

**Huron Transit Corporation**

REQUEST FOR PROPOSAL

**Medium-Duty Diesel Powered Transit Bus RFP# 2024-200-11**

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# SECTION 1: NOTICE OF REQUEST FOR PROPOSALS

## NR 1. Description of the Work to be Done

The Huron Transit Corporation (Agency) requests Proposals for the manufacture and delivery of up to (3) Cadillac ( 1) Kalkaska (1) Yates up to (6) all have the option of powertrain of diesel or gasoline and or propane powered, 40’, minimum thirty-nine (39) passenger seating, lift equipped, Medium-Duty Class Transit Buses, all associated training, and operating and maintenance materials and manuals in accordance with the terms and conditions set forth in RFP 2024-200-11. Contractors shall also submit floor plans for the buses showing wheelchair lift position and seating options. The Contract shall be a firm-fixed-price Contract.

Specifically, the Agency is requesting the following types of buses: Diesel or gasoline or propane Powered, minimum thirty-nine (39) passenger (with lift equipment installed), lift equipped, Medium-Duty Class Transit Buses.

**Identification of Source of Funding**

Financial support of this project is provided through financial assistance grants from the Federal Transit Administration (FTA), and the State of Michigan.

## NR 2. Obtaining Proposal Documents

Proposal documents may be obtained electronically from Ken Jimkoski, Director.

To receive electronic documents, please send your request and complete contact information, company name, title, address, and phone number to [ken.jimkoski@tatbus.com](mailto:ken.jimkoski@tatbus.com)

Documents will not be available for in-person pick-up and will not be sent by mail.

## NR 3. Proposal Due Date and Submittal Requirements

## Proposals must be received by Wednesday, May 3, 2024 @ 5:00 pm EST.

procurement department. Proposals sent by facsimile will not be accepted.

1. Proposals may be delivered to the Huron Transit Corporation’s office or submitted by e-mail to the procurement

department. Proposals sent by facsimile will not be accepted.

1. E-mail your proposals to [ken.jimkoski@tatbus.com](mailto:rfp@saginaw-stars.com) The price proposal and the technical proposal must be sent as separate attachments.
2. Sealed Proposals shall be submitted to the following addresses:

Huron Transit Corporation, Attn: Ken Jimkoski, 1513 S Bad Axe Road, Bad Axe, MI 48413

1. Envelopes or boxes containing Proposals shall be sealed and clearly labeled with the Agency’s

Proposal number and the solicitation title: RFP 2024-200-11 Medium Heavy Duty Transit Buses.

1. Huron Transit Corporation will accept a sealed envelope containing the **Technical Proposal.** It must be labeled with the RFP name and number, due date, your firm’s name, and made out to the attention of the Procurement Department. Submit one (1) original, three (3) additional paper copies, and one

electronic copies (Adobe PDF, Excel, or Word) of the Technical Proposal on a USB Flash Drive. The original Technical Proposal must be marked “ORIGINAL”. The proposer must also submit a labeled and sealed **Price Proposal,** one (1) original and one (1) electronic copy (Adobe PDF, Excel, or Word) on a USB Flash Drive. Only the original documents need to be emailed rather than emailing several copies.

A Proposal is deemed to be late if it is received by the Agency after the Proposal Due Date. Proposals received after the submission deadline may be rejected. Any electronic altering of this RFP shall be grounds for rejection of your proposal submission. Each proposal received by Huron Transit Corporation becomes the property of Huron Transit Corporation. Failure to provide the required number of complete duplicate copies may result in rejection of your proposal.

Huron Transit Corporation reserves the right to waive any informality in the Request for Proposal; to reject any or all proposals for sound, documentable, business reasons; and to make any award which it considers to be in the best interest of Huron Transit Corporation. Huron Transit Corporation reserves the right to use whatever reasonable and prudent evaluation techniques it deems appropriate.

No proposals shall be withdrawn for a period of ninety (90) days after submission.

## NR 4. Validity of Proposals

Proposals and subsequent offers shall be valid for a period of not less than 180 days.

Prospective Proposers are requested to submit written questions to the Director, 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.” Responses will be shared with all prospective Proposers. Prospective Proposers are reminded that any changes to the RFP will be by written addenda only, 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.

# SECTION 2: INSTRUCTIONS TO PROPOSERS

## IP 1. Obtaining Proposal Documents

Proposal documents may be obtained electronically from Ken Jimkoski, Director.

To receive electronic documents, please send your request and complete contact information, company name and address, title, and phone.

Documents will not be available for in-person pick-up and will not be sent by mail.

## IP 2. Quantities

The Work under these Contract documents consists of the manufacture and delivery of a base order of (3) for Huron,(6) Yates, (1) Kalkaska and (1) Cadillac Powertrain Option of diesel, unleaded gasoline and propane powered, <40’, minimum thirty-nine (39) passenger seating, lift equipped, medium-duty transit buses, all associated training, and operating and maintenance materials and manuals in accordance with the terms and conditions set forth in RFP 2024-200-11. Contractors shall also submit floor plans for the buses showing wheelchair lift position and seating options.

Option for additional 9 Buses over 5 years.

## IP 3. Proposed Schedule for the Procurement

The following is the solicitation schedule for Proposers:

* Proposed communication’s (e.g., questions, clarifications, and requests for approved equals) must be written on designated form CER 2. and submitted to [ken.jimkoski@tatbus.com](mailto:rfp@saginaw-stars.com) Deadline: April, 12, 2024 @ 5:00 pm EST.
* Responses to Proposer’s communications. Estimated Deadline: April 19, 2024 @ 5:00 pm EST.
* Proposal Due Date: Wednesday, May 3, 2024, by 5:00 pm EST.

## IP 4. Questions, Clarifications and Omissions

All correspondence, communication and contact regarding any aspect of this solicitation or offers shall be only with the Contracting Officer, Ken Jimkoski. Unless otherwise instructed by the Contracting Officer, 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 Contracting Officer, regarding any aspect of this solicitation or offers.

At any time during this procurement up to the deadline 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 Contracting Officer. The Proposer making the request shall be responsible for its proper delivery to the Agency as identified on form CER 2. 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.

**Contracting Officer’s Contact Information:**

Name: Ken Jimkoski Title: Director

Address: 1513 S Bad Axe Road, Bad Axe, MI 48413 Phone number: (989) 269-2121

E-mail: [ken.jimkoski@tatbus.com](mailto:ken.jimkoski@tatbus.com)

## IP 5. 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. Notification of or the addenda also will be distributed to all such prospective Proposers officially known to have received the RFP and posted on the Huron Transit Corporation website [https://www.tatbus.com](https://saginaw-stars.com/about/purchasing/) 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 five (5) 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 6. DBE Requirements for Transit Vehicle Manufacturers

Pursuant to Title 49, Code of Federal Regulations, Part 26.49, a Proposer, as a condition of being authorized to respond to this solicitation, must certify by completing the form DBE Approval Certification that it has on file with the Federal Transportation Administration (FTA) an approved or not disapproved annual disadvantaged business enterprise (DBE) subcontracting participation goal.

## IP 7. Buy America Certification

This Contract is subject to the “Buy America” requirements of 49 United States Code (USC) §5323(j) and 49 Code of Federal Regulations (CFR) Part 661, as may be amended from time to time, and applicable federal regulations. Prospective Proposers’ attention is directed to 49 CFR §661.11, “Rolling Stock Procurements.” Prospective Proposers have the responsibility to comply with the cited and any governing statutes and regulations, including official interpretations.

A Proposer shall submit to the Agency the appropriate Buy America certification, included in this document, with all offers on FTA-funded contracts. Proposals that are not accompanied by a properly completed Buy America certification are subject to the provisions of 49 CFR 661.13 and will be rejected as nonresponsive.

The two signature blocks on the Buy America certificate are mutually exclusive. Proposers shall sign only one signature block on the certificate. Signing both signature blocks will make the Proposal nonresponsive. A false certification is a criminal act in violation of 18 USC §1001.

A Proposer who has submitted an incomplete Buy America certificate or an incorrect certificate of noncompliance through inadvertent or clerical error (but not including failure to sign the certificate, submission of certificates of both compliance and noncompliance, or failure to submit any certification), may submit to the FTA Chief Counsel within ten (10) days of Proposal opening a written explanation of the circumstances surrounding the submission of the incomplete or incorrect certification in accordance with 28 USC §1746, sworn under penalty of perjury, stating that the submission resulted from inadvertent or clerical error. The Proposer will also submit evidence of intent, such as information about the origin of the product, invoices, or other working documents. The Proposer will simultaneously send a copy of this information to the Agency.

The FTA Chief Counsel may request additional information from the Proposer, if necessary. The Agency may not make Contract award until the FTA Chief Counsel issues his or her determination, except as provided in 49 CFR Part 661.15(m).

Certification based on ignorance of proper application of the Buy America requirements is not an inadvertent or clerical error.

A waiver from the Buy America provisions will be sought by the Agency from the FTA for the proposed awardee, if the grounds for a waiver exist. All Proposers seeking a waiver must submit to the Agency a timely request in writing, which shall include the facts and justification to support the granting of the waiver. Such waiver from the Buy America provisions may be granted if the FTA determines the following:

1. Their application would be inconsistent with the public interest.
2. Materials are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality; or
3. Inclusion of domestic material will increase the cost of the overall Contract by more than 25 percent.

Any party may petition the FTA to investigate a successful Proposer’s compliance with the Buy America certification. The procedures are set out in 49 CFR Part 661.15. If the FTA determines that the evidence indicates noncompliance, the FTA will require the Agency to initiate an investigation. The successful Proposer has the burden of proof to establish compliance with its certification. If the successful Proposer fails to demonstrate compliance, then the successful Proposer will be required to substitute sufficient domestic materials without revision of the original Contract terms. Failure to do so will be a breach of the Contract and may lead to the initiation of debarment proceedings under 49 CFR Part 29.

## IP 8. 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 Deviations shall be included in the technical package.

## IP 9. Protest Procedures

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

### IP 9.1 Address

All protests must be addressed as follows:

Huron Transit Corporation Attn: Ken Jimkoski, Director

1513 Bad Axe MI 48413

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

Copies of the Agency’s protest procedures and the protest provisions of FTA Circular 4220.1F or its successor may be obtained by going to [https://www.tatbus.com/procurement](http://www.tatbus.com/procurement)

### IP 9.2 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 unless a protest is filed with FTA. See “FTA Review,” below.

### IP 9.3 Protests on the Recommended Award

All Proposers will be notified of the recommended award. This notice will be transmitted to each Proposer via e-mail. 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 9.4 FTA Review

After such administrative remedies have been exhausted, an interested party may file a protest with the Federal Transit Administration of the U.S. Department of Transportation pursuant to the procedures provided in the FTA C 4220.1For its successor. FTA review is limited to the alleged failure of the Agency to have written protest procedures, the alleged failure of the Agency to follow those procedures, the alleged failure of the Agency to review a protest or the alleged violation of federal law or regulation.

## IP 10. Preparation of Proposals

### IP 10.1 Use of Proposal Forms

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

### IP 10.2 Alternate and Multiple Proposals

Alternate or Multiple Proposals will not be considered for this procurement.

### IP 10.3 Proposal Format Requirements

Proposals shall be submitted via e-mail or physical delivery. Proposals shall be arranged into the four separate packages identified in this section. 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.

For physical deliveries, submit one (1) original, three (3) additional paper copies, and one (2) electronic copies (Adobe PDF, Excel, or Word) of the Technical Proposal on a USB Flash Drive. The original Technical Proposal must be marked “ORIGINAL”. The proposer must also submit a labeled and sealed Price Proposal, one (1) original and one (1) electronic copy (Adobe PDF, Excel, or Word) on a USB Flash Drive. Original documents need to be emailed rather than emailing several copies.

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
3. Acknowledgement of Addenda
4. Contractor Service and Parts Support Data
5. Form for Proposal Deviation (without price data)
6. Vehicle Questionnaire
7. References and Non-Priced Information
8. Engineering organization chart, engineering change control procedure, field modification process
9. Manufacturing facilities plant layout, other contracts, staffing
10. Production and delivery schedule and other Contract commitments for the duration of this Contract
11. Management Plan
12. The Agency’s required Technical Documents as noted in Section IP 15

**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.

1. Letter of Transmittal
2. Price proposal (optional)
3. Pricing Schedule (form CER.6), including but not limited to such pricing elements as option buses, spare parts package, manuals, training, special tools and test equipment
4. Alternate options

The Proposer is required to complete and execute the Agency’s Pricing Schedule, contained as part of the Proposal documents, and provide same in the Price Proposal. The Contractor shall be liable for payment of all local taxes applicable to the complete bus as delivered and should add these amounts to the Proposal price.

**Package 3: Qualification Package Requirements**

1. Pre-Award Evaluation Data Form
2. 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
3. Letter for insurance, indicating the Contractor’s ability to obtain the insurance coverage in accordance with the RFP requirements
4. Form for Proposal Deviation, if applicable (without price data)
5. Proposal Form
6. All 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 10.4 Agency Treatment of Proprietary/Confidential Information

Access to government records is governed by the laws of the State of Michigan. Except as otherwise required to be disclosed by applicable law, the Agency will be 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 ten (10) 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 laws of the State of Michigan 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 10.5 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 10.6 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 10.7 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 11. 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 11.1 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 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 11.2 Duration of the Validity of Proposals

Proposals and subsequent offers shall be valid for a minimum period of 180 days as 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 11.3 Evaluation Committee

An Evaluation Committee, comprised of Agency Employees, will be established. The Evaluation Committee will carry out the detailed evaluations, including establishing the Competitive Range, and making the selection of the Proposer, if any, that may be awarded the Contract.

The Evaluation Committee may report its recommendations and findings to the appropriate Agency individual or body responsible for awarding the Contract.

### IP 11.4 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 a Proposer to 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 11.5 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 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’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 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.

1. 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.

1. Evidence that Proposer is qualified in accordance with the provisions of “Section 8: Quality

Assurance.”

1. 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, listed in their relative order of importance, 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. 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 criteria are listed numerically by their relative order of importance. However, certain criteria may have sub-criteria identified that are listed by their relative order of importance within the criterion they comprise. Also, certain sub-criteria may have sub-criteria that are listed by their relative degree of importance within the specific sub-criterion they comprise.

1. **Product design and performance:** The information provided by the Proposer in its

technical submittal relating to the buses to be provided will be utilized to evaluate the Proposal in relation to this factor. Vehicle construction and system design, as well as documented reliability, may be used in this evaluation, as well as other design and performance elements of the components that comprise those systems. At a minimum, test results, safety and maintenance factors, and cost of

normal operation for the bus design and system components proposed, may be considered in determining a final value for this factor.

1. **Proposer’s reputation and performance:** The Committee will consider the capability and reputation of the Proposer as presented in the Proposal or as is determined by review of information available from references or other resources. The evaluation may look at the Proposer’s overall organizational and financial capabilities and consider key components such as organizational reporting structure, quality control, quality assurance, research and development, technical, training and parts support, response time, product capabilities, ability to furnish multiple bus configurations, bonding capacity, and financial history, as well as other considerations, in reaching a final point determination. The committee may also look at judgments, liens, Fleet Defect history, warranty claims and the steps that the manufacturer took to resolve these concerns in assessing the overall reputation of the manufacturer.
2. **Delivery schedule:** The Committee will review the proposed delivery schedule for the Agency’s minimum purchase of coaches. Delivery schedules that fulfill the delivery requirements, with evidence that the schedule can be accomplished, may receive higher points for this category.
3. **Cost:** Proposals found to be in the Competitive Range will be given points proportionately in relation to the lowest price.

### IP 11.6 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. Proposers are advised that the detailed evaluation forms and procedures will follow the same Proposal format and organization specified in “Preparation of Proposals.” Therefore, Proposers should pay close attention to and strictly follow all instructions. 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 11.7 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.

* 1. **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 in accordance with the Agency’s policies.
  2. **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.

* 1. **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.

* 1. **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, reservations or understandings that have been approved. A common date and time for submission of written BAFOs, allowing a reasonable opportunity for prepara- tion 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.

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

## IP 12. Response to Proposals

### IP 12.1 Single Proposal Response

If only a single Proposal is received and found to be acceptable, the Agency may require that the Proposer provide a cost analysis or a price comparison between that of similar equipment, materials, supplies, and/or services to assure that the price is fair and reasonable. If requested, the Proposer shall provide the cost or price analysis or both within seven (7) calendar days of the date requested. The Agency reserves the right to reject or accept the Proposal on the basis of the cost analysis or price comparison. The Proposer has agreed to such analysis by submitting a Proposal in response to this RFP.

### IP 12.2 Availability of Funds

This procurement is subject to the availability of funding from the State of Michigan and the Federal Transit Administration.

### IP 12.3 Agency Contract Approval Process

The Proposal which is deemed and determined by the Agency's Selection Committee, in its sole discretion, to

be the most responsive and responsible Proposal that is the most advantageous to the Agency, considering price and other evaluation criteria and complying with all of the conditions hereof, will be recommended to the Huron Transit Corporation Board of Directors for approval, unless all Proposals are rejected. The Agency will announce which Proposal it has accepted, or that all Proposals have been rejected, in an e-mail addressed to each person submitting a Proposal.

The successful proposer will be notified of the contract award as soon as possible.

THE AGENCY RESERVES THE RIGHT TO INTERVIEW; REVIEW MATERIAL AND/OR VISIT QUALIFIED RESPONDENT FACILITIES. THE AGENCY RESERVES THE RIGHT TO NEGOTIATE ANY PART OF THIS PROPOSAL INCLUDING ON A COST ELEMENT BASIS AND/OR REQUEST A BEST AND FINAL PROPOSAL. ADDITIONALLY, THE AGENCY RESERVES THE RIGHT TO AWARD ON THE BASIS OF INITIAL PROPOSALS SUBMITTED WITHOUT ANY NEGOTIATIONS OR DISCUSSIONS. PROPOSALS SHOULD BE SUBMITTED INITIALLY ON THE MOST FAVORABLE TERMS POSSIBLE, FROM A TECHNICAL STANDPOINT. THE AGENCY ADDITIONALLY RESERVES THE RIGHT TO DISCARD ALL PROPOSALS AND REISSUE SAID RFP. THE AGENCY RESERVES THE RIGHT TO WAIVE ANY INFORMALITIES OR VARIATION IN ANY PROPOSAL THAT IT DEEMS TO BE IMMATERIAL OR TO REJECT ANY OR ALL, OR ANY PART OF ANY PROPOSAL IF SUCH ACTION IS DEEMED TO BE IN THE BEST INTEREST OF THE AGENCY, THE STATE OF MICHIGAN, THE UNITED STATES DEPARTMENT OF TRANSPORTATION AND THE FEDERAL TRANSIT ADMINISTRATION.

### IP 12.4 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 12.5 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 ten (10) 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 13. 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 14. Huron Transit Corporation Standards of Conduct

The Agency maintains the following standards of conduct governing the performance of its employees engaged in the award and administration of contracts. The Agency operates a public service, using public funds and facilities. Accordingly, all Agency employees are expected to maintain the highest standards of ethical conduct in their performance of public business.

The Agency provides that no employee, officer, agent, immediate family member, or Board member of the Agency shall participate in the selection, award, or administration of a contract supported by the Agency funds if a conflict of interest, real or apparent, would be involved. Such a conflict would arise when any of the following has a financial or other interest in the firm selected for award:

* The employee, officer, agent, or Board member
* Any member of his/her immediate family
* His or her partner, or
* An organization that employs, or is about to employ, any of the above.

The Agency officers, employees, agents or board members may neither solicit nor accept gifts, gratuities, favors, or anything of monetary value from contractors, potential contractors, or parties to any agreement or sub agreements.

The Agency reserves the right to disqualify a vendor who violates, attempts to violate, or otherwise acts to thwart the spirit of these policies regarding conflicts of interest and ethical conduct. Information regarding possible violations of these policies should be communicated directly to the General Manager. All purchasing actions are to be taken in strict conformance with the Agency’s established Written Standard of Conduct regarding conflicts of interest. Violations will result in discipline, including discharge, depending on the severity, circumstances and other factors related to the violation.

