ORIGINAL REQUEST

LoNo Budget 12 Buses		
40' Battery Electric Bus	12	$9,000,000
Depot Charging Equipment	12	$540,000
Project Management & Tech	1	$500,000
Total		$10,040,000
LONO GRANT		$5,813,000
Local Match		$4,227,000
Total Funds		$10,040,000
Difference		$10,040,000

REVISED AFTER GRANT AWARD

LoNo Budget 10 Buses		
40' Battery Electric Bus	10	$7,400,000
Resident Inspection	1	$30,000
Workforce Development	1	$25,000
Project Management & Tech/ Pre/Post Buy America Audit	1	$440,000
Depot Charging Equipment	10	$80,000
Depot Design/Build/Inspection	1	$100,000
Depot Installation	10	$50,000
Total		$8,125,000
LONO GRANT		$3,905,378
Local Match		$4,227,004
Total Funds		$8,132,382
Difference		$7,382

** All prices are subject to negotiation and bid submittals

CENTER FOR TRANSPORTATION & THE ENVIRONMENT
730 PEACHTREE STREET
SUITE 760
ATLANTA, GA 30308
P: 678-244-4150
F: 678-244-4151

September 15, 2016

Mr. Albert Babinicz
Chief Executive Officer/General Manager
Clemson Area Transit
Administrative Offices
200 West Lane
Clemson, SC 29631

Re: Letter Agreement for CTE Scope of Work related to Clemson Area Transit Deployment of Battery Electric Buses

Dear Mr. Babinicz,

This Letter Agreement between the Center for Transportation and the Environment ("CTE"), located at 730 Peachtree Street, Suite 760, Atlanta, GA 30308 and Clemson Area Transit ("CAT"), located at 200 West Lane, Clemson, SC 29631, both hereinafter referred to collectively as the "Parties" and individually as "Party," serves as the contract for the scope of work that CTE agrees to provide under the Federal Transit Administration ("FTA") Low or No Emission Grant Program ("Low-No"). In consideration of the mutual covenants contained herein, the parties agree as follows:

The following attachments are incorporated by reference and made part of this Letter Agreement herein:

Attachment I: *CTE Statement of Work*
Attachment II: *General Provisions - Required Federal Clauses*

1. STATEMENT OF SERVICES TO BE PERFORMED

By executing this Letter Agreement, CTE agrees to perform and comply with the scope of work set forth in the Statement of Work, attached and fully incorporated herein as Attachment I. CTE shall perform the scope of work specified in the time and manner described and in accordance with the terms and provisions of this Agreement. CTE agrees to perform the scope of work with that standard of professional care, skill, and diligence normally provided in the performance of similar services.

2. TERM OF AGREEMENT

The period of performance for this Agreement shall commence upon the execution of this Letter Agreement by both parties. Services, work products and/or deliverables defined in

CTE's Statement of Work shall be completed no later than 36 months from the latter of the execution date of this Letter Agreement or the date of the FTA's grant award to CAT.

3. AGREEMENT AMOUNT

The total Agreement Amount to be paid CTE for the scope of work defined under this Agreement shall not exceed $440,000, CTE will invoice CAT for services provided, and/or services and equipment purchased, based on actual and allowable costs.

4. INVOICES

CTE will submit invoices to CAT on a timely basis, with the appropriate supporting documentation providing evidence of hours worked and associated hourly rates, as well as any documentation of actual costs incurred and paid by CTE in performing their scope of work under this Agreement. A final invoice will be submitted by CTE within 30 days of the end date of the project or Termination of this Agreement. Invoices will be submitted to Mr. Albert Babinicz, Clemson Area Transit, 200 West Lane, Clemson, SC 29631 by mail, courier, or e-mail to ababinicz@cityofclemson.org

5. TERMINATION

This agreement may be terminated in whole or in part as follows:

A. By Either party, if the Other Party materially fails to comply with the terms and conditions of this Agreement and such failure is not corrected within fifteen (15) days following receipt of written notice from the non-breaching party.
B. By CTE, upon thirty (30) days written notification to CAT setting forth the reasons for such termination, the effective date, and, in the case of partial termination, the portion to be terminated.
C. By CAT, upon thirty (30) days written notification to CTE setting forth the reasons for such termination, the effective date, and, in the case of partial termination, the portion to be terminated.
D. By CAT, if CAT's prime award supporting this Letter Agreement is terminated by FTA.

