOEFC will be applicable to the project for which the CSOEFC is being submitted and that all information in the CSOEFC is up to date and accurate.

EVALUATION OF CSOEFC

For Invitations for Bids (IFBs), SRTA shall only evaluate the CSOEFC of the apparent lowest bidder. If the apparent low bidder does not meet the required qualifications, only then will SRTA evaluate the next apparent lowest bidder.

For other solicitations types, SRTA will evaluate the CSOEFC as outlined in the solicitation.

AGE OF FINANCIAL INFORMATION

SRTA reserves the right to reject statements in which the financial condition shown is twelve months or more prior to the date the CSOEFC was required to be submitted.

DATA REQUIRED

All applicable portions of the form should be filled out completely, with schedules being attached if the space provided is not sufficient.

It will be acceptable, in lieu of completing the specific schedules in the financial portion of the statement, for the contractor to submit the customary accountant's report and schedules, provided that they include all of the information specifically requested in the form.

It is essential that the questions regarding construction experience be completed as such experience is a major consideration in establishing qualifications.

AFFIDAVITS

The appropriate affidavit must be completely executed or the statement will be returned. Where a consolidated statement is submitted to obtain joint qualification of several organizations, an appropriate affidavit must be executed for each entity that is a part of the joint venture. If firms are bidding or responding as a joint venture and have no consolidated statement, each partner in the joint venture must submit their own CSOEFC.

ACCOUNTANT'S CERTIFICATE

The certificate of a Certified Public Accountant or Public Accountant will be required in all cases. A suggested form of unqualified certificate is included which may be used if appropriate. However, it will be acceptable for the accountant to submit a certificate in their own words, including such qualifications as may be necessary in view of the scope of this assignment; provided that such qualifications shall not be so extensive as to nullify the value of the statement or its usefulness to SRTA.

Bearing in mind that working capital and the dollar value of previous construction projects worked on are important factors in determining the qualification of a contractor, the accountant will perform a valuation service for his or her client and at the same time assist SRTA by furnishing supplementary schedules, or as a part of their certificate, any information not specifically called for by the statement which in the accountant's opinion may be properly taken into consideration.

In the event that the contractor's job income and expenditures are accounted on a completed-contract basis and the balance sheet includes an item reflecting the excess of costs-to-date over billings-to-date, or vice versa, the elements of "Accumulated Costs" and "Billings to Date" must be shown in support of the balance sheet item.

LICENSING

Contractor requirements shall be guided by Division 3 of the Business and Professional Code concerning the licensing of contractors.

COMPLETENESS

All forms must be completed, or the bidder must note where the required information is reflected in the attachments.

BIDDING INFORMATION

1. Any contractor may download an Invitation for Bid (IFB) package free of charge from the SRTA website (<http://srta.ca.gov>).

2. Should contractors desire to bid or respond jointly, a joint-qualification statement containing information regarding each of the contractors must be submitted. Attention is called to the "Contractors' License Law" with respect to the license requirements for joint bids or responses.

REVIEW PROCESS

Qualification approvals are outlined in the solicitation and are based on showing evidence of the availability of sufficient working capital, the dollar value of previous contracts worked on, and the successful completion of previous contracts of similar scope to the SRTA contract or exceeding five times the annual value of the SRTA contract, subject to adjustment upon consideration of experience, equipment, and performance factors.

Working capital may be augmented by submission of Statement of Bank Credit (See Exhibit 6).

SRTA QUALIFICATION REGULATIONS

SRTA requires a CSOEFC for all contracts where the estimated cost exceeds \$500,000. SRTA may require a CSOEFC for projects where the estimated cost is under \$500,000. When completed, the CSOEFC shall be verified under oath by the bidder in the manner in which pleadings in civil actions are verified.

SRTA shall apply a uniform system of reviewing bidders on the basis of the CSOEFC.

In no event shall any bidder be awarded a contract if such contract award would result in the bidder having under contract an amount of work in excess of that authorized by its qualification approval.

The CSOEFCs will be treated as confidential records.

Contractor's Statement of Experience and Financial Condition

EXHIBIT 1 – CONTRACTOR’S STATEMENT OF EXPERIENCE

A Corporation

A Co-partnership

An Individual

Combination

Name: _____
(Name Must Correspond with Contractor’s License in Every Detail)

Principal Office: _____
(Street or P.O. Box) (City) (State) (ZIP Code)

The signatory of this questionnaire guarantees the truth and accuracy of all statements and of all answers to Interrogatories hereinafter made.

1. Are you licensed as a contractor to do business in California? _____ License No. _____ Type _____
Classification (Type) of Specialty Contractor: _____
2. How many years has your organization been in business as a contractor under your present business name: _____

3. How many years’ experience in _____ construction work has your organization had?
(Type)
(a) As a general contractor? _____ (b) As a Subcontractor? _____
4. Show the projects your organization has completed or are under construction during the last five years in the following tabulation. (Attach additional sheets as needed).

To assure maximum consideration for your qualification, be specific as to the nature of the work your firm actually performed.

Year	Type of Work	Value of Work Performed	Location of Work	Project Duration (Months)	For Whom Performed and Phone Number to Contact for Verification

A contractor that wishes to bid on projects handled by SRTA shall be licensed in accordance with the laws and regulations of California. The licensing must correspond to the applicable types of work and organization. Corporations not incorporated in the State of California must take the necessary steps to register to conduct business in the state.

For Questions 5-13, please also provide name of owner, title of project, contract amount, location of project, date of contract, and name of bonding company as applicable (attach additional pages if needed). All references to “bidder” should be treated as a reference to “proposer” and all references to a “bid” as a reference to a “proposal” where applicable.

5. List how many construction projects your organization will be working on in conjunction with the SRTA project:
- _____
- _____
- _____
6. Bidder or proposer must submit a summary of all claims made in the last five years arising out of previous contracts listed (including all claims by owner against bidder or proposer or bidder or proposer against owner, and the final status of each claim): _____
- _____
- _____
7. Have you or your organization, or any officer or partner thereof, failed to complete a contract? _____ If so, give details: _____
- _____
8. Have you, your organization, or any officer or partner thereof, defaulted on a construction project within the last two years? _____
- _____
9. Have you or your organization, or any officer or partner thereof, ever been terminated by an owner or client, or rejected from bidding or responding on a public works project in the last five years? _____
- _____
10. Has a surety ever completed any portion of work of your organization’s projects within the last five years? _____
- _____
11. Have you or your organization, or any officer or partner thereof, been formally found to be a nonresponsive bidder by a public agency within the last two years? _____
- _____
12. List any violation of the Apprenticeship Requirements under a State Business and Professions Code or Labor Code found by an appropriate authority within the last two years: _____
- _____
13. Have you or your organization, or any officer to partner thereof, been found guilty of failure to pay required prevailing wages on a public contract within the last two years? _____
- _____
14. In what other liens of business are you financially interested? _____
- _____
15. Name the persons with whom you have been associated in business as partners or business associates in each of the last five years? _____
- _____

16. What is the construction experience of the principal individuals of your present organization?

Individual's Name	Length of Employment	Present position or office in our organization	Has individual been involved in the same level of responsibility on successfully completed contracts during the previous five years that together exceeds the value of this SRTA contract?	Years of Construction Experience	Magnitude and Type of Work	In What Capacity?

If a corporation, answer: Capital paid in cash, \$ _____ When incorporated? In what state? _____ President's name: Secretary's name: _____ Treasurer's name: _____	If a co-partnership, answer: Date of organization: _____ State whether partnership is general, limited, or association: _____ _____ _____ Name and address of each partner: _____ _____ _____ _____ _____
--	--

18. Attach a resume for the individuals listed above, including the name, title, address, and phone number of an individual or organization who could verify the individual's experience.
19. Have you or your organization, or any officer or partner thereof, or any employee of such organization who has a proprietary interest in such organization ever been disqualified, removed, or otherwise prevented from bidding or responding on or completing a federal, state, or local government project because of a violation of a law or safety regulation? If so, please explain the circumstances below:
- _____
- _____
- _____

EXHIBIT 2 – AFFIDAVIT

WHERE PREQUALIFICATION IS BASED ON A COMBINATION OF ORGANIZATIONS, THE APPROPRIATE AFFIDAVITS BELOW MUST BE EXECUTED FOR EACH MEMBER OF SUCH COMINATION

AFFIDAVIT FOR INDIVIDUAL

(Name of Individual)

Doing business as: _____

certifies and says: That she/he is the person submitting the statement of experience and financial condition: that she/he has read the same, and that the same is true of his/her own knowledge; that the statement is for the purpose of inducing SRTA to supply the submittor with plans and specifications, and that any depository, vendor, or other agency therein named is hereby authorized to supply said SRTA with any information necessary to verify the statement and that furthermore, should the foregoing statement at any time cease to properly and truly represent his financial condition in any substantial respect, she/he will refrain from further bidding on SRTA work until she/he shall have submitted a revised and corrected statement.

I certify and declare under penalty of perjury that the foregoing is true and correct.

Subscribed at _____, _____, State of _____
(City) (County)

Note: Statement will be returned unless affidavit on _____, 20____

Is complete including the date of signature

(Applicant must sign here)

AFFIDAVIT FOR CO-PARTNERSHIP

_____, certifies and says: That she/he/it is a partner of

(Name of

firm)

that said partnership submitted the statement of experience and financial condition: that she/he has read the same and that the same is true of his/her own knowledge; that the statement is for the purpose of inducing SRTA to supply the submittor with plans and specifications, and that any depository, vendor, or other agency therein named is hereby authorized to supply SRTA with any information necessary to verify the statement; and that furthermore, should the foregoing statement at any time cease to properly and truly represent the financial condition of said firm in any substantial respect, he/she/it will refrain from further bidding on SRTA work until he/she/it has submitted a revised and corrected statement.

I certify and declare under penalty of perjury that the foregoing is true and correct.

Subscribed at _____, _____, State of _____
(City) (County)

Note: Statement will be returned unless affidavit on _____, 20____

Is complete including the date of signature

(Member of firm must sign here)

(Remaining members of firm sign here)

(Name of firm)

AFFIDAVIT FOR CORPORATION

_____, certifies and says: That she/he is _____
(Name of Officer) (Official Capacity)

Of the _____
(Name of Firm)

the corporation submitting the statement of experience and financial condition; that she/he has read the same, and that the same is true of his/her own knowledge; that the statement is for the purpose of inducing SRTA to supply the submittor with plans and specifications, and that any depository, vendor, or other agency therein named is hereby authorized to supply said SRTA with any information necessary to verify the statement; and that furthermore, should the foregoing statement at any time cease to properly and truly represent the financial condition of said corporation in any substantial respect, it will refrain from further bidding on SRTA work until it shall have submitted a revised and corrected statement.

I certify and declare under penalty of perjury that the foregoing is true and correct.

Subscribed at _____, _____, State of _____
(City) (County)

Note: Statement will be returned unless affidavit on _____, 20_____
Is complete, including the date of signature

(Officer must sign here)

Note: use full corporate name and attach corporate seal

CONTRACTOR'S COMMENTS

EXHIBIT 3 – INDEPENDENT AUDITOR’S REPORT

We have audited the accompanying balance sheet of _____ as of _____, and the related statements of income and retained earnings and cash flows for the year then ended. These financial statements are the responsibility of the Company’s management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with generally accepted auditing standards. Those standards required that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audit provides a reasonable basis for our opinion. In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of _____ as of _____, and the results of its operations and its cash flows for the year then ended in conformity with generally accepted accounting principles.

Signature

Date

Special Note to Accountant:

The above Certificate of Accountant must not be made by any individual who is in the regular employ of the individual, co-partnership, or corporation submitting this statement, nor by any individual who is a member of the concern, unless she/he discloses his/her financial interest therein. A determination will be made by SRTA if the financial interest is excessive.

THE CERTIFICATE OF A LICENSED ACCOUNTANT WILL BE REQUIRED IN ALL CASES.

ACCOUNTANT COMMENTS

EXHIBIT 4 – CONTRACTOR’S FINANCIAL STATEMENT

NAME: _____

Condition at close of business _____, 20_____

ASSETS	DETAIL	TOTAL					
Current Assets							
1.	Cash						
2.	Notes Receivable						
3.	Accounts receivable from completed contracts						
4.	Sums earned on incomplete contracts						
5.	Other accounts receivable						
6.	Advances to construction joint ventures						
7.	Materials in stock not included in Item 4						
8.	Negotiable securities						
9.	Other current assets						
	TOTAL						
Fixed and Other Assets							
10.	Real Estate						
11.	Construction plant and equipment						
12.	Furniture and fixtures						
13.	Investments of a non-current nature						
14.	Other non-current assets						
	TOTAL						
	Total Assets						
	LIABILITIES AND CAPITAL						
Current Liabilities							
15.	Current portion of notes payable, exclusive of equipment obligations and real estate encumbrances						
16.	Accounts payable						
17.	Other current liabilities						
	TOTAL						
Other Liabilities and Reserves							
18.	Real estate encumbrances						
19.	Equipment obligations secured by equipment						
20.	Other non-current liabilities and non-current notes payable						
21.	Reserves						
	TOTAL						
Capital and Surplus							
22.	Capital Stock Paid Up						
23.	Surplus (or Net Worth)						
	TOTAL						
	Total Liabilities and Capital						
CONTINGENT LIABILITIES							
24.	Liability on notes receivable, discounted or sold						
25.	Liability on accounts receivable, pledged, assigned or sold						

26.	Liability as bondsman			
27.	Liability as guarantor on contracts or on accounts of others			
28.	Other contingent liabilities			
	Total Contingent Liabilities			

Note: Show details under main headings in that column, extending totals of main headings to second column.

1	Cash: (a) On hand _____ \$ _____ (b) Deposited in banks named below _____ \$ _____ (c) Elsewhere – (state where) _____ \$ _____
----------	---

	Name of Bank	Location	Deposit in Name of	Amount

2*	Notes Receivable: (a) Due within one year _____ \$ _____ (b) Due after one year _____ \$ _____ (c) Past Due _____ \$ _____
-----------	--

	Receivable From	For What	Date of Maturity	How Secured	Amount

3*	Accounts receivable from completed contracts exclusive of claims not approved for payment \$ _____
-----------	--

	Receivable From	Type of Work	Amount of Contract	Amount Receivable

	Have any of the above been assigned, sold, or pledged? _____ If so, state amount, to whom, and reason _____
--	---

4*	Sums earned on incomplete contracts, as shown by engineers' or architects' estimates \$ _____
-----------	---

	Receivable From	Type of Work	Amount of Contract	Amount Receivable

	Have any of the above been assigned, sold, or pledged? _____ If so, state amount, to whom, and reason _____
--	---

*List separately each item amounting to 10 percent or more of the total and combine the remainder.

EXHIBIT 4 -DETAILS RELATIVE TO ASSETS (Continued)

5*	Accounts receivable not from construction contracts _____ \$ _____				
Receivable From	For What	When Due	Amount		
What amount, in any, is past due? _____			\$ _____		
Assigned, sold, or pledged _____			\$ _____		

6	Advances to construction joint ventures _____ \$ _____		
Name of Joint Venture	Type of Work	Amount	
What amount, in any, has been assigned, sold or pledged? _____ \$ _____			

7	Materials in stock and not included in Item 4 (a) For use on incomplete contracts (inventory value) _____ \$ _____ (b) For future operations (inventory value) _____ \$ _____ (c) For sale (inventory value) _____ \$ _____		
VALUE			
Description	Quantity	For Incompl ete Contrac ts	For Future Operations / For Sale
What amount, in any, has been assigned, sold, or pledged? _____ If so, state amount, to whom, and reason _____			

8>	Negotiable Securities (List non-negotiable items under Item 13) (a) Listed – Present market value For use on incomplete contracts (inventory value) _____ \$ _____ (b) Unlisted – Present value) _____ \$ _____					
		Book Value	Present Value (Actual or Estimated)			
Issuing Company	Class	Quantity	Unit Price	Amount	Unit Price	Amount
Who has possession? _____						
If any are pledged or in escrow, state form whom and reason _____						
Amount pledged or in escrow _____ \$ _____						

*List separately each item amounting to 10 percent or more of the total and combine the remainder.

>Important: items listed under this heading will be given no consideration as working capital unless actual or estimated market value is furnished.

EXHIBIT 4 – DETAILS RELATIVE TO ASSETS (Continued)

9	Other current assets Bid deposits, prepaid expenses, cash value of life insurance, accrued interest, etc. _____ \$ _____										
Description	Amount										
10*	<table style="width:100%; border: none;"> <tr> <td style="width:40%;">Real Estate</td><td style="width:60%;">(a) Used for business purposes</td></tr> <tr> <td></td><td style="text-align: right;">\$ _____</td></tr> <tr> <td>Book Value</td><td>(b) Not used for business purposes</td></tr> <tr> <td></td><td style="text-align: right;">\$ _____</td></tr> </table>			Real Estate	(a) Used for business purposes		\$ _____	Book Value	(b) Not used for business purposes		\$ _____
Real Estate	(a) Used for business purposes										
	\$ _____										
Book Value	(b) Not used for business purposes										
	\$ _____										
Location	Description	Held in Whose Name	Value								
11	Construction plant and equipment _____ \$ _____										
11A	What is your approximate annual income from rental of equipment owned by you, Exclusive of such income from associated concerns having same ownership \$ _____										
12*	Furniture and Fixtures _____ \$ _____										
13	Investments of non-current nature \$ _____										
Description	Amount										
14	Other non-current assests \$ _____										
Description	Amount										
		Total Assets \$ _____									

***Show book value (Cost less Depreciation) unless an appraisal schedule prepared by an independent appraiser is attached; in which case, appraised value may be shown.**

EXHIBIT 4 – DETAILS RELATIVE TO ASSETS (Continued)

15	Current portion of Notes Payable, exclusive of equipment obligations and real estate obligations \$ _____			
	To Whom Payable	What Security	When Due	
16	Accounts Payable: (a) Not past due \$ _____ (b) Past due..... \$ _____			
	To Whom Payable	What Security	When Due	
17	Other current liabilities \$ _____ Accrued interest, taxes, insurance, payrolls, etc.			
	Description	Amount		
18	Real Estate encumbrances \$ _____			
19	Construction Equipment obligations (a) Total payments due within six months \$ _____ Secured by equipment: (b) Total payments due after six months \$ _____			
	To Whom Payable	How Payable**		
20	Other non-current liabilities and non-current notes payable \$ _____			
	Description	For What	When Due	
21	Reserves \$ _____			
	Description	Amount		
22	Capital stock paid up:	(a) Common..... (b) Preferred.....		
23	Surplus (or Net Worth) \$ _____			
	Total Liabilities and Capital \$ _____			

EXHIBIT 5 – SUBORDINATION OF NOTES OR ACCOUNTS PAYABLE

SRTA

Amounts owing to officers or stockholders of a corporation may be considered as advances of capital, and may be added to net worth for approval purposes, in those cases where verified subordination agreements are executed stating:

The amount of \$ _____ due me from _____

(Name of Corporation)

Represents an advance of Working Capital and will not be withdrawn without prior notice to SRTA nor during the life of any contract with said SRTA on which the corporation may be the successful bidder or proposer.