## IP 15. Huron Transit Corporation Technical Documents

The Proposer shall supply a copy of the following documents in the Technical portion of the submitted proposal:

1. A floor plan of the bus shall be provided indicating dimensions and showing the interior layout of the bus. The plan shall include wheelchair placement, stanchion locations, engineering calculated loaded bus axle weights, and be drawn to scale for all configurations. The Agency to provide

required seating / with positions.

1. Detailed engineering drawing for the design of the entrance door and door opening device (with drawings).
2. Detailed engineering drawing for the design of the entrance step configuration (with drawings).
3. Roof, sidewall, and flooring drawings showing structure and structural specifications indicating metal size and type used. Include side sheathing and inside panels.
4. A description of the manufacturer's chassis (specifications).
5. Detailed engineering drawing on how body structure is mounted on chassis frame.
6. All Contractors must supply manufacturer's technical specifications for wheelchair lifts and wheelchair restraints. Manufacturer's sales literature is acceptable if it contains the technical specifications.
7. The warranties for body, chassis, and drive train.
8. A copy of the Bus Rollover Protection Test (FMVSS 220) results of the bus offered as specified in the bid.
9. The technical data sheet including flammability and smoke emissions for the seat covering material supplied.
10. Seat frame Salt Spray, humidity and impact resistance tests’ results
11. Certification test data showing that the seats, the seat belts, and the installation are in compliance with FMVSS-207, 208, 209, and 210 where applicable for the bus model being offered in this bid.
12. Certification that the wiring and the switches for air conditioning and all add-on components are adequate to withstand transient loads expected.
13. A copy of the dealer agreement between the Bus Manufacturer and the designated dealer.
14. Certification that the bus model offered is a 10 year or 350,000 mile bus and will meet the requirements of Federal Register Rules and Regulations 49 CFR Part 665, Bus Testing Program. Stating from ' 665.13 Test Report and Manufacturer Certification, Section (b)(1), "A manufacturer of a new bus model or a bus produced with a major change in component or configuration shall provide a copy of the test report to a recipient during the point in the procurement process specified by the recipient"
15. Certification for 1,000 hour salt spray test per ASTM procedure B-117.

# SECTION 3: GENERAL CONDITIONS

## GC 1. Definitions

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

**Agency:** Huron Transit Corporation

**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.”

**Contracting Officer:** 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:** Unless otherwise stated, “days” shall mean calendar days.

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

**Deviation:** [Variance](http://www.businessdictionary.com/definition/variance.html) from a requirement or [specification](http://www.businessdictionary.com/definition/specification-spec.html) that does not alter the basis of a [contract](http://www.businessdictionary.com/definition/contract.html)or adversely affects its [performance.](http://www.businessdictionary.com/definition/performance.html)

**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’s Representative 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 Representative’s inspection and approval in accordance with the approved Work products developed as a result of the Contract Documents.

The 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 resident inspector. When a bus passes these tests and inspections, the resident inspector shall authorize release of the bus.

Within fifteen (15) 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 15 calendar days after delivery, then acceptance of the bus by the Agency occurs on the 15th 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.

**NOTE:** Under federal requirements (49 CFR 663.37), no resident inspector is required for orders of 10 or fewer buses or 20 or fewer vehicles serving rural or urbanized areas of 200,000 people or fewer.

### 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 the State of Michigan shall be provided to the Agency not less 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 Contracting Officer. 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 Contracting Officer.

### 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 Contracting Officer 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 Contracting Officer. 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 Contracting Officer 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:

* 1. 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;
  2. The Contractor demonstrates that the completion of the Work and/or any affected deliveries will be actually and necessarily delayed;
  3. 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
  4. 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 of 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 Contracting Officer 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 Contracting Officer, 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 Contracting Officer, 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 Contracting Officer, 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 Contracting Officer 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 Contracting Officer, 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 Contracting Officer, 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 Contracting Officer 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 Contracting Officer 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 close-out 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 Contracting Officer may authorize in writing, after receipt of notice from the Contracting Officer 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 Contracting Officer 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, 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 Contracting Officer determines to be necessary to protect the Agency against loss because of outstanding liens or claims of former lien holders.

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, FTA regulations, policies, procedures and directives, including those listed directly or by reference in the agreement between the Agency and FTA that funds any part of this Contract, 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.

### 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 Michigan without regard to conflict of law rules. The Contractor consents to the jurisdiction of the identified state, County of Huron.

### GC 9.8 Disputes

**NOTE:** The following section deals with disputes arising after Contract award and not during the procurement process. The latter are “protests” that should be dealt with under the Agency’s procurement procedures as outlined in “Protest Procedures.”

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 Contracting Officer’s or Chief Executive Officer’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 10 (ten) calendar days of the determination of the dispute.
2. **Negotiation between Contracting Officers.** 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 14 (fourteen) 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 28 (twenty-eight) calendar days after delivery of the dispute notice, the Contracting Officer 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 42 (forty-two) calendar days of the dispute notice, 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.

1. **Chief Executive Officer’s decision.** Should the dispute not be resolved by negotiation between Contracting Officers, as provided in paragraph 2 above, the Agency’s Contracting Officer from paragraph 2 above shall submit a written request for decision to the Agency’s Executive Director along with all documentation and minutes from the negotiations. The Executive Director shall issue a written decision within 14 (fourteen) days of receipt of a request.
   1. For disputes involving $50,000 or less, the decision of the Executive Director 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 Executive Director 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.
   2. 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.
   3. Any dispute that is not resolved by the parties through the operation of the provisions of this paragraph, or any mutually agreed-upon alternative disputes resolution process pursuant to paragraph 4, may be submitted to any court in the State of Michigan.
   4. 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.
2. **Alternatives disputes 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.
3. **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 by the arbitrators shall be final and enforceable in any court having jurisdiction over the parties.

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

In accordance with 49 CFR § 18.36(i), 49 CFR § 19.48(d) and 49 USC § 5325(a), provided that the Agency is the FTA recipient or a sub-grantee of the FTA recipient, the Contractor agrees to provide the Agency, FTA,

the Comptroller General of the United States, the Secretary of the U.S. Department of Transportation, State of Michigan 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 Contracting Officer, the U.S. Department of Transportation 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, the Contracting Officer, the U.S. Department of Transportation, 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 State of Michigan and the Agency. Except as otherwise required by the City of Bad Axe, state or local open records law, 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 City of Bad Axe, state or local open records law 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”

# 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 the 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 Huron Transit Corporation

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 fifty ($50) dollars 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 and for 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 thirty (30) 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 30-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.

Upon delivery of pilot bus, the Contractor shall supply the Director of Maintenance the Post Delivery Buy America information within thirty (30) days of delivery date. If Contractor requires the Agency to travel to Contractor’s location for Buy America verification then Contractor shall pay travel expenses to complete this task. Agency will sign confidentiality agreement for Buy America verification if held on Agency’s location.

### 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 fifteen

(15) days after bus delivery and shall be conducted in accordance with 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 criteria that are different from the criteria applied in an analogous pre-delivery test (if any).

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), Ken Jimkoski. Director at the following point of delivery and may be preceded by a cursory inspection of the bus: 1513 S Bad Axe Road, Bad Axe, MI 48413.

### SP 2.2 Delivery Schedule

Delivery shall be completed within 28 weeks after delivery of the executed Contract documents. Hours of delivery shall be 8:00 am – 3:00 pm on the following days of the week: Monday thru Friday.

### SP 2.3 Contract Deliverables

Contract deliverables associated with this Contract are set forth in the table below, along with other pertinent information. Contract deliverables shall be submitted in accordance with “Section 6: Technical Specifications.” Due dates shown note the last acceptable date for receipt of Contract deliverables. The Agency will consider early receipt of Contract deliverables on a case-by-case basis. The reference section designates the appropriate specification section(s) where the requirement is referenced.

##### TABLE 1

Contract Deliverables

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Deliverable** | | **Agency Action** | **Reference Section** | **Due Date** | **Format** | **Quantity Due** |
| 1. | Bus Testing— Altoona Test Report | Review |  | Prior to pilot bus delivery | Hardcopy | 1 |
| 2. | List of serialized units installed on each bus | Review |  | With each delivered bus | Electronic media | 1 per bus |
| 3. | Copy of Manufacturers’ formal Quality Assurance Program | Review |  | Pre-award site visit | Hardcopy | 1 |
| 4. | QA manufacturing certificate | Review |  | With each delivered bus | Hardcopy | 1 per bus |
| 5. | QA purchasing certifications acknowledging receipt of applicable specification | Review |  | 30 days following first Pre- Production Meeting | Hardcopy | 1 per major Supplier |
| 6. | Pre-Delivery Bus Documentation Package | Review |  | With each delivered bus | Hardcopy | 1 per bus |

##### TABLE 1

Contract Deliverables

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Deliverable** | | **Agency Action** | **Reference Section** | **Due Date** | **Format** | **Quantity Due** |
| 7. | Motor Vehicle Pollution Requirements Certificate | Review |  | With each bus | Hardcopy | 1 |
| 8. | Engine Emissions Certificate— NOx levels | Review |  | Prior to completion of pilot bus | Hardcopy | 1 |
| 9. | Pre-Production Meeting minutes | Approval |  | 30 days after each meeting | Hardcopy | 2 originals |
| 10. | Driver’s log and incident report | Review |  | With each bus delivery if drive-away service is used | Hardcopy | 1 per bus |
| 11. | Title documentation | Review |  | 10 days prior to bus delivery | Hardcopy | 1 per bus |
| 12. |  |  |  |  |  |  |
| 13. | Insurance certificates | Approval |  | Before Work commences | Hardcopy | 1 |
| 14. | Engineering support | Review |  | During Pre-Production Meeting | Contracts | 1 |
| 15. | Training instructor information | Approval |  | 30 days prior to delivery of pilot bus |  |  |
| 16. | Training curriculum | Approval |  | 30 days prior to delivery of pilot bus | Electronic media |  |
| 17. | Teaching materials | Review |  | During classroom instruction | Hardcopy | 1 |
| 18. | Professionally prepared mechanics’ “Bus Orientation” training video | Review |  | 30 days prior to first production bus | Electronic Media | 20 each |
| 19. | Final preventative maintenance manuals | Review |  | 90 days after Agency written approval | Hardcopy  Electronic media | 10/100  buses 20 |
| 20. | Final diagnostic procedures manuals | Review |  | 90 days after Agency written approval | Hardcopy  Electronic media | 10/100  buses 20 |
| 21. | Final parts manuals | Approval |  | 90 days after Agency written approval | Hardcopy  Electronic media | 10/100  buses 20 |
| 22. | Component repair manuals (Agency approval/review period of 90 days from date of receipt) | Approval |  | 90 days after Agency written approval of OEM component repair list | Hardcopy  Electronic media | 2  2 |
| 23. | Draft preventative maintenance manuals (Agency approval/review period of 90 days from date of receipt) | Approval |  | With pilot bus | Hardcopy | 10 |

##### TABLE 1

Contract Deliverables

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Deliverable** | | **Agency Action** | **Reference Section** | **Due Date** | **Format** | **Quantity Due** |
| 24. | Draft diagnostic procedures manuals (Agency approval/review period of 90 days from date of receipt) | Approval |  | With pilot bus | Hardcopy | 10 |
| 25. | Draft parts manuals (Agency approval/review period of 90 days from date of receipt) | Approval |  | With pilot bus | Hardcopy | 10 |
| 26. | List of OEM component repair manuals | Approval |  | With pilot bus | Hardcopy | 10 |
| 27. | Draft operators’ manuals (Agency approval/review period of 90 days from date of receipt) | Approval |  | With pilot bus or maximum of 30 days prior to start of production | Hardcopy | 10 |
| 28. | Final operators’ manuals | Review |  | 30 days following Agency approval of draft manual | Hardcopy | 1 per bus |
| 29. | Recommended spare parts list, including bill of materials | Review |  | 60 days prior to shipment of first bus | Hardcopy | 1 |
| 30. | Part number index | Approval |  | 60 days prior to shipment of first bus | Hardcopy  Spreadsheet | 1  1 |
| 31. | Current price list | Review |  | 90 days after Agency written approval of draft parts manual | Hardcopy | 20 |
| 32. | In-process drawings | Review |  | 30 days prior to production | Scale drawings | 1 |
| 33. | Electrical and air schematics | Review |  | 30 days prior to production | Hardcopy | 1 |
| 34. | As-built drawings | Review |  | Within 60 days after final bus delivery | Electronic media | 1 |
| 35. | Material samples | Review |  | By conclusion of Pre- Production Meetings |  | 1 |
| 36. | Undercoating system program | Approval |  | First Pre-Production Meeting | Hardcopy | 1 |
| 37. | Flooring certificate | Review |  | First Pre-Production Meeting | Certificate/ copy of purchase order | 1 |
| 38. | Interior features – fire- resistance certificates | Review |  | Prior to pilot bus completion | Certificates | 1 |
| 39. | Crashworthiness | Review |  | Pre-award audit | Certificate | 1 |
| 40. | Technical review of electronic functionality | Approval |  | Prior to production | Hardcopy | 1 |
| 41. | Interior security camera layout | Approval |  | Prior to pilot bus completion | Copies of interior views | 1 each |
| 42. | Technical review of power plant |  |  | Prior to production |  |  |

##### TABLE 1

Contract Deliverables

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Deliverable** | | **Agency Action** | **Reference Section** | **Due Date** | **Format** | **Quantity Due** |
| 43. | Power plant certifications | Review |  | Prior to pilot bus completion | Hardcopy | 1 each |
| 44. | Striping layout | Approval |  | Prior to production | Hardcopy | 1 |
| 45. | Resolution of issues “subject to  Agency approval” | Approval |  | Prior to production | Hardcopy | 1 |

## SP 3. Options and Option Pricing

The Contractor hereby grants the Agency and any permissible assignee options (“Options”) to purchase up to 9 additional vehicles (“Option Vehicles”). The Options shall be valid for a period of five (5) 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 a maximum of five (5) 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:

*Latest Published Preliminary Index Number Prior to Notice of Exercise of Option / 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 7 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 7-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 FTA funds in accordance with FTA Circular 4220.1F or its successors.

## 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

The Agency shall make payments for buses at the unit prices itemized in the price schedule within forty five (45) calendar days after the delivery and acceptance of each bus and receipt of a proper invoice.

The Agency shall make payments for spare parts and/or equipment at the unit prices itemized in the price schedule within thirty (45) calendar days after the delivery and acceptance of said spare parts and/or equipment and receipt of a proper invoice.

The Agency shall make a final payment for all retained funds within forty-five (45) 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 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. At the present time, the Agency asserts that the taxes applicable to this Contract are exempt and the Contractor will be furnished a Tax Exemption Certificate upon request. The Contractor will maintain auditable records, subject to the Agency reviews, confirming that tax payments are current at all times.

## 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 first bus delivered and for each first bus of any new model year or Alternate Floor plan delivered to the Agency or any eligible grantee the Contractor shall provide an electronic copy and four (4) printed current maintenance manuals to include preventative maintenance procedures, diagnostic procedures or troubleshooting guides and major component service manuals, an electronic copy and four (4) printed current parts manual(s), and an electronic copy and four (4) printed standard operator’s manual(s) as part of this Contract. 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’ parts numbers, company names, addresses, telephone numbers and contact persons’ names for all of 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’ parts 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:

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.

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.

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 one (1) 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. The Contractor shall submit one (1) copy of the FMVSS decal that shall be applied to the Pilot Bus.

## SP 9. Insurance

Before any contract is executed, the successful Proposer(s) will be required to file with the Agency, prior to the commencement of work under this contract or within ten (10) days from the date of notification (which- ever occurs first) a Certificate of Insurance. The certificate must be executed by a company authorized to write such business in the State of Michigan and have an A.M. Best rating of A or better, and the company must be authorized to underwrite the specific line coverage as designated below.

The insurance certificate and coverage requested must be updated and kept current throughout the life of the contract, including any extensions. Failure to submit proof of insurance coverage within the specified time frame will allow the Agency to re-award the contract or re-bid the project as it deems necessary. Insurance certificates must document that the Proposer has owner’s and Proposer’s protective liability, commercial gen- eral liability, automotive liability, workers compensation insurance, and any other insurance requirements in the amounts cited in the Proposal document to protect the Agency in the event of a claim, and/or in accord- ance with any statutory requirements.

With respect to the operations performed by the Proposer under the terms of this Contract and also those performed for the Proposer by its subcontractors, the Proposer will be required to obtain at its own cost and for the duration of this Contract, and any supplements thereto, for and in the name of the Agency in conjunction with paragraphs (A), (B), and (D), below, and with the Agency being named as an additional insured party in paragraphs (A), (B), and (D) specified, the following minimum liability insurance coverage at no direct cost to the Agency. Changes to the types and dollar amounts of coverage, if required, will be specified in the individual Proposal package.

Proposer shall assume any and all deductibles in the described insurance policies. The Proposer's insurers shall have no right of recovery or subrogation against the Agency and the described insurance shall be primary coverage. Any failure to comply with the claim reporting provisions of the policy shall not affect coverage provided to the Agency.

Each required insurance policy shall not be suspended, voided, cancelled or reduced except after 30 days prior written notice by certified mail has been given to the Agency. "Claims Made" coverage is unacceptable, with the exception of Professional Liability. Proposer agrees that he/she will not use the defense of sovereign immunity in the adjustment of claims or in the defense of any suit, unless requested by the State.

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

##### COMMERCIAL GENERAL LIABILITY

Commercial General Liability Insurance, including Contractual Liability Insurance, shall at a minimum, be provided in an amount of **TWO MILLION DOLLARS ($2,000,000.00)** per occurrence for all damages arising out of bodily injury to or death of all persons in any accident or occurrence, and for all damages arising out of injury to or destruction of property in any accident or occurrence, and, subject to that limit per occurrence. Coverage shall include Premises and Operations, Independent Contractors, Products and Completed Operations, Contractual Liability and Broad Form Property Damage.

##### AUTOMOBILE LIABILITY

The operation of all motor vehicles, including those hired or borrowed, used in connection with the Contract shall be covered by Automobile Liability Insurance providing a total of **TWO MILLION DOLLARS ($2,000,000.00)** per occurrence for all damages arising out of bodily injury to or death of all persons in any accident or occurrence, and for all damages arising out of injury to or destruction of property in any accident or occurrence. Coverage extends to owned, hired and non-owned automobiles. If the vendor/Proposer does not own an automobile, but one is used in the execution of the contract, then only hired and non-owned coverage is required. When it is clearly established that no vehicle is used in the execution of the contract, then automobile coverage is not required.

##### WORKERS’ COMPENSATION

With respect to all operations the Proposer performs and all those performed for the Proposer by subcontractor(s), the Proposer, and subcontractor(s) if used, shall carry Workers Compensation Insurance at statutory coverage limits and/or, as applicable, insurance required in accordance with, the Federal Employers Liability Act, all in accordance with the requirements of the laws of the State of Michigan or for the State in which the work is to be performed, and the laws of the United States respectively.

##### UMBRELLA LIABILITY

In the event the Proposer secures excess/umbrella liability insurance to meet the minimum requirements specified as items A, B, C, the Huron Transit Corporation must be named as Additional Insured.

Proposer hereby indemnifies and shall defend and hold harmless the Agency, its officers and its employees from and against any and all suits, actions, legal or administrative proceedings, claims, demands, damages, liabilities, monetary loss, interest, attorney’s fees, costs and expenses of whatsoever kind or nature arising out of the performance of this agreement, including those arising out of injury to or death of Proposer’s employees or subcontractors, whether arising before, during or after completion of the services hereunder and in any manner directly or indirectly caused, occasioned or contributed to in whole or in part, by reason of any act, omission, fault or negligence of Proposer or its employees, agents or subcontractors.

Updates on the insurance coverage are the responsibility of the Proposers. Insurance requirements will be strictly enforced. Proposers should hand carry or mail Insurance Certificates to the Agency’s Purchasing Supervisor.

Please deliver certificates to:

Huron Transit Corporation Director Attn: Ken Jimkoski

1513 S Bad Axe Road Bad Axe, MI 48413

Or e-mail certificates to: [ken.jimkoski@tatbus.com](mailto:ken.jimkoski@tatbus.com)

Purchase orders WILL NOT be issued without receipt of properly executed insurance certificates. 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 Huron Transit Corporation.

# SECTION 5: FEDERAL REQUIREMENTS

## 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, 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, 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 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, 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 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.