6. INDEMNIFICATION

A. Each Party (the "Indemnifying Party") agrees to, and will, indemnify, defend, and hold harmless the other Party (the "Indemnitee") and its Board Members, officers, agents, employees, and representatives against any liabilities, losses, claims, expenses (including attorney's fees) or damage they may suffer as a result of third party claims, demands, actions, costs or judgments resulting or alleged to have resulted from the Indemnifying Party's negligence or willful misconduct related to performance under this contract, except to the extent that the liability, loss or damage results from (i) the non-Indemnifying Party's failure to substantially comply with any applicable law; or (ii) the negligence or willful malfeasance of any board member or employee of the non-Indemnifying Party.

B. It is further agreed by and between the Parties that the Indemnitee shall (a) promptly notify the Indemnifying Party in writing of any claim for which indemnification is sought and (b) forward to the Indemnifying Party any other information available regarding the claim as promptly as is reasonably practicable; provided that the failure to provide such notice shall not release the Indemnifying Party from any of its obligations hereunder except to the extent that the Indemnifying Party is actually and materially prejudiced by such failure.
C. The Indemnifying Party shall be entitled, at its option, to assume and control the defense of any third party claim under this section, at its expense and through counsel of its choice if it gives notice of its intention to do so to the Indemnitee within 45 days of the receipt of notice of the right to be indemnified.

7. MISCELLANEOUS

A. Independent Contractor Status. The Parties agree that CTE, as well as any individual working for CTE, is an independent contractor and not an employee of CAT for any purpose. Nothing contained in this Agreement shall be construed to create the relationship of employer and employee, principal and agent, partnership, or joint venture. Both parties acknowledge that CTE is not an employee for state or federal tax purposes and is not entitled to any employee benefits of CAT.
B. Subcontracting. CTE may subcontract with third party providers in performance of specific tasks included in CTE's Statement of Work. In the event that subcontractors are used, CTE will notify CAT of the intent to use subcontractors and ensure subcontractor adherence to the same quality standards and assurances required of CTE, including adherence to applicable Federal Terms and Conditions.
C. Non-Exclusivity. As an independent contractor, CTE may engage the services of any other individual or company that competes with CAT or offers services similar to those offered by CAT, and any such engagement shall not be considered a breach of this Agreement.
D. Entire Agreement. This Agreement constitutes the entire Agreement of the Parties with respect to the subject matter of the Agreement and supersedes all previous oral and written agreements, understandings, and communications of the Parties relating to such matters.
E. Amendment or Waiver. This Agreement may not be modified, amended or waived except by a written instrument executed by duly authorized representatives of both parties. No failure or delay in exercising any right shall operate as a waiver thereof.
F. Severability. Should any part of this agreement be rendered or declared invalid or unenforceable by a court of competent jurisdiction, it shall not affect the validity of any other provision, which shall remain in full force and effect.
G. Assignment. Neither Party may assign its respective rights or duties under this

agreement to a third Party (except to a successor in interest to substantially all of the business of the assignor) without the prior written consent of the other Party.

H. Governing Law. This Agreement will be governed by and constructed in accordance with the laws of the State of Georgia, USA, without regard to the conflict of laws principles thereof.

- Signature Page to Follow-

Please indicate your acceptance of these terms by returning one signed copy of this letter agreement to CTE.

Center for Transportation & the Environment (CTE):

Signature: _____

Printed Name: _____

Title: _____

Date: _____

Read, agreed to, and accepted by Clemson Area Transit (CAT):

Signature: _____

Printed Name: _____

Title: _____

Date: _____

Enclosures:

Attachment I: *CTE Statement of Work*
Attachment II: *General Provisions - Required Federal Clauses*

CENTER FOR TRANSPORTATION AND THE ENVIRONMENT

Attachment I

CTE Statement of Work

Project Management Plan
and
CTE Scope of Work

This Project Management Plan summarizes the nine primary phases that will be used to guide the Clemson Area Transit deployment of battery electric buses to accomplish the proposed project scope. It also defines CTE's Scope of Work, as defined in the LowNo application awarded by FTA.

1. FTA Award and Sub-Recipient Contract Execution (3 months)

The project will not begin until the FTA has awarded the grant to the CAT and sub-recipient agreements with Center for Transportation & the Environment (CTE) have been executed. We assume that this will take at least three months from the time that FTA announces the awardees.