(Signature of Creditor)

(Date)

EXHIBIT 6 – GENERAL STATEMENT OF BANK CREDIT

In connection with the prequalification of _____,
(Name of Contractor)

a contractor seeking to be awarded a contract(s) with SRTA, we hereby declare that said contractor has been extended a line of credit in a total amount exceeding \$ _____, and that such credit will not be withdrawn or reduced without notice to SRTA.

This letter is signed with the understanding that it is a document to be used by SRTA for the purpose of determining the financial resources of said contractor available for use in performing work under contracts which may be awarded to him by SRTA during the term of his prequalification.

This General Statement of Bank Credit will EXPIRE with the Contractor's Statement of Experience and Financial Condition for which the line of credit was issued.

(Name of Bank)

(Address)

By _____

(Title)

PLEASE NOTE: The above form may be used to augment your Working Capital and completed by your bank, or if they prefer, one with substantially the same provisions may be issued on their own letterhead, referencing the contract number.

CONTRACTOR'S STATEMENT OF EXPERIENCE AND FINANCIAL CONDITION (CSOEFC) REVIEW SHEET

2. Contract Bid Amount: \$

4.	Statement of Bank Credit	\$	See Exhibit 6
----	--------------------------	----	---------------

6.	Subtotal x 10 (Line 5 x 10)	\$
----	-----------------------------	----

7. Is Line 6 > Line 2? yes / no (Circle one)

8. Does the largest value of all work bidder or proposer has had under contract over a previous similar time frame as the subject contract meet or exceed the total amount bid? If so, please explain.

9. Does the dollar value of at least one of the previous individual contracts listed have at least 50 percent of the dollar value bid on the SRTA contract? If so, please explain.

10. Has the bidder or proposer successfully completed contracts during the previous five years that together exceeds five times the annual value of the SRTA contract? If so, please explain. **SRTA USE ONLY**

I have reviewed the contractor-furnished information contained in the CSOEFC and have determined that the submittal is in compliance with SRTA Policies. Therefore, this firm can be recommended for the award of this contract.

Initial Review Completed by _____, Firm Name: _____ Date: _____
[Enter person name, role and Firm Name here if applicable]

Experience Reviewed and Checked for Completeness by _____ Date: _____

Contracts & Procurement

Financials Approved by _____
Finance/Accounting Dept.

Date: _____

Experience Reviewed by _____

Date: _____

CER 8. Federal Certifications

The procurement is not federally funded.

The Contractor shall at all times comply with all applicable laws, regulations, policies, procedures and directives (together, the “Law”), including without limitation all contractual provisions required by the State of California Department of Transportation (“Caltrans” or “Department”) as set forth in Master Agreement No. 64SRTAMA, including those listed directly or by reference in said agreement between the Agency and Caltrans that funds this Contract. Contractor’s failure to so comply shall constitute a material breach of this Contract.

Complete the following Federal Certifications where applicable.

CER 8.1 Buy America Certification

This form is to be submitted with an offer exceeding the small purchase threshold for federal assistance programs, currently set at \$100,000.

Certificate of Compliance

The Proposer hereby certifies that it will comply with the requirements of 49 USC Section 5323(j)(2)(C), Section 165(b)(3) of the Surface Transportation Assistance Act of 1982, as amended, and the regulations of 49 CFR 661.11:

Name and title:

Company:

Authorized signature

Date

Certificate of Non-Compliance

The Proposer hereby certifies that it cannot comply with the requirements of 49 USC Section 5323(j)(2)(C) and Section 165(b)(3) of the Surface Transportation Assistance Act of 1982, as amended, but may qualify for an exception to the requirements consistent with 49 USC Sections 5323(j)(2)(B) or (j)(2)(D), Sections 165(b)(2) or (b)(4) of the Surface Transportation Assistance Act, as amended, and regulations in 49 CFR 661.7.

Name and title:

Company:

Authorized signature

Date

CER 8.2 Debarment and Suspension Certification for Prospective Contractor

Primary covered transactions must be completed by Proposer for contract value over \$25,000.

Choose one alternative:

- ☐ The Proposer, **[insert name]**, certifies to the best of its knowledge and belief that it and its principals:
1. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any federal department or agency;
 2. Have not within a three-year period preceding this Proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (federal, state or local) transaction or Contract under a public transaction; violation of federal or state antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
 3. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (federal, state, or local) with commission of any of the offenses enumerated in Paragraph 2 of this certification; and
 4. Have not within a three-year period preceding this Proposal had one or more public transactions (federal, state or local) terminated for cause or default.

OR

- ☐ The Proposer is unable to certify to all of the statements in this certification, and attaches its explanation to this certification. (In explanation, certify to those statements that can be certified to and explain those that cannot.)
- The Proposer certifies or affirms the truthfulness and accuracy of the contents of the statements submitted on or with this certification and understands that the provisions of Title 31 USC § Sections 3801 are applicable thereto.

Executed in **[insert city and state]**.

Name:

Authorized signature

Date

CER 8.3 Debarment and Suspension Certification (Lower-Tier Covered Transaction)

This form is to be submitted by each Subcontractor receiving an amount exceeding \$25,000.

The prospective lower-tier participant (Proposer) certifies, by submission of this Proposal, that neither it nor its "principals" as defined at 49 CFR § 29.105(p) is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any federal department or agency.

If the prospective Proposer is unable to certify to the statement above, it shall attach an explanation, and indicate that it has done so by placing an "X" in the following space: _____

THE PROPOSER, _____, CERTIFIES OR AFFIRMS THE TRUTHFULNESS AND ACCURACY OF EACH STATEMENT OF ITS CERTIFICATION AND EXPLANATION, IF ANY. IN ADDITION, THE PROPOSER UNDERSTANDS AND AGREES THAT THE PROVISIONS OF 31 USC §§ 3801 *ET SEQ.* APPLY TO THIS CERTIFICATION AND EXPLANATION, IF ANY.

Name and title of the Proposer's authorized official:

Authorized signature

Date

CER 8.4 Non-Collusion Affidavit

This affidavit is to be filled out and executed by the Proposer; if a corporation makes the bid, then by its properly executed agent. The name of the individual swearing to the affidavit should appear on the line marked "Name of Affiant." The affiant's capacity, when a partner or officer of a corporation, should be inserted on the line marked "Capacity." The representative of the Proposer should sign his or her individual name at the end, not a partnership or corporation name, and swear to this affidavit before a notary public, who must attach his or her seal.

State of _____, County of _____ I, _____, being first duly sworn, do hereby state that (Name of Affiant) I am _____ of _____ Capacity) (Name of Firm, Partnership or Corporation) whose business is _____ and who resides at _____ and that _____ (Give names of all persons, firms, or corporations interested in the bid) is/are the only person(s) with me in the profits of the herein contained Contract; that the Contract is made without any connection or interest in the profits thereof with any persons making any bid or Proposal for said Work; that the said Contract is on my part, in all respects, fair and without collusion or fraud, and also that no members of the Board of Trustees, head of any department or bureau, or employee therein, or any employee of the Authority, is directly or indirectly interested therein. _____ Signature of Affiant Date _____	
Sworn to before me this _____ day of _____, 20____. _____ Notary public My commission expires _____	Seal

CER 8.5 Lobbying Certification

This form is to be submitted with an offer exceeding \$100,000.

The Proposer certifies, to the best its knowledge and belief, that:

1. No federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of a federal department or agency, a member of the U.S. Congress, an officer or employee of the U.S. Congress, or an employee of a member of the U.S. Congress in connection with the awarding of any federal Contract, the making of any federal grant, the making of any federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment or modification thereof.
2. If any funds other than federal appropriated funds have been paid or will be paid to any person for making lobbying contacts to an officer or employee of any agency, a member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with this federal Contract, grant, loan or cooperative agreement, the undersigned shall complete and submit Standard Form LLL, "Disclosure Form to Report Lobbying," in accordance with its instruction, as amended by "Government wide Guidance for New Restrictions on Lobbying," 61 Fed. Reg. 1413 (1/19/96).
3. The undersigned shall require that the language of this certification be included in the award documents for all sub awards at all tiers (including subcontracts, sub grants and contracts under grants, loans and cooperative agreements) and that all sub recipients shall certify and disclose accordingly. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31, USC § 1352 (as amended by the Lobbying Disclosure Act of 1995). Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

THE PROPOSER, _____, CERTIFIES OR AFFIRMS THE TRUTHFULNESS AND ACCURACY OF EACH STATEMENT OF ITS CERTIFICATION AND DISCLOSURE, IF ANY. IN ADDITION, THE PROPOSER UNDERSTANDS AND AGREES THAT THE PROVISIONS OF 31 USC §§ 3801 ET SEQ. APPLY TO THIS CERTIFICATION AND DISCLOSURE, IF ANY.

Name of the bidder or Proposer's authorized official:

Title:

Signature

Date

Per paragraph 2 of the included form Lobbying Certification, add Standard Form–LLL, "Disclosure Form to Report Lobbying," if applicable.

CER 8.6 Certificate of Compliance with Bus Testing Requirement

The undersigned certifies that the vehicle offered in this procurement complies and will, when delivered, comply with 49 USC § 5323(c) and FTA's implementing regulation at 49 CFR Part 665 according to the indicated one of the following three alternatives.

Mark one and only one of the three blank spaces with an "X."

1. _____ The buses offered herewith have been tested in accordance with 49 CFR Part 665 on _____ (date). If multiple buses are being proposed, provide additional bus testing information below or on attached sheet. The vehicles being sold should have the identical configuration and major components as the vehicle in the test report, which must be submitted with this Proposal. If the configuration or components are not identical, then the manufacturer shall provide with its Proposal a description of the change and the manufacturer's basis for concluding that it is not a major change requiring additional testing. If multiple buses are being proposed, testing data on additional buses shall be listed on the bottom of this page.
2. _____ The manufacturer represents that the vehicle is "grandfathered" (has been used in mass transit service in the United States before October 1, 1988, and is currently being produced without a major change in configuration or components), and submits with this Proposal the name and address of the recipient of such a vehicle and the details of that vehicle's configuration and major components.
3. _____ The vehicle is a new model and will be tested and the results will be submitted to the Agency prior to acceptance of the first bus.

The undersigned understands that misrepresenting the testing status of a vehicle acquired with federal financial assistance may subject the undersigned to civil penalties as outlined in the Department of Transportation's regulation on Program Fraud Civil Remedies, 49 CFR Part 31. In addition, the undersigned understands that FTA may suspend or debar a manufacturer under the procedures in 49 CFR Part 29.

Company name:

Name and title of the Proposer's authorized official:

Authorized signature

Date

CER 8.7 DBE Approval Certification

I hereby certify that the Proposer has complied with the requirements of 49 CFR 26, Participation by Disadvantaged Business Enterprises in DOT Programs, and that its goals have not been disapproved by the Federal Transit Administration.

Name and title of the Proposer's authorized official:

Authorized signature

Date

CER 8.8 Federal Motor Vehicle Safety Standards

The Proposer and (if selected) Contractor shall submit (1) manufacturer's FMVSS self-certification sticker information that the vehicle complies with relevant FMVSS or (2) manufacturer's certified statement that the contracted buses will not be subject to FMVSS regulations.

Company name:

Name of signer:

Title:

Authorized signature

Date

CER 9. Other Certifications

CER 9.1 Proposal Form

Proposer shall complete the following form and include it in the price Proposal.

PROPOSAL

By execution below by a duly authorized representative(s) of the Proposer, the Proposer hereby offers to furnish equipment and services as specified in its Proposal submitted to **[insert Agency name]** in response to Request for Proposal No. **[insert RFP number]** in its entirety.

Proposer: _____

Street address: _____

City, state, ZIP: _____

Name and title of Authorized Signer(s): _____

Name and title of Authorized Signer(s): _____

Phone: _____

Authorized signature

Date

Authorized signature

Date

CER 9.2 Notice of Award

Not Applicable.

CER 9.3 Certification of Compliance with Standards, Certifications, and Regulations

CER 9.3 identifies the specifications, standards, regulations, and references used within the RFP. This form must be completed and included in the Technical Proposals and requires an indication of the state of compliance and an opportunity for listing other pertinent references. Please indicate “compliance” as, full, partial, N/A (not applicable). If “partial” or “N/A”, please describe.

Standard	Title	Compliance: full, partial, or N/A	If “partial” or “N/A,” please describe
SAE J10	Automotive and Off-Highway Air Brake Reservoir Performance and Identification Requirements - Truck and Bus J10_201312		
SAE J211a	Instrumentation for Impact Test J211A_197112		
SAE J287	Driver Hand Control Reach J287_201603		
SAE J366	Exterior Sound Level for Heavy Trucks and Buses (STABILIZED Sep 2011) J366_201109		
SAE J382	Windshield Defrosting Systems Performance Requirements--Trucks, Buses, and Multipurpose Vehicles (Cancelled Sep 2000) J382_200009		
SAE J534	Lubrication Fittings J534_201508		
SAE J537	Storage Batteries J537_201604		
SAE J541	Voltage Drop for Starting Motor Circuits(Cancelled Jul 2013)J541_201307		
SAE J587	License Plate Illumination Devices (Rear Registration Plate Illumination Devices) J587_201711		
SAE J593	Backup Lamp (Reversing Lamp) J593_201606		
SAE J673	Automotive Safety Glazing Materials J673_201506		
SAE J680	Location and Operation of Air Brake Controls in Motor Truck Cabs J680_201508		
SAE J686	Motor Vehicle License Plates (STABILIZED Jul 2012) J686_201207		
SAE J689	Curbside Clearance, Approach, Departure, and Ramp Breakover Angles—Passenger Car and Light Truck (Cancelled Aug 2009) J689_200908		
SAE J833	Human Physical Dimensions		
SAE J844	Nonmetallic Air Brake System Tubing (STABILIZED Dec 2012) J844_201212		
SAE J941	Motor Vehicle Drivers’ Eye Locations J941_201003		
SAE J994	Alarm—Backup—Electric Laboratory Performance Testing J994_201409		
SAE J1050	Describing and Measuring the Driver’s Field of View J1050_200902		
SAE J1113	Electromagnetic Compatibility Measurement Procedures and Limits for Components of Vehicles, Boats (up to 15 m), and Machines (Except Aircraft) (16.6 Hz to 18 GHz) J1113/1_201810		
SAE J1127	Low Voltage Battery Cable J1127_201512		
SAE J1128	Low Voltage Primary Cable J1128_201512		

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SAE J1149	Metallic Air Brake System Tubing and Pipe (STABILIZED Oct 2015) J1149 201510		
SAE J1292	Automobile and Motor Coach Wiring(STABILIZED Apr 2016) J1292 201604		
SAE J1308	Fan Guard for Off-Road Machines J1308 201312		
SAE J1455	Recommended Environmental Practices for Electronic Equipment Design in Heavy-Duty Vehicle Applications J1455 201703		
SAE J1587	Electronic Data Interchange Between Microcomputer Systems in Heavy-Duty Vehicle Applications (STABILIZED Jan 2013) J1587 201301		
SAE J1654	Unshielded High Voltage Primary Cable J1654 201609		
SAE J1708	Serial Data Communications Between Microcomputer Systems in Heavy-Duty Vehicle Applications (STABILIZED Sep 2016) J1708 201609		
SAE J1763	A Conceptual Its Architecture: An Atis Perspective (Cancelled May 2003) J1763 200304		
SAE J1772	SAE Electric Vehicle and Plug in Hybrid Electric Vehicle Conductive Charge Coupler J1772 201710		
SAE J1939	Serial Control and Communications Heavy Duty Vehicle Network - Top Level Document J1939 201808		
SAE J1986	Balance Weight and Rim Flange Design Specifications, Test Procedures, and Performance Recommendations J1986 201603		
SAE J1995	Engine Power Test Code - Spark Ignition and Compression Ignition - Gross Power and Torque Rating J1995 201401		
SAE J2344	Guidelines for Electric Vehicle Safety J2344 201003		
SAE J2402	Road Vehicles—Symbols for Controls, Indicators, and Tell-tales J2402 201001		
SAE J2464	Electric and Hybrid Electric Vehicle Rechargeable Energy Storage System (RESS) Safety and Abuse Testing J2464 200911		
SAE J2711	Recommended Practice for Measuring Fuel Economy and Emissions of Hybrid-Electric and Conventional Heavy-Duty Vehicles(STABILIZED Jul 2018) J2711 201807		
SAE J2910	Recommended Practice for the Design and Test of Hybrid Electric and Electric Trucks and Buses for Electrical Safety J2910 201404		
SAE J3068	Electric Vehicle Power Transfer System Using a Three-Phase Capable Coupler J3068 201804		
FMVSS 105	Hydraulic and Electric Brake Systems		
FMVSS 121	Air Brake Systems		
FMVSS 207	Seating Systems		
FMVSS 210	Seat Belt Assembly Anchorages		
FMVSS 217	Bus Emergency Exits and Window Retention and Release		
FMVSS 301	Fuel System Integrity		
FMVSS 302	Flammability of Interior Materials		
FMVSS 403	Platform Lift Systems for Motor Vehicles		
FMVSS 404	Platform Lift Installations in Motor Vehicles		

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ANSI/IAS NGV2 (1998)	Basic Requirements for Compressed Natural Gas Vehicle (NGV) Fuel Containers		
ANSI/IAS PRD1 (1998)	Pressure Relief Devices For Natural Gas Vehicle (NGV) Fuel Containers		
ANSI Z26.1	Safety Glazing Materials for Glazing Motor Vehicles and Motor Vehicle Equipment Operating on Land Highways - Safety Standard		
ANSI/ASHRAE 52.1	Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size		
ASTM A240	Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications		
ASTM A269	Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service		
ASTM B117	Standard Practice for Operating Salt Spray (Fog) Apparatus		
ASTM D1003	Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics		
ASTM D4541-85	Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers		
ASTM E162-90	Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source		
ASTM E424	Standard Test Methods for Solar Energy Transmittance and Reflectance (Terrestrial) of Sheet Materials		
FTA Docket 90A	Recommended Fire Safety Practices for Transit Bus and Van Materials Selection		
CGA C-6.4	Methods for External Visual Inspection of Natural Gas Vehicle (NGV) Fuel Containers and Their Installation		
NGV-3.1/CGA-12.3	Fuel system components for compressed natural gas powered vehicles		
CARB 2292.5	Specifications for Compressed Natural Gas		
UL 935	Standard for Fluorescent-Lamp Ballasts		
ISO 5128	Acoustics – Measurement of noise inside motor vehicles		
ISO 26262	Road Vehicles – Functional Safety		
NFPA-52	Vehicular Natural Gas Fuel Systems Code		
PS 1-95	Construction and Industrial Plywood		
UN/DOT 38.3	UN Transportation Testing for Lithium Batteries		
UNECE Council Directive 95/54(R10)	Adapting to technical progress Council Directive 72/245/EEC on the approximation of the laws of the Member States relating to the suppression of radio interference produced by spark-ignition engines fitted to motor vehicles and amending Directive 70/156/EEC on the approximation of the laws of the Member States relating to the type-approval of motor vehicles and their trailers		

CER 10. Vehicle Attribute Summary

Shasta Regional Transportation Agency
Procurement No. 2019-01
Battery Electric Vehicle Procurement for Salmon Runner and North Valley Feeder

Form CER 10 is a separate Microsoft Excel Workbook form that is to be completed and included in the Proposal.