* 1. **Equal Employment Opportunity:** The following equal employment opportunity requirements apply to the underlying Contract:
     1. **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.
     2. **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.
     3. **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.

* 1. 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

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 over 70% percent domestic content.

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

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 October 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

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 leading for shipments originating outside the United States, a legible copy of a rated, “on-board” 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.

1. **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

These technical specifications define the minimum requirements for a mid-size, medium-duty, Diesel pow- ered Transit Bus equipped optional with a commercial wheelchair lift, which, by the selection of specifically identified alternative configurations, may be used for both suburban express service and general service on urban arterial streets. The lift-equipped floor plan shall seat a minimum of thirty-nine (39) passengers. Con- tractors shall submit floor plans for buses with lift location options. As a minimum, buses must meet all appli- cable Michigan Motor Carrier Vehicle Codes, all applicable Federal Motor Vehicle Safety Standards (FMVSS) and the Americans with Disabilities Act (ADA). Buses shall have a minimum expected life of ten

(10) years or 350,000 miles, whichever comes first, and are intended for the widest possible spectrum of pas- sengers, 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.

**NOTE:** Analog signals are used to represent the state of variable devices such as rheostats, potentiometers, temperature probes, etc.

**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). **Cells:** Individual components (i.e., battery or capacitor cells).

**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 Recommended Practice J941, except that the height of the ellipse shall be determined from the seat at its reference height.

**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.

**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.

**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.

**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.

**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 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.

**Gross Load:** 150lbs 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:** An assembly of individual components

**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.

**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.

**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.

**NOTE:** Since this is a pressure-activated device, it may not protect against rupture of the container when the application of heat weakens the container to the point where its rupture pressure is less than the rated burst pressure of the relief device, particularly if the container is partially full.

**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:** 150lbs for every designed passenger seating position and for the driver.

**SLW (Seated Load Weight):**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.

**NOTE:** An example is the communication that takes place between two or more electronic components with the ability to process and store information.

**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 Vsystems).

**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 “pigtails” 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.

**NOTE:** Since this is a thermally activated device, it does not protect against over-pressure from improper charging practices.

**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 lbs when occupied.

## 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 APTA issuance of this specification.

## TS 4. Legal Requirements

The Contractor shall comply with all applicable federal, state and local regulations. These shall include but not be limited to 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 Michigan Motor Carrier Vehicle Codes and FMVSS regulations and shall accommodate all applicable FMCSR 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 or performance.

Buses at a capacity load shall not exceed the tire factor limits, brake test criteria or structural design criteria.

### TS 5.2 Capacity

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

### TS 5.3 Service Life

The minimum useful design life of the bus in transit service shall be at least ten (10) years or 350,000 miles. It shall be capable of operating at least 40,000 miles per year, including the 10th year.

### TS 5.4 Maintenance and Inspection

Scheduled maintenance tasks shall be related and shall be in accordance with the manufacturer’s recommended preventative maintenance schedule (along with routine daily service performed during the fueling operations).

Test ports, as required, shall be provided for commonly checked functions on the bus, such as air intake, exhaust, hydraulic, pneumatic, charge-air and engine cooling systems.

The coach manufacturer shall give prime consideration to the routine problems of maintaining the vehicle. All coach components and systems, both mechanical and electrical, which 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 coach structure and/or equipment such as seats and flooring under seats in order to gain access to these areas. Each coach 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 will be minimized. The body and structure of the coach shall be designed for ease of maintenance and repair. Individual panels or other equipment that may be dam- aged in normal service shall be repairable or replaceable. Ease of repair shall be related to the vulnerability of the item to damage in service. Additionally, the Contractor shall have the ability to supply body replacement parts within five (5) business days unless the Contractor notifies the Agency that the part is not available for shipment and provides a shipping date for the part required.

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

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

The Contractor shall provide the Agency one (1) OEM diagnostic reader (or laptop) with all applicable soft- ware with the delivery of the first bus from the base order of buses.

### TS 5.5 Use of Brand Names

Wherever brand, manufacturer, or product names are used, they are included only for the purpose of establishing a description of minimum quality of the item. This inclusion is not to be construed as advocating or prescribing the use of any particular brand or item or product. The Huron Transit Corporation must be able to determine whether the Proposer’s offered product is or is not equal to the product described in the specifications from information (technical data, test results, and the like) contained in the proposal.

All detailed descriptions and specifications provided in the proposal must match the product offered for use in the Contract.

### TS 5.6 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 5.7 Training

The Contractor shall provide as part of this Contract a minimum of forty (40) hours of training to be con- ducted at the Agency’s property after acceptance of the first bus. The hours for training shall be mutually agreed upon by the Huron Transit Corporation’s Director of Maintenance and the Contractor. Instructor(s) shall conduct schools and advise the personnel of the Agency on the proper operation and maintenance of the equipment. The Contractor also shall provide visual and other teaching aids (such as manuals, slide presenta- tions and literature) for use by the Agency’s own training staff and which become the property of the Agency. Proposers shall include with their submissions, their training capabilities and a detail of the training to be in-cluded in the Contract.

#### TS 5.7.1 Technical/Service Representatives

The Contractor shall, at its own expense, have one or more competent technical service representatives 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.”

### TS 5.8 Operating Environment

The bus shall achieve normal operation in ambient temperature ranges of -15 ºF to 115 ºF, at relative humidity between 10 percent 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 115 °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, gradability and acceleration performance requirements shall be met at, or corrected to, 77 °F, 29.31 in. Hg, dry air per- SAEJ1995.

### TS 5.9 Noise

#### TS 5.9.1 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 engine and accessories switched off.

The bus-generated noise level experienced by a passenger at any seat location in the bus shall not exceed 80 dBA. The driver area shall not experience a noise level of more than 75 dBA. Measurements of interior noise levels shall be taken in accordance with SAEJ2805. An exception shall be made for the turntable area, which shall be considered a separate environment.

#### TS 5.9.2 Exterior Noise

Airborne noise generated by the bus and measured from either side shall not exceed 80dBA under full power acceleration when operated at 0 to 35 mph at curb weight. The maximum noise level generated by the bus pulling away from a stop at full power shall not exceed 83 dBA. The bus-generated noise at curb idle shall not exceed 65dBA.If the noise contains an audible discrete frequency, a penalty of 5 dBA shall be added to the sound level measured. The Contractor shall comply with the exterior noise requirements defined in local laws and ordinances identified by the Agency andSAEJ366.

### TS 5.10 Fire Safety & Required Equipment

The bus shall be designed and manufactured in accordance with all applicable fire safety and smoke emission regulations. These provisions shall include the use of fire-retardant/low-smoke materials, fire detection sys- tems, bulkheads and facilitation of passenger evacuation. The bus shall be equipped with a minimum 5lb.

ABC fire extinguisher, 16-unit first aid kit and triangular reflectors. Emergency equipment shall be stowed properly and accessibly. The storage location of the emergency equipment shall be STARS approved on pilot bus.

#### TS 5.10.1 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 5.11 Fire Suppression

The bus shall have as a option Fogmaster fire suppression system or an approved equal installed. The fire suppression system shall have an very efficient high pressure water mist for extinguishing fires in engine compartments.. The water mist shall fill the entire engine compartment and access fire beds outside the direct spreading area of the nozzles. The fire suppression system shall have a hydro pneumatic fire detection suppression system that works with the same effect even when the electricity supply is disconnected. The system shall also be po-sition independent (if the bus is laying on the side or up- side-down).

### TS 5.12 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.

# 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 rub rails, the bus shall have the following overall dimensions at static conditions and design height.

### TS 6.1 Bus Length

For ease of use, the following tolerances will be allowable for each given bus length. Bus length is determined as the measurement from bumper to bumper.

40ft bus: 38ft to 44ft, 11 in.

### TS 6.2 Bus Width

Body width shall be 96 in. (+0, -1 in.).

### TS 6.3 Bus Height

Maximum overall height shall not exceed 140 in., including all rigid, roof-mounted items such as A/C, ex- haust, fuel system and cover, etc.

### TS 6.4 Step Height

The step height shall not exceed 13.8” at either doorway.

### TS 6.5 Underbody Clearance

The bus shall maintain the minimum clearance dimensions as defined and shown in Figure 2 of SAE Standard 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 break over 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.

Buses shall have a minimum angle of approach of 9 degrees, a minimum angle of departure of 7 degrees and a minimum breakover angle of 10 degrees in order that they may safely negotiate vertical curves in the Agency’s service area.

### TS 6.7 Ground Clearance

Buses shall have a minimum 15’6” front ground clearance and 16’1” rear at any position under the bus excluding axles zones. The minimum ground clearance in any axle zone shall be 15’5”. No part of the bus, other than the wheels, tires or mud flaps, shall touch a flat road surface in a stopped condition with a single tire or a dual set fully deflated.

|  |
| --- |
| Transit Bus Minimum Road Clearance |
| **18” 24”**  **WHEEL WHEEL**  **AREA AREA**  **AXLE AXLE**  **ZONE ZONE**  **o o o o**  **45 45 45 45**  **18” 24”** |
| **REAR FRONT**  **½ WHEEL BASE**  **DEPARTURE BREAKOVER APPROACH**  **ANGLE ANGLE ANGLE** |

### TS 6.8 Floor Height

Height of the step above the street shall be no more than 16 in. measured at the centerline of the front and rear 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. A maximum of two steps are allowed to accommodate a raised aisle floor in the rear of the bus.

### TS 6.9 Interior Headroom

Headroom above the aisle and at the centerline of the aisle seats shall be no less than 75.5 in. in the forward half of the bus tapering to no less than 74 in. forward of the rear settee. Headroom shall be measured from finished product surfaces. 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 above the aisle and at the centerline of the aisle seats shall be no less than 75.5 in. Headroom shall be measured from finished product surfaces. 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 propulsion system shall be sized to provide sufficient power to enable the bus to meet the defined acceleration, top speed and gradability requirements, and operate all propulsion-driven accessories using actual road test results and computerized vehicle performance data.

### TS 7.1 Top Speed

The bus shall be capable of achieving a top speed of 74 mph but not less than 65 mph on a straight, level road at GVWR with all accessories operating. The bus shall be capable of safely maintaining the vehicle speed ac- cording to the recommendations by the tire manufacturer.

**NOTE:** Values are assumed to be sustained. Manufacturer shall supply Agency with data if there is a variance between peak performance and sustained vehicle performance.

### TS 7.2 Gradability

Gradability 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 2½ percent ascending grade and 15 mph on a 10 percent ascending grade continuous.

**NOTE:** Values are assumed to be sustained. Manufacturer shall supply Agency with data if there is a variance between peak performance and sustained vehicle performance.

### TS 7.3 Acceleration

The acceleration shall meet the requirements in **Table 3** below and shall be sufficiently gradual and smooth to prevent throwing standing passengers off-balance. The buses shall be capable of achieving the following speeds in corresponding time intervals, starting from a stationary condition, with passenger load of 100% of seated load, at 150 pounds per seated passenger, plus 250 pounds per wheelchair passenger. The rate of change of acceleration shall be minimized throughout the acceleration/deceleration range and shall be no greater than .03 g/sec. Acceleration measurement shall commence when the accelerator is depressed.

##### TABLE 3

Maximum Start Acceleration Times on a Level Surface1

|  |  |
| --- | --- |
| **Speed (mph)** | **Maximum time (seconds)** |
| 10 | 2.85 |
| 20 | 5.95 |
| 30 | 10.50 |
| 40 | 16.7 |
| 50 | 26 |
| Top speed |  |

1. Vehicle weight = GVWR

### TS 7.4 Operating Range

The operating range of the coach when run on the FTA ABD Cycle shall be at a minimum of 200 miles (483 km) or 20 hours with full fuel capacity.

## TS 8. Fuel Economy (Design Operating Profile)

Test results from the FTA ABD Cycle economy tests or other applicable test procedures shall be provided to the Agency. Results shall include vehicle configuration and test environment information. Fuel economy data

shall be provided for each design operating profile. The design operating profile is assumed to be defined by the FTA ABD Cycle.

Fuel economy test run shall comprise 3 CBD phases, 2 Arterial phases, and 1 Commuter phase. An electronic fuel measuring system will indicate the amount of fuel consumed during each phase of the test. The test runs will be repeated until there are at least two runs in both the clockwise and counterclockwise directions in which the fuel consumed for each run is within ± 4 percent of the average total fuel used over the 4 runs. A 20-minute idle consumption test is performed just prior to and immediately after the driven portion of the fuel economy test. The amount of fuel consumed while operating at normal/low idle is recorded on the Fuel Econ- omy Data Form. This set of four valid runs along with idle consumption data comprise a valid test.

# POWER PLANT

## TS 9. Engine

The engine shall comply with applicable local, state and/or federal emissions and useful life requirements. The engine shall have a design life of not less than 300,000 miles without replacement or major service. The lifetime estimate is based on the design operating profile.

The engine shall have 6 cylinders and be equipped with an electronically controlled management system, compatible with either 12 or 24V power distribution. The engine control system shall be capable of transmitting and receiving electronic inputs and data from other drivetrain components and broadcasting that data to other vehicle systems. Communication between electronic drivetrain components and other vehicle systems shall be made using the communications networks. The engine’s electronic management system shall monitor operating conditions and provide instantaneous adjustments to optimize both engine and bus performance. The system shall be programmable to allow optimization of programmable features.

The engine starting system shall be protected by an interlock that prevents its engagement when the engine is running. Special equipment or procedures may be employed to start the bus when exposed to temperatures less than 30 °F for a minimum of four hours without the engine in operation. All cold weather starting aids, engine heating devices and procedures shall be of the type recommended by the engine manufacturer and approved by the Agency. The integration of all systems on the vehicle relative to engine idle speed shall be the responsibility of the vehicle manufacturer to meet the requirements of the transit property.

The engine control system shall protect the engine against progressive damage. The system shall monitor conditions critical for safe operation and automatically derate power and/or speed and initiate engine shutdown as needed.

## TS 10. Cooling Systems

The cooling systems shall be of sufficient size to maintain all engine and transmission fluids and engine intake air at safe, continuous operating temperatures during the most severe operations possible and in accordance with engine and transmission manufacturers’ cooling system requirements. The cooling system fan controls should sense the temperatures of the operating fluids and the intake air, and if either is above safe

operating conditions, the cooling fan should be engaged. The fan control system shall be designed with a fail-

safe mode of “fan on.” The cooling system shall meet the requirements stated in the operating environment.

### TS 10.1 Engine Cooling

A means of determining satisfactory engine coolant level shall be provided.

The cooling fan shall be temperature controlled, allowing the engine to reach operating temperature quickly. The radiator and charge air cooler shall be of durable, corrosion-resistant construction with non-removable radiator headers.

#### TS 10.1.1 Radiator Screen

No screen in front of radiator

#### TS 10.1.2 Coolant

Standard Requirement for Coolant Filtration

#### TS 10.1.3 Drive Design

Standard Control and 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 shall be the Contractor’s standard design.

### TS 10.2 Charge Air Cooling

The charge air cooling system, also referred to as after-coolers or inter-coolers, shall provide maximum air intake temperature reduction with minimal pressure loss. The charge air radiator shall be sized and positioned to meet engine manufacturer’s requirements. The charge air radiator shall not be stacked ahead of or behind the engine radiator and shall be positioned as close to the engine as possible unless integrated with the radia- tor. Air ducting and fittings shall be protected against heat sources and shall be configured to minimize re- strictions and maintain sealing integrity.

### TS 10.3 Transmission Cooling

The transmission shall be cooled by a dedicated heat exchanger sized to maintain operating fluid within the transmission manufacturer’s recommended parameters of flow, pressure and temperature. 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. The engine cooling system should provide coolant bypass flow to the transmission cooling system with the engine

thermostats closed. Unless otherwise noted, the transmission cooler is to be the first component to see cold water from the radiator outlet. In addition, all return water piping, aside from the thermostat bypass line, is to be plumbed in after the transmission cooler.

## TS 11. Transmission (Conventional Powertrain)

The transmission shall be multiple speed, automatic shift with torque converter, retarder and electronic controls. Gross input power, gross input torque and rated input speed shall be compatible with the engine. The transmission shall be designed to operate for not less than 350,000 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 Vpower distribution, provide consistent shift quality, and compensate for changing conditions, such as variations in vehicle weight and engine power. At a minimum, drivetrain 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 among components exists when the vehicle ignition is switched to the “on” position.

A nominal 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 electronically controlled transmission shall have on-board 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 on-board 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. The transmission shall not incorporate an automatic neutral shift function.

## TS 12. Mounting

All power plant mounting shall be mechanically isolated to minimize transfer of vibration to the body structure and provide a minimum clearance of 0.75 in. Mounts shall control the movement of the power plant so as not to affect performance of belt-driven accessories or cause strain in piping and wiring connections to the power plant.

### TS 12.1 Service

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.

All fluid fill locations shall be properly labeled 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.

## TS 13. 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 tamper-proof 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.

### TS 13.1 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 13.2 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 13.3 Charge Air Piping

Charge air piping and fittings shall be designed to minimize air restrictions and leaks. Piping shall be as short as possible, and the number of bends shall be minimized. Bend radii shall be maximized to meet the pressure drop and temperature rise requirements of the engine manufacturer. The cross section of all charge air piping shall not be less than the cross section of the intake manifold inlet. Any changes in pipe diameter shall be gradual to ensure a smooth passage of air and to minimize restrictions. Piping shall be routed away from heat sources as practicable and shielded as required to meet the temperature rise requirements of the engine manufacturer.

Charge air piping shall be constructed of stainless steel, aluminized steel, anodized aluminum or painted steel rated at minimum 1000 hours of salt spray according to ASTM B117, except between the air filter and turbocharger inlet, where piping may be constructed of flexible heat-resistant material. Connections between all charge air piping sections shall be sealed with a short section of reinforced hose and secured with stainless steel constant tension clamps that provide a complete 360deg seal.

## TS 14. Radiator

Radiator piping shall be stainless steel, brass tubing or painted steel rated at 1000 hours of salt spray according to ASTM B117 and where practicable, hoses shall be eliminated, including biodiesel. Necessary hoses shall be impervious to all bus fluids. All hoses shall be secured with stainless steel clamps that provide a complete 360deg 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 15. Oil and Hydraulic Lines

Oil and hydraulic lines shall be compatible with the substances they carry. The 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). Lines within the engine compartment shall be composed of steel tubing where practicable, except in locations where flexible lines are required.

Hydraulic lines of the same size and with the same fittings as those on other piping systems of the bus, but not interchangeable, shall be tagged or marked for use on the hydraulic system only.

## TS 16. Fuel

### TS 16.1 Fuel Lines

Fuel lines shall be securely mounted, braced and supported as designed by the bus manufacturer to minimize vibration and chafing and shall be protected against damage, corrosion or breakage due to strain or wear.

Manifolds connecting fuel containers shall be designed and fabricated to minimize vibration and shall be installed in protected locations to prevent line or manifold damage from unsecured objects or road debris.

Fuel hose and hose connections, where permitted, shall be made from materials resistant to corrosion and fuel and protected from fretting and high heat. Fuel hoses shall be accessible for ease of serviceability.

#### TS 16.1.1 Fuel Lines, Diesel

Fuel lines shall be capable of carrying #2 ultra-low sulfur Diesel fuel.

### TS 16.2 Design and Construction

#### TS 16.2.1 Design and Construction, Diesel

###### Fuel Tank

The fuel tank shall be made of corrosion-resistant ASME certified steel located between frame rails and surrounded by a reinforcing steel barrier for protection. Fuel tank shall be a minimum of 100 gallons (diesel).

###### Installation

The fuel tank shall be securely mounted to the bus to prevent movement during bus maneuvers.

The fuel tank shall be equipped with an external, hex head, drain plug. It shall be at least a ⅜in. size and shall be located at the lowest point of the tank(s).The fuel tank shall have an inspection plate or easily removable filler neck to permit cleaning and inspection of the tank without removal from the bus. The tank shall be baffled internally to prevent fuel-sloshing regardless of fill level. The baffles or fuel pickup location shall assure continuous full power operation on a 6 percent upgrade for 15 minutes starting with no more than 25 gal of fuel over the unusable amount in the tank. The bus shall operate at idle on a 6 percent downgrade for 30 minutes starting with no more than 10 gal of fuel over the unusable amount in the tank.

The materials used in mounting shall withstand the adverse effects of road salts, fuel oils and accumulation of ice and snow for the life of the bus.