2. Project Planning and Initiation (1 month)

This phase will include detailed project planning to finalize the Project Management Plan (PMP) that defines the project objectives, scope, approach, resources, tasks, and timeline. CTE will meet CAT project staff to review an initial draft of the PMP, which will be updated based on their feedback. This phase will result in a formal kick-off of the project with all stakeholders and project team members to align the project team on tasks, assignments, timelines, and expectations to successfully meet project goals and objectives.

Key CTE Deliverables: *Project Management Plan, Project Kick-off Presentation*

3. Requirements Analysis (2 months)

This phase includes route modeling and development of technical specifications for the bus and charging equipment. CAT and CTE will conduct a survey and site visits of each Bus OEMs capable of delivering Buy America-compliant 40' battery electric buses that will have been Altoona tested prior to bid submittal. CTE will model the CAT routes based on generic battery electric bus specifications to predict the performance of the bus on the selected routes. The model uses powertrain simulation software developed by Argonne National Laboratory called Autonomie. CTE will collect route data by riding the route on an existing CAT bus with a GPS data logger to capture time, distance, speed, acceleration, GPS coordinates, and grade. CTE will use this data, along with specifications of battery electric bus and charging systems (on-route and shop charging

units), to develop a baseline route performance model. Additionally, CTE will also develop a rate model to assess the operational cost of the proposed service. If needed, CTE may engage the services of an external vendor to complete the route performance model and the rate model. The results of the route modeling and bus simulation will be presented to CAT to determine if any changes are required to the bus specifications, routes, or operating service.

The results of the route modeling effort will be used to help refine CAT's bus specification used in their Request for Proposal.

Key CTE Deliverables: *CAT BEB Survey and Results Summary, CAT Route Model Results, CAT Rate Model Results*

Key Phase Deliverables: *CAT BEB Technical Specifications*

4. Bus Procurement & Build (15 months)

CTE will support CAT as they finalize the technical specifications other documents required for bus procurement. The specification will be based, in part, on APTA's Bus Procurement Guidelines. The specifications will be part of the RFP for Zero Emission buses issued by CAT. Once proposals are received, CTE will analyze the proposed bus specifications for comparison against the model created during the previous phase. A life cycle cost analysis will be developed to compare 12-year capital and operating cost assessment of each proposal. The information will be presented to CAT as part of their evaluation and selection process.

Once the OEM has been selected, CAT will execute a contract and issue a notice to proceed. The OEM will submit their final design for CAT approval before proceeding with production. CTE will conduct a pre-build Buy America audit. CAT, CTE, the BUS OEM, and CTE's Resident Inspector will participate in a pre-production meeting to review the sales production order, final design, drawings, production procedures, inspection procedures, acceptance procedures, and the BUS OEM's Quality Management System. CTE will monitor bus production and CTE will have a resident inspector on-site during production. The goal of the inspection is to ensure that the buses meet the specification requirements and that the selected OEM is adhering to their quality control and quality assurance standards. Once production is completed, a Pre-Delivery Buy America Audit is conducted to ensure the buses and charging equipment meet Buy America requirements. CAT will conduct a pre-delivery inspection, approve buses for delivery, and then conduct post-delivery acceptance inspections. If needed, CAT may engage the services of external vendors to complete the resident inspections, quality assessments, and Buy America audits.

Key CTE Deliverables: *Proposed BEB Technical Assessment & Route Model Results, Proposed BEB Life Cycle Cost Comparative Analysis*

Key Phase Deliverables: *Zero Emission Bus Request for Proposal, Zero Emission Bus Proposal Evaluation Criteria and Selection Procedure, Zero Emission Bus Proposal Evaluation and Selection Results, BUS OEM Sales Production Order, Bus Design Drawings, Master Resolution Log, Change Orders, Inspection Logs, Pre-Award and Pre-Delivery Buy America Audits, BUS OEM Battery Electric Buses*

5. Infrastructure Procurement, Design and Build (11 months)

CAT will work with BUS OEM and CTE during this phase to finalize site plans for the depot charging stations. Final determination of the charging station will be based, in part, on the results of CTE's route model. CTE will conduct a Buy America Audit on Manufactured Products for the charging equipment. CAT will issue an RFP or IFB for site engineering and design (including civil, electrical, and mechanical), construction, and equipment installation. CAT will seek the necessary permits from the local permitting authority to install the system. Once the site preparation is completed and the charging equipment has been installed, BUS OEM will commission the equipment for charging operations. CTE will monitor progress of the construction of depot and on route charging stations to ensure coordination with the bus build.

Key Phase Deliverables: *Charging Station Design, Buy America Audit on Manufactured Products, BUS OEM On Route and Depot Charging Equipment, Commissioned Charging Stations.*

6. Bus and Infrastructure Deployment (1 month)

Delivered buses will be registered and insured by CAT. BUS OEM will conduct a series of tests to ensure the buses can be charged properly with the on-route and depot charging equipment. During this phase, CAT staff will receive the necessary training to operate and maintain the vehicles. CAT and CTE will conduct a series of tests to validate the performance and operation of the buses. These tests will include route validation, where buses are operated along the planned route under controlled conditions (temperature, AC load, passenger load, traffic patterns, etc.) to validate the bus against the performance specification and modeling results. Route validation results will be used to update route planning, as needed. Next, CAT will conduct a Full Service Validation where buses are placed in shadow service for a period acceptable to CAT to demonstrate full operational capability. CAT will review and approve BUS OEM's Operation Manuals, Maintenance Manuals, and Parts Manuals. BUS OEM will review their post-delivery support and warranty procedures with CAT staff. BUS OEM will also deliver spare parts in accordance with the contract. Once buses and the charging stations have completed testing and acceptance by CAT, they will be phased into revenue service.

Key CTE Deliverables: *CAT Route Validation Results*

Key Phase Deliverables: *CAT Route Service Plan; BUS OEM Training Manuals, Operation Manuals, Maintenance Manuals, and Parts Manuals; Trained Operators and Maintenance Technicians*

7. Deployment Validation (15 months)

CTE will collect various operational data points to measure and report actual energy savings, cost savings, and greenhouse gas emissions reductions resulting from deployment of battery electric buses into revenue service. The data will be used to generate a series of Key Performance Indicators (KPIs) to validate performance of battery electric buses against other buses in CAT's fleet. Key performance indicators include availability, on-time performance, energy consumption and costs, maintenance costs, and driver acceptance. By tracking and analyzing these KPIs, CAT and FTA will be fully informed regarding the overall impact of the electric buses.

Key CTE Deliverables: *Quarterly KPI Reports*

8. Project Close-out (3 months)

After the data collection period is over, CTE will issue a final report summarizing project results, findings, and lessons learned. CAT will close out the project with FTA.

Key CTE Deliverables: *Final Report*

9. Project Management, Administration, Reporting and Control (3 years)

CTE will guide the entire project by the control and risk management procedures detailed below. CTE's centralized management of the work program will enable team members to concentrate on exceeding project goals and ensure production of deliverables in a clear and well-coordinated manner. CTE will present project findings on behalf of the project team at an appropriate industry venue. CTE will also integrate project findings into our existing battery electric bus decision support tools to improve their function and ability to support this and future ZEB deployments. CTE will represent the [transit agency]'s interests within industry wide ZEB commercialization efforts such as charging and procurement standards committees.

Key CTE Deliverables: *Weekly Status Meeting Agendas and Minutes, Project Work Plan, Near Term Task Plans, Milestone Plan, Issue & Risk Management Log, Quarterly Progress Reports, Project Findings Presentation(s)*

Details of CTE's processes for ensuring the efficient accomplishment of these tasks are as follows.

Collaboration Tools
CTE will provide an on-line, cloud based, collaborative project management website to share project files.

Communications Plan
Team members will participate in weekly or bi-weekly conference calls to discuss project status and current issues. CTE will schedule and manage the calls using calendar invites. Meeting minutes will be taken and stored on the project website. WebEx will be employed when team members desire a presentation format to share status updates. CTE will schedule additional conference calls with team members, as needed.

Reporting Plan
CTE will provide CAT with Monthly Status Reports (MSRs) and Quarterly Management Reports (QMRs). The MSR provides a brief snapshot of project status, identifying progress and key issues that may require management attention. The QMRs provides a summary of progress and accomplishments of the previous quarter and projections for the remainder of the project. The QMR will be structured to allow CAT to easily incorporate the information into the required FTA Quarterly Report submitted by CAT. The QMR will document project progress and activities as well as describe any known risks and plans for mitigation.

CTE will compile the QMRs with input from team members. CTE will provide team members with a QMR template that will include:

- Summary narrative of accomplishments by task/milestone during the period
- Estimated % completion and expected completion dates of task/milestone
- Significant events affecting progress and discussion of project variances
- Projected activities for the next quarter

CTE will also compile a Final Management Report at the end of the project to summarize the project accomplishments, realized benefits, and lessons learned.

Operational Analysis & Reporting Plan
CTE will collect, analyze and report Key Performance Indicators (KPIs) to help track and understand the performance of the electric buses. These indicators will allow CAT and FTA to fully understand operational metrics to determine if the projected benefits have been realized from the deployment of the electric buses, including impact on emissions, reductions in fuel consumption and cost, reductions in maintenance and costs, and any potential increase in ridership. The analysis will also help to understand any impact that charging of electric buses or range limitations may have on service levels, operations, and on-time performance. By tracking and analyzing theses KPIs, CAT and FTA will be fully

informed regarding the overall impact of the electric buses.

CTE will conduct a reporting workshop with CAT to determine the KPIs they wish to capture and the procedures for collecting data. The following KPI's are a sample of the type of information may be analyzed and tracked:

- **Fuel Cost Savings:** The fuel cost analysis will provide information regarding the cost of powering the electric buses on the chosen routes compared to the cost of operating a non-electric fleet on the same routes.
- **Agency Energy Performance & Fuel Efficiency:** Agency energy performance will provide an overall energy consumption and fuel efficiency comparison (to include diesel, CNG, LNG, LPG and electricity consumption, as applicable) pre- and post-electric bus deployment. Overall CO2 emissions will also be compared.
- **Emission Reduction:** Reduction in fossil fuel consumption will lead to a direct reduction in emissions, which is offset by indirect emissions related to the local utility. CTE will calculate monthly emission reductions as a result of displacing current buses with electric buses.
- **Availability:** The bus availability data will be analyzed to determine the overall availability of the electric buses versus non-electric fleet, regardless of whether the buses are actually placed into service.
- **On-Time Performance:** Analysis of on-time performance will provide details on the impact, if any, electric buses have on the on-time route performance as compared to non-electric fleet operating on the same routes.
- **Maintenance Costs:** The maintenance cost analysis will compare maintenance activities, time, and cost for the electric buses against CAT's non-electric fleet, regardless of whether the maintenance activity is covered by warranty.

Driver reaction and attitudes in response to new designs and advanced technologies are often critical to gaging the success or failure of a new vehicle. Their driving experience can help identify early-on issues or problems that may not manifest themselves in KPI data until much later, or sometimes not at all. CTE can work with the transit agency to conduct a survey of drivers to assess their acceptance of the new technology within six months of initial deployment, and a second follow-up survey 12 to 18 months later.

Schedule Control Plan

CTE and team members developed a high level schedule as part of this proposal that includes estimated durations for all project phases. During the project's Planning and Initiation phase, CTE will work with each team member to develop a detailed schedule. Based on each team member's inputs, CTE will identify the critical path for the plan and identify any project plan risks. CTE will be responsible for maintaining the overall schedule with input from team members.

Team members will manage the detailed schedule for their assigned tasks and report schedule status for each regular team call. If the actual progress for a task is determined to be behind the planned schedule, CAT will determine if corrective action must be made based on the schedule variance, the amount of work remaining, the impact on other tasks, and impact on the overall schedule. Corrective action, if necessary will be identified during the team conference calls.

Risk Management and Mitigation Plan

CTE provides strong and engaged oversight of project progress through the suite of management controls and procedure outlined above. CTE's management method ensures quick recognition of any project risks that arise. Our project approach includes identifying, documenting, and tracking issues. Issues are assigned to project team members for research, analysis, and resolution. Issues and related tasks are prioritized to ensure that project team members remain focused on the right activities at the right time. Critical issues that remain unresolved or proposed solutions that impact project timeline, scope, budget or resources are escalated to CAT management for immediate attention.

CENTER FOR TRANSPORTATION AND THE ENVIRONMENT

Attachment II

General Provisions - Required Federal Clauses

GENERAL PROVISIONS
REQUIRED FEDERAL CLAUSES