- See file “CER 10 Vehicle Attribute Summary.xlsx”

CER 11. Infrastructure Attribute Summary

Shasta Regional Transportation Agency

Procurement No. 2019-01

Battery Electric Vehicle Procurement for Salmon Runner and North Valley Feeder

Form CER 11 is a separate Microsoft Excel Workbook form that is to be completed and included in the Proposal.

- • See file “CER 11 Infrastructure Attribute Summary.xlsx”

CER 12. Minimum Milestone Plan

**Shasta Regional Transportation Agency
Procurement No. 2019-01**

Battery Electric Vehicle Procurement for Salmon Runner and North Valley Feeder

Form CER 12 is a separate Microsoft Excel Workbook form that is to be completed and included in the Proposal.

- • See file “CER 12 Minimum Milestone Plan.xlsx”

SECTION 10: CONTRACT

CONTRACT

1. Contract Documents and Order of Precedence

The Contract consists of the documents listed below. In case of any conflict among these documents, the order of precedence shall be:

1. Form of Contract
2. Contractor's Best and Final Offer
3. Contractor deviations requested and accepted by Agency
4. Contractor Proposal
5. Responses to Proposer Questions & Clarification Requests
6. Addenda
7. "Section 4: Special Conditions"
8. "Section 3: General Conditions," and "Section 5: Federal Requirements"
9. "Section 6: Technical Specifications," "Section 7: Warranty Requirements," and "Section 8: Quality Assurance"

A modification or change to any Contract document shall take its precedence from the term it amends. All other documents and terms and conditions shall remain unchanged.

2. Compensation

The Agency shall pay [insert dollar amount in both words and numbers of the base Contract], and the Contractor shall accept the amount as full compensation for all costs and expenses of completing the Work in accordance with the Contract, including but not limited to all labor and material required, overhead, storage and shipping, risks and obligations, taxes (as applicable), fees and profit, and any unforeseen costs.

NOTE: The Agency may insert a full pricing schedule here.

3. Contract Term and Period of Performance

The effective date of this Contract shall be the effective date set forth in the Notice to Proceed (NTP). The Contractor shall commence work after the effective date of the Contract, upon receipt of the NTP.

The base Contract will contain orders for [insert number and type of vehicles]. The Contract delivery date for the vehicles, in accordance with the delivery schedule set forth in "Delivery Schedule," shall be [insert date].

If any option is exercised, the option vehicles or other option items shall be delivered in accordance with the schedule contained in the Notice of Exercise of Option.

4. Notices

Any Notice legally required to be given by one party to another under the Contract shall be in writing, dated and signed by the party giving such Notice or by a duly authorized representative of such party.

Notices shall not be effective unless transmitted by any method that provides confirmation of transmission and delivery, such as fax, certified mail or registered mail and addressed to:

[Insert Agency name, address, point of contact and Contract number]
[Insert Contractor name, address and point of contact]

5. Entire Agreement

This Contract constitutes the complete and entire agreement between the Agency and Contractor and supersedes any prior representations, understandings, communications, commitments, agreements or Proposals, oral or written, that are not incorporated as a part of the Contract.

[Agency to inserts its normal signature format in accordance with its governing law and regulations. The Agency should ensure that the signature format conforms to state law and Agency policy.]

_____ Contractor name	_____ Agency name
_____ Signature of authorized official	_____ Signature of authorized official
_____ (Print or type name and title)	_____ (Print or type name and title)
_____ Date	_____ Date
_____ Tax ID number	Approved as to form by: _____ Insert name and title

SECTION 11: MASTER AGREEMENT NO. 64SRTAMA

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California State Transportation Agency
Transit and Intercity Rail Capital Program

Grant Recipient:

Shasta Regional Transportation Agency

CalSTA Transit and Intercity Rail Capital Program Administered by:

California Department of Transportation
Division of Rail and Mass Transportation
1120 N Street, Room 3300
P.O. Box 942874, MS-39
Sacramento, California 94274-0001

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**STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION**

Effective Date of this Agreement: November 1, 2018

Termination Date of this Agreement: November 1, 2021

Recipient: Shasta Regional Transportation Agency

Application Funding: The Greenhouse Gas Reduction Fund and Senate Bill 1 Fund is the applicable funding source covered by this Agreement and will identified in each specific Program Supplement, adopting the terms of this Agreement.

RECITALS

1. WHEREAS, The Global Warming Solutions Act of 2006 (the "ACT") (Assembly Bill [AB] 32, Nunez, Chapter 488) created a comprehensive program to reduce greenhouse gas emissions in California. AB 32 requires California to reduce greenhouse gases to 1990 levels by 2020, and to maintain and continue reductions beyond 2020. In March 2012, Governor Brown signed Executive Order B-16-2012 affirming a long-range climate goal for California to reduce greenhouse gases from the transportation sector to 80 percent below 1990 levels by 2050.
2. WHEREAS, the Cap-and-Trade Program is a key element in California's climate plan. It creates a limit on the emissions from sources responsible for 85 percent of California's greenhouse gas emissions, establishes the price signal needed to drive long-term investment in cleaner fuels and more efficient use of energy, and gives covered entities flexibility to implement the lowest-cost options to reduce greenhouse gas emissions.
3. WHEREAS, in 2012, the Legislature passed and Governor Brown signed into law three bills, AB 1532 (Pérez, Chapter 807, Statutes of 2012), Senate Bill (SB) 535 (De León, Chapter 830, Statutes of 2012), and SB 1018 (Budget and Fiscal Review Committee, Chapter 39, Statutes of 2012), that established the Greenhouse Gas Reduction Fund to receive proceeds from the distribution of allowances via auction and provided the framework for how those auction proceeds will be appropriated and expended. These statutes require that expenditures from the Greenhouse Gas Reduction Fund be used to facilitate the achievement of greenhouse gas emission reductions and further the purposes of AB 32.

4. WHEREAS, in 2017, the Legislature passed and Governor Brown signed into law the Road Repair and Accountability Act of 2017 Senate Bill [SB] 1, directed additional funding to the Transit and Intercity Rail Capital Program.

5. WHEREAS, the Transit and Intercity Rail Capital Program is one of several programs funded as part of the 2014-2015 State of California Budget (Senate Bill 852 and Senate Bill 862), and implemented pursuant to Public Resources Code section 75220 et seq and Health and Safety Code section 39719 et seq..

6. WHEREAS, as directed by the ACT, CalSTA established TIRCP Program Guidelines that describe the policy, standards, criteria, and procedures for the development, adoption and management of the TIRCP Program.

7. WHEREAS, Recipient has submitted an application, been evaluated and selected by CalSTA in accordance with the TIRCP Program Guidelines.

8. WHEREAS, on August 17, 2015, CalSTA delegated the administration of the TIRCP Program to the Department pursuant to the TIRCP Program Guidelines and the Department's policies and procedures for the administration of similar grant programs.

NOW THEREFORE, in consideration of the recitals and the rights, duties and covenants set forth herein, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereby agree to the following:

This Agreement, entered into effective as of the date set forth above, is between the signatory public entity identified hereinabove, (hereinafter referred to as Recipient), and the STATE OF CALIFORNIA, acting by and through the California Department of Transportation (hereinafter referred to as DEPARTMENT), and subject to the approval of the California State Transportation Agency (CalSTA).

ARTICLE I - DEFINITIONS

The terms defined in this Article I shall for all purposes of this Agreement have the meanings specified herein.

1.1 "Act" refers to the Global Warming Solutions Act of 2006 (the "ACT") (Assembly Bill [AB] 32, Nunez, Chapter 488) created a comprehensive program to reduce greenhouse gas emissions in California.

1.2 "Agreement" shall mean this Agreement, inclusive of all appendices and Program Supplements, whereby the Department, on behalf of CalSTA, and pursuant to the Act and as set forth herein, administers the TIRCP Program.

1.3 "California Department of Transportation" or "Caltrans" or "Department" means the State of California, acting by and through its Department of Transportation of the State of the

State of California, and any entity succeeding to the powers, authorities and responsibilities of the Department invoked by or under this Agreement or the Program Supplements.

1.4 "California Transportation Commission" or "CTC" shall refer to the Commission established in 1978 by Assembly Bill 402 (Chapter 1106, Statutes of 1977).

1.5 "Effective Date" means the date set forth on page 4 of this Agreement.

1.6 "Greenhouse Gas Reduction Funds" or "GGRF" shall mean the funds subject to Chapter 26, Statutes of 2014, authorizing the State to fund capital improvements and investments for California's transit systems and intercity, commuter, and urban rail systems.

1.7 "Senate Bill 1" or "SB 1" shall mean the funds subject to Chapter 5, Statutes of 2017, authorizing the State to fund capital improvements and investments for California's transit systems and intercity, commuter, and urban rail systems.

1.8 "Overall Funding Plan" has the meaning set forth in Article II, Section 2(A)(5)(c).

1.9 "Program Guidelines" shall mean the policy, standards, criteria, and procedures for the development, adoption and management of the TIRCP Projects established by CalSTA and provided in Appendix A.

1.10 "Award Agreement" shall mean a project-specific subcontract to this agreement executed following Project award and may include Project specific information, expected outcomes, and deliverables.

1.11 "Program Supplement" shall mean a project-specific subcontract to this Agreement that is executed following a CTC approved action and includes all Project specific information needed to encumber funding.

1.12 "Program Supplement Termination Date" shall have the meaning set forth in Article III, Section 3(C) and refers to the last date for Recipient to incur valid Project costs or credits and is the date that the Program Supplement expires.

1.13 "Progress Payment Invoice" shall have the meaning set forth in Article II, Section 3(A).

1.14 "Project Closeout Report" shall have the meaning set forth in Article II, Section 3(B).

1.15 "Project Financial Plan" shall have the meaning set forth in Article II, Section 2(A)(5)(d).

1.16 "Project Schedule" has the meaning set forth in Article II, Section 2(A)(5)(b).

1.17 "Project" shall mean the project identified in Recipient's application in Appendix C.

1.18 "Scope of Work" has the meaning set forth in Article II, Section 2(A)(5)(a).

1.19 “Secretary” shall mean the Secretary of the California State Transportation Agency (CalSTA). Unless the context otherwise requires, any reference to the Secretary includes CalSTA and its officers and employees.

1.20 “State” shall mean the State of California.

1.21 “TIRCP Projects” shall mean projects that are selected and funded pursuant to the Transit and Intercity Rail Capital Program.

1.22 “TIRCP” shall mean the “Transit and Intercity Rail Capital Program”.

ARTICLE II – TIRCP PROJECTS AND ADMINISTRATION

Section 1. TIRCP Projects and Project Management

1. TIRCP Projects, pursuant to the Act, are established by CalSTA in accordance with the TIRCP Program Guidelines. Under delegation from CalSTA, the Department will administer the TIRCP Program in accordance with the TIRCP Program Guidelines and best management practices identified in the administration of similar Department grant programs.

2. By this reference, those Guidelines are made an express part of this Agreement and shall apply to each TIRCP Program funded Project. Recipient will cause its specific TIRCP mandated Resolution to be attached as part of any TIRCP funded Program Supplement as a condition precedent to the acceptance of Greenhouse Gas Reduction Funds or SB 1 Funds (upon availability and allocation), for such project.

3. All inquiries during the term of this Agreement and any applicable Program Supplement will be directed to the project representatives identified below:

State’s Project Administrator:

Department of Transportation

Ezequiel Castro

Chief, State Transit Grants Branch

Phone: (916) 654-8012

Email: ezequiel.castro@dot.ca.gov

Recipient’s Project Administrator:

Shasta Regional Transportation Agency

Jennifer Pollom

Senior Transportation Planner

(530) 262-6195

jpollom@srta.ca.gov

Section 2. Program Supplement

A. *General*

1. This Agreement shall have no force and effect with respect to the Project unless and until a separate Project specific program supplement hereinafter referred to as "Program Supplement," adopting all of the terms and conditions of this Agreement has been fully executed by both State and Recipient.

2. Recipient agrees to complete the defined scope of work for the Project, described in the Program Supplement adopting all of the terms and conditions of this Agreement.

3. A financial commitment of actual funds will only occur in each detailed and separate Program Supplement. No funds are obligated by the prior execution of this Agreement alone.

4. Recipient further agrees, as a condition to the release and payment of the funds encumbered for the scope of work described in each Program Supplement, to comply with the terms and conditions of this Agreement and all the agreed-upon special covenants and conditions attached to or made a part of the Program Supplement identifying and defining the nature of that specific scope of work.

5. The Program Supplement shall include a detailed scope of work, which shall include but not be limited to, a Project Description, a Project Schedule, an Overall Funding Plan, and a Project Financial Plan as required in the TIRCP Program Guidelines. The Program Supplement will be in a form similar to Appendix C.

a. The Scope of Work shall include a detailed description of the Project and will itemize the major tasks and their estimated costs.

b. The Project Schedule shall include major tasks and/or milestones and their associated beginning and ending dates and duration.

c. The Overall Funding Plan shall itemize the various Project Components, the committed funding program(s) or source(s), and the matching funds to be provided by Recipient and/or other funding sources, if any [these Components include Environmental and Permits; Plans, Specifications and Estimates (PS&E); Right-of-Way (ROW); and Construction (including transit vehicle acquisition)].

d. The Project Financial Plan shall identify estimated expenditures for the Project Component by funding source, provided that for the purposes of this Agreement the State is only monitoring compliance for expenditures for the TIRCP, including but not limited to Greenhouse Gas Reduction Funds and Senate Bill (SB) 1 Funds allocated for the Project Component.

6. Adoption and execution of the Program Supplement by Recipient and State, incorporating the terms and conditions of this Agreement into the Program Supplement as though fully set forth therein, shall be sufficient to bind Recipient to these terms and conditions when performing the Project. Unless otherwise expressly delegated to a third-party in a resolution by Recipient's governing body, which delegation must be expressly assented to and concurred in by State, the Program Supplement shall be managed by Recipient.

7. The estimated cost and scope of the Project will be as described in the applicable Program Supplement. The State, shall not participate in any funding for the Project beyond those amounts actually encumbered by the STATE as evidenced in the applicable Program Supplement unless the appropriate steps are followed and approval is granted by the CTC as described below.

8. Upon the stated expiration date of this Agreement, any Program Supplement executed under this Agreement for the Project with work yet to be completed pursuant to the approved Project Schedule shall be deemed to extend the term of this Agreement only to conform to the specific Project termination or completion date contemplated by the applicable Program Supplement to allow that uncompleted Project to be administered under the extended terms and conditions of this Agreement.

B. *Project Overrun*

1. If Recipient or the State determine, at any time during the performance of the Project, that the Project budget may be exceeded, Recipient shall take the following steps:

a. Notify the designated State representative of the nature and projected extent of the overrun and, within a reasonable period thereafter, identify and quantify potential cost savings or other measures which Recipient will institute to bring the Project Budget into balance; and

b. Identify the source of additional Recipient or other third party funds that can be made available to complete Project. Recipient agrees that the allocation of the GGFR and SB 1 Funds is subject to the allocation made proposed by the CalSTA, submitted by the State, and approved by the CTC.

C. *Cost Savings*

1. Recipient is encouraged to evaluate design and construction alternatives that would mitigate the costs of delivering the commitments for the Project. Recipient shall take all steps necessary on a commercially reasonable basis that would generally be taken in accordance with best management practices. In determining cost savings, the Parties shall take into account all avoided costs, including avoided design, material, equipment, labor, construction, testing, acceptance and overhead costs and avoided costs due to time savings, and all the savings in financing costs associated with such avoided costs.

2. Recipient shall bear the burden of providing such cost savings to the Department. If there is an identification and implementation of any alternative resulting in reduction of the Project costs, the parties agree that such net savings will be reimbursed to the Department no later than 30 days after the submission of the final invoice for any remaining Project costs.

D. *Scope of Work*

1. Recipient shall be responsible for complete performance of the work described in the approved Program Supplement for the Project related to the commitment of encumbered funds. All work shall be accomplished in accordance with the applicable provisions of the Act, Public Utilities Code, the Streets and Highways Code, the Government Code, and other applicable statutes and regulations.
2. Recipient acknowledges and agrees that Recipient is the sole control and manager of the Project and its subsequent employment, operation, repair and maintenance for the benefit of the public. Recipient shall be solely responsible for complying with the funding and use restrictions established by (a) the statutes from which the GGRF and SB 1 Funds are derived, (b) the CTC, (c) the State Treasurer, (d) the Internal Revenue Service, (e) the applicable Program Supplement, and (f) this Agreement.
3. Recipient acknowledges and agrees that the Recipient is responsible for complying with all reporting requirements established by the TIRCP Guidelines and California Air Resource Board Funding Guidelines.

E. *Program Supplement Amendments*

Program Supplement amendments will be required whenever there are CalSTA or CTC approved actions, including but not limited to, Financial Allocations, Financial Allocation Amendments, Time Extensions and Technical Corrections,. These changes shall be mutually binding upon the Parties only following the execution of a Program Supplement amendment.

Section 3. Allowable Costs and Payments

A. *Allowable Costs and Progress Payment Invoice*

1. Not more frequently than once a month, Recipient will prepare and submit to State signed Progress Payment Invoice for actual Project costs incurred and paid for by Recipient consistent with the Scope of Work document in the Program Supplement and State shall pay those uncontested allowable costs once the invoice is reviewed and approved by the Department, subject to CalSTA's approval. If no costs were incurred during any given quarter, Recipient is exempt from submitting a signed Progress Payment Invoice.
2. State shall not be required to reimburse more funds, cumulatively, per quarter of any fiscal year greater than the sums identified and included in the Project Financial Plan.

3. The State shall hold the right to determine reimbursement availability based on an approved expenditure plan and TIRCP anticipated or actual funding capacity.

4. Each such invoice will report the total of Project expenditures from GGRF and SB 1 Funds (including those of Recipient and third parties) and will specify the percent of State reimbursement requested and the GGRF fund and SB 1 Funds source.

B. *Final Invoice*

The Program Supplement Termination Date refers to the last date for Recipient to incur valid Project costs or credits and is the date that the Program Supplement expires. Recipient has one hundred and eighty (180) days after that Termination Date to make already incurred final allowable payments to Project contractors or vendors, prepare the Project Closeout Report, and submit the final invoice to State for reimbursement of allowable Project costs before those remaining State funds are unencumbered and those funds are reverted as no longer available to pay any Project costs. Recipient expressly waives any right to allowable reimbursements from State pursuant to this Agreement for costs incurred after that termination date and for costs invoiced to Recipient for payment after that one hundred and eightieth (180th) day following the Project Termination Date.