###### Labeling

The capacity, date of manufacture, manufacturer name, location of manufacture, and certification of compliance to federal motor carrier safety regulations shall be permanently marked on the fuel tank. The markings shall be readily visible and shall not be covered with an undercoating material.

###### Fuel Filler

The filler cap shall be retained to prevent loss and shall be recessed into the body so that spilled fuel will not run onto the outside surface of the bus.

The fuel lines forward of the engine bulkhead shall be in conformance to SAE Standards. OEM to designate height of fuel filler.

## TS 17. Emissions and Exhaust

### TS 17.1 Exhaust Emissions

The engine and related systems shall meet all applicable emission and engine design guidelines and standards. Buses shall conform to the air pollution control standards of the Environmental Protection Agency of the Fed-eral Government.

### TS 17.2 Exhaust System

Exhaust system shall be high capacity 4” aluminized steel exhaust pipe and muffler properly routed and installed with heat shields, baffles and anti-vibration mounts as required.

The exhaust pipe shall be of sufficient height to prevent exhaust gases and waste heat from discoloring or causing heat deformation to the bus. The entire exhaust system shall be adequately shielded to prevent heat damage to any bus component, including the exhaust after treatment compartment area. The exhaust outlet shall be designed to minimize rain, snow or water generated from high-pressure washing systems from entering into the exhaust pipe and causing damage to the after treatment.

Exhaust gases and waste heat shall be discharged from the roadside rear corner of the roof.

# STRUCTURE

## TS 18. General

### TS 18.1 Design

The structure of the bus shall be designed to withstand the transit service conditions typical of an rural and city duty cycle throughout its service life. Body material shall be fabricated out of aluminum or galvanized steel with ABS plastics or reinforced fiberglass for trim to extend durability and provide consistency of ap- pearance throughout the life of the bus. Detailing shall be kept simple; add-on devices and trim shall be mini- mized and where necessary integrated into basic design. The vehicle structural frame shall be designed to op- erate with minimal maintenance throughout the 10-year design operating profile. The design operating profile specified by the Agency shall be considered for this purpose.

The bus body design shall have a clean, smooth, sleek, compact design, correctly proportioned and properly balanced. The exterior and body features, including grills and louvers shall be shaped to allow complete and easy cleaning by automatic bus washers without snagging washer brushers. Water and dirt shall not be re- tained in or on any body feature to freeze or bleed out onto the bus after leaving the washer. Body and win- dows 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. Accumulation of spray and splash on any window of the bus, generated by the bus wheels on a wet road shall be minimized.

## TS 19. Altoona Testing

The Altoona Test Report shall be provided to the Agency with the Proposal submittal. If not available, then the report shall be provided prior to first acceptance of bus. Any items that required repeated repairs or replacement must undergo the corrective action with supporting test and analysis. A report clearly describing and explaining the failures and corrective actions taken to ensure that any and all such failures will not occur shall be submitted to the Agency.

### TS 19.1 Structural Validation

The structure of the proposed bus model shall have undergone structural testing prior to assembly of the first bus. The OEM shall provide the Agency with completed reports of other structural tests as specified by the Agency which shall include but not limited to the Altoona testing and finite element analysis (FEA).

## TS 20. 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 21. 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 21.1 Engine Compartment Bulkheads

The passenger and engine compartment shall be separated by fire-resistant bulkheads. The engine compartment shall include areas where the engine and exhaust system are housed. This bulkhead shall preclude or retard propagation of an engine compartment fire into the passenger compartment and shall be in accordance with the Recommended Fire Safety Practices defined in FTA Docket 90A, dated October 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 21.2 Crashworthiness

The bus body and roof structure as integrated shall be designed to meet the rollover requirements of FMVSS 220.

## TS 22. Corrosion

The bus flooring, sides, roof, understructure and axle suspension components shall be designed to resist corrosion or deterioration from atmospheric conditions and de-icing 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.

###### Corrosion-Resistance Requirements

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 23. Towing

Two (2) front and two (2) rear towing hook accessible under the bumpers shall be provided. Access to tow hooks may be made through holes in the bumper assembly. Each towing hook shall withstand, without permanent deformation, tension loads up to 1.2 times GVWR of the bus within 20 deg of the longitudinal axis of the bus. The intended use for tow hooks is only to safely move the bus to a point of tow truck hook-up.

Tow hooks shall be installed to prevent them from dragging when the bus is driven over an incline. The tow hooks equal to Original Equipment Manufacturer (OEM) units shall be mounted and adequately secured to

the chassis frame as recommended by the tow hook manufacturer or may be supplied by the OEM as standard equipment on the chassis. If applicable, the rear towing device(s) shall not provide a toehold for unauthorized riders. The method of attaching the towing device shall not require the removal, or disconnection, of front suspension or steering components. Tow hooks shall be easily accessed and free of interference with the bumper system when in use.

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.

## TS 24. 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.

## TS 25. Hoisting

The bus axles or jacking plates shall accommodate the lifting pads of a two-post 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. All hoist pads must be painted Traffic Yellow.

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 26. Floor

### TS 26.1 Design

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 ¼ 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.

### TS 26.2 Strength

The floor deck may be integral with the basic structure or mounted on the structure securely to prevent chaf- ing 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. Tap- ping 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. All floor fasteners shall be countersink below the floor deck and filled level and sanded before installation of flooring material.

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 lbs applied through the flat end of a ½ in. diameter rod, with 1/32 in. radius, without permanent visible deformation.

### TS 26.3 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.

Plywood shall be marine grade with 5/8 or greater certified at the time of manufacturing by an industry- approved third-party inspection agency such as APA – The Engineered Wood Association (formerly the American Plywood Association). Plywood shall be of a thickness adequate to support design loads, manufactured with exterior glue, satisfy the requirements of a Group I Western panel as defined in PS 1-95 (Voluntary Product Standard PS 1-95,

“Construction and Industrial Plywood”) and be of a grade that is manufactured with a solid face and back. Plywood shall be installed with the highest-grade, veneer side up. Preservative treatments shall utilize no EPA-listed hazardous chemicals. The concentration of preservative chemicals shall be equal to or greater than required for an above ground level application. Plywood will be certified for preservative penetration and retention by a third-party inspection agency. plywood shall have a moisture content at or below 15 percent.

## TS 27. Platforms

### TS 27.1 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 27.2 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 2** illustrates a means by which the platform height can be determined, using the critical line of sight.

|  |
| --- |
| **FIGURE 2**  Determining Platform Height |
| P2012C2T4#yIS1 |

### TS 27.3 Farebox

Farebox placement should minimize impact to passenger access and minimize interference with the driver’s

line of sight.

###### Driver Interface Required; Platform Needed to Bring Height to Driver Access

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 28. Wheel Housing

### TS 28.1 Design and Construction

Sufficient clearance and air circulation shall be provided around the tires, wheels and brakes to preclude over- heating when the bus is operating on the design operating profile. Interference between the tires and any por- tion of the bus shall not be possible in maneuvers up to the limit of tire adhesion with weights from curb weight to GVWR. Wheel housings shall be a minimum of 16 gauge galvanized steel or an approved equal to securely sealed and welded to floor. Wheel housings shall be constructed of corrosion resistant and fire-re- sistant material. Wheel house exterior surface shall be thoroughly undercoated. The finish of the front wheel housings shall be scratch-resistant and complement interior finishes of the bus utilizing a rubber floor cover- ing to minimize the visual impact of the wheel housing.

Wheel housings not equipped with seats or equipment enclosure shall have a horizontal assist mounted on the top portion of the housing no more than 4 in. higher than the wheel well housing.

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

# CHASSIS

## TS 29. Suspension

### TS 29.1 General Requirements

The front, rear and mid (if articulated) 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 29.2 Front Suspension

Air Ride Suspension providing the driver and passengers with the highest level of ride quality and safety shall be provided. The front suspension shall be Hendrickson Airtek, or approved equal with a minimum of 12,000 lbs. capacity.

Minimum of two (2) rolling lobe air springs per axle shall be provided. Spring air pressure shall be maintained by two (2) each zero delay height control valves. Air springs shall be internally equipped with jounce rubber stops. Springs shall be dampened by two (2) heavy duty suspension valved shock absorbers using bonded bushings. Lateral stability shall be provided by a rubber bushed radius rod with replaceable bushings. Roll stability shall be controlled by zero delay constant height control valves, one (1) each on the road and curb side.

### TS 29.3 Rear Suspension

Air Ride Suspension shall be provided for passenger ride quality, safety and roll stability. The rear suspension shall be Hendrickson Comfort Air, or approved equal, with a minimum of 21,000 lbs., capacity. Minimum of two (2) rolling robe air springs per axle shall be provided. Spring air pressure shall be maintained by a zero delay height control valves. Air Springs shall be internally equipped with jounce rubber stops.

Springs shall be dampened by two (2) heavy duty suspension valved shock absorbers using bonded bushings. Lateral stability shall be provided by rubber bushed lateral tracking bar with replaceable ends. Ride height shall be controlled by a zero delay constant height control valve.

### TS 29.4 Alignment

All axles should be properly aligned so the vehicle tracks accurately within the size and geometry of the vehicle. A written copy of alignment specifications shall accompany each bus at delivery.

### TS 29.5 Springs and Shock Absorbers

#### TS 29.5.1 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 29.5.2 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 less 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 29.5.3 Lubrication

All elements of steering, suspension and drive systems requiring scheduled lubrication shall be provided with grease fittings conforming to SAE Standard 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 less than every 6000 miles.

## TS 30. Wheels and Tires

### TS 30.1 Wheels

Wheels shall be 22.5”x7.50” minimum, steel disc, 10-bolt pattern lug with a single front and dual rear. Wheels shall be compatible with tires in size and load-carrying capacity. All tires assembly shall be balanced as an assembly per SAE J1986.

###### Painted Steel

Wheels and rims shall be hub-piloted with powder-coated steel (maximum 3.5 mil) and shall resist rim flange wear. Agency shale choose white or black rims.

### TS 30.2 Tires

All tires (6) shall be from the same manufacturer and, tubeless, steel radial blackwall, single front, dual rear. Tire size option of 275/80R22.5 or 11R22.5 or equal capacity. Option of dedicated drive tires or all position tires.

Tires must handle 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.

Each bus shall be shipped one (1) spare tire/wheel. Spares will shipped unattached to the bus. Tires and spares shall all be matching on the complete order of all buses.

## TS 31. Mud Flaps and Fender Trim

The bus shall have commercial grade anti-sail mud flaps/splash aprons behind front and rear wheels which contain no visible imprinted logo or advertising. An inverted stainless steel “T” bracket shall be used to prevent the wind movement of the mud flap when the bus is in motion. The flaps/aprons shall be securely fastened with full width metal strips and appropriate fasteners. The flaps/aprons shall be compressed betwee8n5 a gauge number 11 (.125" thickness, minimum) support bracket and a gauge number 14 (.075" thickness,

minimum) metal strip. The support bracket shall be fastened securely to the body substructure or chassis frame. The flaps shall extend to within 6" of the road surface at curb weight. The mud flaps/aprons shall be at least 1" wider than the tire widths (single front, dual rear) to control splash at the rear of wheel openings.

Fender Trim shall be steel with rubber fenders. Rubber fender splash guards, secured with stainless fasteners shall be installed on all wheel well openings. Other mud flaps/splash aprons/shields shall be installed to protect bus equipment (AC components, batteries, front wheel inner shield, auxiliary heater box, and the like) from road splash.

## TS 32. Steering

Full integral hydraulic powered assisted steering shall be provided designed for the rigors of transit with a minimum design capacity of 12,000 lb. rating. The steering gear shall be an integral type with the number and length of flexible lines minimized or eliminated. TRW THP60, or approved equal, gear-driven hydraulic pump with remote mounted reservoir having a minimum of one (1) gallon capacity and filters all returning oil shall be provided for power steering. The gear shall be Ross TAS-65, or approved equal, with a 20.4.1 ratio.

### TS 32.1 Steering Axle

###### Solid Beam Axle and Grease-Type Front Bearings and Seals

The front axle shall be solid beam, non-driving with a load rating sufficient for the bus loaded to GVWR and shall be equipped with grease type front 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 32.2 Steering Wheel

#### TS 32.2.1 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.-lbs. and no more than 10 ft.-lbs. Steering torque may increase to 70 ft.-lbs. 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 lbs 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 32.2.2 Steering Wheel, General

The steering wheel diameter shall be approximately 18 to 20 in.; the rim diameter shall be ⅞ to 1¼ 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 inline with or behind the instrument cluster.

#### TS 32.2.3 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.

#### TS 32.2.4 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.

## TS 33. Drive Axle

Arvin Meritor Model RS-21-145, or approved equal, full floating type with ratio drive axle providing 70 mph road speed and a minimum design load rating of 21,000 lbs. capacity. Carrier housing shall be separable carrier housing construction with riveted ring gear and shall be equipped with magnetic internal hex head lubricant drain plug. Carrier and hubs shall be internally oil lubricated with multi-grade, multi-purpose gear oil. The drive axle shall have a design life to operate for not less than 350,000 miles on the design operating profile without replacement or major repairs.

If a planetary gear design is employed, 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.

**NOTE:** The retardation duty cycle can be more aggressive than propulsion.

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 33.1 Front Axle Assembly

The Front Axle Assembly shall be wide track, drop center, I-beam type and shall be provided with a minimum design load rating of 12,000 lbs. capacity. The king pin bushings shall be replaceable at all lateral joints. The top and bottom king pin bushings and tie rod end joints shall be equipped with zerk type grease fittings. Front hub and spindle bearings shall be prepacked grease type.

## TS 34. Turning Radius

Buses shall have a curb to curb turning radius not exceeding 37 feet maximum and a wall to wall turning ra- dius not exceeding 38 feet maximum. **Contractor shall supply curb to curb and wall to wall turning ra- dius with proposal**.

## TS 35. Brakes

The brake system shall be Air Brake System with auto adjustment meeting FMVSS 105.

### TS 35.1 Service

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 lbs 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 mate- rial wear rate at all wheel locations. Manufacturer shall demonstrate compliance by providing a copy of a thermodynamic brake balance test upon request.

### TS 35.3 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.

### TS 35.4 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.

**Disc Brakes on All Axles**

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 35.5 Parking/Emergency Brake

The parking brake shall be actuated by a dash 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 37. Pneumatic System

### TS 37.1 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 5psi 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 37.2 Air Compressor

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

### TS 37.3 Air Lines and Fittings

Air lines, except necessary flexible lines, shall conform to the installation and material requirements of SAE Standard J1149 for copper tubing with standard, brass, flared or ball sleeve fittings, or SAE Standard 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 5ft 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 2ft 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 37.4 Air Reservoirs

All air reservoirs shall meet the requirements of FMVSS Standard 121 and SAE Standard 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 37.5 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,F AND DATA COMMUNICATION SYSTEMS

## TS 38. 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 bi-directional communications networks that electronic device s 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:

* **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.
* **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.
* **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.

|  |  |
| --- | --- |
|  | **FIGURE 4**  Data Communications Systems Levels |
| Information level | P2236C3T6#yIS1 |
| Multiplex level |
| Drivetrain level |

### TS 38.1 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.

Power plant wiring shall be an independent wiring harness. Replacement of the engine compartment wiring harness(es) shall not require pulling wires through any bulkhead or removing any terminals from the wires.

## TS 39. 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, asrecommendedinSAEJ1455.

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. As a recommendation, no vehicle component shall generate, or be affected by, electromagnetic interference or radio-frequency interference (EMI/RFI) that can disturb the performance of electrical/electronic equipment as defined in SAEJ1113and UNECE Council Directive 95/54(R10).

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

### TS 39.1 Hardware Mounting

The mounting of the hardware shall not be used to provide the sole source ground, and all hardware shall be isolated from potential EMI/RFI, as referenced in SAE J1113.

All electrical/electronic hardware mounted in the interior of the vehicle shall be in accessible to passengers and hidden from view unless intended to be viewed. The hardware shall be mounted in such a manner as to protect it from splash or spray.

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 sealed enclosure.

All electrical/electronic hardware and its mounting shall comply with the shock and vibration requirements of SAEJ1455.

## TS 40. General Electrical Requirements

### TS 40.1 Batteries

#### TS 40.1.1 Low-Voltage Batteries

###### Four Group 31 Maintenance-Free Batteries

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.

###### Same Size Terminal Ends

Positive and negative terminal ends shall be the same size

#### TS 40.1.2 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 and 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 onto pof the batteries. Except as interrupted by the master battery switch, battery and starter wiring shall be continuous cables with connections secured by bolted terminals and shall conform to specification requirements of SAE Standard J1127–Type SGR, SGT, SGX or GXL and SAE Recommended Practice J541,with 2100 strand 4/0 cable or greater recommended.

#### TS 40.1.3 Jump Start

A jump-start connector, shall be provided in battery compartment, equipped with dust cap and adequately protected from moisture, dirt, and debris.

#### TS 40.1.4 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 doors hall 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 manufacturers specification.

The vehicle shall be equipped with a12VDC quick disconnect switch(es). The battery compartment door shall conveniently accommodate operation of the12VDC quick disconnect switch(es).

The battery quick disconnect access door shall be identified with a decal. The decal size shall not be less than3.5 × 5in. (8.89 × 12.7cm).

The battery hold-down bracket shall be constructed of a nonconductive and corrosion-resistant material (plastic or fiberglass).

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

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 40.1.5 Master Battery Switch

The location of the master battery switch shall be clearly identified on the exterior access panel, be accessible in less than10 seconds for deactivation and prevent corrosion from fumes and battery acid when the batteries are washed of for are in normal service.

Turning the master switch off with the power plant operating, during an emergency ,shall shut off the engine and shall not damage any component of the electrical system. The master switch shall be capable of carrying and interrupting the total circuit load.

**Single Switch**

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

#### TS 40.1.6 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. Electronic circuit protection for the cranking motor shall be provided to prevent engaging of the motor for more than 30 seconds at a time to prevent overheating. 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 in-line 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. Any manually resettable circuit breaker s 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 40.2 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 5 ground

ring/spade 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 40.3 Low Voltage/Low Current Wiring and Terminals

All power and ground wiring shall conform to specification requirements of SAE Recommended Practice J1127, J1128 and J1292.Double insulations hall be maintained as close to the junction box, electrical compartment or terminals as possible. The requirement for double insulations hall be met by wrapping the harness with plastic electrical tape or by sheathing all wires and harnesses with non-conductive, rigid or flexible conduit.

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 non-conductive 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 include10 percent (minimum one wire) excess wires for spares. This requirement for spare wires does not apply to data links 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 water tight 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 conduct or 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 8AWG 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.

Wiring located in the engine compartment shall be routed away from high- heatsourcesorshieldedand/orinsulatedfromtemperaturesexceedingthewiringandconnector operating requirements.

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 40.4 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 less 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 40.5 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 service able from the driver’s seat, vestibule or from the outside. “Rear start and run” controls shall be mounted in an accessible location in the engine compartment and shall be protected from the environment.

## TS 41. 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 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 41.1 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 41.1.1 Discrete I/O (Inputs/Outputs)

All wiring to I/O devices, either at the harness level or individual wires, shall be labeled, stamped 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 41.1.2 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 a tone 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.

**NOTE:** A shield grounded at both end forms a ground loop, which can cause intermittent control or faults.

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 41.1.3 Communications

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

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

#### TS 41.1.4 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 at tribute 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 41.1.5 Audio

Cabling used for microphone level and line level signals shall be 22AWG minimum with shielded twisted pair. Cabling used for amplifier level signals shall be18AWG minimum.

## TS 42. Multiplexing

### TS 42.1 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 42.1.1 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 (0–12V,10–24V,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 on-board components.

## TS 43. Data Communications

### TS 43.1 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:

* 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).
* Data definition requirements that ensure access to diagnostic information and performance characteristics.
* The capability and procedures for uploading new application or configuration data.
* Access to revision level of data ,application software and firmware.
* The capability and procedures for uploading new firmware or application software.
* 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 43.2 Drivetrain Level

Drivetrain components, consisting of the engine, transmission, retarder, anti-lock 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 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 among components exists when the vehicle ignition is switched to the “on” position.

#### TS 43.2.1 Diagnostics, Fault Detection and Data Access

Drive train 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 43.2.2 Programmability (Software)

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

### TS 43.3 Multiplex Level

#### TS 43.3.1 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 43.3.2 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 on-board 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 hand held unit. Either unit shall have the ability to check logic function. The diagnostic data can be incorporated into the information level network or the central data access system.

#### TS 43.3.3 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:

* Password protection
* Limited distribution of the configuration software
* Limited access to the programming tools required to change the software
* 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:

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

### TS 43.4 Electronic Noise Control

Electrical and electronic subsystems and components on all buses shall not emit electromagnetic radiation that will interfere with on-board 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.

# DRIVER PROVISIONS, CONTROLS AND INSTRUMENTATION

## TS 44. Driver’s Area Controls

### TS 44.1 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 Recommended Practice 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 Recommended Practice J287, “Driver Hand Control Reach.”

### TS 44.2 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 44.3 Visors/Sun Shades

Front and Side Sun Shade/Visor

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 rear- view 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 transmit- tance 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 44.4 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 Recommended Practice 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 controls 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.

### TS 44.5 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.

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.

On-board 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 6**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 6

Transit Bus 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 |  |
| Engine start, front | Approved momentary switch | Side console | Activates engine starter motor |  |
| Engine start, rear | Approved momentary switch | Engine compartment | Activates engine starter motor |  |
| Engine run, rear | Three-position toggle switch | Engine compartment | Permits running engine from rear start, normal front run position and off | Amber light |
| Drive selector | Touch panel switch | Side console | Provides selection of propulsion: forward, reverse and neutral | Gear selection |

##### TABLE 6

Transit Bus Instruments and Alarms

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Device** | **Description** | **Location** | **Function** | **Visual/ Audible** |
| 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 | Rotary, three-position detent | Side console or dash left wing | Permits supplemental ventilation: fan off, low or high |  |
| Defroster fan | Rotary, three-position detent | 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 rotary position 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, normal |  |
| Fast idle | Two-position switch | Side console | Selects high idle speed of engine |  |
| WC ramp/ kneel enable | Two-position switch1 | 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 switch1 | Front door remote or dash right wing | Permits ramp and kneel activation from front door area, key required1 | 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 |
| Rear door ramp/kneel enable | Two-position keyed switch1 | Rear door remote | Permits ramp and kneel activation from rear door area; key required1 | 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 |  |

##### TABLE 6

Transit Bus Instruments and Alarms

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Device** | **Description** | **Location** | **Function** | **Visual/ Audible** |
| Silent alarm | Recessed push button, NO and NC contacts momentary | 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 momentary switch with plastic guard | Side console | Triggers event equipment, triggers 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 |  |
| Engine shutdown override | Momentary switch with operation protection | Side console | Permits driver to override auto engine shutdown |  |
| Hazard flashers | Two-position switch | Side console or dash right wing | Activates emergency flashers | Two green lights |
| Fire suppression | Red push button with protective cover | Dash left wing or dash center | Permits driver to override and manually discharge fire suppression system | Red light |
| 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 6

Transit Bus 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 | Detented 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 |
| Park brake release | Pneumatic PPV | Vertical side of the side consoler dash center | Permits driver to push and hold to release brakes |  |
| Hill holder | Two-position momentary switch | Side console | Applies brakes to prevent bus from rolling |  |
| Remote engine speed | Rotary rheostat | Engine compartment | Permits technician to raise and lower engine RPM from engine compartment |  |
| 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 |
| Retarder disable | Multi-pole switch detented | Within reach of operator or approved location | Permits driver override to disable brake retardation/regeneration | Red light |
| Alarm acknowledge | Push button momentary | Approved location | Permits driver to acknowledge alarm condition |  |
| Rear door passenger sensor disable | Multi-pole toggle, detented | In sign compartment or driver’s barrier compartment | Permits driver to override rear door passenger sensing system |  |
| Indicator/ alarm test button | Momentary switch or programming1 | 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 |

##### TABLE 6

Transit Bus Instruments and Alarms

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Device** | **Description** | **Location** | **Function** | **Visual/ Audible** |
| 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 | Sensing low primary and secondary air tank pressure | Dash center | Indication of low air system pressure | Buzzer and red light |
| Methane detection function | Detection of system integrity | Property specific or dash center | Detects system failure | No start condition, amber light |
| Methane detection | Indication of 20% LED emergency light (LEL) | Property specific or dash center | Detects levels of methane | Flashing red at 20% LEL |
| Methane detection | Indication of 50% LEL | Property specific or dash center | Detects levels of methane | Solid red at 50% LEL |
| Engine 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 engine indicator | Coolant temperature indicator may be supplied as audible alert and visual and/or text message | Within driver’s  sight | Detects hot engine condition and initiates time delay shutdown | Red light |
| Low engine oil pressure indicator | Engine oil pressure indicator may be supplied as audible alert and visual and/or text message | Within driver’s  sight | Detects low engine oil pressure condition and initiates time-delayed 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 |
| 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 |
| Bike rack deployed indicator | Detects bike rack position | Dash center | Indication of bike rack not being in fully stowed position | Amber or red light |

##### TABLE 6

Transit Bus Instruments and Alarms

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Device** | **Description** | **Location** | **Function** | **Visual/ Audible** |
| Fuel tank level | Analog gauge, graduated based on fuel type | Dash center | Indication of fuel tank level/pressure |  |
| DEF gauge | Level Indicator | Center dash | Displays level of DEF tank and indicates with warning light when low | Red light |
| Active regeneration | Detects status | Dash center | Indication of electric regeneration | Amber or red light |
| Turntable | Detects status | Dash center | Warning indication for hinge locking | Audible and amber warning and red light if locked |
| Turntable | Interlock momentary switch | Side console | Momentarily release interlock brakes due to overangled condition |  |

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

### TS 44.6 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 44.6.1 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 50deg at the point of initiation of contact and extend downward to an angle of 10 to 18deg 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 44.6.2 Pedal Dimensions and Position

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 44.7 Brake and Accelerator Pedals

Brake Pedal

Non-adjustable brake pedal.

## TS 45. Driver’s Amenities

### TS 45.1 Coat Hanger

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

### TS 45.3 Storage Box

An enclosed driver storage area shall be provided with a positive latching door and/or lock.

## TS 46. Windshield Wipers and Washers

### TS 46.1 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 46.2 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 47. Driver’s Seat

Recaro Ergo S Air Suspension Driver Seat or approved equal. Upholstery shall be vinyl and treated

for low smoke/low flame. Color to be determined from manufacturer’s standard.

Driver Seat shall have the following characteristics:

Seat shall be **certified per FMVSS 222**.

**Dual Recliner Gears:** Dual recline gears make adjusting the seat back smooth and easy.

**Integrated Head Restraint**: Integrated Head restraint tilts forward for optimum comfort and safety. **Thigh Extension & Tilt**: Seat cushion extends and tilts upward and downward, allowing for fit from a 5th percentile female up to a 95 percentile male.

**9” Fore / Aft Seat Travel:** Manual or Air Track Release for seat travel adjustment.

**Adjustable Shock Suspension with (1) Adjustable Shock**: Pneumatic suspension with 6“ suspension travel. This allows an operator to adjust the suspension to their individual comfort needs.

**Solid Steel Back**: High quality solid steel back for the best in strength and durability.

**Plastic Seat Back Protector**: Plastic seat back keeps the seat looking good for years.

**High Density Foam**: Quality high density foam keeps its shape over time and provides superior comfort and firm support.

**Fully Supported Seat Cushion**: The pan fully supports the seat cushion for long lasting durability comfort.

|  |
| --- |
| **FIGURE 5**  Driver’s Seat |
| Head rest  Seat back  Seat back lumbar support  Arm rest  Seat belt  Seat pan cushion Seat base |

### TS 47.1 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 47.1.1 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 47.1.2 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 ad- just in height from a minimum of 14 in., with a minimum 6 in. vertical range of adjustment

#### TS 47.1.3 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 47.1.4 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 than6 in. On all high-floor buses, the seat base shall travel a minimum of9 in. and adjust no closer to the heel point than 6 in.

#### TS 47.1.5 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 47.1.6 Seat Suspension

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

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

#### TS 47.1.7 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 47.1.8 Headrests

Adjustable headrest.

#### TS 47.1.9 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 47.1.10 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 47.2 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. Seat belts shall be provided across the driver’s lap. Seat belt webbing shall be black in color. The lap belt assembly shall be a minimum of 72 in. in length.

### TS 47.3 Adjustable Armrest

No armrests.

### TS 47.4 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 47.5 Seat Structure and Materials

###### Cushions

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

### TS 47.6 Pedestal

The pedestal shall be powder-coated steel.

### TS 47.7 Mirrors

#### TS 47.7.1 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.

Combination of flat and convex mirrors referred to as transit-specific.

###### Curbside Mirrors

The curbside rearview mirror shall be mounted so that its lower edge is no less than 76in. above the street surface. A lower mount may be required due to mirror configuration requests.

###### Street-Side Mirrors

Standard mirror, not heated, no remote adjustment.

#### TS 47.7.2 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 48. General

All windows must meet State and Federal safety regulations. Windshield shall be AS-1, driver’s side window shall be AS-2 and passenger windows must be AS-3 in quality.

Use with 35ft length: A minimum of 8000 sq in. of window area, including operator and door windows, shall be required on each side of the standard configuration bus.

Use with 40ft length: A minimum of 10,000 sq in. of window area, including operator and door windows, shall be required on each side of the standard configuration bus.

Use with 45ft length: 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 49. Windshield

The windshield shall permit an operator’s field of view as referenced in SAE Recommended Practice J1050. Windshield shall be front body contoured two piece ¼” thick, 70% or greater light transmission, laminated safety float glass. 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 49.1 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.

Windshields shall be glazed with two piece black ozone treated extruded lock and key rubber.

###### Shaded Band

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 D-1003.

## TS 50. Driver’s Side Window

The driver’s side window shall be black extruded aluminum full 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. Drivers' window in the open position shall not block a 5th percentile per- son to 95th percentile person driver's view of the exterior 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 replacea- ble. The glazing material shall have a single-density tint.

The driver’s side window glazing material shall have a ¼ in. nominal thickness laminated 70% or greater light transmission density 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.

## TS 51. Side Windows

### TS 51.1 Configuration

Passenger side windows shall be Transit, black extruded aluminum with push out capability. Windows shall be glazed with 7/32” thick approximately 30% light transmission, gray density, laminated safety sheet glass. Windows on each side shall be so designed as to meet FMVSS 217 for emergency egress. Emergency operating instructions on metal plates shall be provided at each seat position for operating the top hinged, push out at bottom designed sashes. 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.

**NOTE:** All glass treatments must be permanent, within the glass and/or in the center membrane. Surface films are not permitted.

SHGC and light transmission performance shall be defined by the National Fenestration Rating Council.

### TS 51.2 Rear Window

No requirement for rear window.

# HEATING, VENTILATING AND AIR CONDITIONING

## TS 52. 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 bus shall be supplied with Dual Thermo King SLR air conditioning system or approved equal designed for semi-automatic control of cooling or ventilation of the bus interior. The rooftop unit will also have front and rear air discharge. The evaporator and condenser unit shall be mounted in the rooftop unit located on top of the bus. The unit will be a low profile design and be 6” or less in height on top of the bus. The interior protrusion from the ceiling to the bottom of the unit shall not exceed 3 1⁄2 “. The total weight of the rooftop unit will not exceed 136 lbs. The compressor and clutch assembly shall be belt driven from the bus engine. A/C controls provided to the driver shall be rotary switches to select mode of HVAC operation and fan speed.

###### System Performance

The cooling performance of the main system and the dash system together shall be adequate to maintain the interior temperature below 80 qF, under all normal bus operating conditions, in ambient conditions up to, and including, 105 qF with a full seated passenger load and one driver. In ambient temperatures above 105 qF the interior temperature may rise 1 °F for each 1°F rise in ambient temperature above 105 °F. The system shall have condenser coils large enough to support full system operation in ambient temperatures up to 130 qF. The net delivered cooling capacity of the two combined systems must be adequate to meet the general cooling requirements of the bus. A load analysis of the bus with the expected passenger loads must be presented to demonstrate the balance of the bus load and the cooling system. In lieu of the above, the main unit alone must deliver a net cooling capacity of 65,000 BTUs (IMACA) for the SLR65 per unit or combined 130,000 BTUs (IMACA).

## TS 53. Temperature and Electrical Controls

* The bus temperature and electrical controls shall provide fully automatic cool, heat and vent functions. The electrical controls shall monitor the air conditioning systems critical pressures, discharge air, return air, ambient air, and bus interior air temperature.
* The driver A/C control panel shall be mounted at a convenient location on the driver’s console.
* The setpoint of the HVAC system shall range between 62° and 82° F, and either be selectable by the driver or locked at a prescribed temperature.
* The electrical controls shall consist of reliable electromechanical relays, contactors, bi-metal control circuit breakers and terminal board for trouble shooting. Electrical controls shall be located for ease of maintenance and servicing, however they shall not be accessible to the driver or passengers.
* HVAC system diagnostics, alarm codes, and suction and discharge pressure shall be available from the driver’s display and connection via laptop. The control system shall be capable of broadcasting functional and alarm information to the bus via J1939.

## TS 54. Air Flow

* In the ventilation and/or cooling modes, the unit will evenly distribute the air from the discharge vents of the front and the back of the unit. This air shall be 100% re-circulated air - no outside air is utilized by the main evaporato**r** unit. Mount units so interior of bus is equally covered by front and rear air flow of each unit.
* The driver’s evaporator unit shall deliver air into the bus at the base of the front windshield to meet the requirements of SAE Recommended Practice J382, Windshield Performance Requirements, and shall have the capability of diverting air to the driver’s feet and legs at a combined rate of 500 cubic feet per minute (CFM).
* All air circulated by the air conditioning units shall be filtered prior to introduction into the passenger compartment. The air filter shall be easily serviced and be cleanable and reusable. The filter material shall be fire retardant meeting the requirements of FMVSS 302.

## TS 55. Unit Construction

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.

## TS 56. Maintenance Unit

* The air conditioning condenser and evaporator unit frames shall be constructed of ABS structural foam. All hardware shall be 300 series stainless steel to protect against corrosion. Neverseez (or equivalent) anti-seizing lubricant shall be applied to the threads of all stainless steel hardware during unit assembly to prevent thread galling. Proper mounting adaptor used to fit contour of bus roof.
* The condenser heat exchangers shall utilize brazed aluminum microchannel technology. The evaporator coils shall use 3/8 inch outside diameter inner-grooved tubing and lanced aluminum fins for optimum heat transfer capability.
* The electric motors shall be permanent magnet, 12vdc design. Motors shall be capable of three speed operation. The evaporator fan motors shall operate at high speed during cool and vent modes. Evaporator blowers shall be forward curve, double inlet centrifugal type. Condenser fans shall be axial flow type.
* The unit shall have a 16 cubic inch disposable liquid line filter/dehydrator having maximum moisture absorbing capacity for use with R134a refrigerant. The liquid line filter/dehydrator will also incorporate a sight glass to determine proper refrigerant level and a moisture indicator to indicate the presence of moisture in the refrigerant system.
* The expansion valve shall be externally equalized. The superheat shall be factory set, requiring no field adjustment. The expansion valve bulb shall be clamped to the suction line in the evaporator compartment and insulated from the effects of surrounding air temperature. The expansion valve body shall be properly secured and mounted for ease of access.
* Suction, discharge and liquid line hoses shall be provided to connect the air conditioning condenser/evaporator rooftop unit to the compressor. The hoses shall be Aeroquip GH134 polyamide veneer construction with Aeroquip E-Z Clip tube-o type fittings with swivel connections. O-ring material must be compatible with HFC (R134a) refrigerant and polyolester (POE) or PAG oils.
* The air conditioning system shall be equipped with the following protective devices:

High pressure cutout switch: 350 PSIG-open

275 PSIG-close

Low pressure cutout switch: 10 PSIG-open

20 PSIG-close

High pressure relief valve: 500 +50/-0 PSIG-open

The HPCO and LPCO switches shall interrupt the compressor clutch energizing circuit.

## TS 57. Compressor and Clutch Assembly

The main air conditioning system shall be provided with a Dual TM21 swash- plate type compressor and clutch assembly mounted on the bus engine and belt driven from the engine crankshaft pulley. The compres- sor clutch shall be capable of cycling on/off at all engine operating speeds. PAG oil shall be used. High and low refrigerant pressure cutout switches shall be mounted in the unit, and easily accessible for service. An oil separator for each compressor shall be used to maintain an oil level in the compressor under all operating conditions. Dual compressor mounting bracket to be supplied from bus manufacture.

## TS 58. Electrical Wiring and Terminal

All unit wiring shall be UL758, style 3173/3196 having copper strands with tinned alloy coating rated for up to 600 volts. The insulation shall be cross-linked polyethylene, rated for 125 degrees C and shall be white in color with permanent video jet ink dot matrix style or hot stamp number coding the entire length at a spacing of 1 to 3 inches.

# EXTERIOR PANELS, FINISHES AND EXTERIOR LIGHTING

## TS 59. 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 anybody 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 59.1 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 59.2 Roof-Mounted Equipment

A non-skid, clearly marked walkway or steps shall be incorporated on the roof to provide access to equipment without damaging any system or bus paneling.

## TS 60. 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 61. Repair and Replacement

### TS 61.1 Side Body Panels

Structural elements supporting exterior body panels shall allow side body panels below the windows to be repaired in lengths not greater than 12.5 ft.

Standard attachment of side body panels.

## TS 62. 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 63. 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 64. 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 65. Wheel Covers

Wheel covers not required.

### TS 65.1 Splash Aprons

###### Standard 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 66. Service Compartments and Access Doors

### TS 66.1 Access Doors

Conventional or pantograph hinged doors shall be used 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 by props or counterbalancing with over-center or gas-filled springs with safety props and shall be easily operable by one person. Springs and hinges shall be corrosion resistant. 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 66.2 Access Door Latch/Locks

**Requirement for Latches on Access Doors**

Access doors larger than 100 sq in. in area shall be equipped with corrosion-resistant flush-mounted latches or locks ex- cept for coolant and fuel fill access doors. All such access doors that require a tool to open shall be standardized through- out the vehicle and will require a nominal 5/16 in. square male tool to open or lock.

## TS 67. Bumpers

### TS 67.1 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 67.2 Front Bumper

Bumper shall be a reinforced Romeo Rim or approved equal. No part of the bus, including the bumper, shall be damaged as a result of a 5mph 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 4000lbs parallel to the longitudinal centerline of the bus. It shall protect the bus from damage as a result of 5.5mph impacts into the corners at a 30deg 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.

No provisions for installing a bike rack shall be made.

### TS 67.3 Rear Bumper

Bumper shall be a reinforced Romeo Rim or approved equal. No part of the bus, including the bumper, shall be damaged as a result of a 2mph 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/sec. 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 lbs, at 4 mph parallel to or up to a 30degangle to the longitudinal centerline of the bus. The rear bumper shall be shaped to preclude 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. Bumpers shall be attached to the chassis frame with a minimum of .5” diameter, Grade 8 bolts.

### TS 67.4 Bumper Material

Bumper material shall be corrosion-resistant and withstand repeated impacts of the specified loads without sustaining damage. These bumper qualities shall be sustained throughout the service life of the bus.

## TS 68. Finish and Color

### TS 68.1 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-lbs. 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.

1. All exterior surfaces shall be smooth and free of visible fasteners (excluding round head structural rivets), dents, dirt, orange peel, and wrinkles. All exterior finished surfaces shall be impervious to LPG & diesel fuel, gasoline, and commercial cleaning agents. Finished surfaces shall not be damaged by controlled applications of commonly used graffiti-removing chemicals.
2. Standard color for all buses shall be the manufacturer’s pre-finished white exterior panels. Color scheme on all buses shall be provided at the time of ordering.
3. Color scheme decals and stripes shall be durable and of high quality such as 3M or a 10 year Vinyl if used. A FINAL COLOR, PAINT AND DECAL/STRIPE SCHEME SHALL REQUIRE H.T.C APPROVAL PRIOR TO THE MANUFACTURE OF THE PILOT COACH.

## TS 69. Decals, Numbering and Signing

Monograms, numbers and other special signing shall be applied to the inside and outside of the bus as required. Signs shall be durable and fade-, chip- and peel-resistant. They may be painted signs, decals or pressure-sensitive appliqués. All decals shall be installed per the decal Supplier recommendations. Signs shall be provided in compliance with the ADA requirements defined in 49 CFR Part 38, Subpart B, 38.27.