ARTICLE III – GENERAL PROVISIONS

Section 1. Funding

1. Recipient agrees to contribute at least the statutorily or other required local contribution of matching funds (other than State or federal funds), if any is specified within the Program Supplement or any appendices thereto, toward the actual cost of the Project or the amount, if any, specified in any executed SB 2800 (Streets and Highways Code Section 164.53) Agreement for local match fund credit, whichever is greater. Recipient shall contribute not less than its required match amount toward the Project cost in accordance with a schedule of payments as shown in the Project Financial Plan prepared by Recipient and approved by State as part of a Program Supplement.

Section 2. Audits and Reports

A. *Cost Principles*

1. Recipient agrees to comply with Title 2 Code of Federal Regulations 200 (2 CFR 200) Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards.

2. Recipient agrees, and will assure that its contractors and subcontractors will be obligated to agree to follow 2 CFR 200 and it shall be used to determine the allowability of individual Project cost items. Every sub-recipient receiving Project funds as a contractor or sub-contractor under this Agreement shall comply with 2 CFR 200.

3. Any Project costs for which Recipient has received payment or credit that are determined by subsequent audit to be unallowable under 2 CFR 200, are subject to repayment by Recipient to State. Should Recipient fail to reimburse moneys due State within thirty (30) days of demand, or within such other period as may be agreed in writing between the Parties hereto, State is authorized to intercept and withhold future payments due Recipient from State or any third-party source whose funding passes through the State, including but not limited to, the State Treasurer, the State Controller and the CTC.

4. The State may terminate the grant for any reason at any time if it is determined by the State, based on an audit under this section, that there has been a violation of any State or federal law or policy by the Recipient during performance under this or any other grant agreement or contract entered into with the State. If the grant is terminated under this section, the Recipient may be required to fully or partially repay funds.

B. *Record Retention*

1. Recipient agrees, and will assure that its contractors and subcontractors shall establish and maintain an accounting system and records that properly accumulate and segregate incurred Project costs and matching funds by line item for the Project. The accounting system of Recipient, its contractors and all subcontractors shall conform to Generally Accepted Accounting Principles (GAAP), enable the determination of incurred costs at interim points of completion, and provide support for reimbursement payment vouchers or invoices. All accounting records and other supporting papers of Recipient, its contractors and subcontractors connected with Project performance under this Agreement and each Program Supplement shall be maintained for a minimum of three (3) years from the date of final payment to Recipient under a Program Supplement and shall be held open to inspection, copying, and audit by representatives of State, the California State Auditor, and auditors representing the federal government. Copies thereof will be furnished by Recipient, its contractors, and subcontractors upon receipt of any request made by State or its agents. In conducting an audit of the costs and match credits claimed under this Agreement, State will rely to the maximum extent possible on any prior audit of Recipient pursuant to the provisions of federal and State law. In the absence of such an audit, any acceptable audit work performed by Recipient's external and internal auditors may be relied upon and used by State when planning and conducting additional audits.

2. For the purpose of determining compliance with Title 21, California Code of Regulations, Section 2500 et seq., when applicable, and other matters connected with the performance of Recipient's contracts with third parties pursuant to Government Code section 8546.7, Recipient, Recipient's contractors and subcontractors and State shall each maintain and make available for inspection all books, documents, papers, accounting records, and other evidence pertaining to the performance of such contracts, including, but not limited to, the costs of administering those various contracts. All of the above referenced parties shall make such Agreement and Program Supplement materials available at their respective offices at all reasonable times during the entire Project period and for three (3) years from the date of final payment to Recipient under any Program Supplement. State, the California State Auditor, or any duly authorized

representative of State or the United States Department of Transportation, shall each have access to any books, records, and documents that are pertinent to the Project for audits, examinations, excerpts, and transactions, and Recipient shall furnish copies thereof if requested.

3. Recipient, its contractors and subcontractors will permit access to all records of employment, employment advertisements, employment application forms, and other pertinent data and records by the State Fair Employment Practices and Housing Commission, or any other agency of the State of California designated by State, for the purpose of any investigation to ascertain compliance with this Agreement and the Act.

C. *Reporting Requirements*

1. Subject to the discretion of State, Recipient agrees to provide on a quarterly basis, Project Progress Reports that include the following information:

- a. Activities and progress made towards implementation of the project;
- b. Identification of whether the Project is proceeding on schedule and within budget;
- c. Identification of changes to the Project funding plan;
- d. Any actual or anticipated problems which could lead to delays in schedule, increased costs or other difficulties for either the Project or other State funded projects impacted by the Projects scope of work;
- e. Identify metrics and benefits achieved for disadvantaged communities, low income communities, and/or low income households;
- f. Reporting requirements per California Air Resource Board Cap and Trade Auction Proceeds Funding Guidelines for Agencies that Administer California Climate Investments which may include, continued reporting following project implementation to identify benefits achieved.

2. Reporting requirements of Recipient will include whether reported implementation activities are within the scope of the Project Program Supplement and in compliance with State laws, regulations, and administrative requirements.

3. Within one year of the Project or reportable Project components becoming operable, the implementing agency must provide a final delivery report including at a minimum:

- a. Scope of completed Project as compared to Programmed Project;
- b. Performance outcomes derived from the project as compared to outcomes described in the Project application and shall include but not be limited to before and after measurements and estimates for ridership, service levels, greenhouse gas reductions, updated estimated greenhouse gas reductions over the life of the project, benefits to disadvantaged communities, low income communities, and/or low income

households, and project co-benefits as well as an explanation of the methodology used to quantify the benefits.

Section 3. Special Requirements

A. *California Transportation Commission Resolutions*

1. Recipient shall adhere to applicable CTC policies on "Timely Use of Funds" as stated in Resolution G-06-04, adopted April 26, 2006, addressing the expenditure and reimbursement of GGRF Funds and SB 1 Funds. These resolutions, and/or successor resolutions in place at the time a Program Supplement is executed, shall be applicable to GGRF funds and SB 1 funds, respectively.

2. Recipient shall be bound to the terms and conditions of this Agreement, the Project application contained in the Program Supplement (as applicable); and CTC Resolutions G-06-04, G-09-11 and/or their respective successors in place at the time the Program Supplement is signed (as applicable) and all restrictions, rights, duties and obligations established therein on behalf of State and CTC shall accrue to the benefit of the CTC and shall thereafter be subject to any necessary enforcement action by CTC or State. All terms and conditions stated in the aforesaid CTC Resolutions and CTC-approved Guidelines in place at the time the Program Supplement is signed (if applicable) shall also be considered to be binding provisions of this Agreement.

3. Recipient shall conform to any and all permit and mitigation duties associated with Project as well as all environmental obligations established in CTC Resolution G-91-2 and/or its successors in place at the time a Program Supplement is signed, as applicable, at the expense of Recipient and/or the responsible party and without any further financial contributions or obligations on the part of State unless a separate Program Supplement expressly provides funding for the specific purpose of hazardous materials remediation.

B. *Recipient Resolution*

1. Recipient has executed this Agreement pursuant to the authorizing Recipient resolution, attached as Appendix C to this Agreement, which empowers Recipient to enter into this Agreement and which may also empower Recipient to enter into all subsequent Program Supplements adopting the provisions of this Agreement.

2. If Recipient or State determines that a separate Resolution is needed for each Program Supplement, Recipient will provide information as to who the authorized designee is to act on behalf of the Recipient to bind Recipient with regard to the terms and conditions of any said Program Supplement or amendment and will provide a copy of that additional Resolution to State with the Program Supplement or any amendment to that document.

C. *Termination*

1. State reserves the right to terminate funding for any Program Supplement, subject to CalSTA approval, upon written notice to Recipient in the event that Recipient fails to proceed with Project work in accordance with the Program Supplement, or otherwise violates the conditions of this Agreement and/or the Program Supplement or the funding allocation such that substantial performance is significantly endangered.
2. No such termination shall become effective if, within thirty (30) days after receipt of a notice of termination, Recipient either cures the default involved or, if not reasonably susceptible of cure within said thirty (30)-day period, Recipient proceeds thereafter to complete the cure in a manner and time line acceptable to State. Any such termination shall be accomplished by delivery to Recipient of a notice of termination, which notice shall become effective not less than thirty (30) days after receipt, specifying the reason for the termination, the extent to which funding of work under this Agreement is terminated and the date upon which such termination becomes effective, if beyond thirty (30) days after receipt. During the period before the effective termination date, Recipient and State shall meet to attempt to resolve any dispute.
3. Following a fund encumbrance made pursuant to a Program Supplement, if Recipient fails to expend GGRF or SB 1 monies within the time allowed specified in the Program Supplement, those funds may revert and be deemed withdrawn and will no longer be available to reimburse Project work unless those funds are specifically made available beyond the end of that Fiscal Year through re-appropriation or other equivalent action of the Legislature and written notice of that action is provided to Recipient by State.
4. In the event State terminates a Program Supplement for convenience and not for a default on the part of Recipient as is contemplated in this section, Recipient shall be reimbursed its authorized costs up to State's proportionate and maximum share of allowable Project costs incurred to the date of Recipient's receipt of that notice of termination, including any unavoidable costs reasonably and necessarily incurred up to and following that termination date by Recipient to effect such termination following receipt of that termination notice.

D. *Third Party Contracting*

1. Recipient shall not award a construction contract over \$10,000 or other contracts over \$25,000 [excluding professional service contracts of the type which are required to be procured in accordance with Government Code Sections 4525 (d), (e) and (f)] on the basis of a noncompetitive negotiation for work to be performed under this Agreement without the prior written approval of State. Contracts awarded by Recipient, if intended as local match credit, must meet the requirements set forth in this Agreement regarding local match funds.
2. Any subcontract entered into by Recipient as a result of this Agreement shall contain the provisions of ARTICLE III – GENERAL PROVISIONS, Section 2. Audits and Reports and shall mandate that travel and per diem reimbursements and third-party contract reimbursements to

subcontractors will be allowable as Project costs only after those costs are incurred and paid for by the subcontractors.

3. In addition to the above, the preaward requirements of third party contractor/consultants with local transit agencies should be consistent with Local Program Procedures (LPP-00-05).

E. Change in Funds and Terms/Amendments

This Agreement and the resultant Program Supplements may be modified, altered, or revised only with the joint written consent of Recipient and State.

F. Project Ownership

1. Unless expressly provided to the contrary in a Program Supplement, subject to the terms and provisions of this Agreement, Recipient, or a designated subrecipient acceptable to State, as applicable, shall be the sole owner of all improvements and property included in the Project constructed, installed or acquired by Recipient or subrecipient with funding provided to Recipient under this Agreement. Recipient, or subrecipient, as applicable, is obligated to continue operation and maintenance of the physical aspects of the Project dedicated to the public transportation purposes for which Project was initially approved unless Recipient, or subrecipient, as applicable, ceases ownership of such Project property; ceases to utilize the Project property for the intended public transportation purposes; or sells or transfers title to or control over Project and State is refunded the Credits due State as provided in paragraph (2) herein below.

2. Project right-of-way, Project facilities constructed or reconstructed on the Project site and/or Project property (including vehicles and vessels) purchased by Recipient (excluding temporary construction easements and excess property whose proportionate resale proceeds are distributed pursuant to this Agreement) shall remain permanently dedicated to the described public transit use in the same proportion and scope, and to the same extent as mandated in the Program Supplement, unless State agrees otherwise in writing. Vehicles acquired as part of Project, including, but not limited to, buses, vans, rail passenger equipment, shall be dedicated to that public transportation use for their full economic life cycle, which, for the purpose of this Agreement, will be determined in accordance with standard national transit practices and applicable rules and guidelines, including any extensions of that life cycle achievable by reconstruction, rehabilitation or enhancements. The exceptions to this section are outlined below:

a. Except as otherwise set forth in this Section 4, State, or any other State-assignee public body acting on behalf of the CTC, shall be entitled to a refund or credit (collectively the Credit), at State's sole option, equivalent to the proportionate Project funding participation received by Recipient from State if Recipient, or a sub-recipient, as applicable, (i) ceases to utilize Project for the original intended public transportation purposes or (ii) sells or transfers title to or control over Project. If federal funds (meaning only those federal funds received directly by

Recipient and not federal funds derived through or from the State) have contributed to the Project, Recipient shall notify both State and the original federal source of those funds of the disposition of the Project assets or the intended use of those sale or transfer receipts.

b. State shall also be entitled to an acquisition credit for any future purchase or condemnation of all or portions of Project by State or a designated representative or agent of State.

c. The Credit due State will be determined by the ratio of State's funding when measured against the Recipient's funding participation (the Ratio). For purposes of this Section 4, the State's funding participation includes federal funds derived through or from State. That Ratio is to be applied to the then present fair market value of Project property acquired or constructed as provided in (d) and (e) below.

d. For Mass Transit vehicles, this Credit [to be deducted from the then remaining equipment value] shall be equivalent to the percentage of the full extendable vehicle economic life cycle remaining, multiplied by the Ratio of funds provided for that equipment acquisition. For real property, this same funding Ratio shall be applied to the then present fair market value, as determined by State, of the Project property acquired or improved under this Agreement.

e. Such Credit due State as a refund shall not be required if Recipient dedicates the proceeds of such sale or transfer exclusively to a new or replacement State approved public transit purpose, which replacement facility or vehicles will then also be subject to the identical use restrictions for that new public purpose and the Credit ratio due State should that replacement project or those replacement vehicles cease to be used for that intended described pre-approved public transit purpose.

i. In determining the present fair market value of property for purposes of calculating State's Credit under this Agreement, any real property portions of the Project site contributed by Recipient shall not be included. In determining State's proportionate funding participation, State's contributions to third parties (other than Recipient) shall be included if those contributions are incorporated into the Project.

ii. Once State has received the Credit as provided for above because Recipient, or a sub-recipient, as applicable, has (a) ceased to utilize the Project for the described intended public transportation purpose(s) for which State funding was provided and State has not consented to that cessation of services or (b) sold or transferred title to or control over Project to another party (absent State approval for the continued transit operation of the Project by that successor party under an assignment of Recipient's duties and obligations), neither Recipient, subrecipient, nor any party to whom Recipient or subrecipient, as applicable, has transferred said title or control shall have any further obligation under this Agreement to continue operation of Project and/or Project facilities for those described public transportation purposes, but may then use Project and/or any of its facilities for any lawful purpose.

iii. To the extent that Recipient operates and maintains Intermodal Transfer Stations as any integral part of Project, Recipient shall maintain each station and all its appurtenances, including, but not limited to, restroom facilities, in good condition and repair in accordance with high standards of cleanliness (Public Utilities Code section 99317.8). Upon request of State, Recipient shall also authorize State-funded bus services to use those stations and appurtenances without any charge to State or the bus operator. This permitted use will include the placement of signs and informational material designed to alert the public to the availability of the State-funded bus service (for the purpose of this paragraph, "State-funded bus service" means any bus service funded pursuant to Public Utilities Code section 99316).

G. *Disputes*

Parties shall develop a mutually agreed upon issue resolution process, as described below, and issues between the Parties are to be resolved in a timely manner. The Parties agree to the following:

1. If the Parties are unable to reach agreement on any particular issue relating to either Parties' obligations pursuant to this Agreement, the Parties agree to promptly follow the issue resolution process as outlined below:

a. The Department's project manager and the Recipient's equivalent may initiate the process of informal dispute resolution by providing the other Party with written notice of a dispute. The written notice shall provide a clear statement of the dispute, and shall refer to the specific provisions of this Agreement or Program Supplement that pertain to the dispute. The Department's project manager and the Recipient's equivalent shall meet and attempt to resolve the dispute within five days from the written notice. If the dispute is resolved, the Parties shall create and sign a short description of the facts and the resolution that was agreed upon by the Parties.

b. If the dispute is not resolved by the fifth day from the written notice, the Department's senior project manager and the Recipient's equivalent shall meet and review the dispute within five days. The Department's senior project manager and the Recipient's equivalent manager shall attempt to resolve the dispute within ten days of their initial meeting. If the dispute is resolved, the Parties shall create and sign a short description of the facts and the resolution that was agreed upon by the Parties.

c. If the dispute is not resolved by the tenth day, the Department's Director or his designee and the Recipient's equivalent manager shall meet and review the dispute within five days. The Department's Director or his designee and the Recipient's equivalent manager shall attempt to resolve the dispute within ten days of the initial meeting. If the dispute is resolved, the Parties shall create and sign a short description of the facts and the resolution that was agreed upon by the Parties. If the dispute is not resolved by the tenth day by the Department's Director or his designee and the Recipient's equivalent manager, the Parties shall submit the matter to the Secretary of CalSTA for a final administrative determination.

H. *Hold Harmless and Indemnification*

1. Neither State nor any officer or employee thereof shall be responsible for any damage or liability occurring by reason of anything done or omitted to be done by Recipient, its agents and contractors under or in connection with any work, authority, or jurisdiction delegated to Recipient under this Agreement or any Program Supplement or as respects environmental clean-up obligations or duties of Recipient relative to Project. It is also understood and agreed that, Recipient shall fully defend, indemnify and hold the CTC and State and their officers and employees harmless from any liability imposed for injury and damages or environmental obligations or duties arising or created by reason of anything done or imposed by operation of law or assumed by, or omitted to be done by Recipient under or in connection with any work, authority, or jurisdiction delegated to Recipient under this Agreement and all Program Supplements.

2. Recipient shall indemnify, defend and hold harmless State, the CTC and the State Treasurer relative to any misuse by Recipient of State funds, Project property, Project generated income or other fiscal acts or omissions of Recipient.

I. *Labor Code Compliance*

Recipient shall include in all subcontracts awarded using Project funds, when applicable, a clause that requires each subcontractor to comply with California Labor Code requirements that all workers employed on public works aspects of any project (as defined in California Labor Code §§ 1720-1815) be paid not less than the general prevailing wage rates predetermined by the Department of Industrial Relations as effective the date of Contract award by the Recipient.

J. *Non-Discrimination Clause*

1. In the performance of work under this Agreement, Recipient, its contractor(s) and all subcontractors, shall not unlawfully discriminate, harass or allow harassment against any employee or applicant for employment because of sex, race, color, ancestry, religious creed, national origin, physical disability, mental disability, medical condition, age, marital status, family and medical care leave, pregnancy leave, and disability leave. Recipient, its contractor(s) and all subcontractors shall ensure that the evaluation and treatment of their employees and applicants for employment are free from such discrimination and harassment. Recipient, its contractor(s) and all subcontractors shall comply with the provisions of the Fair Employment and Housing Act (Government Code section 12900 et seq.), and the applicable regulations promulgated thereunder (California Code of Regulations, Title 2, section 7285 et seq.). The applicable regulations of the Fair Employment and Housing Commission implementing Government Code section 12990 (a-f), set forth in Chapter 5 of Division 4 of Title 2 of the California Code of Regulations, are incorporated into this Agreement by reference and made a part hereof as if set forth in full. Each of Recipient's contractors and all subcontractors shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other agreements, as appropriate.