The following decals (but not limited to) shall be installed on the interior of the vehicle:

1. Two (2) decals “watch your step”
2. “Federal law prohibits standing forward of the standee line while bus is moving”
3. “Height clearance is feet inches”
4. “Use of interlock system”
5. Plus any and all mandatory decals required on a public transit vehicle.

Final location shall be approved at the pilot inspection.

**NOTE:** Manufacturer and/or dealer shall not install Contractor’s logo or decals on exterior of the bus

or mud flaps without the Agency’s approval.

### TS 69.1 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.

## TS 70. 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 utilized at all exterior lamp locations.

**Standard Lamps**

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.

**Standard Size**

Size of LED lamps used for tail, brake and turn signal lamps shall be standard installation of OEM.

### TS 70.1 Backup Light/Alarm

Visible and audible warnings shall inform following vehicles or pedestrians of reverse operation. Visible reverse operation warning shall conform to SAE Standard J593. Audible reverse operation warning shall conform to SAE Recommended Practice J994 Type C or D.

### TS 70.2 Doorway Lighting

LED 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 foot-candle 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 70.3 Turn Signals

**Standard Turn Signals**

LED turn-signal lights shall be provided on the front, rear, curb and street sides of the bus in accordance with federal regulations.

### TS 70.4 Headlights

Headlamps shall be designed for ease of replacement.

**Standard Installation**

Standard OEM headlight installation shall be provided in accordance with federal regulations.

### TS 70.5 Brake Lights

#### TS 70.5.1 Transit Coach

LED brake lights shall be provided in accordance with federal regulations.

Bus shall include red, high and center mount brake lamp(s) along the backside 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 70.6 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.

# INTERIOR PANELS AND FINISHES

## TS 71. General Requirements

Materials shall be selected on the basis of maintenance, durability, appearance, safety, 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.

## TS 72. Interior Panels

Interior panel required to meet FMVSS 302.

### TS 72.1 Driver Area Barrier

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 (1.2kg), microcomputer, public address amplifier, etc. The panel should be properly attached to minimize noise and rattles.

**Wheel-Well-to-Ceiling Configuration of Driver’s Barrier**

The driver’s barrier shall extend from the top of the wheel well to the ceiling the level of the seated driver and shall fit close to the bus side windows and wall to prevent passengers from reaching the driver or the driver’s personal effects.

### TS 72.2 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 its 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 lbs applied to a 4 × 4 in. area in the center of the panel without permanent visible deformation.

### TS 72.3 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 72.4 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, side walls 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 72.5 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 72.6 Fastening

Interior panels shall be attached so that there are no exposed unfinished or 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 72.7 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.

**FTA Docket 90-A**

All insulation materials shall comply with the Recommended Fire Safety Practices defined in FTA Docket 90-A, dated October 20, 1993.

### TS 72.8 Floor Covering

The floor covering shall have a non-skid 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 standee line shall be approximately 2 in. wide and shall extend across the bus aisle. The color and pattern shall be consistent throughout 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.

The floor covering shall closely fit the sidewall in a fully sealed butt joint or extend to the top of the cove.

### TS 72.9 Interior Lighting

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. (LED single lights with two (2) zones may also be submitted.)

### TS 72.10 Passenger

**First Row Lights**

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 transmission selector is in reverse and the engine run

switch is in the “on” position.

The interior lighting design shall require the approval of the Agency.

**First Light Modules Dim/Extinguish When Front Door is Closed**

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 72.11 Driver’s Area

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 foot-candles.

### TS 72.12 Seating Areas (Transit Coach)

The interior lighting system shall provide a minimum 15 foot-candle illumination on a 1 sq ft plane at an angle of 45 degrees from horizontal, centered 33 in. above the floor and 24 in. in front of the seat back at each seat position. Allowable average light level for the rear bench seats shall be 7 foot-candles.

### TS 72.13 Vestibules/Doors

Floor surface in the aisles shall be a minimum of 10 foot-candles, and the vestibule area a minimum of 4 foot- candles with the front doors open and a minimum of 2 foot-candles with the front doors closed. The front entrance area and curb lights shall illuminate when the front door is open and master run switch is in the “lights” positions. Rear exit area and curb lights shall illuminate when the rear door is unlocked.

### TS 72.14 Step Lighting

Step lighting for the intermediate steps between lower and upper floor levels shall be a minimum of 4 foot- candles and shall illuminate in all engine 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 72.15 Farebox Lighting

A light fixture shall be mounted in the ceiling above the farebox location. The fixture shall be capable of projecting a concentrated beam of light on the farebox. This light will automatically come on whenever the front doors are opened and the run switch is in the “night run” or “night park” position.

## TS 73. Fare Collection

Space and structural provisions shall be made for installation of a Diamond Manufacturing Model SV Farebox or approved equal 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 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 Recommended Practice 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. 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. Final location shall be approved at the pilot inspection.

## TS 74. 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 over-center 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.

**Access Doors that Do Not Require Tools or Keys to Open**

Access doors shall be secured with hand screws or latches. All fasteners that retain access panels shall be captive in the cover.

### TS 74.1 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. The number of special fastener tools required for panel and access door fasteners shall be minimized.

# PASSENGER ACCOMMODATIONS

## TS 75. Passenger Seating

### TS 75.1 Arrangements and Seat Style

The passenger seating arrangement in the bus shall be such that seating capacity is maximized and in compliance to the following requirements.

-Passenger seating shale be Freedman commercial bus seats must meet FMVSS

-option for integrated child seat FMVSS 213 Compliant

-vinyl and fabric option

|  |
| --- |
| **TS 75.4 Seat back fitness**  **TS 75.5 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.  **TS 75.6 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.  **TS 75.7 Aisles (Transit Coach)**  The aisle between the seats shall be no less than 20 in. wide at seated passenger hip height. Seat backs shall be shaped to increase this dimension to no less than 24 in. at 32 in. above the floor (standing passenger hip height).  **TS 75.8 Dimensions (Transit Coach)**  **FIGURE 6**  Seating Dimensions and Standard Configuration  Figure 1 |
| Seat dimensions for the various seating arrangements shall have the dimensions as follows (refer to Figure 6):   * The width, W, of the two-passenger transverse seat shall be a minimum 34.5 in. * The length, L, shall be 17 in., ±1 in. * The seat back height, B, shall be a minimum of 15 in. |

* The seat height, H, shall be 17 in., ± 1 in. For the rear lounge (or settee) and longitudinal seats, and seats located above raised areas for storage of under-floor components, a cushion height of up to 18 in., ±2 in., will be allowed. This shall also be allowed for limited transverse seats, but only with the expressed approval of the Agency.
* Foot room = F.
* The seat cushion slope, S, shall be between 5 and 11 deg.
* The seat back slope, C, shall be between 8 and 17 deg.
* Hip to knee room = K.
* The pitch, P, is shown as reference only.

### TS 75.9 Structure and Design

The passenger seat frame and its supporting structure shall be constructed and mounted so that space under the seat is maximized and is completely free of obstructions to facilitate cleaning.

Seats, structures and restraints around the securement area should not infringe into the mobility device envelope or maneuverability.

The transverse seat structure shall be fully cantilevered from the sidewall with sufficient strength for the intended service. The lowest part of the seat assembly that is within 12 in. of the aisle shall be at least 10 in. above the floor.

In locations at which cantilevered installation is precluded by design and/or structure, other seat mounting may be allowed.

All transverse objects—including seat backs, modesty panels, and longitudinal seats—in front of forward- facing seats shall not impart a compressive load in excess of 1000lbs onto the femur of passengers ranging in size from a 5th-percentile female to a 95th-percentile male during a 10g deceleration of the bus. This deceleration shall peak at 0.05 to0.015 seconds from initiation. Permanent deformation of the seat resulting from two 95th-percentile males striking the seat back during this 10g deceleration shall not exceed 2 in., measured at the aisle side of the seat frame at height H. The seat back should not deflect more than 14 in., measured at the top of the seat back, in a controlled manner to minimize passenger injury. Structural failure of any part of the seat or sidewall shall not introduce a laceration hazard.

The seat assembly shall withstand static vertical forces of 500 lbs applied to the top of the seat cushion in each seating position with less than ¼in. permanent deformation in the seat or its mountings. The seat assembly shall withstand static horizontal forces of 500 lbs evenly distributed along the top of the seat back with less than ¼ in. permanent deformation in the seat or its mountings. The seat backs at the aisle position and at the window position shall withstand repeated impacts of two 40-lb sandbags without visible deterioration. One sandbag shall strike the front 40,000 times and the other sandbag shall strike the rear 40,000 times. Each sandbag shall be suspended on a 36in. pendulum and shall strike the seat back 10,000 times each from distances of 6, 8, 10 and 12 in. Seats at both seating positions shall withstand 4000 vertical drops of a 40-lb sandbag without visible deterioration. The sandbag shall be dropped 1000 times each from heights of 6, 8, 10 and 12 in. Seat cushions shall withstand 100,000 randomly positioned 3½ in. drops of a squirming, 150-lb, smooth-surfaced, buttocks-shaped striker with only minimal wear on the seat covering and no failures to seat structure or cushion suspension components.

The back of each transverse seat shall incorporate a handhold no less than ⅞ in. in diameter for standees and seat access/egress. The handhold shall not be a safety hazard during severe decelerations. The handhold shall extend above the seat back near the aisle so that standees shall have a convenient vertical assist, no less than 4 in. long that may be grasped with the full hand. This handhold shall not cause a standee using this assist to interfere with a seated 50th-percentile male passenger. The handhold shall also be usable by a 5th-percentile female, as well as by larger passengers, to assist with seat access/egress for either transverse seating position. The upper rear portion of the seat back and the seat back handhold immediately forward of transverse seats shall be padded and/or constructed of energy-absorbing materials. During a 10g deceleration of the bus, the HIC number (as defined by SAE Standard J211a) shall not exceed 400 for passengers ranging in size from a 5th percentile female through a 95th percentile male.

The seat back handhold may be deleted from seats that do not have another transverse seat directly behind and where a vertical assist is provided.

Seat back handhold shall withstand static horizontal and vertical forces of 250 lbs applied anywhere along their length with less than ¼ in. permanent deformation. Seat back handhold and armrests shall withstand 25,000 impacts in each direction of a horizontal force of 125 lbs with less than ¼in. permanent deformation and without visible deterioration.

### TS 75.10 Construction and Materials

Selected materials shall minimize damage from vandalism and shall reduce cleaning time. The seats shall be attached to the frame with tamper-resistant fasteners. Coloring shall be consistent throughout the seat material, with no visually exposed portion painted. Any exposed metal touching the sides or the floor of the bus shall be stainless steel. The seat, pads and cushions shall be contoured for individuality, lateral support and maximum comfort and shall fit the framework to reduce exposed edges.

The minimum radius of any part of the seat back, handhold or modesty panel in the head or chest impact zone shall be a nominal ¼in.The seat back and seat back handhold immediately forward of transverse seats shall be constructed of energy-absorbing materials to provide passenger protection and, in a severe crash, to allow the passenger to deform the seating materials in the impact areas. Complete seat assemblies shall be interchangeable to the extent practicable.

## TS 76. Passenger Assists (Transit Coach)

Vertical stanchions or handholds shall be provided for the safety of standees and for ingress/egress. Passenger assists shall be convenient in location, shape and size for both the 95th-percentile male and the 5th-percentile female standee. Starting from the entrance door and moving anywhere in the bus and out the exit door, a vertical assist shall be provided either as the vertical portion of the seat back assist or as a separate item so that a 5th-percentile female passenger may easily move from one assist to another using one hand and the other without losing support. All handholds and stanchions at the front doorway, around the farebox, and at interior steps for bi-level designs shall be powder-coated in a high-contrast yellow color.

Any joints in the assist structure shall be underneath supporting brackets and securely clamped to prevent passengers from moving or twisting the assists. Seat handholds may be of the same construction and finish as the seat frame. Door-mounted passenger assists shall be of anodized aluminum, stainless steel or powder- coated metal. Connecting tees and angles may be powder-coated metal castings. Assists shall withstand a force of 300 lbs applied over a 12in. lineal dimension in any direction normal to the assist without permanent visible deformation. All passenger assist components, including brackets, clamps, screw heads and other fasteners used on the passenger assists shall be designed to eliminate pinching, snagging and cutting hazards and shall be free from burrs or rough edges.

### TS 76.2 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 and the vertical assist and the assists on the wheel housing or on the front modesty panel.

### TS 76.3 Vestibule

The aisle side of the driver’s barrier, the wheel housings and when applicable the modesty panels shall be fitted with vertical passenger assists that are functionally continuous with the overhead assist and that extend to within 36 in. of the floor. These assists shall have sufficient clearance from the barrier to prevent inadvertent wedging of a passenger’s arm.

A horizontal passenger assist shall be located across the front of the bus and shall prevent passengers from sustaining injuries on the fare collection device or windshield in the event of a sudden deceleration. Without restricting the vestibule space, the assist shall provide support for a boarding passenger from the front door through the fare collection procedure. The assist shall be no less than 36 in. above the floor. The assists at the front of the bus shall be arranged to permit a 5th-percentile female passenger to easily reach from the door assist, to the front assist, to vertical assists on the driver’s barrier, wheel housings or front modesty panel.

### TS 76.4 Overhead

Except forward of the standee line, a continuous, full-grip, overhead assist shall be provided. This assist shall be located over the center of the aisle seating position of the transverse seats. The assist shall be no less than 70 in. above the floor.

No requirements for overhead grab straps/extensions.

Overhead assists shall simultaneously support 150 lbs on any 12in. length. No more than 5 percent of the full grip feature shall be lost due to assist supports.

### TS 76.5 Wheel Housing Barriers/Assists

Unless passenger seating is provided on top of wheel housings, passenger assists shall be mounted around the exposed sides of the wheel housings (and propulsion compartments if applicable), which shall also be designed to prevent passengers from sitting on wheel housings. Such passenger assists shall also effectively retain items, such as bags and luggage, placed on top of wheel housings.

## TS 77. Passenger Doors

### TS 77.1 Transit Coach

Passenger doors and doorways shall comply with ADA requirements. Both front and rear doors shall be of two (2) panel design providing a minimum of 30”x76” clear opening front and 41.5”x80 clear opening rear. Door Shall be driver controlled and electro-pneumatically actuated.

Passenger doors and doorways shall comply with ADA requirements.

#### TS 77.1.1 Front door

Door shall be forward of the front wheels and under direct observation of the driver.

### TS 77.2 Materials and Construction

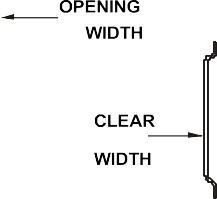
Structure of the doors, their attachments, inside and outside trim panels and any mechanism exposed to the elements shall be corrosion resistant. Door panel construction shall be of corrosion-resistant metal or reinforced non-metallic composite materials. When fully opened, the doors shall provide a 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 77.3 Dimensions

##### FIGURE 7

Transit Bus Minimum Door Opening



When open, the doors shall leave an opening no less than 75 in. in height.

**31¾in.Minimum Doorway Clear Width**

Front door clear width shall be a minimum of 31¾ in. with the doors fully opened.

If the Agency requires a minimum rear door clear width of 31¾ in. or greater and an outward opening (swing) door is specified, then the maximum outboard excursion of 13 in. may be exceeded.

### TS 77.5 Door Projection (Transit Coach)

#### TS 77.5.1 Exterior

The exterior projection of the front doors beyond the side of the bus shall be minimized and shall not block the line of sight of the rear exit door via the curb side mirror when the doors are fully open. The exterior projection of both doors shall be minimized and shall not exceed 14 in. during the opening or closing cycles or when doors are fully opened

#### TS 77.5.2 Interior

Projection inside the bus shall not cause an obstruction of the rear door mirror or cause a hazard for standees.

### TS 77.6 Door Height Above Pavement

### TS 77.7 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 lbs 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 lbs.

### TS 77.8 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 lbs 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 77.9 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 lbs 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 77.10 Door Control

The door control shall be located in the operator’s area within the hand reach envelope described in SAE Recommended Practice J287, “Driver Hand Control Reach.” The driver’s door control shall provide tactile feedback to indicate commanded door position and resist inadvertent door actuation.

Door control located on street side.

The front door shall remain in commanded state position even if power is removed or lost.

### TS 77.11 Door Controller

**Single Switch Driver’s Door Controller**

The control device shall be protected from moisture. Mounting and location of the door control device handle shall be designed so that it is within comfortable, easy arm’s reach of the seated driver. The door control device handle shall be free from interference by other equipment and have adequate clearance so as not to cre- ate a pinching hazard.

### TS 77.12 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 78. Accessibility Provisions

Space and body structural provisions shall be provided at the front or rear door of the bus to accommodate a wheelchair loading system.

### TS 78.1 Loading Systems

The loading system shall be a high-floor lift.

### TS 78.2 Platform Lift (Shall Meet ADA Requirements)

1. All buses equipped with lifts must meet FMVSS 403 and 404 requirements. All costs required to meet these requirements shall be included in the proposal price.
2. The platform lift shall be installed in a separate door opening for use by persons with disabilities. The lift assembly shall be mounted within the bus body on the right (curb) side. The bus manufacturer

must provide documentation (reviewed by the Agency at pilot model production) that the lift installation

complies with the lift manufacturer’s lift installation requirements. The overhead clearance between the top of the door opening and the raised lift platform, and highest point of a ramp shall be a minimum of 68" for a bus over 22 feet in length to meet ADA requirements.

1. The lift door(s) shall be manually operated with an outside key locking handle. Spring loaded struts, gas struts or manual latches shall be provided on the lift door(s) to positively hold the door(s) in the open position. All door openings shall have full structural framing around the opening equal to the structural members of the body. The lift door(s) shall have an upper window similar to the side windows of the bus. Any exposed lift door frame structure shall be constructed of 304 stainless steel acid- etched, coated with zinc based primer and powder coated OEM white (including the fasteners).
2. The lift shall be an electro-hydraulic type. If the lift has a crossbar, it shall be above the door opening and well padded. The platform lift equipment shall be a double "C" channel parallel arm construction, hydraulically operated by two single-acting cylinders with gravity unfold, gravity down, power

up, and power fold (stow) operation. No part of the lift platform shall exceed 6 inches/second during the lowering and lifting of an occupant, and shall not exceed 12 inches/second during deploying or stowing. The lift shall have a mechanical outboard safety wheel stop to prevent wheelchair from rolling off the platform during the lifting cycle. Successful bidder shall deliver the lift equipped bus with

the type of lift equipment requested by the Agency.

1. A manual safety override shall be provided that will remain operable. Lift shall have manual override instructions visible from inside and outside the bus with door open.
2. The entire lift assembly shall be installed inside the bus body and shall have adequate protection installed on all sharp corners or items that protrude into the passenger area to prevent accidental injury

to passengers. Wall and floor mounting points shall be reinforced and shall be attached with fasteners having a thread locking feature. Lift installation shall insure that no lift rattling exists when the

bus is operated while the lift is stowed.

1. A lift control interlock system shall be installed that shall ensure that the bus cannot be moved when the lift is not stowed and that the lift cannot be deployed unless the interlock is engaged [to meet

ADA regulation in 49 CFR Part 38, Subpart B--Buses, Vans and Systems, §38.23, (b)(2)(I)]. The interlock system shall engage when the lift operation sequence is followed. Interlock operating instructions

shall be included with the bus at delivery. An indicator light (red, labeled) shall be provided at

the driver's station that is activated when the lift door is open and when the lift is in operation. An interlock override system shall be installed that allows service personnel to move the bus to a safe area

for repairs.

1. All lift equipped buses shall display the international symbol of accessibility, one each on left and right side of the bus. Location shall be determined at pilot model inspection.
2. The lift shall meet ADA & NHTSA requirements as well as these minimum requirements.
   1. Capacity 1000 pounds minimum.
   2. Usable platform width 34" minimum.
   3. Usable platform length 54" minimum.
   4. Platform shall include automatic locking inboard safety wheel stop (minimum 6" height) and out- board safety wheel stops to prevent wheelchair from rolling off.
   5. Platform shall automatically stop at floor level.
   6. Platform shall automatically stop when lowered to ground level.
   7. Hand held controls shall be conveniently located on a flexible, cut resistant cable and shall be mounted with access from inside or outside the bus. The cable shall be routed to eliminate being pinched in any moving parts and be wrapped with a flexible exterior protective conduit.
   8. Platform, bridge plate, and area between bridge plate and aisle shall be skid resistant.
   9. Bridge plate and platform shall be coated to resist rust.
   10. Platform shall have horizontal handrails (one each side) on platform to assist passenger during lift operations. Handrails (yellow) shall fold automatically to prevent any obstructions into the bus passenger area.
   11. Lift door operated interrupt switch shall prevent use of lift with lift door(s) closed. Heavy duty long life switches shall be used in this application.
   12. The color of the lift shall coordinate with bus interior colors and be approved by the State. The outside edges of the platform shall either be painted yellow or use 3M™ vinyl safety stripe tape to enhance visibility when extended on the ground.
   13. Sharp corners of lift platform shall be padded (remove for lift use) when in the stored position.
   14. The wheelchair lift shall comply with all federal, Americans with Disabilities Act (ADA), and Veterans' Administration regulations.
   15. Lift platform shall be fitted with device to prevent the platform from touching or leaning against door after being returned to stored position when the lift assembly is not in use.

### TS 78.3 Wheelchair Securement Area

**NOTE:** Agency will approve acceptable securement system.

* + 1. **The wheelchair securement system shall be installed according to ADA requirements.** Securement location shall be installed as shown by the required seating plans displaying wheelchair accommodations. Fold-away seating shall be provided for use when wheelchairs are not being carried as shown in one (1) floor plan. The integrated securement system shall restrain the occupant and the wheelchair separately and securely.

###### Wheelchair securement shall meet these minimum requirements:

1. Forward facing wheelchair tie down and occupant restraint shall consist of four floor attachment points for the chair and a combination, lap belt/shoulder restraint with manual height

adjuster for the occupant per location.

1. A wheelchair single point securement system shall offer 360 degree directional usage “pucks”

and shall be cast stainless steel with a 2 ½” bolt to be secured to the floor positions. With the single point securement system the pucks shall not be shared in the center run of anchorage points

(i.e. separate single point securement systems for each wheelchair securement area) and one securement space shall have an additional anchorage puck as to aid in the securement of scooters or difficult mobility devices. This additional anchorage puck shall be centered between the rear anchorages of the largest securement space.

1. Securement wall anchorage point for shoulder restraint shall be stainless steel or other aircraft quality noncorrosive metal. Wall anchorage device shall provide vertical adjustment (approximately 12") for differences in height of the secured mobility aid. Wall anchor shall be permanently fastened to the body structure in the wall according to the belt assembly manufacturer’s installation instructions.
2. The belt components shall be permanently marked to identify their location as follows: "floor", "lap", or "shoulder". The four belts that attach to the wheelchair from the floor anchorage points shall use a simple speed hook end (“J” or “S” style) for chair attachment and have automatic heavy duty retractors with a hard metal cover and manual knob control. All floor attachment belts shall be the same and work in any of the four floor attachment points and be equipped with connector brackets for the lap belt assembly. Automatic self-tensioning and self-locking retractors with metal covers shall be part of the four floor belt assemblies for automatic belt tensioning. Belt ends with floor anchor attachments shall be easily identified for placement in the floor track.
3. All belt components shall meet ADA requirements and random static testing forces equal to: rear belt assy. 6,000 lbs. each, minimum

front belt assy. 2,000 lbs. each, minimum lap belt assy. 2,500 lbs. each, minimum

shoulder belt assy. 2,500 lbs. each, minimum floor insert assy. 6,000 lbs. each, minimum

1. All components shall meet SAE J2249 requirements and be 30 MPH/20G impact tested.
2. All components shall be installed to the securement manufacturer’s recommended specifications.

###### Restraint Storage System shall:

1. Keep restraints clean
2. Provide easy accessibility to restraints
3. Restraints shall be stored securely to prevent noise while the vehicle is in motion.
4. Restraint storage system shall be permanently mounted and compatible with the installed securement system (360 degree single point securement system). Wall or seat mounted bags will not be acceptable.
5. Storage system and location must be pre-approved by the Agency.

### TS 78.4 Interior Circulation

Maneuvering room inside the bus shall 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 20 in. shall be maintained. As a guide, no width dimension should be less than 34 in. Areas requiring 90deg turns of wheelchairs should have a clearance arc dimension no less than 45 in., and in the parking area where 180deg turns are expected, space should be clear in a full 60in.diameter circle. A vertical clearance of 12in. above the floor surface should be provided on the outside of turning areas for wheelchair footrests.

# SIGNAGE AND COMMUNICATION

## TS 79. Destination Signs

Transign Mobilite electronic sign or **approval equal** shall be provided and mounted above the front windshield area.

#### Destinations Sign shall have the following characteristics:

Operator Control Unit (OCU) with USB port Simple Web-based sign programming tool

High intensity LEDs with automatic brightness adjustment Minimum operating life of 100,000 hours

Full readability range of 130 degrees 12 VDC operation

ADA-compliant fonts

The console shall be mounted overhead in easy reach of the driver. All necessary programming equipment and supplies shall be included. The controller console shall be conveniently located for the bus driver within reach of the seated driver. Front Sign and OCU dimensions are as follows:

## TS 80. Passenger Information and Advertising

### TS 80.2 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 81.2 Camera Surveillance System

Provide all wiring and mounting locations for a multi-camera surveillance system for the later provision of and installation of cameras, recorder, microphone, etc. Agency to specify the camera system cable to be installed, the locations for pre-wiring and the quantity.

### TS 81.3 Public Address System

A public address system shall be provided on each bus for facilitating radio system and driver-originated announcements to passengers.

#### TS 81.3.1 Speakers

Agency will specify the number of interior loudspeakers shall be provided, semi-flush mounted, on alternate sides of the bus passenger compartment, installed with proper phasing. Total impedance seen at the input connecting end shall be 8 Ohms. Mounting shall be accomplished with riv-nuts and machine screws.

### TS 81.5 Radio Handset and Control System

#### TS 81.5.1 Drivers 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 81.5.2 Handset

Contractor will install a handset for driver use.

#### TS 81.5.3 Driver Display Unit (DDU)

Contractor shall install a driver display unit as close to the driver’s instrument panel as possible.

#### TS 81.5.4 Emergency Alarm

Contractor shall install an emergency alarm that is accessible to the driver but hidden from view.

# 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. Performance requirements based on design criteria shall not be deemed a warranty item.

#### WR 1.1.2 Complete Bus

The complete bus, propulsion system, components, major subsystems and body and chassis structure are warranted to be free from Defects and Related Defects for one year or 50,000 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 three years or 150,000 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 10 years or 350,000 miles, whichever comes first.

#### WR 1.1.4 Propulsion System

Propulsion system components, including the engine, transmission or drive motors, and generators (for hybrid technology) and drive and non-drive axles shall be warranted to be free from Defects and Related Defects for the standard two years or 100,000 miles, whichever comes first. An Extended Warranty to a maximum of five years or 300,000 miles, whichever comes first, may be purchased at an additional cost. 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 1.1.5 Emission Control System (ECS)

The Contractor warrants the emission control system for five years or 100,000 miles, whichever comes first. The ECS shall include, but is not limited to, the following components:

* complete exhaust system, including catalytic converter (if required)
* after treatment device
* components identified as emission control devices

#### WR 1.1.6 Subsystems

Other subsystems shall be warranted to be free from Defects and Related Defects for two years or 100,000 miles, whichever comes first. Other subsystems are listed below:

* 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.
* Engine cooling systems: Radiator including core, tanks and related framework, including surge tank. Transmission cooler.
* Passenger seating excluding upholstery.
* Fuel storage and delivery system.
* Surveillance system including cameras and video recorders.

#### WR 1.1.7 Extended Warranty

The Agency requires the following additional subsystems to be warranted to be free from Defects and Related Defects for two years or 100,000 miles, whichever comes first.

To comply with FTA guidelines, portions of HTC required warranties that are not cov- ered under the prevailing manufacturers’ standard warranties shall be considered as ex- tended warranties. The Contractors shall state in their proposals any portions of HTC required warranties being considered as extended warranties. The costs of the extended warranties shall NOT be included in the base price of the bus. The extended warranties shall be treated as an option subject to HTC approval.

Contractors shall clearly identify the extended warranties and include in their proposals an itemized list of the extended warranty items and their costs. Extended warranty on engine, transmission and A/C system shall be provided by the Contractor through the component manufacturers’ extended warranty program. If HTC includes the extended warranties in the contract award, Contractor shall provide HTC the component manufacturers’ ex- tended warranty registrations/certificates for the engines, transmissions and A/C systems as a condition for bus final acceptance and payment.

#### WR 1.1.8 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, but is not limited to the following:

* engine
* transmission
* alternator
* starter
* A/C compressor and condenser/evaporator unit
* 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 1.1.9 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 $50.00 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 fifteen (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 Contractor shall furnish warranty procedure instructions and necessary forms for the Agency to process and obtain necessary warranty repairs or reimbursement.

### 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:

Huron Transit Corporation Attn Ken Jimkoski

1513 S Bad Axe Road Bad Axe, MI 48413

# 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 each Supplier to maintain 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, engine 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, as required by FTA. Resident inspectors may be Agency employees or outside contractors. The Agency shall provide the identity of each inspector and shall also identify his or her 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 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 acceptance 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.

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 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.

## QA 4. Agency-Specific Requirements

#### QA 4.1 Air Conditioning Certification

Bus manufacturer shall provide air conditioning system performance certification This test shall be conducted in the presence of the Agency’s appointed inspector. This certification may be completed by the bus manufacturer, but must provide that the air conditioning system installed in the bus meets or exceeds perfor- mance levels required by these specifications.

1. The air conditioning system performance testing shall be conducted using a heating chamber of suffi- cient size to contain the basic bus, to heat soak the bus at 100oF for 4 hours minimum, to simulate sun

load entering windshield, and to maintain 100oF exterior temperature continuously after heat soak dur- ing testing. An interior temperature of 72oF (±3oF) must be reached within 30 minutes from the begin- ning of the test. Engine speed shall be maintained at 1300 RPM (± 200 RPM) during the test.

1. Instrumentation for temperature monitoring of the bus interior shall be a minimum of 3 points in the passenger area 30" above the floor - one in driver's area at knee level, and one at the evaporators’ air inlets and air outlets. Instrumentation and recording equipment shall be able to monitor all points, rec-ord data at one minute intervals, and print a data report.
2. This test shall not be performed without a designated Huron Transit Corporation inspector on-site during this certification and shall require his/her sign off.

#### QA 4.2 Heating/Ventilating Certification

The bus manufacturer shall provide test results that certify the performance of the heating/ventilating system as installed in the bus meets or exceeds performance levels required by these specifications. This test shall be conducted in the presence of an Huron Transit Corporation appointed inspector. This certi-fication may be

completed by the bus manufacturer. Testing may be performed in natural cold climate conditions.

1. The bus will be cold soaked at 0 degrees F (+/- 3 degrees F) for 4 hours minimum. An exterior tem- perature of 0 degrees F (+/- 3 degrees F) shall be maintained during the test. An interior temperature of 60 degrees F (+/- 3 degrees F) must be reached within 30 minutes from the beginning of the test. Engine speed shall be maintained at 1300 RPM (+/- 200 RPM) during the test. No dynamometer will be used.
2. Instrumented monitoring for the bus interior temperature to determine pass/fail, shall be 3 points lo- cated front, center, and rear in the passenger area 30” above the door. Additional monitoring points shall be; one in driver’s area at knee level 22” above the floor, at heater’s air inlets and air outlets, and at rear heater’s air inlets and air outlets. Other temperature monitoring points shall be: engine operat- ing (coolant) at radiator; engine outlet to rear heater; rear heater return to engine; and exterior ambi- ent.
3. Coolant flow shall be monitored from the engine outlet to the heaters only. Supplemental heat shall be supplied to raise engine to normal operating temperature. Supplemental heat shall be engaged 60 minutes prior to the start of the test. Instrumentation and recording equipment shall be able to monitor all points, record data at one minute intervals, and print data report.
4. This test shall not be performed without a designated Huron Transit Corporation inspector on-site during this certification and shall require his/her sign off.

#### QA 4.3 Inspection by the Agency

The Agency reserves the right and shall be at liberty to inspect all material and workmanship at all times during the progress of the work, and shall have the right to reject all material and workmanship which do not conform to the specifications or accepted practice. Where a resident inspector is used, upon the request to the quality assurance supervisor, the resident inspectors shall have access to the Contractor's quality assurance files related to this procurement. These files shall include drawings, material standards, parts lists, inspection processing and records, and record of defects.

## 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 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).

**NOTE:** As a result of this 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 (if Meeting at OEM’s Location)

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 acceptance 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 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 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
  + Gradability test
  + Kneeling system function
  + HVAC pull down/heat
  + Speedometer
  + Outside air infiltration (smoke)
  + Wheelchair ramps
  + Engine performance qualification

This test shall be jointly conducted by the Contractor and the engine manufacturer (including but not limited to charge air cooler performance, air to boil test, loss of coolant, fuel system electrical inputs and engine protection system).

* + 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 onsite 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.

**NOTE:** If there is not a pilot/prototype bus, then the Buy America post-delivery audit should be

performed following completion of the first serial production bus. In addition to monitoring of the production processes, the Agency must verify compliance that more than 70 percent of the costs of all components are pro- duced in the United States. Finally, the Agency must execute the required certificates.

### 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 onsite 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 close-outs 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
  + Gradability 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 contract administrator. 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 Gradability 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

|  |  |  |
| --- | --- | --- |
| **RFP # 2024-200-11 MEDIUM-DUTY TRANSIT**  **BUSES Package 1: Technical Proposal** | | |
| □ | 1. Letter of Transmittal | |
| □ | 2. Technical Proposal | |
| □ | 3. Acknowledgement of Addenda | |
| □ | 4. Form for Proposal Deviation | |
| □ | 5. Vehicle Questionnaire | |
| □ | 6. References and non-priced information (if provided by Proposer) | |
| □ | 7. Engineering organization chart, engineering change control procedure, field modification process | |
| □ | 8. Manufacturing facility plant layout, other contracts, staffing | |
| □ | 9. Production schedule and other Contract commitments for the duration of this Contract. | |
| □ | 10. Quality Assurance Program  □ 11. Technical Documents | |
| **Package 2: Price Proposal** | | |
| □ | | 1. Letter of Transmittal |
| □ | | 2. Pricing Schedule (including option buses, spare parts package, engineering, manuals, training, special tools and test equipment) |
| **Package 3: Qualifications Package** | | |
| □ | | 1. Pre-Award Evaluation Data Form |
| □ | | 2. A copy of the three (3) most recent audited financial statements or a statement from the Proposer regarding how financial information may be reviewed by the Agency |
| □ | | 3. Letter for insurance |
| □ | | 4. All Federal Certificates complete |
| □ | | 5. Proposal form |
| **Package 4: Proprietary/Confidential Information** | | |
| □ | | 1. Proprietary/Confidential Information |
| There may be items in the first three packages that are included in Package 4 because they are considered to be proprietary/confidential information. When this occurs, the Proposer must note that fact in packages 1 through 3. | | |

## CER 2. Request for Pre-Offer Change or Approved Equal

This form must be used for questions and clarifications, changes, substitutes or approval of items equal to items specified with a brand name and must be submitted by the deadline, as specified in “Questions, Clarifications and Omissions.” Submit this form electronically to [KenJimkoski.tat@gmail.co](mailto:rfp@saginaw-stars.com)m.

Huron Transit Corporation

RFP 2024-200-11 MEDIUM-DUTY TRANSIT BUSES

|  |  |  |
| --- | --- | --- |
| **Request #:**  **Proposer:**  **RFP Section:**  **Page:** | | |
| **Questions/clarification or approved equal:** | | |
| **Agency action:** | □Approved  □ See addendum | □ Denied  □See response below |
| **Agency response:** | | |

## 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.”

Huron Transit Corporation

2024-200-11 MEDIUM-DUTY TRANSIT BUSES

|  |  |  |  |
| --- | --- | --- | --- |
| **Deviation No.:** | **Contractor:** | **RFP section:** | **Page:** |
| **Complete description of Deviation:** | | | |
| **Rationale (pros and cons):** | | | |

## CER 6. Pricing Schedule

Huron Transit Corporation 2024-200-11 MEDIUM-HEAVY DUTY TRANSIT BUSES

|  |  |  |
| --- | --- | --- |
|  | **Per Bus (USD)** | **Extension (USD)** |
| **Up to (11) Diesel or Propane or Gasoline Powered Medium-Duty Transit Buses** | $ | $ |
|  | | |
| **Optional Equipment** |  |  |
| Non-permanent Driver Safety Barriers | $ |  |
| Polycarbonate Passenger Seating Partitions | $ |  |
| On spot tire chains or approved | $ |  |
| Passenger Area USB Outlets | $ |  |
| **Total Proposed Price for Buses** |  | $ |

## CER 7. Pre-Award Evaluation Data Form

**NOTE:** This form is to be completed and included in the Qualification Package. Attach additional pages if required.

Huron Transit Corporation 2024-200-11 MEDIUM-DUTY TRANSIT BUSES

|  |
| --- |
| **2. Name of firm:** |
| **3. Address:** |
| **4. □ Individual□ Partnership□ Corporation□ Joint Venture** |
| **5. Date organized:**  **State in which incorporated:** |
| **6. 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 non-disclosure 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 |

## CER 8. Federal Certifications

### 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 $150,000.

|  |
| --- |
| **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 |

**OR**

|  |
| --- |
| **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 |

The Proposer shall obtain and submit to the Agency, copies of all signed Buy America certifications, including Buy America certifications that may be required of its subcontractors if the dollar thresholds established by FTA are exceeded. These completed certifications if applicable, shall be included in the bid proposal submitted to the Agency.

#### 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 or 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 8.2 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 8.3 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 8.4 Lobbying Certification

This form is to be submitted with an offer exceeding $150,000.

|  |
| --- |
| 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 8.5 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 8.6 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 8.7 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 Huron Transit Corporation in response to Request for Proposal No. RFP 2023-200-11 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 10. Vehicle Technical Information

This form must be completed and included in the Technical Proposal. Note n/a if not available.

**GENERAL COACH DATA SHEET**

Diesel Powered Medium-Duty Transit Bus

**Bus manufacturer:**

|  |
| --- |
|  |
|  |
|  |
|  |

Bus model:

**Understructure manufacturer:**

Model number:

**Basic Body Construction**

|  |
| --- |
|  |
| **and dimensions** |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |

Type:

**Tubing or frame member thickness**

Overstructure Understructure

**Skin thickness and material**

Roof Sidewall Skirt panel Front end Rear end

**Dimensions**

**Overall length** Over bumpers

Over body

**Overall width** Over body excluding mirrors

Over body including mirrors–driving position Over tires front axles

Over tires center axle Over tires rear axles

ft in.

ft in.

|  |
| --- |
|  |
|  |
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|  |
|  |
|  |

|  |
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|  |
|  |
|  |

ft in.

ft in.

ft in.

ft in.

ft in.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Overall height (maximum)** |  | ft |  | in. |
| **Overall height (main roof line)** |  | ft |  | in. |

**Angle of approach Breakover angle Breakover angle (rear) Angle of departure**

|  |
| --- |
|  |
|  |
|  |
|  |

deg deg deg deg

**Doorway Dimensions Front Rear**

Width between door posts Door width between panels Clear door width

Doorway height Knuckle clearance

in.

in.

|  |
| --- |
|  |
|  |
|  |
|  |
|  |

in.

in.

in.

in.

in.

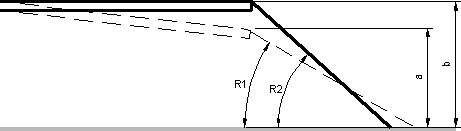
|  |
| --- |
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|  |

in.

in.

in.

Step height from ground measured at center of doorway



**Front doorway, empty Ramp angle Rear Doorway, empty**

Kneeled a. in. R1 deg a. in. Unkneeled b. in. R2 deg b. in.

**Interior head room (center of aisle)**

Front axle location Center axle location Rear axle location

in.

in.

|  |
| --- |
|  |
|  |
|  |

in.