2. Each of the Recipient's contractors, subcontractors, and/or subrecipients shall give written notice of their obligations under this clause to labor organizations with which they have collective bargaining or other labor agreements. The Recipient shall include the non-discrimination and compliance provisions hereof in all contracts and subcontracts to perform work under this Agreement.

3. Should federal funds be constituted as part of Project funding or compensation received by Recipient under a separate Contract during the performance of this Agreement, Recipient shall comply with this Agreement and with all federal mandated contract provisions as set forth in that applicable federal funding agreement.

4. Recipient shall include the non-discrimination and compliance provisions of this clause in all contracts and subcontracts to perform work under this Agreement.

5. The Recipient shall comply with the nondiscrimination program requirements of Title VI of the Civil Rights Act of 1964. Accordingly, 49 CFR 21 (Nondiscrimination in Federally-Assisted Programs of The Department Of Transportation—Effectuation of Title VI of The Civil Rights Act of 1964) and 23 CFR Part 200 (Title VI Program and Related Statutes—Implementation and Review Procedures) are made applicable to this Agreement by this reference. Wherever the term "Contractor" appears therein, it shall mean the Recipient.

6. The Recipient shall permit, and shall require that its contractors, subcontractors, and subrecipients will permit, access to all records of employment, employment advertisements, application forms, and other pertinent data and records by the State Fair Employment Practices and Housing Commission or any other agency of the State of California designated by Department to investigate compliance with this Section J.

K. *State Fire Marshal Building Standards Code*

The State Fire Marshal adopts building standards for fire safety and panic prevention. Such regulations pertain to fire protection design and construction, means of egress and adequacy of exits, installation of fire alarms, and fire extinguishment systems for any State-owned or State-occupied buildings per section 13108 of the Health and Safety Code. When applicable, Recipient shall request that the State Fire Marshal review Project PS&E to ensure Project consistency with State fire protection standards.

L. *Americans with Disabilities Act*

By signing this Master Agreement, Recipient assures State that Recipient shall comply with the Americans with Disabilities Act (ADA) of 1990, which prohibits discrimination on the basis of disability, as well as all applicable regulations and guidelines issued pursuant to the ADA (42 U.S.C. 12101 et seq.).

M. *Access for Persons with Disabilities*

Disabled access review by the Department of General Services (Division of the State Architect) is required for all publicly funded construction of buildings, structures, sidewalks, curbs and related facilities. Recipient will award no construction contract unless Recipient's plans and specifications for such facilities conform to the provisions of sections 4450 and 4454 of the California Government Code, if applicable. Further requirements and guidance are provided in Title 24 of the California Code of Regulations.

N. *Disabled Veterans Program Requirements*

1. Should Military and Veterans Code sections 999 et seq. be applicable to Recipient, Recipient will meet, or make good faith efforts to meet, the 3% Disabled Veterans Business Enterprises goals (or Recipient's applicable higher goals) in the award of every contract for Project work to be performed under these this Agreement.

2. Recipient shall have the sole duty and authority under this Agreement and each Program Supplement to determine whether these referenced code sections are applicable to Recipient and, if so, whether good faith efforts asserted by those contractors of Recipient were sufficient as outlined in Military and Veterans Code sections 999 et seq.

O. *Environmental Process*

Completion of the Project environmental process ("clearance") by Recipient (and/or State if it affects a State facility within the meaning of the applicable statutes) is required prior to requesting Project funds for right-of-way purchase or construction. No State agency may request funds nor shall any State agency, board or commission authorize expenditures of funds for any Project effort, except for feasibility or planning studies, which may have a significant effect on the environment unless such a request is accompanied with all appropriate documentation of compliance with or exemption from the California Environmental Quality Act (CEQA) (including, if as appropriate, an environmental impact report, negative declaration, or notice of exemption) under California Public Resources Code section 21080(b) (10), (11), and (12) provides an exemption for a passenger rail project that institutes or increases passenger or commuter services on rail or highway rights-of-way already in use.

P. *Force Majeure*

Each party will be excused from performance of its obligations where such non-performance is caused by any event beyond its reasonable control, such as any non-appealable order, rule or regulation of any federal or state governmental body, Acts of God (of Acts of God (including fire, flood, earthquake, storm, hurricane or other natural disaster), war, invasion, act of foreign enemies, hostilities (regardless of whether war is declared), civil war, rebellion, revolution, insurrection, military or usurped power or confiscation, terrorist activities, nationalization, government sanction, blockage, embargo, labor dispute, strike, lockout or interruption, provided

that the party excused hereunder shall use all reasonable efforts to minimize its non-performance and to overcome, remedy or remove such event in the shortest practical time.

Should a *force majeure* event occur which renders it impossible for a period of forty-five (45) or more consecutive days for either party to perform its obligations hereunder, the Parties agree to negotiate in good faith to amend the existing Business Plan or Business Plan Update to deal with such event and to seek additional sources of funding to continue the operation of the Service.

ARTICLE IV – MISCELLANEOUS PROVISIONS

Section 1. Miscellaneous Provisions

A. *Successor Acts*

All statutes cited herein shall be deemed to include amendments to and successor statutes to the cited statutes as they presently exist.

B. *Successor and Assigns to the Parties*

Neither this Agreement nor any right, duty or obligation hereunder may be assigned, transferred, hypothecated or pledged by any party without the express written consent of the other party; provided, that unless otherwise expressly required herein, a party shall not be obligated to obtain the written consent of the other party with respect to any contract related to the Service for the provision of goods and/or services to the contracting party in the ordinary course of business.

C. *Notice*

Any notice which may be required under this Agreement shall be in writing, shall be effective when received, and shall be given by personal service, or by certified or registered mail, return receipt requested, to the addresses set forth below, or to such other addresses as may be specified in writing and given to the other party in accordance herewith.

If given to the Department:

State of California

Department of Transportation

Division of Rail and Mass Transportation

P.O. Box 942874

Sacramento, CA 95832-0001

Attention: Mass Manager, MS 39

with a copy to:

California State Transportation Agency
915 Capitol Mall Suite 350 B
Sacramento, CA 95814

If given to the Recipient:

Shasta Regional Transportation Agency
1255 East Street, Suite 202
Redding, CA 96001
Attention: Jennifer Pollom

D. *Amendment*

This Agreement may not be changed, modified, or amended except in writing, signed by the parties hereto, and approved in advance in writing by the Secretary, and any attempt at oral modification of this Agreement shall be void and of no effect.

E. *Representation and Warranties of the Parties*

a. Recipient hereby represents and warrants to the Department that:

i. Recipient is in good standing under applicable law, with all requisite power and authority to carry on the activities for which it has been organized and proposed to be conducted pursuant to this Agreement.

ii. Recipient has the requisite power and authority to execute and deliver this Agreement and to carry out its obligations hereunder. The execution and delivery of this Agreement by such entity, the performance by it of its obligations thereunder and the consummation of the transactions contemplated thereby have been duly authorized by the governing board of such entity and no other proceedings are necessary to authorize this Agreement or to consummate the transactions contemplated thereby. The Agreements have been duly and validly executed and delivered by such entity and constitute valid and binding obligations of such entity, enforceable against it in accordance with their terms, except to the extent that such enforceability may be subject to bankruptcy, insolvency, reorganization, moratorium or other laws now or hereinafter in effect relating to the creditor's rights and the remedy of specific enforcement and injunctive and other forms of equitable relief, and may be subject to equitable defenses and to the discretion of the court before which any proceeding therefore may be brought.

iii. Neither the execution and delivery of this Agreement and the performance of its obligations thereunder nor the consummation of the transactions contemplated thereby will

(i) conflict with or result in a breach of any provision of any agreement to which Recipient is a party; (ii) violate any writ, order, judgment, injunction, decree, statute, rule or regulation of any court or governmental authority applicable to such entity or its property or assets.

b. The Department does hereby represent and warrant with respect to each of this Agreement to the Recipient that:

i. It validly exists with all requisite power and authority to carry on the activities proposed to be conducted pursuant to this Agreement.

ii. It has the requisite power and authority to execute and deliver this Agreement and to carry out its obligations thereunder. The execution and delivery of this Agreement, the performance by it of its obligations thereunder and the consummation of the transactions contemplated thereby have been duly authorized and no other proceedings are necessary to authorize this Agreement or to consummate the transactions contemplated thereby. The agreements have been duly and validly executed and delivered by it and constitute valid and binding obligations, enforceable against it in accordance with their terms, except to the extent that such enforceability may be subject to bankruptcy, insolvency, reorganization, moratorium or other laws now or hereinafter in effect relating to creditor's rights and other forms of equitable relief, and may be subject to equitable defenses and to the discretion of the court before which any proceeding therefore may be brought.

iii. Neither the execution and delivery of this Agreement and the performance of its obligations thereunder nor the consummation of the transactions contemplated thereby will (i) conflict with or result in a breach of any other agreement; (ii) violate any writ, order, judgment, injunction, decree, statute, rule or regulation of any court or governmental authority applicable to such entity or its property or assets.

F. *Construction, Number, Gender and Captions*

The Agreements have been executed in the State of California and shall be construed according to the law of said State. Numbers and gender as used therein shall be construed to include that number and/or gender which is appropriate in the context of the text in which either is included. Captions are included therein for the purposes of ease of reading and identification. Neither gender, number nor captions used therein shall be construed to alter the plain meaning of the text in which any or all of them appear.

G. *Complete Agreement*

This Agreement, including Appendices, constitutes the full and complete agreement of the parties, superseding and incorporating all prior oral and written agreements relating to the subject matter of this Agreement. All attached Appendices A through E are hereby incorporated and made an integral part of this Agreement by this reference.

H. *Partial Invalidity*

If any part of this Agreement is determined to be invalid, illegal or unenforceable, such determination shall not affect the validity, legality or enforceability of any other part of this Agreement and the remaining parts of this Agreement shall be enforced as if such invalid, illegal or unenforceable part were not contained herein.

I. *Conflicts*

To the extent that any provision of or requirement of this Agreement may conflict with a provision or requirement of any other agreement between the parties hereto, or between a party hereto and any other party, which is attached to this Agreement as an appendix, the priority of agreements shall be employed to resolve such conflict. IN the event of a conflict, the Master Agreement controls the Program Supplement and any further Amendments.

J. *Counterparts*

This Agreement may be executed in one or more counterparts and may include multiple signature pages, all of which shall be deemed to be one instrument. Copies of this Agreement may be used in lieu of the original.

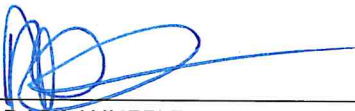
K. *Governing Law*

The Agreement shall be governed by and construed in accordance with the laws of the State of California.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement by their duly authorized officers.

[SIGNATURES TO FOLLOW]

**STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION**

BY: 
DARA WHEELER
Chief, Division of Rail and Mass
Transportation

**SHASTA REGIONAL
TRANSPORTATION AGENCY**

BY: 
DANIEL S. LITTLE, AICP
Executive Director

APPROVED AS TO FORM AND PROCEDURE

**STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION**

BY: 
JON OLDENBURG
Deputy Attorney

APPENDIX A

TIRCP PROGRAM GUIDELINES AND DEPARTMENT DELEGATION

2018 TRANSIT AND INTERCITY RAIL CAPITAL PROGRAM GUIDELINES

October 13, 2017



TRANSIT AND INTERCITY RAIL CAPITAL PROGRAM

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1 Authority and Purpose

The Transit and Intercity Rail Capital Program was created by Senate Bill 862 (Chapter 36, Statutes of 2014) and modified by Senate Bill 9 (Chapter 710, Statutes of 2015) to provide grants from the Greenhouse Gas Reduction Fund to fund transformative capital improvements that will modernize California's intercity, commuter, and urban rail systems, and bus and ferry transit systems, to significantly reduce emissions of greenhouse gases, vehicle miles traveled, and congestion.

Senate Bill 9 requires this grant cycle to approve a five-year program of projects starting with the 2018-19 fiscal year and ending with the 2022-23 fiscal year. Funding for this five-year cycle may significantly increase due to legislation passed in 2017. First, Senate Bill 1 (Chapter 5) provides a historic funding increase for transportation with an estimated \$1.4 billion directed to the Transit and Intercity Rail Capital Program from the Public Transportation Account for new programming in this cycle. Second, Assembly Bill 398 (Chapter 135) extended the Cap and Trade Program from 2020 through 2030, potentially providing an estimated \$1 billion in Greenhouse Gas Reduction Funds to this program during the programming period of 2018-19 through the 2022-2023 fiscal year. While these amounts are reasonable estimates as of the date of the guidelines, funding from both sources are subject to impacts from market forces. Auction proceeds, in particular, may vary significantly from one auction to the next.

These guidelines describe the policy, standards, criteria, and procedures for the development, adoption and management of the Transit and Intercity Rail Capital Program. The guidelines were developed in consultation with the California Air Resources Board, the California Transportation Commission (Commission), the Department of Transportation (Caltrans), and the Strategic Growth Council, and were informed by input received both in writing and through in-person workshops in the summer and fall of 2017.

2 Background

The Global Warming Solutions Act of 2006 (Assembly Bill [AB] 32, Nunez, Chapter 488) created a comprehensive program to reduce greenhouse gas emissions in California. AB 32 requires California to reduce greenhouse gas emissions to 1990 levels by 2020, and to maintain and continue reductions beyond 2020. In 2016, Governor Brown signed Senate Bill 32 (Chapter 249) that sets a climate goal for California to reduce greenhouse gases to 40 percent below 1990 levels by 2030. Senate Bill 398 extends the Cap and Trade Program to help achieve the 2030 climate goal.

The Cap-and-Trade Program, a key element in California's Scoping Plan, implements measure to achieve greenhouse gas reduction goals. It creates a limit on the emissions from sources responsible for 85 percent of California's greenhouse gas emissions, establishes the price signal needed to drive long-term investment in cleaner fuels and more efficient use of energy, and gives covered entities flexibility to implement the lowest-cost options to reduce greenhouse gas emissions.

In 2012, the Legislature passed and Governor Brown signed into law three bills, AB 1532 (Pérez, Chapter 807, Statutes of 2012), Senate Bill (SB) 535 (De León, Chapter 830, Statutes of 2012), and SB 1018 (Budget and Fiscal Review Committee, Chapter 39, Statutes of 2012), that established the Greenhouse Gas Reduction Fund to receive the State's portions of proceeds from the distribution of allowances via auction and provided the framework for how those auction proceeds will be appropriated and expended. Subsequent legislation, AB 1550 (Chapter 369, Statutes of 2016), modified requirements for expenditures from the Greenhouse Gas Reduction Fund relative disadvantaged communities and low- income

communities and households. State law requires that expenditures from the Greenhouse Gas Reduction Fund be used to facilitate the achievement of greenhouse gas emission reductions. In addition, Transit and Intercity Rail Capital Program expenditures must comply with the requirements contained in SB 862 and SB 9, which provide statutory direction the program.

Senate Bill 1 (Chapter 5, Statutes of 2017) provides a historic funding increase for transportation with an estimated ten-year funding level of \$54 billion to fix highways and local roads and bridges, address congestion for commuters and freight movement, and invest in transit and active transportation. SB 1 funds are estimated to provide about \$1.4 billion for the Transit and Intercity Rail Capital Program in 2017-18 through 2022-23.

3 Objectives

The goals of the Transit and Intercity Rail Capital Program are to provide monies to fund transformative capital improvements that modernize California's intercity rail, bus (including feeder buses to intercity rail services, as well as vanpool services that are eligible to report as public transit to the Federal Transit Administration), ferry, and rail transit systems (collectively referred to as transit services or systems inclusive of all aforementioned modes unless otherwise specified) to achieve all of the following objectives:

1. Reduce emissions of greenhouse gases
2. Expand and improve transit service to increase ridership
3. Integrate the rail service of the state's various rail operations, including integration with the high-speed rail system
4. Improve transit safety

Additionally, SB 862 establishes a programmatic goal to provide at least 25 percent of available funding to projects that provide a direct, meaningful, and assured benefit to disadvantaged communities, consistent with the objectives of SB 535 and AB 1550, and address a community need.

4 Funding

The Transit and Intercity Rail Capital Program will receive both a specified portion of annual Senate Bill 1 revenues and 10 percent of the Cap-and-Trade auction proceeds deposited in the Greenhouse Gas Reduction Fund.

Pursuant to Senate Bill 9 of 2015, the California State Transportation Agency (CalSTA) will adopt a multi-year program of projects covering 2018-19 through 2022-23. An estimate for the funding available for the Transit and Intercity Rail Capital Program will be available with the call for projects.

While the Fund Estimate will be based on anticipated revenue through 2022-23, Senate Bill 9 authorizes CalSTA to enter into a multi-year funding agreement with an eligible applicant for an amount of program money and for any duration. Such a multi-year funding agreement would be implemented in cooperation with the Commission. CalSTA may use this authority to allow an allocation of funds for a project that would depend on revenue received subsequent to the allocation, and could include funds received subsequent to the 2022-23 fiscal year.

Pursuant to SB 9, no later than July 1, 2018, CalSTA will approve an initial five-year program of projects with the first year being 2018-19, with additional five-year programs approved by April 1 of each even-numbered year thereafter. Each program of projects shall be a statement of intent by the Transportation Agency for the allocation and expenditure of moneys during those five fiscal years.

As provided in statute, the Transportation Agency may revise its approved program of projects as necessary, including to better align allocation authority with available funding. The Transportation Agency may also adopt an allocation plan for multi-year projects, tying allocation of funding to an awarded project to funds available in specified fiscal years. The goal of such a plan is to allow a project with construction over multiple years to have a commitment of funds programmed over multiple years in order to enter into necessary contracts for construction.

5 Schedule

Distribute discussion draft guidelines	Aug. 4, 2017
Present discussion draft guidelines to California Transportation Commission	Aug 17, 2017
Informal workshop, Southern California	Aug. 18, 2017
Informal workshop, Northern California	Aug. 21, 2017
Post and send final draft guidelines to Legislature	Aug. 29, 2017
Workshop, Southern California	Sep. 29, 2017
Workshop, Northern California	Oct. 2, 2017
Final comments on guidelines due to CalSTA	Oct 5, 2017
CalSTA publishes final program guidelines	Oct. 13, 2017
Call for projects	Oct. 13, 2017
Optional meetings to discuss project concepts and quantification with CalSTA and Caltrans staff	Nov 6-14, 2017
Project applications due to Caltrans	Jan. 12, 2018
CalSTA publishes summary of applications	Feb. 12, 2018
CalSTA anticipates publishing list of approved projects	Apr. 30, 2018
Anticipated presentation of project list to CTC (at regular meeting)	May 2018

6 Eligible Applicants

Eligible applicants must be public agencies, including joint powers agencies, that operate or have planning responsibility for existing or planned regularly scheduled intercity or commuter passenger rail service (and associated feeder bus service to intercity rail services), urban rail transit service, or bus or ferry transit service (including commuter bus services and vanpool services). Public agencies include construction authorities, transportation authorities, and other similar public entities created by statute.

An applicant assumes responsibility and accountability for the use and expenditure of program funds. Applicants must comply with all relevant federal and state laws, regulations, policies, and procedures.

7 Eligible Projects

Eligible applicants may submit project applications individually or as part of a joint application. In order to be eligible for funding under this program, **a project must demonstrate that it will achieve a reduction in greenhouse gas emissions using the CARB quantification methodology.**

Projects eligible for funding under the program include, but are not limited to, the following:

1. Rail capital projects, including the acquisition of rail cars and locomotives, and the facilities to support them, that expand, enhance, or improve existing rail systems and connectivity to existing and future transit systems, including the high-speed rail system.
2. Intercity, commuter, and urban rail projects that increase service levels, improve reliability, or

decrease travel times. These projects may include infrastructure access payments to host railroads in lieu of capital investments, efforts to improve existing rail service effectiveness with a focus on improved operating agreements, schedules, and minor capital investments that are expected to generate increased ridership, as well as larger scale projects designed to achieve significantly larger benefits.

3. Rail, bus, and ferry integration implementation, including: integrated ticketing and scheduling systems and related capital investments (including integration with bus or ferry operators); projects enabling or enhancing shared-use corridors without increasing net air pollution (both multi-operator passenger only corridors as well as passenger-freight corridors); related planning efforts focused on, but not limited to, delivery of integrated service not requiring major capital investment; and other service integration initiatives.
4. Bus rapid transit and other bus and ferry transit investments (including vanpool services operated as public transit) to increase ridership and reduce greenhouse gas emissions, including capital investments, as a component implementing transit effectiveness studies, that will contribute to restructured and enhanced service.

CalSTA intends to fund a small number of transformative projects that will significantly reduce vehicle miles traveled, congestion, and greenhouse gas emissions by creating a new transit system, increasing the capacity of an existing transit system, or otherwise significantly increasing the ridership of a transit system. Significant change will be measured both in percentage terms and in total quantity terms. These may include, for example, both lower-cost projects focused on integration, reliability and enhancement of service, and higher-cost capital expansion projects. In addition, CalSTA seeks projects that link key destinations and improve accessibility to economic opportunities.

CalSTA may also make some funding available for demonstration projects that are smaller-scale efforts with great potential to be expanded. Projects may include novel approaches to attracting new riders such as smart phone mobile ticketing or other software and hardware solutions to reduce ticketing transaction costs, or a test of a concept related to integrated ticketing, as well as intercity rail or transit effectiveness or operational planning as a component of the capital investments in improved, expanded and/or restructured service designed to cost-effectively increase ridership.

Pursuant to statute, the Transit and Intercity Rail Capital Program is required to fund transformative capital improvements, including the facilities that support them, that significantly reduce vehicle miles traveled, congestion, and greenhouse gas emissions, along with achieving geographic equity. An applicant submitting multiple project applications must clearly prioritize its projects, and is encouraged to identify phases or priorities within each project application, if applicable, if available resources do not permit the full project to be funded. Applicants submitting a high-dollar, single application with no scalability or separable project elements may increase the risk of having an uncompetitive project application. At the same time, applicants are advised to submit projects that are scalable where practical. In the event that available program resources expand or contract prior to the completion of the programming cycle, the Transportation Agency may revise the funding available for the programming cycle.

While there is no minimum match requirement for this funding source, funding leverage is desirable and will be considered in the evaluation of expected project benefits. In particular, emphasis will be placed on projects that leverage funding from other greenhouse gas reduction programs such as Caltrans' Low Carbon Transit Operations Program, the Strategic Growth Council's Affordable Housing and Sustainable Communities Program or the California Air Resources Board's Low Carbon Transportation funding program, leveraging of funding from SB1 sources (including formula program sources), or the leveraging of funding from other federal, state, local or regional sources (including potential local transportation funding measures, as further detailed in Section 11), with consideration of those sources that are discretionary compared to those that are non-discretionary. A recipient of money under the program may combine funding from the program with other state funding (if allowed), including, but not limited

to, the State Transportation Improvement Program, the Low Carbon Transit Operations Program, the State California Air Resources Board clean vehicle program, and state transportation bond funds.

If a project is awarded funds, all funds identified as committed to the project may be required as a funding match at the time of project selection, and based on the matching percentage identified at the time of selection, a pro-rata reimbursement agreement (or other suitable agreement) may be established to ensure project savings are equitably distributed and that committed non-TIRCP funds are not supplanted. If capital assets are removed from service before the end of their useful life, pro-rata repayment of grant funds may be required.

Redeployment of capital assets to achieve similar, or greater, benefits more effectively (i.e., redeploying bus service to achieve greater greenhouse gas reductions or better serve a disadvantaged community based on current needs) may be permitted, but must be documented (with documentation including a detailed justification of the requested redeployment) by the grantee and approved in advance by CalSTA.

CalSTA will give priority to projects which fund construction or implementation; however, projects that will be completed with other funds are eligible for funding. If an implementing agency receives funding for a project that is to be completed with other funds (for example, a project which receives funds for plans, specifications, and estimates from the Transit and Intercity Rail Capital Program but which will receive local measure funding for construction), that agency is required to complete the project as proposed. If the project is not completed as proposed, the agency may be required to fully or partially repay funds from the Transit and Intercity Rail Capital Program commensurate with the failure to complete the project and deliver anticipated reductions in greenhouse gas emissions.

Prior to the project application due date, CalSTA intends to invite interested eligible applicants to optional meetings to discuss proposed project concepts and greenhouse gas reduction quantification in order to clarify program requirements.

8 Project applications

Applications must be submitted to Caltrans by January 12, 2018. Applications will be treated in accordance with Public Records Act requirements and certain information, subject to those requirements, may be publicly disclosed.

Each project application must include:

A signed cover letter, with signature authorizing and approving the application.

An explanation of the project and its proposed benefits, including the following:

1. Project title, which should be a brief non-technical description of the project type, scope, and location.
2. Project priority (if agency is submitting multiple applications). Explain the prioritization, including any state, regional or local planning efforts that support the ranking.
3. Project purpose and need.
4. Project scope.
5. Project Location
 - Provide a map for each of the following
 - A. Project location denoting the project site. Provide a KML file for the project with the transit route/project location represented by lines and stops represented by points as applicable.
 - B. Project location denoting disadvantaged communities, low-income communities, and/or low-income households that will benefit from the project, as applicable, according to the

California Air Resources Board's 2017 Draft Funding Guidelines for Agencies that Administer California Climate Investments released on August 4, 2017 (Funding Guidelines). The Funding Guidelines document is available here:

<https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/fundingguidelines.htm>

- C. Greenhouse gas reducing features such as the transportation corridors experiencing improved air quality, surrounding land use density, housing and employment centers, transit oriented development/sustainable communities strategy projects, active transportation infrastructure and other features, to the extent available.
- 6. Project costs

Documentation of the basis for the costs, benefits and schedules must be cited in the project application and made available upon request. The application should identify:

 - A. Cost estimates should be escalated to the year of proposed delivery.
 - B. Only cost estimates approved by the Chief Executive Officer or other authorized officer of the implementing agency should be used.
 - C. The amount and source of funds committed to the project (including funding for initial operating costs). A funding commitment is defined in section 11 below.
 - D. The amount of Transit and Intercity Rail Capital Program funds requested. Transit and Intercity Rail Capital Program funds cannot be used to supplant other committed funds.
- 7. Project schedule, including the project's current status and major delivery milestones.
- 8. Project benefits:
 - A. A clear demonstration of the expected benefits and the proposed metrics for tracking and reporting on those benefits consistent with the California Air Resources Board's Funding Guidelines (www.arb.ca.gov/cc/capandtrade/auctionproceeds/fundingguidelines.htm).
 - B. The description of project benefits must address all of the Primary and Secondary Evaluation Criteria listed below under Project Selection Process (Section 9), indicating that a category is not applicable or no benefits are expected when that is the case.
 - C. An estimate of the useful life of the project for the dominant project asset type (can be separated by project category or phase if elements of the project have independent utility and could be separately funded or placed in service).
 - D. When investment of TIRCP is proposed to improve private infrastructure, an assessment of public and private benefits to show that the share of public benefit is commensurate with the share of public funding.
 - E. If a project will be competing for funding from other greenhouse gas reduction programs (such as Caltrans' Low Carbon Transit Operations Program, the Strategic Growth Council's Affordable Housing and Sustainable Communities Program or the California Air Resources Board's Low Carbon Transportation funding program) or from the Commission's Active Transportation or State Transportation Improvement Programs, the applicant must indicate if there are separable elements that will be funded from those other sources. The applicant must clearly explain any change to the benefits of the project if the funding from that source is not awarded to the project.
 - F. Identify studies or planning documents relevant to expected project benefits and include a copy of the referenced documents as an attachment.
- 9. A discussion of the proposed project's impact, both favorable and unfavorable, on other transit services and projects planned or underway within the corridor, including intercity rail, transit or high speed rail services in a parallel or connecting corridor. Impacted plans should be clearly identified and corresponding planning documents should be included as an attachment. If ridership of the other services are expected to be impacted by the proposed project, evidence of how the other services are to be impacted should be included in the application, including evidence of coordination with the other service providers and an estimate of multi-operator impacts where available. Project

impacts that increase ridership on other services through increased transfers of passengers may be reflected in the quantification of GHG benefits only if the project also documents the ability of the connected corridor to provide capacity sufficient to accommodate the riders. If additional service must be operated by the adjoining operator, the operation of such service must be included in the calculation of emissions related to the project. If an agency recognizes value in additional efforts to integrate services with other transportation providers or enhance station access (including by active transportation) during the post-award period (and prior to the beginning of service resulting from the project), a specific task and budget for the proposed activities should be included in the project application. The general scope of the proposed effort should be submitted in draft form, but is considered subject to revision and development of additional detail prior to allocation of TIRCP funding for these activities. During application review, if additional efforts are seen as necessary in order to successfully integrate the project with other services or to address station access, CalSTA may propose an additional task and potentially assign additional funding to pursue such integration and access planning above and beyond what is requested in the project application, with the scope agreed to during development of the agreements necessary to implement the selected project.

10. If appropriate, an explanation of how some or all of the project provides direct, meaningful, and assured benefits to a disadvantaged community, low income communities or low income households. Identify a need of that community, including how the need was established identify the portion of the project, if any, that is located within a disadvantaged community or low income community and that addresses the need (see Section 9.3 and Attachment 1). If an agency plans to engage in additional efforts to consult with disadvantaged or low income stakeholders during the post-award period (and prior to the beginning of service resulting from the project), a specific task and budget for the proposed activities should be included in the project application. Such efforts may include plans for service implementation of the specific project, addressing station access issues specific to the stakeholders, as well as developing proposals for service changes and capital investments that may be funded through future capital or operating funds or through project cost savings. Activities that address community engagement may include, but are not limited to, public workshops/meetings, door-to-door canvassing, house meetings, established website and/or social media efforts, surveys, focus groups, subcontracts with community-based organizations to conduct outreach, allocation of staff or contractor positions focused on community engagement, and advisory bodies or other shared decision-making bodies. The general scope of the proposed effort should be submitted in draft form, but is considered subject to revision and development of additional detail prior to allocation of TIRCP funding for these activities. During application review, if additional efforts are seen as necessary in order to successfully address the needs of disadvantaged or low income stakeholders, CalSTA may propose an additional task and potentially assign additional funding to pursue such consultations above and beyond what is requested in the project application, with the scope agreed to during development of the agreements necessary to implement the selected project.
11. Description of funding sources and approach to ensuring ongoing operating and maintenance costs of the project are funded through the useful life of the project (as applicable).
12. Each application must include a Project Programming Request (PPR) Form. A template of this form in Excel may be found at www.dot.ca.gov/drrmt/sptircp.html. Each Project Programming Request must list Federal, State, and local funding categories by fiscal year. All applicants must demonstrate the ability to absorb any cost overruns and deliver the proposed project with no additional funding from this program beyond that provided in initial grant or cooperative agreement, and to fund initial operating costs. If the project is a scope addition to a project with a prior PPR Form, the prior PPR should be included, and the revised PPR must not reflect supplantation of previously committed funds.

An eligible applicant may submit an application to fund a project over multiple fiscal years. The cost of each project component must be listed in the State fiscal year in which the particular

project component can be delivered. For environmental studies and permits, costs should be listed in the fiscal year during which environmental studies will begin. Costs for the preparation of plans, specifications, and estimates should be listed in the fiscal year during which this work will begin. Right-of-way costs should be listed in the fiscal year(s) during which each right-of-way acquisition (including utility relocation) contract will first be executed. Construction costs should be programmed in the fiscal year during which each construction contract will be advertised, or if an agency can receive TIRCP construction funding over multiple fiscal years to fund a given proposed contract, a reflection of the years in which construction funding is required to meet expected contract requirements. If a project is expected to require multiple contracts for any stage of project development, each contract should be listed separately. Applicants are encouraged to submit a narrative explanation or supplement to the PPR to reflect the proposed contracting approach, and describing the ability of the project to receive funds on varying allocation schedules. If a project has special cash flow considerations that would benefit from TIRCP funds being available at a particular time, please describe this in the application. Finally, please note if a project is only requesting funds for a particular phase of the proposed project, such as a construction contract expected to be awarded in year three of the project. Under these circumstances, TIRCP funding allocation may be conditioned on achieving bid-ready status.

12. Letters of support for project implementation, including letters from:
 - A. Project partners essential to project implementation, such as host railroads or facility owners. If TIRCP funds are to be used at a later stage of project implementation (such as construction), and an agency is able to commit to delivering the project goals with no additional TIRCP funding (supplementing if necessary from non-TIRCP sources), letters of support may indicate overall support for the project as described in the application and willingness to engage in best efforts to achieve a formal agreement for the construction elements of the project requiring future stakeholder agreement. Allocation of awarded TIRCP funding will be conditioned on such agreements being finalized and the project being implemented in a manner consistent with original application.
 - B. A Metropolitan Planning Organization (MPO), indication that the project is or is not consistent with an adopted Sustainable Communities Strategy, or in non-MPO regions, a regional plan to reduce greenhouse gas emissions. (It is not necessary for establishment of project eligibility for an MPO to indicate its specific support for the project.)
 - C. Regional agency or agencies.
 - D. Members of the community, including representatives of impacted disadvantaged or low income communities. Letters from community organizations stating their recognition of benefits from the project are encouraged.
 - E. Additional stakeholders relevant to the proposed project
13. Description of project elements that are separable or scalable based on available funding, if applicable, while still maintaining independent utility. For example, if an application is for improving service on three routes, each route should be separately described and prioritized so that the highest-priority portion of the application could be funded if resources are not sufficient for full project funding. If some or all of the project is already programmed using state or federal funds, the application must clearly explain if and how the scope of the project has changed since the most recent state or federal programming action. If the project is not scalable, the applicant should provide background detailing why it is not practical for it to be phased or scaled.

Documentation of the basis for the costs, benefits, and schedules must be included in the project application and additional detail made available upon request.

CalSTA will post basic project application information from all applications on its website prior to awarding funding. After projects are selected, CalSTA will post the status of all project applications to its website.

Each project will be required to track and report on project status and benefits. CalSTA encourages project applicants to carefully consider how to track the status and benefits of the proposed project, including having project budgets that allow for an appropriate level of before and after data collection and analysis (e.g., greenhouse gas reductions, diesel particulate matter reductions, increased transit service for disadvantaged community residents, etc.). This tracking could take the form of customer surveys made before and after the proposed project, specific data analysis before and after the project, or other efforts. Since this is an ongoing funding program of the state, developing lessons learned and good supporting data are critical to future program effectiveness.

9 Project Evaluation

Applications will receive an initial screening for completeness and eligibility. Incomplete or ineligible applications may not be evaluated.

9.1 Primary Evaluation Criteria

Projects will be selected through a competitive process. The primary evaluation will be based on how well a project meets the objectives of the program:

1. Reduce greenhouse gas (GHG) emissions. The California Air Resources Board (CARB) has developed a quantification methodology for estimating greenhouse gas reductions that may occur as a result of project implementation (see Appendix 2). The inputs and assumptions behind these calculations must be thoroughly documented as part of the application. Applicants should present project elements that are scalable or separable in a manner that allows the greenhouse gas emission reductions of each element to be understood. Total cost per ton of carbon dioxide equivalents (CO₂e) reduction and Transit and Intercity Capital Program funding per ton of CO₂e reduction will be primary elements of the evaluation for project selection. Applicants must quantify greenhouse gas reductions (see Appendix 2) and submit reporting information in accordance with the California Air Resources Board's Funding Guidelines (www.arb.ca.gov/cc/capandtrade/auctionproceeds/fundingguidelines.htm), including reporting on benefits to disadvantaged communities, low-income communities, and/or low-income households. Highly rated projects will exhibit a low cost per ton of CO₂e reduction, and will have strong documentation of the ridership and passenger mile impacts of the project.
2. Increase ridership through expanded and improved rail and transit service (including connectivity to rail services through expanded and improved transit and/or feeder bus services). Documentation of the assumptions and approach to estimating ridership changes is a critical component of evaluating greenhouse gas emission reductions. Highly rated projects will have significant ridership impacts relative to the project cost and well documented methodologies for establishing ridership forecasts. If multiple operators benefit from or are impacted by a project, highly rated projects will document specific ridership results specific to each operator, including any reductions impacting other operators.
3. Integrate the services of the state's various rail and transit operations, including integration with the high-speed rail system, as described in the most recent, currently approved High Speed Rail Business Plan, or subsequent documents referenced at the time of project solicitation. Highly rated projects will demonstrate specific agreements and project features that ensure integration, will often include multiple agencies cooperating to deliver a project, and will generally have a significant portion of ridership benefitting from integration.
4. Improve safety. Projects that include specific measures to address safety for users or non-users of the transit or rail service should specifically note such project elements and the

funding related to them. Such improvements may include grade separations, improved crossing protection at railroad crossings, or elements in transit stations that reduce the likelihood of pedestrian fatalities and injuries, among other safety elements. Such safety elements may also include elements that increase the safety of disadvantaged and/or vulnerable populations, including safer circulation for the elderly, mobility impaired, very young, and the vision impaired. Highly rated projects will have significant project element related to safety and will not leave major safety considerations unaddressed.

9.2 Secondary Evaluation Criteria

Projects will also be evaluated based on the following criteria:

1. The co-benefits of projects that support the implementation of sustainable communities strategies through one or more of the following:
 - A. Reducing vehicles miles traveled from automobiles and the number of automobile trips through growth in transit ridership.
 - B. Promoting housing development in the vicinity of rail stations and major transit centers, including existing or planned high-density housing development within one-half mile walk of an applicant's rail stations or major transit stops. Consideration will be given to station communities with HCD-certified housing elements, high-density zoning, affordable housing, and strategies for avoiding the displacement of local residents as related to the project elements.
 - C. Increasing the attractiveness of a transit-served area for the location of additional jobs and housing, and the resulting low-carbon impact of such location efficiency on statewide GHG emissions relative to the status quo.
 - D. Expanding existing rail and public transit systems.
 - E. The contribution of the project to the acceleration of later phases of the project or to other rail and transit projects in the region or service area.
 - F. Enhancing the connectivity, integration, and coordination of the state's various transit systems, including, but not limited to, regional and local transit systems and the high-speed rail system.
 - G. Implementing clean vehicle technology, especially zero emission technology.
 - H. Promoting active transportation, by increasing the proportion of trips accomplished by biking and walking or increasing the safety and mobility of bicyclists and pedestrians.
 - I. Improving public health, with particular emphasis on elements benefiting the most impacted and disadvantaged communities, low-income communities, and/or low-income households.
 - J. Air quality impacts of the project not included in the reduction of greenhouse gas emissions, including health benefits from improved regional air quality resulting from the project.
2. Benefit to disadvantaged communities, low-income communities, and/or low-income households. The applicant must evaluate the criteria detailed in Attachment 1 to determine whether the project meets criteria for providing direct, meaningful, and assured benefits to a disadvantaged community, low-income community, and/or low-income households and address a community need pursuant the California Air Resources Board's Funding Guidelines (www.arb.ca.gov/cc/capandtrade/auctionproceeds/fundingguidelines.htm), and specifically document the manner in which all or part of the project does so. Projects that will be used by residents of disadvantaged communities, low-income communities, and/or low-income households should document the nature of such use and its degree of relevance to disadvantaged community, low-income community, and/or low-income household

residents in the service areas of the operators benefiting from the project. Project applicants should be explicit on the deliberate steps they take to achieve a meaningful level of participation from disadvantaged communities, low-income communities, and/or low-income households in the planning and design of projects that are intended to address community identified priorities and needs.

3. The project priorities developed through the collaboration of two or more rail operators and any memoranda of understanding between state agencies (including intercity rail joint powers authorities) and local or regional rail operators.
4. Geographic equity, with particular attention by applicants in identifying efforts to address underserved communities within an applicant's region or service area. The Transportation Agency will separately apply geographic equity considerations at a statewide level.
5. Consistency with a plan or strategy contained in an adopted Sustainable Communities Strategy, as confirmed by the Metropolitan Planning Organization (MPO), or, in non-MPO regions, a regional plan that includes policies and programs to reduce greenhouse gas emissions. Projects that are part of a regional network and are considered regionally significant should be noted as such. All referenced documents should be included as an attachment.
6. Benefits to freight movement.
7. The extent to which a project has supplemental funding committed to it from non-state sources, with an emphasis on projects that leverage funding from private, federal, local or regional sources that are discretionary.
8. Integration across other modes of transportation, such as connections at airports, bus and ferry terminals, and subway stations.
9. For expansions of service, the presence and quality of a financial plan that analyzes the financial viability of the proposed service, including the availability of any required operating financial support.

Highly rated projects will address and score highly on multiple secondary evaluation criteria, with clear documentation of claimed benefits. Clear documentation will include data related to evaluating the claimed benefits to the extent available. Agencies are encouraged to document in the secondary evaluation criteria categories of verifiable greenhouse gas reducing activities associated with a project that are not specifically captured in the primary evaluation categories and in the quantification tool provided by the California Air Resources Board.

9.3 Benefit to Disadvantaged Communities and Low Income Communities and Households

It is a goal of this program to maximize benefits to disadvantaged communities and low income communities and households. Pursuant to the requirements of Senate Bill 535 of 2012, as amended by Assembly Bill 1550 of 2016, the overall California Climate Investments Program funded with Cap-and-Trade auction proceeds must result in: (1) a minimum of 25% of the available moneys in the Greenhouse Gas Reduction Fund to projects located within, and benefiting individuals living in, disadvantaged communities, (2) an additional minimum of 5% to projects that benefit low-income households or to projects located within, and benefiting individuals living in, low-income communities located anywhere in the state, and (3) an additional minimum of 5% either to projects that benefit low-income households that are outside of, but within a 1/2 mile of, disadvantaged communities, or to projects located within the boundaries of, and benefiting individuals living in, low-income communities that are outside of, but within a 1/2 mile of, disadvantaged communities.

(CalEPA) has identified disadvantaged communities and low income communities through the map available at this website:

<https://calepa.ca.gov/envjustice/ghginvest/>

To identify low-income households, a “look-up” tool and a list of HCD’s “low-income” thresholds by county and household size are available at: www.arb.ca.gov/cci-communityinvestments.

In addition to contributing benefits towards meeting or exceeding the AB 1550 investment minimums, the TIRCP has a statutory investment target for benefits to disadvantaged communities required by SB 862 (a 25% minimum). This applies across the entire program regardless of funding source. Agencies are responsible for documenting compliance with these requirements. Investments that are eligible to be counted toward AB 1550 as projects within and benefiting disadvantaged communities will also count toward meeting the SB 862 requirements. Refer to criteria in Funding Guidelines (further referenced below) for how to demonstrate benefit.

SB 862 requires the California Air Resources Board, in consultation with CalEPA, to develop funding guidelines for all agencies that are appropriated monies from the Greenhouse Gas Reduction Fund. These guidelines must include a component for how administering agencies should maximize benefits for disadvantaged communities.. The California Air Resources Board released the 2017 Draft Funding Guidelines for Agencies that Administer California Climate Investments on August 4, 2017. Stakeholders can find the Funding Guidelines at this CARB website: <https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/fundingguidelines.htm>

In reviewing efforts to maximize benefits to disadvantaged communities, low-income communities, and/or low-income households, CalSTA may request review of applications by an advisory panel representing such stakeholders during the evaluation of applications. The primary goal of this panel will be to review proposed efforts (both pre-application and those proposed for the post-award period) and to either confirm that the applicant efforts will help align the proposed project with stakeholder and community needs, or to recommend efforts that would allow such needs to be addressed (see items 9 and 10 in section 8 describing how such efforts may be requested and funded as part of project selection).

10 Project Selection Process

CalSTA will evaluate applications for compliance with the objectives of the program and rate them based on the aforementioned primary and secondary criteria, assigning ratings such as “High,” “Medium- High,” “Medium,” “Medium-Low”, and “Low” to the specific alignment of the project to each of the selection criteria, and also considering the cost per ton of CO₂e reduction and the risks of successful project delivery. Because of the wide variety in the type and size of projects that can be funded from this program, CalSTA may group projects for the purpose of comparing the ratings of like applications or for purposes of comparing projects within a region. In addition, projects with clear phases or scalability may be evaluated for the portion of the project that would receive the highest rating if partial funding for the project is under consideration. The highest rated applications that meet the program objectives will be selected for programming, except that CalSTA may make adjustments to meet the disadvantaged community goals of this program and to provide geographic equity.

In addition to being evaluated on the aforementioned criteria and benefit to disadvantaged communities, low-income communities, and/or low-income households, including addressing community needs, each application will also be assessed to determine the risk associated with the

project's capacity to generate, as planned, transportation and greenhouse gas emission reduction benefits (including potential sensitivity to different project benefit outcomes), and to be delivered within budget, on time, and as designed.

Additional factors to be considered include:

1. The overall need and benefit of the project in the context of its contribution to advancing later phases of the project, other aspects of a region's long range plans or towards improving the state's interregional transportation network.
2. Project readiness and reasonableness of the schedule for project implementation, including the following:
 - A. Progress towards achieving environmental protection requirements.
 - B. The comprehensiveness and sufficiency of agreements with key partners (particularly infrastructure owning railroads) that will be involved in implementing the project.
 - C. For projects that are not fully funded through construction, the timing and amount of the project's future non-committed investments. *Please note: CalSTA will give priority to projects which fund construction or implementation.*
3. The leveraging and coordination of funding from other greenhouse gas reduction programs such as Caltrans' Low Carbon Transit Operations Program, the Strategic Growth Council's Affordable Housing and Sustainable Communities Program or the California Air Resources Board's Low Carbon Transportation funding program.
4. The leveraging and coordination of funding from other private, federal, state (including SB1 funding programs), local or regional sources, with consideration of those sources that are discretionary compared to those that are non-discretionary.

Highly rated projects will clearly communicate a compelling need for the project in terms of specific benefits for the public, and will demonstrate a high degree of project readiness with few risks related to proceeding into construction and operating services that achieve the proposed benefits once the project is completed. Most highly rated projects will have an approved environmental document. Those projects that are requesting TIRCP funds to complete the project's funding package (when combined with already committed other funds) will clearly communicate the acceleration in project delivery possible due to receipt of TIRCP funding even if the project may ultimately have been advanced with future local and state resources at a later date. Highly rated projects will quantify the benefits of such acceleration as part of the project application.

CalSTA will collaborate with other state entities when evaluating project proposals, including but not limited to: the California Air Resources Board, CalEPA, the California High-Speed Rail Authority, Caltrans, the Commission, the Department of Housing and Community Development, and the Strategic Growth Council.

CalSTA, or Caltrans acting on CalSTA's behalf, may request additional documentation to support statements or data provided in the applications. However, applicants should endeavor to be as clear as possible in their applications and not assume that opportunity will be provided to clarify or better support a submitted application. Supporting documentation should include spreadsheets, reports and methodology descriptions (with sources noted) when available.

Applications will proceed through a multi-step review process:

1. Basic screening for completeness and eligibility
2. Review of application for potential subdivision into project phases or components, review and analysis of ridership and GHG quantification, and summarization of project to assist technical panel review
3. Initial rating of projects on each primary and secondary evaluation criterion (see section 9) and other additional factors (above in this section) described in the guidelines by multi-

agency technical panels

4. Consideration of technical panel ratings, geographic equity and degree of disadvantaged and/or low-income community benefits by a senior executive panel, with potential to request additional information from subject matter experts that may result in a revised rating on one or more evaluation criteria or factors
5. Project selection by CalSTA, taking into consideration cross-cutting and comparative selection criteria that consider overall program objectives, geographic equity and exceeding program goals for benefits to disadvantaged communities, low-income communities, and/or low-income households.

11 Programming

CalSTA intends to publish a 5-year program of approved projects by April 30, 2018, and to present the program to the Commission at its May 2018 meeting (subject to potential revision). When CalSTA releases the program, it will include a narrative for each approved project that describes that project's rating for primary and secondary criteria as well as special considerations to achieve disadvantaged and/or low-income community benefit and geographic equity. Subsequent programs are expected to be approved by CalSTA biennially. CalSTA may call for additional programming, or adjust existing programming between cycles, as warranted based on the level of auction proceeds.

CalSTA will develop a multi-year allocation plan to guide the allocation of projects at the Commission. The program of projects for each fiscal year will include, for each project, the amount to be funded from the Transit and Intercity Rail Capital Program, and the estimated total cost of the project. Total project costs will include all project support costs and all project listings will specify costs for each of the following components: (1) completion of all permits and environmental studies; (2) preparation of plans, specifications, and estimates; (3) right-of-way capital outlay; (4) support for right-of-way acquisition; (5) construction capital outlay; and (6) construction management and engineering, including surveys and inspection. The cost of each project component will be listed in the Transit and Intercity Rail Capital Program no earlier than in the fiscal year in which the particular project component can be implemented.

When proposing to fund only preconstruction components for a project, the applicant must demonstrate the means by which it intends to fund the construction of a useable segment, consistent with a regional transportation plan or the Caltrans interregional transportation strategic plan. *Please note: CalSTA will give priority to projects which fund construction or implementation.*

When project design, right-of-way, or construction are programmed before the implementing agency completes the environmental process, the applicant must submit to CalSTA updated cost estimates, updated analysis of the project's cost effectiveness, and updated analysis of the project's ability to further the goals of the program following the completion of the environmental process. If this updated information indicates that a project is expected to accomplish fewer benefits or is less cost effective as compared with the initial project application, future funding for the project may be deleted from the program.

Consistent with Commission policies, CalSTA will program and the Commission will allocate funding to projects in whole thousands of dollars and will include a project or project component only if it is fully funded from a combination of Transit and Intercity Rail Capital Program and other committed funding. Funds will be considered as committed when they are programmed by the CalSTA or when the agency or other funding partner with discretionary authority over the funds has made its commitment to the project by ordinance, resolution or appropriate contract vehicle, or in the case of the Federal Transit Administration, recommendation of the project for funding in the *Annual Report on Funding Recommendations* for the Capital Investment Program.

For federal formula funds, including Surface Transportation Program, Congestion Mitigation and Air Quality Improvement Program, and federal formula transit funds, the funding commitment may be by Federal approval of the Federal Statewide Transportation Improvement Program. For projects seeking federal discretionary funds such as New Starts, Core Capacity, or Small Starts, the commitment may take the form of federal acceptance into Accelerated Project Delivery and Development (in the case of Small Starts) with the expectation of federal approval of an Expedited Grant Agreement, or federal approval of a project to enter Engineering (in the case of New Starts or Core Capacity) with the expectation of federal approval of a Full Funding Grant Agreement, as long as all funding, excluding Transit and Intercity Rail Capital Program funding, is committed to the project. A project that is programmed prior to receiving federal approval for construction must receive the federal approval for construction prior to the start of the next Transit and Intercity Rail Capital Program call for projects or the project may be subject to deletion from the program unless other committed funding sources are identified that replace federal funding not obtained. For planning purposes, applicants considering a request for a contingent commitment should anticipate the next call for projects to be on or prior to October 1, 2019 (date subject to revision by CalSTA).

For local funding, the funding commitment may be demonstrated by inclusion of the project in a funding package, such as a sales tax measure, to be submitted to voters during this program cycle and with sufficient funding specified for the project to achieve full funding. The applicant shall provide evidence with the application that the project is included in a future funding package with funds sufficient to meet the local funding commitment when combined with other already available funds. A project that is programmed prior to receiving voter approval for project funding must succeed in receiving the voter approval, or the project may be subject to deletion from the program.

For projects with other funding partners that have entered into a contract vehicle committing their funding, access to the funding must occur before TIRCP funding will be approved for allocation to the project.

If projects do not receive their anticipated federal, local or other funding partner funding commitments, CalSTA may delete the project from the program and consider selection of projects or components of projects that were highly rated but not selected due to lack of sufficient funds in the 2018 round of applications. An applicant may resubmit a deleted project for consideration in future funding round.

CalSTA may make an exception to its policy to only program a project if it is fully funded, if the project may be funded from a combination of Transit and Intercity Rail Capital Program and other committed funding to allow a project to compete for funding from other greenhouse gas reduction programs (such as Caltrans' Low Carbon Transit Operations Program, the Strategic Growth Council's Affordable Housing and Sustainable Communities Program or the California Air Resources Board's Low Carbon Transportation funding program) or from the Commission's Active Transportation or State Transportation Improvement Programs. A project intending to compete for funding in one of the aforementioned programs should indicate, if appropriate, the separable elements to be funded from that source. A project that is programmed prior to receiving a commitment of funding from one of the aforementioned programs must receive the funding commitment in the fiscal year prior to the year in which the project is requesting funding from the Transit and Intercity Rail Capital Program. If the project does not receive funding from that program and the project does not have separable elements, the project may be subject to deletion from the program.

12 Allocations and Project Delivery

When an agency is ready to implement a project or project component, the agency will submit an allocation request to Caltrans. The typical time required, after receipt of the application, to complete

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Caltrans review, and recommendation and Commission allocation is 60 days. The specific details and instructions for the allocation, transfer and liquidation of funds allocated to implementing agencies are included in the Procedures for Administering Local Grant Projects in the State Transportation Improvement Program (see www.dot.ca.gov/hq/LocalPrograms/lam/prog_g/g23stip-2013-10-31.pdf).

Caltrans and CalSTA will review the request and determine whether or not to recommend the request to the Commission for action. The Commission will consider the allocation of funds for a project when it receives an allocation with a recommendation from Caltrans and CalSTA. The recommendation will include a determination of project readiness, the availability of appropriated funding, and the availability of all identified and committed funding. When Caltrans develops its construction allocation recommendation, the Commission expects Caltrans to certify that a project's plans specifications and estimate are complete, environmental and right-of-way clearances are achieved, and all necessary permits and agreements (including railroad construction and maintenance) are executed.

In compliance with Section 21150 of the Public Resources Code, the Commission will not allocate funds for design, right-of-way, or construction prior to documentation of environmental clearance under the California Environmental Quality Act. As a matter of policy, the Commission will not allocate funds for design, right-of-way, or construction of a federally funded project prior to documentation of environmental clearance under the National Environmental Policy Act (NEPA). Exceptions to this policy may be made in instances where federal law allows for the acquisition of right-of-way prior to completion of NEPA review. If requested by the Commission, Caltrans will assist Commission staff in the preparation of agenda items presenting environmental documents to the Commission.

The Commission will approve the allocation if the funds are available, as determined by CalSTA and Caltrans, and the allocation is necessary to implement the project as included in the adopted Transit and Intercity Rail Capital Program. If there are insufficient program funds to approve an allocation, CalSTA may delay the recommendation to allocate funds to a project until the next fiscal year without requiring a Commission action. Agencies should not request Commission allocations unless prepared to award contracts related to the allocation within six months. Funds available following the deletion of a project may be allocated to a programmed project advanced from a future fiscal year or to a project amended into the program.

The Transit and Intercity Rail Capital Program is a reimbursement program for costs incurred. Costs incurred prior to Commission allocation and, for federally funded projects, federal project approval (i.e. Authorization to Proceed) are not eligible for reimbursement. Moreover, contracts may not be awarded prior to fund allocation without specific pre-approval by CalSTA and approval of a Letter of No Prejudice by the Commission. For the procurement of rolling stock and buses, the Commission may consider the exercising

of an option or the certification of funds for contract elements as meeting the milestone for contract award provided that the agency is under no contractual obligation to pay any funds or penalty if the option is not exercised or the funds not certified.

Once the allocation is approved by the Commission, Caltrans and CalSTA will prepare appropriate agreements with the agency. These agreements may include project specific conditions required by CalSTA and Caltrans based on the overall scope of work and expected outcome of the project.

Prior to the completion of project design, an agency may propose to CalSTA modifications to the proposed project in order to achieve the same or greater level of benefits or reduced costs. -

Funds allocated for project development or right-of-way costs must be expended by the end of the fiscal year of allocation plus two additional fiscal years, unless a longer time-frame is specifically authorized by CalSTA tied to contracting requirements. Funds allocated for construction phase contracts, including rolling stock procurement, will have an expenditure timeline determined by the

project schedule. Following liquidation of all project funding and contract acceptance, the implementing agency has six months to make the final payment to the contractor or vendor, prepare the Final Report of Expenditures and submit the final invoice to Caltrans for reimbursement.

12.1 Letter of No Prejudice

An agency may apply to the Commission for a letter of no prejudice for a project or for any component of a project included in the approved program of projects. Statutory authority is provided in Section 75225 of the Public Resources Code as added by Senate Bill 9 of 2015. If approved by the Commission, the letter of no prejudice will allow the agency to expend its local funds for the project or any component of the project and to be eligible for future reimbursement. The amount will be reimbursed if all of the following conditions are met:

1. The project or project component for which the letter of no prejudice was requested has commenced and the expenditures have been incurred.
2. The expenditures are eligible for reimbursement in accordance with applicable laws and procedures. If expenditures made by the lead applicant agency are determined to be ineligible, the state has no obligation to reimburse those expenditures.
3. The agency complies with all legal requirements for the project, including the requirements of the California Environmental Quality Act (Division 13 (commencing with Section 21000)).
4. There are moneys in the Greenhouse Gas Reduction Fund or from SB 1 revenues designated for the program that are sufficient to make the reimbursement payment.

The agency and the Commission shall enter into an agreement governing reimbursement as described in this section.

The Commission, in consultation with intercity, commuter, urban rail, and other public transit entities, may develop guidelines to implement this section.

12.2 Multiyear Funding Agreement

An agency may apply to CalSTA for a multiyear funding agreement. Statutory authority is provided in Section 75224 (d) of the Public Resources Code as added by Senate Bill 9 of 2015. Any such agreements shall be implemented in cooperation with the Commission. If approved by CalSTA, the multi-year funding agreement would operate similar to a federal Full Funding Grant Agreement, wherein an agency may receive an allocation and implement a project at risk, with receipt of future state revenue dependent on legislative appropriation and/or receipt of program SB 1 revenue or Cap-and-Trade auction proceeds. The state would not be responsible for any borrowing costs an agency may incur, or other costs, allocated with the timeline of state revenue availability. Pursuant to Section 75224, the multiyear funding agreement would be for any amount of program money and for any duration, as determined jointly by the CalSTA and the applicant. CalSTA may agree to a duration that exceeds the five-year programming cycle, if deemed helpful in completing large transformative capital projects. Other requirements for the program will be included in the multiyear funding agreement as determined by CalSTA in cooperation with the applicant and the Commission.

12.3 Project Delivery Deadline Extensions

CalSTA, as explained below, may grant a deadline extension if it finds that an unforeseen and

extraordinary circumstance has occurred that justifies the extension. The extension will not exceed the period of delay directly attributable to the extraordinary circumstance.

There are separate deadlines, for award of a contract, for expenditures for project development or right-of-way, and for project completion, and each project component has its own deadlines. CalSTA may grant the extension of a deadline for award of a contract, for expenditures for project development or right-of-way, for project completion, and for project reimbursement.

All requests for project delivery deadline extensions should be submitted by the agency responsible for project delivery to Caltrans at least 60 days prior to the specific deadline for which the particular extension is requested (e.g., 60 days prior to June 30 to request the extension of allocation deadlines). The extension request should describe the specific circumstance that justifies the extension and identify the delay directly attributable to that circumstance. Caltrans will review extension requests and forward them to the CalSTA for approval.

13 Project Reporting

As a condition of the project selection and allocation, the implementing agency must submit to Caltrans quarterly reports on the activities and progress made toward implementation of the project and a final delivery report. The purpose of the reports is to ensure that the project achieves the goals of the program, is executed in a timely fashion, and is within the scope and budget identified when the decision was made to fund the project.

Recordkeeping and reporting requirements will apply through the life of the project. All recordkeeping and reports must be consistent with the reporting requirement, quantification methodologies and records retention periods developed by the California Air Resources Board (www.arb.ca.gov/cc/capandtrade/auctionproceeds/fundingguidelines.htm). At a minimum, agencies must report on all projects selected for funding, yearly progress on each funded project, and the benefits (GHG and co-benefits) achieved for each project once it is completed. Implementing agencies should note that additional reporting may be required for some projects, referred to as Phase 2 reporting, or be modified based on the evolving needs of the program. For projects benefiting disadvantaged communities, low-income communities, and/or low-income households, reports must identify and include metrics to demonstrate the benefits being achieved and how community needs are being met, consistent with the California Air Resources Board's Funding Guidelines. Some reported project information will be publicly available on the California Air Resources Board website, including the amount of funding that is being spent on projects that benefit disadvantaged communities, low-income communities, and/or low-income households.

Within one year of the project becoming operable, the implementing agency must provide a final delivery report to Caltrans which includes:

1. The scope of the completed project as compared to the programmed project.
2. Performance outcomes derived from the project as compared to those described in the project application. This should include before and after measurements and estimates (ridership/service levels, greenhouse gas reductions included updated estimates the greenhouse gas reductions over the life of the project, benefit to disadvantaged communities, low-income communities, and/or low-income households, project co-benefits, etc.), and an explanation of the methodology used to quantify the benefits.
3. Before and after photos documenting the project.
4. The final costs as compared to the approved project budget by component and fund type, and an estimate of the Transit and Intercity Rail Capital Program funds spent to benefit disadvantaged

communities, low-income communities, and/or low-income households.

5. Its duration as compared to the project schedule in the project application.

Upon request from the implementing agency, Caltrans may consider requests to delay reporting on before and after or other performance outcome data until two years after project operation if similar data is requested by the Federal Transit Administration or if the agency deems such delay would improve the reliability of the report.

For the purpose of this section, a project becomes operable when the construction contract is accepted or acquired equipment is received.

In addition to quarterly reports and final delivery report, the California Air Resources Board (CARB) released its Funding Guidelines for Agencies that Administer California Climate Investments on August 4, 2017 that includes reporting requirements for all State agencies that receive appropriations from the Greenhouse Gas Reduction Fund. Caltrans and project sponsors will need to submit reporting information in accordance with CARB's Funding Guidelines, including reporting on greenhouse gas reductions and benefits to disadvantaged communities, low-income communities, and/or low-income households. For more information, see www.arb.ca.gov/cc/capandtrade/auctionproceeds/fundingguidelines.htm

The State of California has the right to review project documents and conduct audits during project implementation and over the life of the project. Caltrans or another State agency may audit a sample of Transit and Intercity Rail Capital Program projects to evaluate the performance of the project, determine whether project costs incurred and reimbursed are in compliance with the executed project agreement or approved amendments thereof; state and federal laws and regulations; contract provisions; and program guidelines, and whether project deliverables (outputs) and outcomes are consistent with the project scope, schedule, and benefits described in the executed project agreement or approved amendments thereof. A report on the projects audited must be submitted by the auditing agency to CalSTA.

14 Project Administration

Caltrans will administer the Transit and Intercity Rail Capital Program consistent with these guidelines and existing Commission and Caltrans policies and procedures.

Agencies must encumber and expend monies consistent with State law, and ensure that Greenhouse Gas Reduction Fund monies are utilized consistent with the expenditure record submitted by Caltrans and required by SB 1018. A determination that use of Greenhouse Gas Reduction Fund monies is not consistent with the expenditure record and does not further the purposes of AB 32 may occur during legal proceedings or during an audit or program review conducted by the Bureau of State Audits, Department of Finance, a third-party auditor, or the California Air Resources Board. Depending on the outcome of those proceedings or review, agencies may be required to return monies to the state if expenditures are not consistent with the statutory requirements (such as not furthering the purposes of AB 32.)

The state may terminate the grant for any reason at any time if it learns of or otherwise discovers that there are allegations supported by reasonable evidence that a violation of any state or federal law or policy by the grantee which affects performance of this or any other grant agreement or contract entered into with the State. If a grant is terminated, the agency may be required to fully or partially repay funds from the Transit and Intercity Rail Capital Program.

Attachment 1: Investments to Benefit Disadvantaged Communities and Low Income Communities and Households

The California Air Resources Board released its Funding Guidelines for Agencies that Administer California Climate Investments on August 4, 2017. Stakeholders can find the Funding Guidelines at this CARB website:

<https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/auctionproceeds.htm>

Attachment 2: Quantification Methodology

The California Air Resources Board is updating the quantification methodology. See the following website for the final methodology.

<https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/quantification.htm>



CALIFORNIA STATE TRANSPORTATION AGENCY

Edmund G. Brown Jr.
Governor

Brian P. Kelly
Secretary

915 Capitol Mall, Suite 350B
Sacramento, CA 95814
916-323-5400
www.calsta.ca.gov

August 17, 2015

**Malcolm Dougherty, Director
California Department of Transportation
1120 N Street
Sacramento, California 95814**

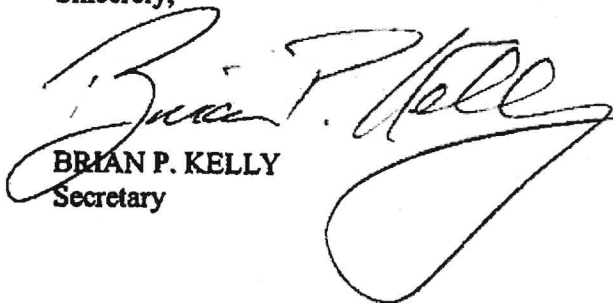
Re: Transit and Intercity Rail Capital Program: Delegation of Authority

Dear Mr. Dougherty:

Statutory authority found in Public Resources Code section 75220 et seq., and Health and Safety Code section 39719 et seq., has created the Transit and Intercity Rail Capital Program (TIRC Program) and made the California State Transportation Agency (Transportation Agency) responsible for the administration of the TIRC Program. Pursuant to my authority as Secretary of the Transportation Agency, I delegate the Transportation Agency's authority for the administration of the TIRC Program to the California Department of Transportation (Caltrans). Caltrans shall administer the TIRC Program pursuant to the TIRC Program Guidelines and Caltrans' policies and procedures for the administration of similar grant programs.

This delegation shall remain in effect until rescinded in writing.

Sincerely,



BRIAN P. KELLY
Secretary

APPENDIX B
RECIPIENT'S RESOLUTION
(INSERT AGENCY BOARD RESOLUTION)



RESOLUTION

RESOLUTION NUMBER:	18-11
SUBJECT:	Delegate Authority to the Executive Director to Perform All Administrative Actions Necessary to obtain Transit and Intercity Rail Capital Program (TIRCP) funds, including Agreements with Caltrans and Other Project Partners of the North State Intercity Bus System Between Redding and Sacramento

WHEREAS, the Shasta Regional Transportation Agency (SRTA) may receive state funding from the California Department of Transportation (Caltrans) now or sometime in the future for transit projects; and

WHEREAS, the Transit and Intercity Rail Capital Program (TIRCP) was created by Senate Bill (SB) 862 (Chapter 36, Statutes of 2014) and modified by SB 9 (Chapter 710, Statutes of 2015) to provide grants for transformative capital improvements that will modernize California's intercity, commuter, and urban rail systems, and bus and ferry transit systems to reduce emissions of greenhouse gases by reducing congestion and vehicle miles traveled throughout California; and

WHEREAS, Caltrans, in collaboration with the California State Transportation Agency (CalSTA), are responsible for administering the TIRCP; and

WHEREAS, Caltrans utilizes master agreements for state-funded transit projects, along with associated program supplements, to administer and reimburse state transit funds to local agencies; and

WHEREAS, pursuant to SB 9 of 2015, CalSTA adopted a TIRCP multi-year program of projects covering 2018-19 through 2022-23; and

WHEREAS, TIRCP administrators have developed guidelines that describe the policy, standards, criteria, and procedures for the development, adoption and management of the program; and

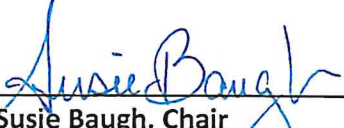
WHEREAS, SRTA was awarded TIRCP funding in the program of projects covering 2018-19 through 2022-23 for the North State Intercity Bus System; and

WHEREAS, the SRTA Board of Directors wishes to delegate authority to the executive director to perform all administrative actions necessary to obtain TIRCP funds, including agreements with Caltrans and other project partners of the North State Intercity Bus System between Redding and Sacramento.

NOW, THEREFORE, BE IT RESOLVED that the Shasta Regional Transportation Agency:

1. Agrees to comply with all conditions and requirements set forth in agreements and applicable statutes, regulations and guidelines for all state-funded transit projects; and
2. Authorizes the Executive Director to perform all administrative actions necessary to obtain TIRCP funds, including executing agreements with Caltrans and other project partners of the North State Intercity Bus System between Redding and Sacramento.

PASSED AND ADOPTED this 19th day of June 2018, by the Shasta Regional Transportation Agency.



Susie Baugh, Chair
Shasta Regional Transportation Agency

APPENDIX C
PROGRAM SUPPLEMENT

APPENDIX D
AWARD AGREEMENT

REFERENCES

SAE #	Title	Date Published
J10	Methods of Test for Paints - Part J10: Determination of Deposition Efficiency of Coating Powders	Sept. 15, 1998
J211	Instrumentation for Impact Test—Part 2: Photographic Instrumentation	May 1, 2001
J287	Driver Hand Control Reach	Feb. 1, 2007
J366	Exterior Sound Level for Heavy Trucks and Buses	Feb. 1, 1987
J382	Windshield Defrosting Systems Performance Requirements - Trucks, Buses, and Multipurpose Vehicles.	Jan. 1, 1994
J534	Lubrication Fittings	May 1, 2008
J537	Storage Batteries	Sept. 1, 2000
J541	Voltage Drop for Starting Motor Circuits	Oct. 1, 1996
J587	License Plate Illumination Devices (Rear Registration Plate Illumination Devices)	Sept. 1, 2003
J593	Backup Lamps (Reversing Lamps)	Sept. 1, 2005
J673	Automotive Safety Glasses	Oct. 1, 2005
J680	Location and Operation of Instruments and Controls in Motor Truck Cabs, Recommended Practice	Sept. 1, 1988
J686	Motor Vehicle License Plates	Oct. 1, 1999
J689	Curbstone Clearance, Approach, Departure, and Ramp Breakover Angles—Passenger Car and Light Truck	Aug. 1, 2009
J833	Human Physical Dimensions	May 1, 2003
J844	Nonmetallic Air Brake System Tubing	Nov. 1, 2004
J941	Motor Vehicle Drivers' Eye Locations	March 1, 2010
J994	Alarm—Backup—Electric Laboratory Performance Testing	March 1, 2009
J1050	Describing and Measuring the Driver's Field of View	Jan. 1, 2003
J1113	Electromagnetic Compatibility Component Test Procedure Part 42, Conducted Transient Emissions	Oct. 1, 2006
J1127	Low Voltage Battery Cable	March 1, 2010
J1128	Low Voltage Primary Cable	Dec. 1, 2005
J1149	Metallic Air Brake System Tubing and Pipe	Aug. 1, 2007
J1292	Automobile and Motor Coach Wiring	Jan. 1, 2008
J1455	Recommended Environmental Practices for Electronic Equipment Design in Heavy-Duty Vehicle Applications	June 1, 2006
J1587	Joint SAE/TMC Electronic Data Interchange between Microcomputer Systems in Heavy-Duty Vehicle Applications, Recommended Practice	Jan. 1, 1996
J1708	Serial Data Communications Between Microcomputer Systems in Heavy-Duty Vehicle Applications	Oct. 1, 2008
J1986	Balance Weight and Rim Flange Design Specifications, Test Procedures, and Performance Recommendations	Jan. 1, 2006
J1939	Data Link Layer	Dec. 1, 2006
J1995	Engine Power Test Code - Spark Ignition and Compression Ignition - Gross Power Rating, Standard;	June 1, 1990
J2402	Road Vehicles—Symbols for Controls, Indicators, and Tell-tales	Jan. 1, 2010

Request for Proposal
January 16, 2019
Procurement No. 2019-01

J2711	Recommended Practice for Measuring Fuel Economy and Emissions of Hybrid-Electric and Conventional Heavy-Duty Vehicles	Sept. 1, 2002
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ABBREVIATION AND ACRONYMS

A/C	air conditioning
ABS	antilock braking system
AC	alternating current
ACQ	alkaline copper quaternary
ADA	Americans with Disabilities Act
ADB	advanced design bus
Ah	amp hour
ALR	auto-locking retractor
APA	The Engineered Wood Association, formerly the American Plywood Association
APC	automatic passenger counter
APTA	American Public Transportation Association
ASTM	ASTM International, formerly the American Society for Testing and Materials
ATC	automatic traction control
AVL	automatic vehicle location
AWG	American Wire Gauge
BAFO	Best and Final Offer
BMS	Battery Management System
BRT	bus rapid transit
CARB	California Air Resources Board
CCS	climate control system
CCTV	closed-circuit television
cfm	cubic feet per minute
CGA	Compressed Gas Association
CNG	compressed natural gas
dB	decibel
DBE	disadvantaged business enterprise
DC	direct current
DDU	driver display unit
DEF	diesel exhaust fluid
DOT	Department of Transportation
DPF	diesel particulate filter
EDR	event data recorder
ECM	Engine Control and Monitoring
ECS	emission control system
ELR	emergency locking retractor
EMI	electromagnetic interference
EPA	Environmental Protection Agency
EOL	end of life
ESS	energy storage system
EVSE	electric vehicle supply equipment
fc	foot-candle
FEA	Finite Element Analysis
FEMA	failure mode effects analysis
FMCSA	Federal Motor Carrier Safety Administration
FMVSS	Federal Motor Vehicle Safety Standards
FTA	Federal Transit Administration

GAWR	gross axle weight rated
GPS	global positioning system
GVW	gross vehicle weight
GVWR	gross vehicle weight rated
H-point	hip-point
HDS	hybrid drive system
HMI	human-machine interface
HSC	hybrid system controller
HV	high voltage
HVAC	heating, ventilation and air conditioning
I/O	input/output
IEEE	Institute of Electrical and Electronics Engineers
inHg	inches of mercury
ISO	International Standards Organization
kJ	kilojoule
LEL	LED emergency light
LFL	lower flammability limit
LV	low voltage
mA	milliampere
MDT	mobile data terminal
MPa	mega-Pascal
NC	normally closed
NFPA	National Fire Protection Association
NGV	natural gas vehicle
NOx	nitrogen oxide
NO	normally open
NTP	notice to proceed
OEM	original equipment manufacturer
OSI	Open Systems Interconnect
PA	public address
PMO	project management oversight
PPV	price per vehicle
PRD	pressure relief device
psi	pounds per square inch
RF	radio frequency
RFI	radio frequency interference
RTC	real-time clock
SAE	SAE International, formerly the Society of Automotive Engineers
scf	standard cubic feet
SLW	seated load weight
SoC	state of charge
UL	Underwriters Laboratories
UNECE	United Nations Economic Commission for Europe
UPS	uninterruptable power supply
USC	United States Code
USCA	United States Code Annotated
V DC	volts of direct current
WEOL	warrantable end of life

Wh watt-hours
VIN vehicle information number
ZEV zero-emission vehicle