Aisle width between transverse seats  in.

**Floor height above ground (centerline of bus)**

At front door At front axle At drive axle At rear door

in.

in.

|  |
| --- |
|  |
|  |
|  |
|  |

in.

in.

**Minimum ground clearance (between bus and ground, with bus unkneeled)**

Excluding axles in.

Including axles in.

**Horizontal turning envelope** (see diagram below)

Outside body turning radius, TR0 (including bumper) ft

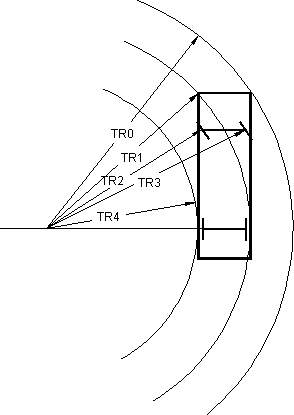
|  |
| --- |
|  |
|  |
|  |
|  |
|  |

Front inner corner radius, TR1 ft

Front wheel inner turning radius, TR2 ft

Front wheel outer turning radius, TR3 ft

Inside Body Turning Radius innermost point, TR4 (including bumper) ft



**Wheel base**

Front in.

Rear in.

in.

in.

|  |
| --- |
|  |
|  |
|  |
|  |
|  |

in.

in.

in.

**Overhang, centerline of axle over bumper**

Front in.

Rear in.

|  |
| --- |
|  |
|  |
|  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Floor** |  | | |
| Interior length | ft |  | in. |
| Interior width (excluding coving) | ft |  | in. |
| Total standee area (approximately) | ft2 |  |  |
| Minimum distance between wheelhouses: | Front |  | in. |
|  | Rear |  | in. |
|  | Center |  | in. |
| Maximum interior floor slope (from horizontal) | deg |  |  |

**Passenger capacity provided** Total maximum seating Standee capacity

|  |
| --- |
|  |
|  |
|  |
|  |

Minimum hip to knee room Minimum foot room

**Weight**

in.

in.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **No. of people** | **Front axle** | | | **Center axle** | | | **Rear axle** | | | **Total bus** |
| Left | Right | Total | Left | Right | Total | Left | Right | Total |
| Empty bus, full fuel and farebox |  |  |  |  |  |  |  |  |  |  |  |
| Fully seated, full fuel and farebox |  |  |  |  |  |  |  |  |  |  |  |
| Fully loaded standee and fully seated, full fuel and farebox |  |  |  |  |  |  |  |  |  |  |  |
| Crush load (1.5x fully loaded) |  |  |  |  |  |  |  |  |  |  |  |
| GVWR |  |  |  |  |  |  |  |  |  |  |  |
| GAWR |  |  |  |  |  |  |  |  |  |  |  |

**Engine, main**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | | | | |
|  | | | | |
|  | | | | |
|  | in. |  |  |  |
|  | in. |  |  |  |
|  | in.3 |  |  |  |
|  | | | | |
|  | | | | |
|  | hp | at |  | RPM |
|  | lb/ft | at |  | RPM |

Manufacturer

Type and weight rating Model number

Bore Stroke

Displacement Compression ratio Injector type and size Net SAE horsepower Net SAE torque Crankcase oil capacity

gal

gal

RPM RPM RPM

RPM

New engine, dry New engine, wet

Turbocharger make and model Maximum speed, no load Maximum speed, full load Speed at idle

Speed at fast idle

**Engine information/graphs to be attached with this form:**

Engine speed vs. road speed Torque vs. engine speed Horsepower vs. engine speed

Fuel consumption vs. engine speed

Vehicle speed vs. time (both loaded and unloaded) Vehicle speed vs. grade (both loaded and unloaded) Acceleration vs. time

Change of acceleration vs. time

**Hybrid drive or transmission**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | | | | |
|  | | | | |
|  | | | | |
| Forward: |  | Reverse: |  |  |

Manufacturer Type

Speeds Gear ratios Shift speeds

|  |
| --- |
|  |
|  |
|  |
|  |
|  |

1st–2nd 2nd–3rd 3rd–4th

4th–5th (if applicable) 5th–6th (if applicable)

mph mph mph mph mph

Fuel capacity (including heat exchanger and filters

**Voltage regulator**

|  |  |
| --- | --- |
| Manufacturer |  |
| Model |  |

**Voltage equalizer**

|  |  |
| --- | --- |
| Manufacturer |  |
| Model |  |

**Alternator**

|  |  |  |  |
| --- | --- | --- | --- |
| Manufacturer |  | | |
| Type |  | | |
| Model |  | | |
| Output at idle |  |  | amps |
| Output at maximum speed | |  | amps |
| Maximum warranted speed | |  | rpm |
| Speed at idle (approximately) | |  | rpm |
| Drive type |  | | |

**Starter motor** Manufacturer Type

|  |
| --- |
|  |
|  |
|  |

Model

**Air compressor** Manufacturer Type

|  |  |  |
| --- | --- | --- |
|  | | |
|  | | |
|  |  | CFM |
| pproximately) |  | CFMs |
| um speed (engine) |  | CFM |
| ed speed |  | rpm |
|  |  | rpm |
|  | | |

Rated capacity Capacity at idle (a Capacity at maxim Maximum warrant Speed idle

Drive type Governor:

Cut-in pressure psi

Cut-out pressure psi

**Axles**

**First** Manufacturer Type

Model number

Gross axle weight rating lbs

Axle load lbs

**Second** Manufacturer Type

Model number

Gross axle weight rating lbs

Axle load lbs

**Third** Manufacturer Type

|  |  |  |  |
| --- | --- | --- | --- |
|  | | | |
|  | | | |
|  | | | |
|  |  | lbs |  |
|  | lbs |  |
|  | |  |

Model number

Gross axle weight rating Axle load

Axle ratio

**Suspension system**

|  |  |
| --- | --- |
|  | |
| First: |  |
| Second: |  |
| Third: |  |
| First: |  |
| Second: |  |
| Third: |  |

Manufacturer Type:

Springs:

**Joint** Manufacturer Type

|  |
| --- |
|  |
|  |
|  |

Model number

**Wheels and tires**

**Wheels** Make Size Capacity Material

|  |
| --- |
|  |
|  |
|  |
|  |

**Tires** Manufacturer Type

Size

Load range/air pressure psi

**Steering, power**

**Pump**

psi

Manufacturer and model number Type

Relief pressure

**Booster/gear box**

|  |
| --- |
|  |
|  |
|  |

Manufacturer and model number Type

Ratio

Power steering fluid capacity Maximum effort at steering wheel Steering wheel diameter

gal

lbs (unloaded stationary coach on dry asphalt pavement) in.

|  |
| --- |
|  |
|  |
|  |

**Brakes**

|  |  |  |
| --- | --- | --- |
|  |  | |
| ze and part number: | First: |  |
|  | Second: |  |
|  | Third: |  |
|  | | |

Make of fundamental brake system Brake chambers vendor si

Brake operation effort

**Slack adjuster’s vendor’s type and part numbers**

|  |
| --- |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |

First: Right: Left:

Second: Right: Left:

Third: Right: Left:

Length: First take-up: Second take-up: Third take-up:

**Brake drums/discs**

|  |  |
| --- | --- |
|  | |
|  | |
|  | in. |
|  | |
|  | |
|  | in. |
|  | |
|  | |
|  | in. |

First: Manufacturer Part number Diameter

Second: Manufacturer Part number Diameter

Third: Manufacturer Part number Diameter

Brake lining manufacturer Type

**Brake lining identification**

|  |
| --- |
|  |
|  |
|  |
|  |
|  |
|  |

First: Forward Reverse

Second: Forward Reverse

Third: Forward Reverse

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Brake linings per shoe** |  |  |  |  |  |  |
| First |  |  |  |  |  |  |
| Second |  |  |  |  |  |  |
| Third |  |  |  |  |  |  |
| **Brake lining widths** |  |  |  |  |  |  |
| First |  | in. |  |  |  |  |
| Second |  | in. |  |  |  |  |
| Third |  | in. |  |  |  |  |
| **Brake lining lengths** |  |  |  |  |  |  |
| First |  | in. |  |  |  |  |
| Second |  | in. |  |  |  |  |
| Third |  | in. |  |  |  |  |
|  |  |  |  |  |  |  |
| Brake lining thickness |  | in. |  |  |  |  |
| **Brake lining per axle** |  |  |  |  |  |  |
| First |  | sq. in. |  |  |  |  |
| Second |  | sq. in. |  |  |  |  |
| Third |  | sq. in. |  |  |  |  |
| **Cooling system** |  |  |  |  |  |  |
| **Radiator/charge air cooler** | | | | | | |
| Manufacturer |  |  |  |  |  |  |
| Type |  |  |  |  |  |  |
| Model number |  |  |  |  |  |  |
| Number of tubes |  |  |  |  |  |  |
| Tubes outer diameter |  | in. | / in. |  |  |  |
| Fins per inch |  | fins |  |  |  |  |
| Fin thickness |  | in. |  |  |  |  |
| Total cooling and heating | stem capacity | | | gal |  |  |
| Radiator fan speed control |  |  |  |  |  |  |
| Surge tank capacity | quarts | | |  |  |  |
| Engine thermostat temperature setting: | | | Initial opening (fully closed) | |  | °F |
|  | Fully open | | |  |  | °F |
| Overheat alarm temperature sending unit setting | | | | °F |  |  |
| Shutdown temperature setting | | | °F |  |  |  |

**Air reservoir capacity**

|  |
| --- |
|  |
|  |
|  |
|  |
|  |
|  |

Supply reservoir Primary reservoir Secondary reservoir Packing reservoir Accessory reservoir Other reservoir type

in.3 in.3 in.3 in.3 in.3 in.3

**Heating, ventilation and air conditioning equipment**

|  |
| --- |
|  |
|  |
|  |

Heating system capacity Air conditioning capacity Ventilating capacity

**Compressor** Manufacturer Model

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | | | | |
|  | | | | |
| rs  ed speed | |  | |  |
|  | |  |
|  | | rpm |
|  | | rpm (recommended) |
|  | | lbs |
| Dry |  | | gal |  |
| Wet |  | | gal |  |
| Type | |  |  | lbs |

Number of cylinde Drive ratio Maximum warrant Operating speed Weight

Oil capacity

BTU/hr BTU CFM

Refrigerant:

**Condenser** Manufacturer Model

tube

in.

in.

Number of fins/in. Outer diameter of Fin thickness

**Condenser fan** Manufacturer Model

Fan diameter Speed maximum

Flow rate (maximum)

in. rpm CFM

**Receiver** Manufacturer Model Capacity

lbs

**Condenser fan drive motors**

hp

rpm

Manufacturer Model

Type Horsepower Operating speed

**Evaporator fan drive motors**

hp

rpm

Manufacturer Model

Type Horsepower Operating speed

**Evaporator(s)** Manufacturer Model

Number of rows Number of fins/in. Outer diameter of tube Fin thickness

Number of evaporators

in.

in.

**Expansion valve** Manufacturer Model

**Filter-drier** Manufacturer Model

**Heater cores** Manufacturer Model Capacity

Btu/hr

Number of rows Number of fins/in. Outer diameter of tube Fin thickness

Number of heater cores

in.

in.

**Floor heater blowers**

|  |  |
| --- | --- |
| Front |  |
| Rear |  |

**Controls**

|  |  |
| --- | --- |
| Manufacturer |  |
| Model |  |

**Driver’s heater**

|  |  |  |
| --- | --- | --- |
| Manufacturer |  | |
| Model |  | |
| Capacity |  | Btu/hr |

**Ventilation system**

|  |  |
| --- | --- |
| Type |  |

**Coolant heater**

Make

Model Capacity

Btu

**Interior lighting** Manufacturer Type

Number of fixtures Size of fixtures Power pack

**Doors**

**Front**

|  |
| --- |
|  |
|  |
|  |

Manufacturer of operating equipment Type of door

Type of operating equipment

**Rear**

|  |
| --- |
|  |
|  |
|  |

Manufacturer of operating equipment Type of door

Type of operating equipment

**Passenger windows**

**Front** Manufacturer Model

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | | | | |
|  | | | | |
|  | | | | |
| Side |  |  | | |
| Rear |  |
|  | | |  |  |
|  | | |  |  |
| Type |  |  | | |
| Thickness | |  | | |
| Color of tint | |  | | |
| Light transmission | |  | | |

Type Number:

Sizes:

Glazing:

**Mirrors**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Size** | **Type** | **Manufacturer** | **Part no.** | **Model no.** |
| Right side exterior |  |  |  |  |  |
| Left side exterior |  |  |  |  |  |
| Center rearview |  |  |  |  |  |
| Front entrance area |  |  |  |  |  |
| Upper-right corner |  |  |  |  |  |
| Rear exit area |  |  |  |  |  |

**Seats Passenger** Manufacturer Model

|  |
| --- |
|  |
|  |
|  |

Type

**Operator**

|  |
| --- |
|  |
|  |
|  |

Manufacturer

Model and part number Type

**Paint** Manufacturer Type

**Wheelchair ramp equipment**

|  |  |  |  |
| --- | --- | --- | --- |
| Manufacturer |  | | |
| Model number |  | | |
| Capacity |  |  | lbs |
| Width of platform |  |  | in. |
| Length of platform |  |  | in. |
| System fluid capacity | |  | quarts |
| Type of fluid used |  |  | |
| Operating hydraulic pressure | |  | psi |

Hydraulic cylinders: Size Number

|  |
| --- |
|  |
|  |

**Wheelchair securement equipment**

|  |  |
| --- | --- |
| Manufacturer |  |
| Model number |  |

**Destination signs**

|  |  |
| --- | --- |
| Manufacturer |  |
| Type |  |

**Character length** Front destination Front route Curbside destination Rear route

in.

in.

in.

in.

**Character height** Front destination Front route Curbside destination Rear route

in.

in.

in.

in.

**Number of characters**

Front destination Front route Curbside destination Rear route

**Message width** Front destination Front route Curbside destination Rear route

in.

in.

in.

in.

**Electrical Multiplex system** Manufacturer Model number

**Batteries** Manufacturer Model number Type

**Communication syste m**

**GPS**

Manufacturer Model number

**PA system**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Manuf** | **acturer** | **Model number** | **Number** |
| Amplifier | | |  |  |
| Microphone | | |  |  |
| Internal speakers | | |  |  |
| External speaker | | |  |  |

**Energy storage (hybrid drive)**

V V

lbs

Type

Number of cells Battery pack voltage Weight

**Security camera system**

Manufacturer Model number Number of cameras Storage capacity

**Bike racks** Manufacturer Model number

|  |
| --- |
|  |
|  |

**Fire detection system**

Manufacturer Model number Fire detectors

Type (thermal or optical) Number of detectors

**Automatic voice annunciator system**

Manufacturer

Model and part number

**Annunciator LED sign** Number of signs Housing dimensions Character length Character height Character width

|  |  |
| --- | --- |
|  |  |
|  | |
|  | in. |
|  | in. |
|  | in. |

**GPS antenna**

Manufacturer

Model and part number

**Automatic passenger counter**

Manufacturer

Model and part number a.

b.

c.

Sensor type

**Real-time bus arrival prediction system**

|  |  |  |
| --- | --- | --- |
|  | **Manufacturer** | **Model number** |
| Router |  |  |
| Cellular modem |  |  |
| Charge protection |  |  |

**Electronic tire pressure monitoring system**

|  |  |
| --- | --- |
| Manufacturer |  |
| Model number |  |

**Electronic brake stroke/wear indicator system**

|  |  |
| --- | --- |
| Manufacturer |  |
| Model number |  |

**NOTE:** All information above is accurate to the timeframe upon submission. The Agency reserves the right to update above data if changes occur, upon consultation with the customer.

# SECTION 10: SAMPLE CONTRACT

**Huron Transit Corporation**

#### CONTRACT AGREEMENT

This Agreement made this day of , 20 , between the Huron Transit Corporation, herein called the

“Authority” and/or “Buyer” and herein called the “Contractor” and/or “Seller”.

In consideration of the mutual promises and agreements hereinafter set forth, the parties agree to undertake, carry out and perform this Contract in accordance with the terms and conditions as set forth herein, and as follows:

1. The Contract Documents:

The Contract Documents consist of this Agreement, the “Information for Bidders”, the “Invitation to Bid”, the “Bidder Proposal”, the “General Terms and Conditions”, and the “Scope of Work”. These form the

Contract and all are fully a part of the Contract as if attached to this Agreement or reported herein. Reference number: .

1. The Performance:

The Contractor shall furnish pursuant to the terms and conditions of this Contract labor and material listed in the attached specifications.

1. Time of Commencement and Completion:

The Contractor shall perform under this Contract from the date hereof until

, or a later date if extended by mutual consent of the parties.

1. Independent Contractor:

The Contractor is employed by the Authority as an independent Contractor and has and retains the right to exercise full control and supervision of the services including compliance with Social Security,

withholding and all other regulations governing such matters. The contractor agrees to indemnify, defend and save harmless the Authority, its agents, officers and members of the Board of the Mass Transportation Authority against any and all loss, damage or expense which the Authority may suffer by reason of liability imposed by law upon the Authority or Contractor for damages because of bodily injury, including death at any time resulting there from sustained by any person or persons, or on account

of damage to property are due to the fault of the Contractor, its sub-contractors or their employees, agents or any other person under the direct or indirect Contract of the Contractor.

1. Contractor’s Financial Responsibilities:

Any costs due to the fault of the Contractor, sub-contractor, or anyone directly employed by them either for making good of defective work, disposal of material wrongly supplied, making good of damage to property, or excess costs from material or labor, or otherwise shall be borne by this Contractor, and the Authority may withhold money due the Contractor to cover any such costs.

1. Assignment:

The Contractor shall not assign or transfer any interest in this Agreement or delegate its performance of duties except on prior written approval of the Authority, which approval shall not be unreasonably withheld.

Consent to assign, transfer or delegate any interest or performance of this Contract shall not be construed to relieve the Contractor of any responsibility for the fulfillment of this Agreement.

1. Payments:

The Authority shall pay the Contractor for the performance of work in current funds per price stated in the “Bidders Proposal” upon completion and acceptance by the Huron Transit Corporation. The Contractor shall invoice each item against an Authority Purchase Order and all invoices for the calendar month shall be payable by the fifteenth day of the following month.

No payment will be made to the Contractor for material not delivered upon the Authority premises, unless otherwise agreed to in writing by the Authority.

Neither payment made under the Contract or used by the Authority of the labor and material provided shall be evidence of performance of the Contract, either in whole or in part, nor shall such payment, final or otherwise, be construed to relieve the Contractor from its obligation to make good any defects

arising or discovered in its performance within the period of its guarantee, nor shall the Authority be deemed to waive any specific obligation the contractor may assume as to its performance.

1. Testing:

At any time if it is determined by an independent testing firm analysis that equipment delivered and installed is substandard, the Authority reserves the right to discontinue shipments and shall not be obligated

to pay for such substandard shipment already delivered. The Contractor agrees to pay all costs incurred by the Authority to provide test on equipment delivered and installed found not meeting the specification.

1. Termination for Convenience:

The Authority may terminate this contract, in whole or in part, at any time by written notice to the Contractor

when it is in the Authority’s best interest. The Contractor shall be paid its costs, including contract close-out costs, and profit on work performed up to the time of termination. The Contractor shall promptly submit its termination claim to the Authority to be paid the Contractor. If the Contractor has any property in its possession belonging to the Authority, the Contractor will account for the same, and dispose of it in the manner the Authority directs.

1. Termination for Default:

The Authority reserves the right to cancel all or any part of the work covered by this Agreement and/or Purchase Order, if Seller does not make deliveries as specified in the schedules or so fails to make progress as to endanger performance of the work and does not correct such failure after receipt of written notice from the Authority specifying such failure, or if Seller breaches any of the terms hereof, including the warrants of Seller. Should cancellation be made for cause, the Authority reserves the right to purchase elsewhere and if additional costs are incurred, such costs are to be at the

Seller’s expense. The Seller shall be liable for any other damages suffered by the Authority as a result

of any breach by the Seller in the performance of this Agreement.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed by their respective duly authorized representatives, as of the day first above written.

VENDOR HURON TRANSIT CORPORATION

Title WITNESS:

Director, Ken Jimkoski

WITNESS: