



April 8, 2019

TO: ALL CALACT BIDDERS

FROM: ORANGE COUNTY TRANSPORTATION AUTHORITY

**SUBJECT: REQUEST FOR QUOTES (RFQ) 9-1001
CALACT CLASS H – 30 TO 32-FOOT COMPRESSED
NATURAL GAS HEAVY DUTY BUSES**

AFFILIATED AGENCIES

*Orange County
Transit District*

*Local Transportation
Authority*

*Service Authority for
Freeway Emergencies*

*Consolidated Transportation
Service Agency*

*Congestion Management
Agency*

*Service Authority for
Abandoned Vehicles*

The Orange County Transportation Authority (Authority) invites firms who are participants in the California Association for Coordinated Transportation (CalACT) / Morongo Basin Transit Authority (MBTA), Contract No. 18-01, to provide a quote for Class H – 2019/20 compressed natural gas buses.

Quotes must be received at or before 11:00 a.m. on Thursday, May 9, 2019. Quotes received after the date and time specified, will not be accepted.

Questions or clarifications must be submitted in writing and must be received by the Authority no later than 11:00 a.m. on Thursday, April 18, 2019. The Authority will respond to written questions via an addendum.

Quotes must be sent via electronic mail to kmason@octa.net and must be submitted on the attached form entitled, "Exhibit E, Price Summary Sheet".

Bidder will be required to comply with all applicable Equal Employment Opportunity Laws and Regulations.

Sincerely,

Kristen Mason
Section Manager, Maintenance Procurement

Enclosures:

- Exhibit A: Scope of Work
- Exhibit B: Quality Assurance
- Exhibit C: Warranty Table
- Exhibit D: Quotation Form
- Exhibit E: Price Summary Sheet
- Exhibit F: Insurance Requirements
- Exhibit G: General Provisions

The Authority intends to purchase up to twelve (12), 30 to 32-foot (+/-6") compressed natural gas (CNG) Class H buses, with an option to purchase up to five (5) additional buses no-later than 30-months after the initial award. These buses are intended for the widest possible spectrum of passengers, including children, adults, the elderly and persons with disabilities.

The basic vehicle, both chassis and body, must be model year 2019/20, factory production, heavy duty, Altoona tested transit bus rated to a twelve-year, 500,000-mile designed life with two American with Disabilities Act (ADA) stations; a design that is cataloged by the manufacturer and for which manufacturer's published literature and printed specifications are currently available.

The specification is intended for use in the purchase of a new and complete vehicle unit and all equipment and accessories necessary for its operation. All parts, equipment and accessories shall be completely installed, assembled and/or adjusted as required.

Contractor shall begin production of the First Article (FA) bus, in accordance with the schedule provided by Contractor and upon receipt of the Notice to Proceed (NTP). Schedule provided by Contractor must be realistic and meet or exceed the Authority's requirements. **The final bus delivery must be no later than September 30, 2020.** Upon approval of the FA, there will be a secondary NTP for the production run.

As part of the quote submittal, Contractor must provide:

1. One (1) copy of the California Air Resources Board Executive Order applicable for the proposed CNG engine.
2. Table with Gross Vehicle Weight Rating (GVWR) and weight calculations to include ADA equipment, components, accessories, passenger and driver.
3. Proposed CNG tank capacities, in gasoline gallons equivalency, number of CNG tanks and estimated vehicle range at GVWR.
4. Contractor shall be responsible for the licensing and registration of each vehicle.
5. Using as a reference the NTP with the FA unit, Contractor must agree to meet or exceed the proposed production and delivery schedule for the following:

A. One FA unit;

The first article must be delivered to OCTA in a fully-functional state of completion, ready to be deployed in revenue service, having all systems and components in operation, **no later than thirty-six (36) weeks after receiving the NTP.**

i. Authority's delivery location:

Santa Ana Base
4301 West MacArthur Boulevard
Santa Ana, California 92704

- ii. Contractor shall produce one (1) FA bus with respect to the base order. The FA bus shall demonstrate that the bus fully meets all contractual requirements. The FA bus shall be inspected, tested and approved by the Authority prior to making the decision to move forward with the production of the remaining order.
- iii. The Authority will test and evaluate the FA for a period of “up to four (4) weeks” in its intended service and operational environment. If no mechanical or component integration failures (e.g., electrical systems, components, destination signs, voice announcements, fire suppression, methane detection, Fleetwatch, etc.) are detected during this period, the Authority will issue the NTP for the production run. If mechanical or integration failures are detected, then the Contractor shall be responsible for performing the repair and, upon satisfactory completion of such repairs, at the Authority’s discretion, the bus will be considered accepted or the four (4) week evaluation period will be restarted.
- iv. An FA inspection shall include both a physical configuration inspection and a functional demonstration. FA inspections shall be conducted at the Contractor’s facilities and the Contractor shall furnish the Authority, prior to each inspection, a written inspection and demonstration plan for each item intended for review. The Authority’s inspectors shall attend each FA inspection unless the Authority provides a written waiver of its right to attend any such inspection. The results of each FA inspection shall be documented by the Contractor in a format deemed acceptable to the Authority and all documents relating to the inspection shall be forwarded to the Authority’s Contract Administrator.
- v. Additionally, upon arrival to the Authority’s facilities, the FA build shall be evaluated/tested for a period up to four (4) weeks. The evaluation/testing shall start after the bus is licensed, registered and delivered to the Authority and all, if any detected discrepancies are repaired and/or corrected to the Authority’s satisfaction. The four (4) week evaluation/testing shall include, among others, compliance with specifications, compliance with regulations, California Highway Patrol inspection, ergonomics, driver’s reach and controls, wheelchair locations, securement, placement, pressure and actions required to activate pedals, switches, knobs, access doors, driver’s field of view, windshield glare, interior and exterior lighting, vehicle handling, vehicle’s ability to maintain its intended course and direction of travel, steering, braking, turning radius, suspension, kneeling, approach and break over angles, vehicle range, handling of slopes, power plant, to include entire and individual pieces of the fuel system, fuel consumption, maintenance logging of break downs, fuel tank performance, operating pressures, ability to fuel and defuel the tanks, ability to maintain temperature and fuel pressure through time, fittings, connections, and fuel leaks.

- vi. Placement of the bus into revenue service, among others, shall be one of the key elements that shall be used for this evaluation/testing. The Authority, at its own discretion, reserves the right to extend the evaluation/testing timeline, or modify it to include other elements and/or tasks as part of this assessment. The bus manufacturer, during this period, shall demonstrate the Maintainability Requirements.
- vii. In the event that a noncompliance is identified, the Authority shall to the extent practicable notify the Contractor of said noncompliance no later than seven (7) days after the end of the four (4) week testing period. The Authority 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 buses.
- viii. Upon approval of the FA, the Contractor shall be given written NTP with the production run / production buses.

B. Production Buses

- i. Production buses shall all be delivered to the Authority, in a fully-functional state of completion, ready to be deployed in revenue service, having all systems and components in operation, **no later than thirty-two (32) weeks after receiving the “notice to proceed with the production run” (Second NTP).**
 - ii. Manufacturing Location(s) – Contractor to indicate all intended location(s) where the vehicles will be manufactured, assembled, integrated, etc., including the address, city and state of each location.
 - iii. The Authority intends to secure contracted inspection services to provide the in-plant manufacturing inspection services for these vehicles. As such, the Contractor shall assume the financial responsibility for compensating the Authority's contracted inspection services resulting for any delays or deviations, from the proposed, or agreed upon manufacturing and production schedule and working weekends.
6. Altoona test report for the proposed vehicle shall be provided as a part of this bid.
 7. Buses will be delivered with decals and City of Irvine i-Shuttle identity package.
 8. The entrance step height shall not be more than 10.75-inches, as measured from ground level, and each (if any) interior step-riser shall be no higher than 8-inches.
 9. Contractor must provide detailed warranty table, with bid submittal, to include all pertinent items; e.g., OE warranty, complete bus, powertrain, HVAC, alternators, suspension, rust, destination sign, fire suppression and methane detection, provisions for *Conduent* radio communication including all cabling and components,

ADA equipment, flooring, mirrors, roof hatch, seating, door system, body structure and others as applicable.

10. Detailed, scaled drawings with dimensions, including all views (front, rear, top and both sides), in electronic AutoCAD and Adobe Illustrator format are to be provided with the Contractor's response. These files will be used by the Authority's Marketing Department to evaluate and design the exterior i-Shuttle identity package applicable to the exterior of the bus.
11. RADIO/COMMUNICATION, INTELLIGENT TRANSIT MANAGEMENT SYSTEM (ITMS), VOICE ANNOUNCEMENT, PASSENGER COUNTER EQUIPMENT
 - a. Contractor/bus manufacturer shall be responsible for delivering a bus equipped with all components necessary for a fully functional ITMS radio system, automatic vehicle location, automatic voice announcement, passenger counters, antennas, cables, etc., with the exception of three items that the Authority shall reuse from the buses intended for replacement:
 - i. IVU
 - ii. OrbStar
 - iii. Harris radio
 - b. All other items required for a fully functional Radio/ITMS/Voice/Passenger Counter/ AVL, etc., radio communication equipment shall be provided as manufactured or supplied by *Conduent* (formerly *Xerox*) and this equipment shall be compatible with the Authority's existing communication system. Hardware location shall be determined at the pre-production meeting and may require refinement during the evaluation of the prototype bus. The radio handset shall be located within reach of the coach operator and not interfere with the operator's feet or walk way (for safety reasons) with proper length of the cord.
 - c. Contractor/bus manufacturer shall be responsible for contacting *Conduent* to secure an accurate and updated part list to match the Authority's configuration and the manufacturer's bus' platform/model.
 - d. The following list of *Conduent*/ITMS Radio/Voice/Passenger Counter and other items provided for the most recent Authority bus delivery is provided only as a reference.
 - e. Passenger Counter
Automatic Passenger Counter (APC) with Infrared Motion Analyzer (IRMA)
4th Generation IRMA 3D; IRMA-S-3D, Sensor type IRMA-DIST4.08
 - f. Contractor/bus manufacturer shall be responsible for delivering to Authority a complete document in electronic PDF, AutoCAD and Adobe Illustrator formats, including but not limited to, the drawing of bus equipment with all components for a fully functional ITMS radio system, automatic vehicle location, automatic voice announcement, passenger counters, antennas, cables, etc.

Conduent/Xerox #	Description
110447-1	ASSEMBLY; RADIO EQUIP TRAY;
120004-5	HANDSET, AVL MOBILE EQUIPMENT
120029-1	SIGN, LED, NEXT STOP, 1 LINE, RED
120039-2	PA AMPLIFIER, 30 SEC TIMEOUT
120041-1	AGC MICROPHONE
120076-2	ANTENNA, GPS, GARMIN 16X
120094-1	TRUION KNOB, ORBSTAR
130615-1	BRACKET, ORBSTAR, ANGLED
130682-1	PA AMP MOUNTING PLATE
130894-1	PLATE, MOUNTING, NEXT STOP SIGN
131205-2	BRACKET, ORBSTAR, STRAIGHT
140397-84	CABLE ASSY, IVU to Destination Sign
140568-60	CABLE ASSY, IVU to PA AMP, W02
140578-240	CABLE ASSY, HANDSET, W09
140583-360	CABLE ASSY, WHEELCHAIR INTERFACE, W10B
140597-72	CABLE, POWER, PA AMP
140598-120	CABLE, POWER, +12 VOLTS
140599-120	CABLE, POWER, IGN
140611-120	CABLE, POWER, GND
140633-240	CABLE ASSY, DRIVER'S MIC INTERFACE, PANEL MOUNT
140809-264	CABLE ASSY, EA ALARM CABLE, W10C
141071-240	CABLE ASSY, IVU-3100 TO ORBSTAR 2, W01 HELIX
141092-120	CABLE ASSY, RADIO TRAY TO GPS ANTENNA, W11 HELIX
141093-240	CABLE ASSY, WLAN ANTENNA W/SMA, W21 HELIX
141111-36	CABLE ASSY, ETHERNET CROSSOVER
141244-60	CABLE ASSY, PA AMP TO SPEAKERS
141253-120	CABLE ASSY, PA Amp Interface to AGC Mic, W10A (NON-PVC)
141267-60	CABLE ASSY, IVU to NEXT STOP SIGN
141369-144	CABLE ASSY, ANTENNA, RADIO, W20 (TNC M TO MINI-UHF MALE)
A4F	CONNECTOR, INLINE, XLR, 4 POSITION, FEMALE
MODEL 596LB	MICROPHONE, HANDHELD, DYNAMIC
SMW-305-3B3C00	ANTENNA, COMBINED, RADIO AND WLAN
131555-1	GROUND PLANE, RADIO
TMS-005995	COUPLER, INLINE, ETHERNET, CROSSOVER
110231-DF1BBDXB	IVU-3100 Not Needed
110385-4	ORBSTAR Not Needed
TMS-004496	HARRIS RADIO Not Needed

12. Conduent - Contact Information

Michael Min
Manager, Operations, Maintenance and Warranty
Information Technology Solutions
Public Sector
7160 Riverwood Drive
Columbia, Maryland 21046
Office (443) 259-7161
Fax (443) 259-7205
michael.min@conduent.com

Additionally, Contractor shall provide separate pricing for the IVU-4000(*).

(*) The Authority is currently evaluating needed upgrades in the existing radio/voice/communication system and the IVU-4000 may be needed for that.

13. MOBILE ROUTER

- a. Contractor shall provide and install a Cradlepoint, or approved equal, router, model number IBR1700 plus five (5) year Advance licensing and a Cradlepoint, or approved equal, 7-in-1 antenna compatible with router model number IBR1700 for each bus. The router shall be mounted within the electronics cabinet using 3.5" of 1" wide 3M Dual Lock SJ3560 applied according to the manufacturer's directions along the mounting holes edge of each side of the mobile router. The antenna shall be mounted at a location approved by Authority's project manager. Power, ground, and ignition signal shall be sourced from the same points as the 12 Volts of the ITMS radio power source.
- b. In addition, each mobile router shall be pre-paid and added to Authority's Cradlepoint ECM Prime account and Authority's CradleCare account for a period of five years. Cradlepoint ECM shall be at Prime service level and CradleCare shall be at full service level to include:
 - i. Twenty-four (24) hours per day, seven (7) days per week qualified phone support and twelve (12) hours per day, five (5) days per week portal/chat support for Cradlepoint routers, NCM and NetCloud Gateway
 - ii. Next business day replacement
 - iii. Service level targets
 - iv. Knowledge Base access
 - v. NetCloud OS upgrades
 - vi. Extended router warranty for term of CradleCare license
- c. **Cloud Services** – Cloud Services for management of the mobile routers for a period of five (5) years shall be provided. At minimum, the cloud services shall meet the following features, functionality, and specifications:
 - i. Open API such that third-party applications can interphase with the cloud service to provide added value functionality.
 - ii. Manage user access at multiple levels.

- iii. Single point management of all mobile routers in Authority's fleet
 - iv. Fleet configurations that provide the ability to set-up and save a single router, then copy that configuration to another router, group, or fleet.
 - v. Group configurations that provide the ability to designate groups of routers with individual configurations to be managed together.
 - vi. Remote firmware management that provides the ability to download and apply firmware to a single router, group, or fleet.
 - vii. GPS based location services.
 - viii. Command line interface to individual routers in real-time.
 - ix. Historical storage of data for a minimum of ninety (90) days.
- d. **Alert System** – Provides the ability for the router to alert the system administrator of critical issues with the router. The system shall be capable of alerting via the cloud interface, through SNMP trapping, and email. Alerts shall be configurable for the following:
- i. Down time
 - ii. Security
 - iii. Data usage
 - iv. Hardware failure
 - v. Geo-fencing
- e. **Support** – Technical support for the mobile routers for a period of five (5) years shall be provided. At minimum technical support shall meet the following features, functionality and specifications:
- i. Unlimited twenty-four (24) hours per day, seven days per week phone support
 - ii. Carrier specific support
 - iii. Dedicated assigned technical engineer
 - iv. Complete access to technical training on the router, networking and cloud services
 - v. Unlimited access to firmware, software, feature upgrades, and patches
 - vi. Priority consideration for advanced access to features and beta testing

14. DESTINATION SIGNS

- a. The sign system shall be Luminator, Hanover, I/O Controls, or approved equal, 100% LED matrix configuration of 16 x 160, or approved equal, consisting of a front, side, rear, interior, run number sign, route/run number display and Operator Display Keyboard (ODK) to include the following signs:
- i. Front, 16 x 160
 - ii. Side, 8 x 96
 - iii. Rear 16 x 48
 - iv. Interior 144 x 19 (one & two row sign)

- b. Interior and route/run number display 12 rows x 40 columns or as large as practical dependent upon the bus' physical constraints. Sign system control shall be capable of accepting logon and route entry via interface to *Conduent* Communication interface and manual entries. The destination sign compartments shall be designed to meet the following minimum requirements:
 - i. Prevent condensation and entry of moisture and dirt. Prevent fogging of both compartment window and glazing on unit itself.
 - ii. Access shall be provided to allow cleaning of inside compartment window and unit glazing.

15. FLUID MANAGEMENT SYSTEM

- a. The bus shall be equipped with a Fleet Watch combination bus mileage/fluid management system transponder that shall be installed and programmed with the OCTA vehicle's ID number and odometer mileage. The system shall be capable of communication at the fuel island, or other location to be determined. Use of this device will not impact, or be impacted by other devices operating in the vehicle, or vehicles, on a CAN-bus network and/or platform.
- b. The Authority shall approve the location of the Fleetwatch datalogger/module/device during the presentation/evaluation of the first article bus. Contractor must contact Fleetwatch to obtain the latest transponder/interface required for the Authority's existing configuration.
- c. S&A Systems Inc., Rockwell, Texas, phone (972) 722-1009.
- d. As a reference, **see Attachment A labeled "Fleetwatch Technical"**.

16. FARE BOX MOUNT/PLATFORM

- a. Contractor shall be responsible for providing a GFI Odyssey Farebox mount platform with a 24V (power and ground) and 1708 CAN connection to the IVU. If the driver's platform is higher than 12-inches, the GFI Odyssey Farebox shall be mounted on a platform of suitable height to provide accessibility (foothold section/area) for the operator without compromising a passenger's access. The platform shall be sufficiently rigid to prevent swaying, bouncing and movement of the Farebox. Contractor shall obtain, in writing, the Authority's approval for the design, securing, materials used, and location of this platform. The Farebox's horizontal platform shall be covered with Line-X, or approved equal, safety yellow anti-skid material.

17. INSTRUMENT AND REAR DOOR CAMERA – DUAL DISPLAY

- a. A liquid crystal, waterproof, 7-inch LCD color monitor with digital panel, or equivalent that shall provide display of rear door viewing camera.

- b. Contractor/bus manufacturer shall be responsible for providing a rear-door viewing camera, Apollo camera RR-CTMIRA, and monitor, Rear View Safety-7709900, with an impact rating of 5G or greater, 7-inch x 5-inch x 1-inch LCD color monitor located on the driver's vicinity intended to monitor the passenger traffic at the rear door of the bus. The LCD color monitor shall be equipped with features that automatically adjust intensity and contrast to provide clear views under all ambient light conditions. Additional operating, display and functionality features shall be discussed at the pre-production meeting and during the first article's evaluation.

18. FIRE SUPPRESSION AND METHANE DETECTION SYSTEMS

- a. A Kidde, or approved equal, fire detection/suppression system shall be provided, to include, 12 channel CAN bus control module, UPS (48-hour minimum stand-alone back-up), minimum of three (3) optical detectors, minimum 22-pound purple K agent, discharge nozzles and required harnesses, brackets, etc. The subject supplier shall also be responsible for providing installation guidelines, certification and approval by a professional registered fire protection engineer and approval of final installation/operation by Kidde. The control module shall be capable of recording events (time stamp log), individual sensor ID and provide a standard data communication port to facilitate the computer interface for diagnostics, data retrieval and others not broadcasted via the system's interface. The fire detection system may also include a local means of thermal detection via Armored Linear Thermal Device (LTD), Armadillo type, in addition to the optic sensors.
- b. The LTD also will be attached, or embedded into the cabling for the major sources of electrical ignition; e.g., generator cables, battery cables, all electrical cooling systems, HVAC, etc. The LTD element shall be routed and secured following the manufacture's guidelines and Authority standards. The fire suppressing agent's delivery lines/plumbing, starting at the fire extinguisher container and ending at the discharge nozzles, shall all be made of stainless steel and shall be properly secured using split-blocks.
- c. The following components, at a minimum, shall be part of the Kidde, or approved equal, fire monitoring and suppression system:
 - i. Driver's display and Control Panel with 12-channel datalogging including a USB port intended for data/fault retrieval and diagnostic capabilities
 - ii. LTD, armadillo, Linear Thermal sensing element
 - iii. Module for Thermal sensing element
 - iv. Installation kit for LTD
 - v. Twenty-two (22) pound extinguisher bottle with pressure sensing device
 - vi. Distribution manifolds
 - vii. Nozzles
 - viii. PM-3M Optical Sensors
 - ix. Stainless steel plumbing

19. FIRE SUPPRESSION AND METHANE DETECTION SYSTEMS CERTIFICATION

- a. The subject supplier shall also be responsible for providing installation guidelines and certification and approval by a professional registered fire protection engineer and approval of final installation/operation of the Fire Suppression and Methane Detection Systems. Certification must be provided at the time of first article/pilot bus' delivery to the Authority.

20. REMOTE WARNING DEVICE FOR PRESENCE OF METHANE

- a. The system shall incorporate a device, e.g., light, buzzer, blinker, etc., properly labeled, mounted on the outside of the bus and connected to the existing on-board methane detection system, intended to provide a visible and audible warning to the driver that the system is/was in any stage of methane alarm level/mode (20% LEL, 50% LEL, etc.) while the bus was left unattended. This device shall be intrinsically safe and it shall not worsen any ongoing condition/stage during its operation. The system/device shall operate in a "latching configuration" and it shall only be resettable by maintenance personnel. Additional details shall be provided during the pre-production meetings and during the first article's evaluation.

21. FIRE SUPPRESSION & METHANE DETECTION THEORY OF OPERATION

- a. Methane detection will be reported at 20% lower explosive limit (LEL) and at 50% LEL.
- b. At 20% LEL, trace level will be displayed with an audible intermittent alarm in a "non-latching" configuration, auto-reset, no output for radio system.
- c. At 50% LEL, significant level will be displayed with a constant non-resettable audible alarm and output to the radio system via ground or 12/24 volt.
- d. Fire detection will provide an audible, non-resettable (*) alarm, capable of being overridden by the driver thus allowing the bus to be driven to a most convenient place/location. The detection of the presence of fire will require to have the major sources of electrical energy to be disconnected; e.g., all electrical cooling fans, HVAC, field voltage to the alternator, 12/24volt battery isolation as close as practical to the batteries via non-automatic resettable (*) relays. And others similar in nature.
- e. *(*) Intended to prevent unintentional re-ignition of fires; reset switches need to be located in places only accessible to maintenance personnel.*
- f. Additional details will be discussed at the pre-production meeting.

22. ADA LOADING SYSTEM

- a. The controls for the loading system shall be located near the door in which the system is located. The key "on" switch, using key UCP #205164, shall be located at the driver's console/dashboard panel. The ramp and kneeling controls shall also be incorporated in a secondary key-locked metal enclosure using key UCP #205164 located by the door, as to not obstruct passage through the doorway or aisle. The location and shape of the enclosure shall be discussed at the pre-production meeting and will be subject to the Authority's approval at that time.
- b. Antiskid Line-X, or approved equal, flooring material, subject to the Authority's approval, is required at all wheelchair locations.

23. INSIDE INTERMEDIATE PLATFORM

- a. If the bus is of a bi-level floor design, an intermediate platform shall be provided along the center aisle of the bus to facilitate passenger traffic between the upper and lower floor levels. This intermediate platform shall be cut into the rear platform and shall be approximately the aisle width, 12.5 to 34-inches deep and approximately one-half the height of the upper level relative to the lower level. The horizontal surface of this platform shall be covered with yellow Hypalon ribbed rubber or Line-X, or approved equal, skid-resistant material and shall be sloped slightly for drainage. Multiple warning decals or signs shall be provided at the immediate platform area, including stanchion poles to alert passengers to the change in floor level.

24. FIRE EXTINGUISHERS—SAFETY TRIANGLES

- a. A general-purpose five (5)-pound ABC extinguisher and mounting bracket shall be provided. The fire extinguisher and safety triangles shall be securely mounted on a storage box located on top of the curb-side wheel well equipped with dual latches and properly labeled indicating the interior contents. Additional details will be discussed during the evaluation of the first article bus.

25. JUMP STARTER

- a. A remote jump starter system shall be provided via Anderson Booster connector or approved equal. Location of the connecting interface shall be discussed during the pre-production meeting and presentation of the first article bus.

26. ADJUSTABLE THROTTLE AND BRAKE PEDALS

- a. The bus shall be equipped with Teleflex/Kongsberg, or approved equal, adjustable foot controls including brake and throttle pedals.

27. ACCELERATOR PEDAL ANGLE

- a. The angle of the accelerator pedal shall be determined from a horizontal plane regardless of the slope of the cab floor. The accelerator pedal shall be positioned at an angle of 27-35 degrees at the point of initiation of contact and extend downward to an angle of 10-18 degrees at full throttle. The Authority's Health, Safety & Environmental Compliance Department shall approve the accelerator pedal angle, actuation and recovery force as well as location.

28. ACCELERATOR PEDAL DIMENSIONS

- a. The floor mounted accelerator pedal shall be ten (10) inches – twelve (12) inches long and three inches – four inches wide.

29. BRAKE FORCE

- a. The force to depress the brake pedal shall be measured at the midpoint of the brake pedal. The brake pedal force shall be no less than ten (10) foot pounds and no more than fifty (50) foot pounds.

30. ELECTRICAL SYSTEM/ BATTERY MANAGEMENT

- a. Contractor/bus manufacturer shall be responsible for providing a single or a combination of components/systems, e.g. battery, battery plus ultra-capacitor or other, capable of providing enough energy to sustain the operation of all sensitive and bus safety related components. The safety and sensitive bus components are: radio system, fire detection/suppression, methane detection, on board video surveillance and others to be discussed during the pre-production meetings
- b. The basic bus electrical platform will be predominantly 24/12 vdc, utilizing a Vanner equalizer, or approved equal, for the 12 vdc power requirements. Electrical power shall be provided to all emergency sensitive systems and components, and the engine starting system for a period of 48 hours when the ignition is placed in the off position.

31. OPERATOR'S SEAT

- a. Contractor shall provide and install the USSC Q90 seat or approved equal. The seat shall accommodate operators from the fifth percentile female to 95th percentile male, and include the following items:
 - i. PNEUMATIC FULL STROKE SUSPENSION: Eliminates torque during suspension movement and provides five (5) inches of vertical height adjustment.
 - ii. QUICK DUMP: Air valve shall incorporate quick dump feature for easy entry and egress. Air valve will have roll pin stop, not snap ring. Air valve will be

mounted on the left-hand side of the seat cushion, close to the front of the seat.

- iii. **BILATERAL DAMPERS:** Suspension system shall be damped by two (2) shock absorbers to eliminate torque in the suspension system. Dampers to attach to the scissors system.
- iv. **SECONDARY ANTI-BOTTOM-OUT SYSTEM:** Two (2) half-circle rubber bumpers that prevent the suspension from bottoming out shall prevent Spine shock.
- v. **THREE (3) POSITION SUSPENSION LOCKOUT:** Seat shall be provided with a three (3) position suspension lockout located on the left rear side of the seat frame. The outward position allows full suspension travel; the middle position limits suspension range; the inside position locks out the suspension completely for use during maintenance and for shipping purposes.
- vi. **PROTECTIVE BELLOWS:** Seat shall be provided with protective bellows that prevent dust and debris from fouling the suspension system and keep fingers and other body parts clear of the scissors system.
- vii. **PROTECTIVE BELLOWS:** Seat shall be provided with a heavy-duty protective back-shell
- viii. **PENDULUM SCISSORS SYSTEM:** Scissors are to be solid bar stock with outside scissors 12.5-inch width.
- ix. **SEAT PAN:** Suspension shall incorporate a secondary leaf spring suspension that facilitates keeping the spine straight up and down.
- x. **AIR SLIDE RELEASE:** Seat shall be equipped with air activated fore and aft slide release, (United States Patent No. 5,613,733); air pressure shall be required to release the fore/aft slides from the locked position. Design shall ensure that seat remains locked in position should there be loss of air pressure. There shall be a manual override.
- xi. **BILATERAL ADJUSTMENTS:** All seat adjustments shall activate both sides of the seat to prevent torque and increase durability.
- xii. **BACK RECLINE:** Recline system shall engage on both sides of the backrest. Operators shall be able to adjust the backrest recline from knobs on either side of the back. Recline shall be adjustable from 45 to 105 degrees.
- xiii. **SEAT TILT:** Two (2) knobs shall manually operate eight (8) degrees of stepless seat tilt, one on either side of the seat. Seat tilt knob on one side is unacceptable. Seat tilt shall operate independently of the seat height

adjustment, allowing full tilt at all heights. Bilateral tilt is necessary to eliminate torque in the suspension system.

- xiv. **FORE/AFT ADJUSTMENT:** The entire seat shall adjust fore/aft a minimum of 11.8-inches. Slides shall be double locking, roller bearing design. Slides shall be located below the suspension.
- xv. **LUMBAR SUPPORT:** Three (3) air bladders shall be located in the lumbar region of the back frame. Independent switches located on the right front side of seat frame shall activate lumbar bags. Lumbar systems shall operate off the vehicle air pressure, without pumps or motors.
- xvi. **SECUREMENT OF UPHOLSTERY TO FOAM:** Foam shall have Velcro molded into the foam. Velcro shall be used to secure the upholstery material in place allowing quick, easy reupholstering of the operator's seat without having to remove it from the vehicle. Foam shall be self-skinning polyurethane.
- xvii. **SOLID STEEL BACK:** Seat shall be equipped with solid steel back that prevents break-through.
- xviii. **INTEGRATED LAP BELT:** Seat shall be provided with Automatic Locking Retractor (ALR) 2-point lap belt. Seat shall have integral tether straps that allow seat to meet Federal Motor Vehicle Safety Standards (FMVSS) 207/210-pull test. Seat systems shall allow operator to move seat front to back without having to loosen lap belts. Seat belt shall be adjustable to fit up to 54-inch in length.
- xix. **RISER:** Seat shall be provided with an appropriate mild steel heavy-duty riser. Height shall be determined during the first article evaluation.
- xx. **SEAT CUSHION:** Air circulation/venting provisions with minimum 19-inch width; minimum 18.5-inch length; 16-21-inches from uncompressed seat cushion to the floor.
- xxi. **UPHOLSTERY:** Seat shall be upholstered with Holdsworth DEFENDER, or approved equal, A72OCW fabric inserts with vinyl boxing. Fabric color to be selected from options provided by the manufacturer.
- xxii. **WIDE BACKREST:** Air circulation/venting provisions with width adjustable from 19-21-inches; 23-inches from uncompressed seat cushion to top of backrest.
- xxiii. **Four (4) way adjustable head rest**

32. BIKE RACK

- a. The bus shall have a front bumper mounted, three (3)-position bike rack, as manufactured by Byk-Rak or approved equal. The bike rack shall be made of stainless steel, powder coated flat black and include a solid-state proximity-sensing device. The sensing device shall be incorporated into the operator's indicator panel, alerting the operator of bike rack position when not in its fully stowed position. In addition, a convex mirror mounted around the driver's workstation shall be used for viewing of deployed bike-rack. From its deployed position, it will take less than 20 pounds of lifting effort to be stowed in the vertical position.

33. DOOR ACTUATORS – ELECTRICAL

- a. The bus shall be equipped with a single electric 24 VDC nominal Vapor, or approved equal, electric door operator/actuator incorporating a non-back drivable feature which shall hold the doors in the closed position without the need or application of electrical power. Front door will be automatically unlocked when the ignition is in the off position and the driver's air-dump valve is activated.

34. PASSENGER CONTACT – LESS ACOUSTIC SENSOR SYSTEM

- a. Each bus shall be equipped with a rear-door mounted contact-less acoustic sensor system (CLASS) as manufactured by Vapor or approved equal. The CLASS system shall be designed to allow passengers to initiate the opening of the doors and exit the vehicle and detect the presence of passenger(s) in the defined zones of detection. The rear door shall be equipped with waterproof or weatherproof touch-tape switches and an "on/off" CLASS-system-switch located in the driver's overhead compartment. That switch shall be labeled and, when in the "off" position, the rear door system shall maintain full door operational functionality (tape switches, sensitive edges, driver's door control, etc.)

35. EXTERIOR REMOTE DOOR SWITCH

- a. An exterior door switch shall be provided at a location discussed and defined during the pre-production meeting and the manufacturing, and presentation of the first article to the Authority, to open and close the door when entering or leaving the bus. Switch shall be operational when the rotary/ignition-switch is in the "on" and in "night park" positions.

36. BUS PERFORMANCE

a. POWER REQUIREMENTS

- i. Propulsion system and drive train shall provide power to enable the bus to meet the defined acceleration, top speed, and gradability requirements, and

operate all propulsion-driven accessories. Power requirements are based on heavy-duty natural gas (HHDG) engines certified by the California Air Resources Board (CARB) for use in California using actual road test results, computerized performance data or engine dynamometer. The engine shall be CARB certified based on the year of the bus' manufacturing.

37. TOP SPEED

- a. The bus shall be capable of being at a top speed of 65 miles per hour (mph) on a straight, level road at GVWR with all accessories operating.

38. GRADABILITY

- a. Gradability requirements shall be met on grades with a dry commercial asphalt or concrete pavement at GVWR with all accessories operating. The propulsion system and drive train shall enable the bus to achieve and maintain a speed of 40 mph on a 2½ percent ascending grade and 7 mph on a 16 percent ascending grade.

39. ACCELERATION

- a. *The acceleration shall meet the requirements below and shall be sufficiently gradual and smooth to prevent throwing standing passengers off-balance. Acceleration measurement shall commence when the accelerator is depressed – (Idle Start)*

MAXIMUM IDLE START ACCELERATION TIMES ON A LEVEL SURFACE
(Vehicle Weight = GVWR)

SPEED (MPH)	TIME (SEC)
10	5.0
20	10.0
30	18.0
40	30.0
50	60.0
65 (*)	Bus Manufacturer to enter time

(*) Bus, based on available fuel, needs to be capable of sustaining 65 mph, for an unlimited amount of time.

40. OPERATING RANGE

- a. The operating range of the bus when run/operated on the transit bus duty cycle shall be at least 320 miles.

41. VEHICLE HANDLING AND STEERING INPUT

- a. The bus must be capable of maintaining a straight line while driven, having minimum driver's input to accomplish this (*) and, be capable of having an operating range, when run/operated on any of the Authority's transit bus duty cycle, of at least 320 miles.

(*) Evaluation of vehicle handling will be a critical parameter as well as, vehicle exhibited behavior during driving at all conditions will be used by the Authority, and its Contractors to determine first article's and production bus' acceptance. Authority's decision shall be final and non-appealable.

42. TRAINING TOPICS, CLASSES

- a. The following topics are minimum requirements. Quantity of classes and training hours per class are indicated within parenthesis. Adjustments to the topics and/or hours may be made upon approval of the Authority.
 - i. Overall Vehicle/System Orientation – Two (2) sessions, four (4) hours each
 - ii. Preventive Maintenance – Two (2) sessions, four (4) hours each
 - iii. Electrical/Electronic – Two (2) sessions, four (4) hours each
 - iv. Multiplex – Two (2) sessions, four (4) hours each
 - v. HVAC – Two (2) sessions, two (2) hours each
 - vi. Brakes – Two (2) sessions, two (2) hours each
 - vii. Engine – Two (2) sessions, four (4) hours each
 - viii. CNG Fuel System – Two (2) sessions, two (2) hours each
 - ix. Methane Detection and Fire Suppression Systems – Two (2) sessions, two (2) hours each

43. MANUALS

- a. Three (3) complete sets of repair, troubleshooting and service manuals must be provided with the order. Manuals shall include and cover all systems and components installed and in operation in the bus, to include among others, Parts, Service, Engine, Engine Maintenance, Engine Repair, Transmission, Electrical, I/O Controls, Destination Signs, Passenger Counters, etc.
- b. One (1) complete set of DRAFT manuals shall be provided at the time of first article delivery to Authority.

44. AUTHORITY'S QUALITY CONTROL & QUALITY ASSURANCE

- a. Authority's Quality Control and Quality Assurance provisions shall be performed by Authority's personnel and/or In Plant Contracted Inspection Services in accordance with **EXHIBIT – B, attached to this RFQ.**

45. EXTERIOR IDENTITY PACKAGE

- a. The image shown from the City of Irvine i-Shuttle bus, is provided as a reference of Authority's expectations in regard to the required identity package for this bus order. The final package will be consistent with existing i-Shuttle buses which includes the encircled i-logo, green, gray and blue base colors, dotted accents, safety CNG markings visible from every approach angle, bus identity (ID) numbers (side, front, rear and large ID, 22-inch numbers at roof) and decal indicating "Operated By...California Carrier Number 43438(*)," among others. The exact size, quantity and location of decals are subject to review/final acceptance by the Authority and will be communicated with the Contractor between time of award and pre-production meeting.

(*) – California Carrier Number subject to change due to Authority's contractual timelines

- b. The target design is illustrated in Attachment B; Authority will confirm design during pilot bus production. The subject review will also include elements of subjective color coordination such as, but not limited to, exterior color approval and interior colors that have not been specifically addressed otherwise.
- c. The image in Attachment B is intended to depict the Authority's general expectations and, it is provided as a reference only. Final rendering with dimensions and others will be provided prior to, or at the pre-production meeting, upon Contractor's presentation of final bus' exterior engineering design.
- d. Contractor must provide not-to-exceed amount of the exterior identity package, on Exhibit E, Price Summary Sheet, taking into consideration the size of vehicle that Contractor is offering. When final dimensions are received from Authority, if price should be less than what was bid, Contractor must reduce the price to reflect the actual charge.

1. GENERAL BUS DATA SHEET:

LOW FLOOR ~30 TO 32-FOOT

Bus Manufacturer:

Bus Model Number:

Basic Body Construction Type:

SECTION 1: General Dimensions

Overall Length	Over bumpers	<input type="text"/>	feet	<input type="text"/>	inches
	Over body	<input type="text"/>	feet	<input type="text"/>	inches
Overall Width	Over body excluding mirrors and lights	<input type="text"/>	feet	<input type="text"/>	inches
	Over body including mirrors	<input type="text"/>	feet	<input type="text"/>	inches
	Over tires	<input type="text"/>	feet	<input type="text"/>	inches
Overall Height (Maximum)		<input type="text"/>	feet	<input type="text"/>	inches
Angle of Approach	<input type="text"/>	degrees			
Angle of Departure	<input type="text"/>	degrees			
Breakover Angle 1	<input type="text"/>	degrees			
Breakover Angle 2	<input type="text"/>	degrees			

Doorway Clear Opening (At Widest Point) inches

	Width With Grab Handles	Width Without Grab Handles	Height
Front Door	<input type="text"/> inches	<input type="text"/> inches	<input type="text"/> inches
Rear Door	<input type="text"/> inches	<input type="text"/> inches	<input type="text"/> inches

Front axle floor height above ground (centerline of bus)	<input type="text"/>	inches
Rear axle floor height above ground (centerline of bus)	<input type="text"/>	inches
Step height from ground (measured at center of doorway)	<input type="text"/>	inches

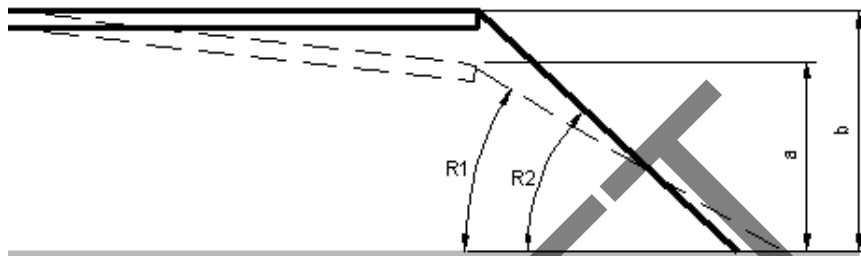
Body – Shell material (stainless steel/ composite)

Body – Sidewall Tube Material (stainless steel)

Body – Roof tube material (stainless steel)

Body – Front/Rear cap material (stainless steel/composite)

Body – CNG Tank enclosure / cage (stainless steel)



	Front Doorway	Center Doorway	Ramp Angle	Rear Doorway
Kneeled	<input type="text"/> inches (a)	<input type="text"/> inches (a)	<input type="text"/> degrees (R1)	<input type="text"/> inches (a)
Unkneeled	<input type="text"/> inches (b)	<input type="text"/> inches (b)	<input type="text"/> degrees (R2)	<input type="text"/> inches (b)

Interior Head Room (Floor to Ceiling at Center of Aisle)

First axle location	<input type="text"/> inches
Center of bus location	<input type="text"/> inches
Rear axle location	<input type="text"/> inches
Rear settee (in front of seat)	<input type="text"/> inches

Aisle Width

Minimum width on floor between first axle wheel housings	<input type="text"/> inches
Minimum width on floor between center axle (1) wheel housings	<input type="text"/> inches
Minimum width on floor between center axle (2) wheel housings	<input type="text"/> inches
Minimum width on floor between rear axle wheel housings	<input type="text"/> inches

Minimum Ground Clearance

Outside axles zones	<input type="text"/> inches
Inside axles zones	<input type="text"/> inches

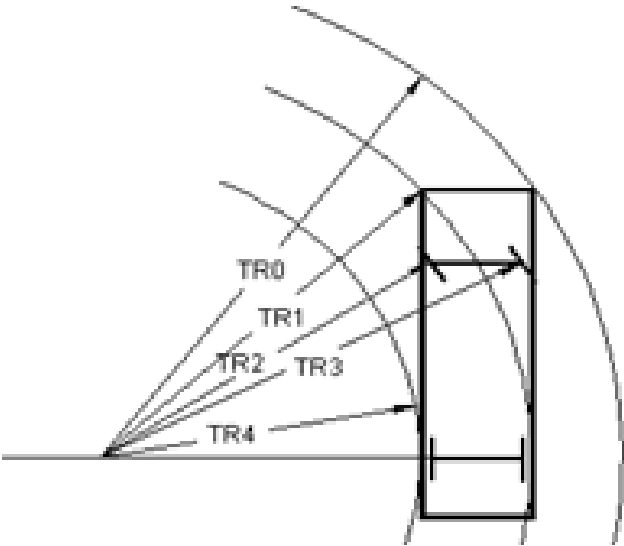
Horizontal Turning Envelope (see diagram below)

Outside body turning radius, TR0 (including bumper)

feetinches

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

feetinches



Wheel Base

First axle to rear axle

inches

Overhang, Centerline of Axle Over Bumper

Front

inches

Rear

inches

Floor

Maximum interior floor slope (from horizontal)

degrees

Capacity

Total number of passenger sittings

Passenger seating manufacturer/model number

Total number of standing passengers (1 per 1.5 sq. ft.)

Minimum hip to knee space

inches

Maximum hip to knee space

inches

Restraint system type and model number

Bus Weight

	Curb Weight		Curb Weight Plus Seated Load*		GVWR	
Front axle	<input type="text"/>	lbs.	<input type="text"/>	lbs.	<input type="text"/>	lbs.
Rear axle	<input type="text"/>	lbs.	<input type="text"/>	lbs.	<input type="text"/>	lbs.
Total	<input type="text"/>	lbs.	<input type="text"/>	lbs.	<input type="text"/>	lbs.

* Including operator and passengers at 150 lbs. per person

Vehicle Speed

0 to 10 MPH (5 sec.min)	<input type="text"/>	Secs.
0 to 20 MPH (10 sec.min)	<input type="text"/>	Secs.
0 to 30 MPH (18 sec.min)	<input type="text"/>	Secs.
0 to 40 MPH (30 sec.min)	<input type="text"/>	Secs.
0 to 50 MPH (60 sec.min)	<input type="text"/>	Secs.
0 to 65 MPH	<input type="text"/>	Secs.
Gradability @ GVWR – 2.5% grade (40 mph min.)	<input type="text"/>	
Gradability @ GVWR – 16% grade (7 mph min.)	<input type="text"/>	

SECTION 2: Steering Axles

Manufacturer	<input type="text"/>
Type and weight rating	<input type="text"/>
Model number	<input type="text"/>

SECTION 3: Drive Axle

Manufacturer	<input type="text"/>
Type and weight rating	<input type="text"/>
Model number	<input type="text"/>

Drive Axle Ratio

Differential ratio	<input type="text"/>
Hub reduction ratio (if used)	<input type="text"/>
Final axle ratio (if hub reduction is used)	<input type="text"/>

SECTION 4: Brake System

Deceleration Braking @ GVWR G-Rate
with friction brakes (0.8g minimum)

Deceleration Braking @ GVWR G-Rate
without friction brakes (0.15g nominal)

Deceleration Braking @ GVWR G-Rate
without friction brakes (0.1g
sustainable)

Make/type of fundamental system

Front axle brake chamber model

Rear axle brake chamber model

Front axle slack adjuster

Manufacturer

Model number

Rear axle slack adjuster

Manufacturer

Model number

Front axle brake drum/rotor

Manufacturer

Rear axle brake drum/rotor

Manufacturer

Air Compressor

Manufacturer

Type

Model number

Rated capacity

Capacity at idle

Maximum warranted speed

Idle speed

Drive type

Governor cut-in pressure

Governor cut-out pressure

	cfm
	cfm
	rpm
	rpm
	psi
	psi

Air Reservoir Capacity

Manufacturer

Supply reservoir number and size

Primary reservoir number and size

Secondary reservoir number and size

Parking reservoir number and size

Accessory reservoir number and size

Other reservoir number and size

	/		cubic inches total
	/		cubic inches total
	/		cubic inches total
	/		cubic inches total
	/		cubic inches total
	/		cubic inches total

SECTION 5: Cooling System

Manufacturer

Type

Model number

Number of tubes

Fins per inch

Fin thickness (inches)

Fin construction

Radiator

Charge air cooler

Total cooling system capacity (gallons)

Radiator fan manufacturer

Fan speed/control type (mech/elect/hyb)

Surge tank capacity

Surge tank material

Overheat alarm temperature

Shutdown temperature settings

	gallons
	gallons
	degrees F
	degrees F

SECTION 6: Electrical

Primary Interior Lighting System

Manufacturer

Type

Model number

Alternator

Manufacturer		
Type		
Model number		
Output at idle		amps

Voltage Regulator

Manufacturer		
Model number		
Temp. Compensation – Range - Ratings		

Voltage Equalizer

Manufacturer		
Model number		

Starter Motor

Manufacturer		
Voltage		
Model number		

Batteries –

Manufacturer		
Type		
Model number		
Cold cranking amps		

Ultra-Capacitor

Manufacturer		
Model number		

Ultra-capacitor ratings: Provide data sheet for energy efficiency, estimated calendar life, cycle life, voltage (each capacitor and each module), working and peak power, and weight

SECTION 7: Engine

Manufacturer			
Model number/version			
Horsepower/torque rating			
Engine Oil Capacity (Qts.)			

SECTION 8: Fire Suppression/Methane Detection System

Manufacturer				
Model number				
Number of detectors		fire		methane
Type of detector	<input type="checkbox"/> Thermal <input type="checkbox"/> Optical			
Battery backup	<input type="checkbox"/> Yes <input type="checkbox"/> No			

SECTION 9: Bumpers

Manufacturer			
Type			

SECTION 10: Fuel and Exhaust System

Fuel type			
Operating range and route profile			

Fuel tanks (CNG)

Manufacturer					
Capacity (total and usable)		SCF	/		SCF
Construction material/Type					
Quantity and location of tanks					
Life Expectancy (years/miles)					

SECTION 11: Air Suspension

	Front	Rear
Shock absorber manufacturer		
Shock absorber quantity per axle		

SECTION 12: Steering

Pump manufacturer		
Pump model number		
Steering gear manufacturer		
Steering gear model number		
Steering gear type		
Steering wheel diameter		inches
Maximum effort at steering wheel*		

* Unloaded stationary coach on dry asphalt pavement

SECTION 13: Transmission

Manufacturer	
Type	
Model number	
Number of forward speeds	
Cooling Type	
Retarder Capacity	
Transm. Oil Capacity (Qty.)	

SECTION 14: Drive-Shaft

Manufacturer/Model #	
----------------------	--

SECTION 15: Wheels

Manufacturer	
Type	
Size	
Mounting type	
Bolt circle diameter	
Protective coating	

Tires

Manufacturer	
Type	
Size	
Load range/air pressure	

SECTION 16: Door System

Door Panels

Front door

Rear door

Manufacturer

Type

Actuating Mechanism (Air, Electric, Spring, Other)

Manufacturer

Front door

Rear door

SECTION 17: Heating and Ventilating Equipment

Heating system capacity

Air conditioning system
capacity

Ventilating capacity

Manufacturer and model

Refrigerant type

	Btu
	Btu
	CFM per passenger

Driver's Heater

Manufacturer

Type

Model number

Capacity

SECTION 18: Passenger Loading System

Manufacturer

Type (hydraulic, electric or both)

Model number

Capacity (lbs.)

Dimensions

Width of ramp

Length of ramp

	inches
	inches

Cycle Times

Stowed to ground

Ground to stow

Normal Idle

seconds

seconds

Fast Idle

seconds

seconds

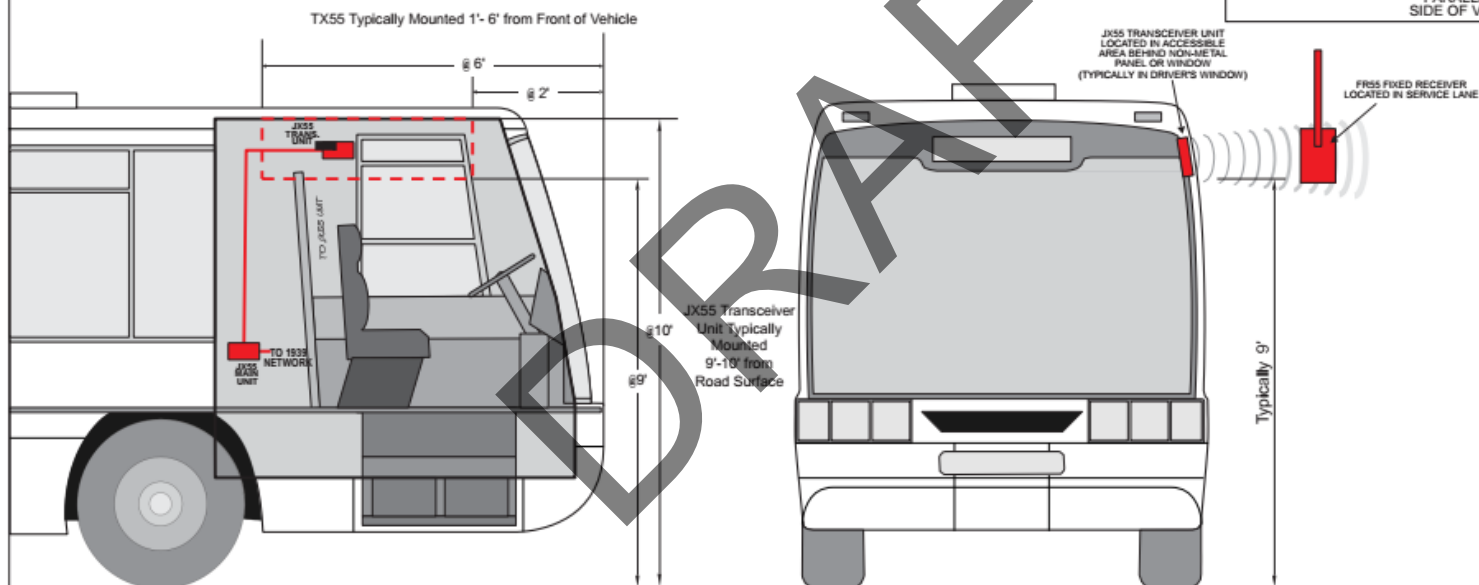
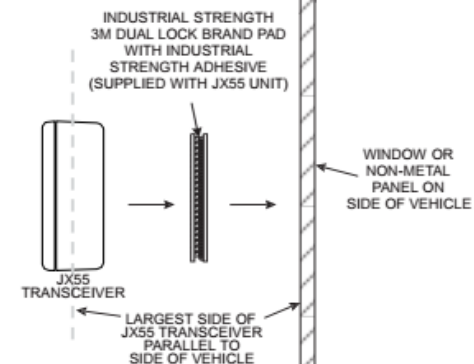
SECTION 19: Electronics

OBVSS manufacturer	Not Required
OBVSS model number	Not Required
Number of cameras	Not Required
Multiplex system manufacturer	
Multiplex system model number	
Automatic passenger counter system manufacturer	
Automatic passenger counter system model number	
Destination sign manufacturer	
Destination sign model number	
AVL/AVM system manufacturer	Not Required
AVL/AVM system model number	Not Required
Passenger information system manufacturer	
Passenger information system model number	

NOTES:

1. THE JX55 TRANSCEIVER UNIT (TX55) MAY BE MOUNTED WITH THE SUPPLIED INDUSTRIAL STRENGTH 3M DUAL LOCK PADS, OR WITH USER SUPPLIED FASTENERS IF DESIRED. FASTENERS SHOULD **NOT** PENETRATE THE JX55 TRANSCEIVER UNIT BOX OR DAMAGE TO THE INTERNAL ELECTRONICS MAY RESULT.
2. THE JX55 TRANSCEIVER UNITS SHOULD BE MOUNTED WITH THE LARGEST SIDE OF THE UNIT PARALLEL WITH THE SIDE OF THE VEHICLE.
3. THE JX55 TRANSCEIVER UNIT SHOULD **NEVER** BE MOUNTED WITH ANY METAL (OR OTHER RADIO BLOCKING MATERIAL) BETWEEN THE TRANSCEIVER UNIT AND THE OUTSIDE OF THE VEHICLE. THE TX55 TRANSCEIVER UNIT MUST BE ABLE TO TRANSMIT FROM ITS INSTALLED LOCATION THROUGH THE SIDE OF THE VEHICLE TO A WAYSIDE RECEIVER.
4. THE JX55 TRANSCEIVER UNIT SHOULD **NEVER** BE MOUNTED IN THE PASSENGER AREA. ACCEPTABLE LOCATIONS ARE ONLY IN THE OPERATOR AREA.
5. THE JX55 MAIN UNIT MAY BE MOUNTED IN ANY LOCATION THAT HAS ACCESS TO A FACTORY J1708/1939 NETWORK PLUG.

MOUNTING DETAIL



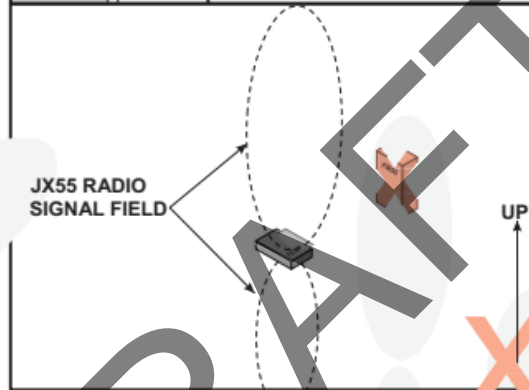
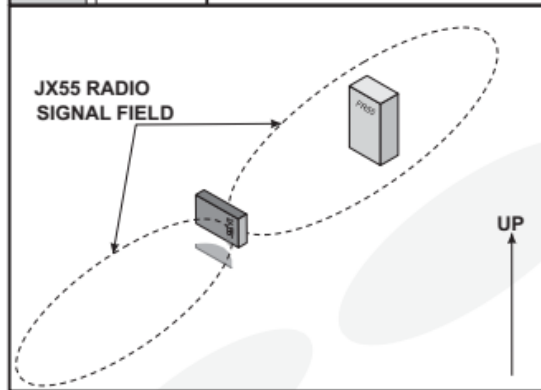
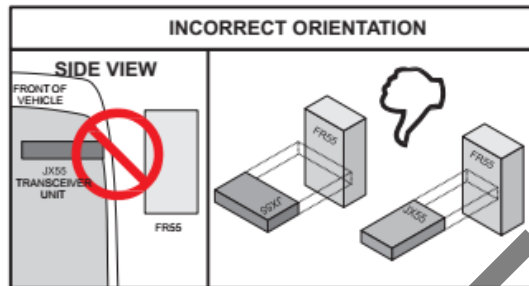
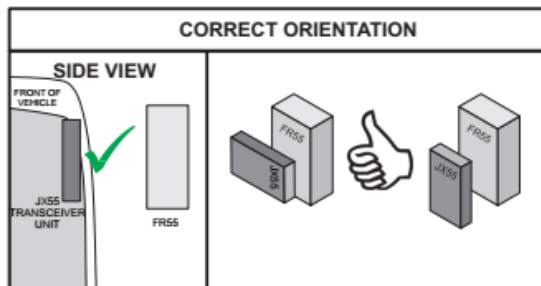
SA SYSTEMS, INC.

PO BOX 1928 ROCKWALL, TEXAS 75032-2028

**FLEETWATCH JX55
INSTALLATION DIAGRAMS**

**JX55 DUAL BOX
MOUNTING INSTRUCTIONS
& LOCATION GUIDELINES**

SCALE	DATE	DRAWN BY	APPROVED BY	ISSUE	DRAWING NUMBER
NONE	02/21/2012	MSG		1.0	JXSBOEM01

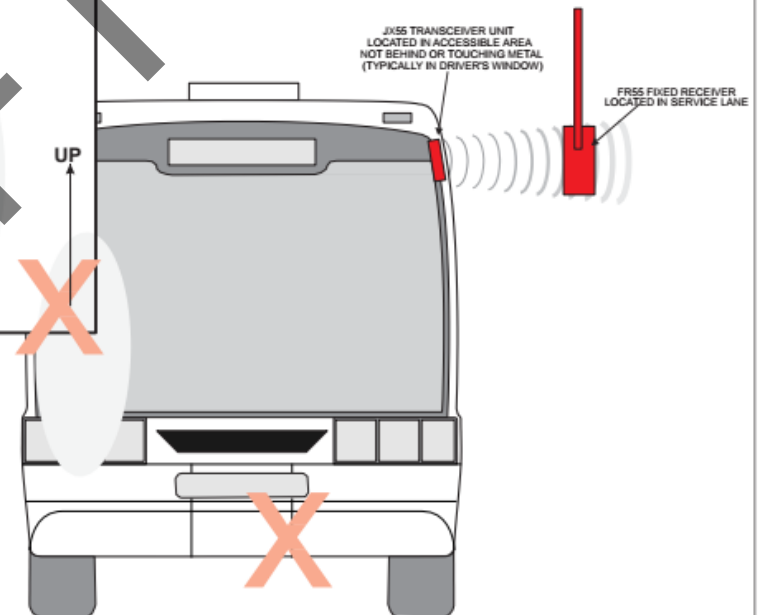


NOTE: THE JX55 TRANSMITS A RADIO SIGNAL TO COMMUNICATE WITH A RECEIVER MOUNTED IN A BUS SERVICE LANE.

THE SIGNAL IS DESIGNED TO BE STRONGEST FROM THE LARGEST SIDES OF THE JX UNIT.

THE JX55 UNITS SHOULD BE MOUNTED WITH THE LARGEST SIDE OF THE UNIT PARALLEL WITH THE SIDE OF THE VEHICLE.

SEE CORRECT ORIENTATION DIAGRAM FOR MORE INFORMATION.



SYSTEMS, INC.

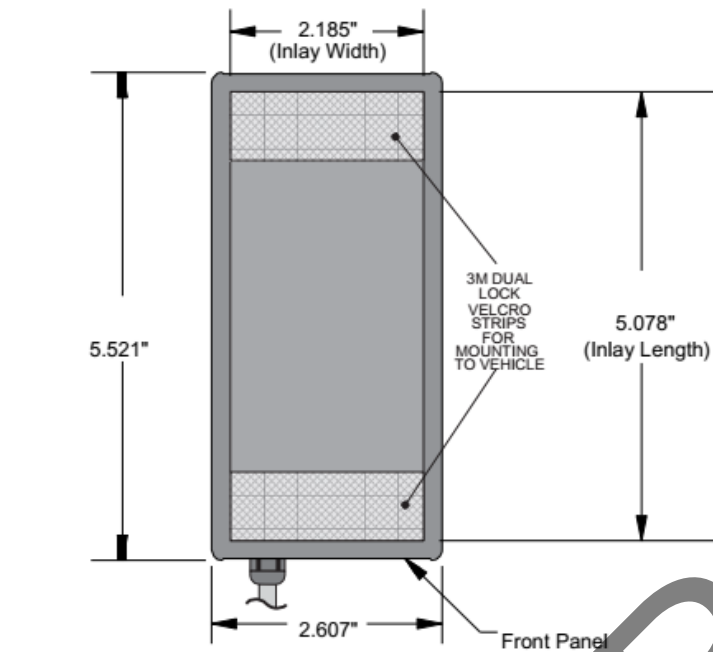
PO BOX 1928 ROCKWALL, TEXAS 75032-2028

**FLEETWATCH JX55
INSTALLATION DIAGRAMS**

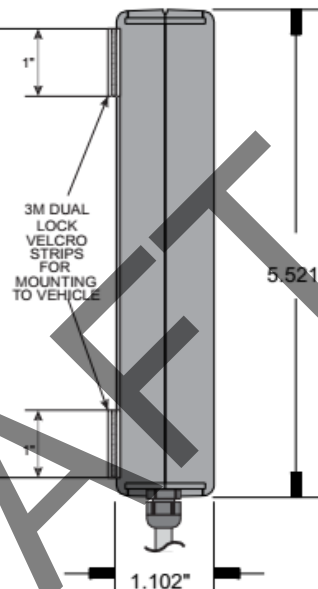
**JX55 ORIENTATION
GUIDELINES**

SCALE	DATE	DRAWN BY	APPROVED BY	ISSUE	DRAWING NUMBER
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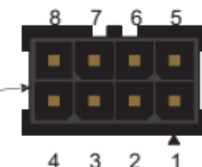
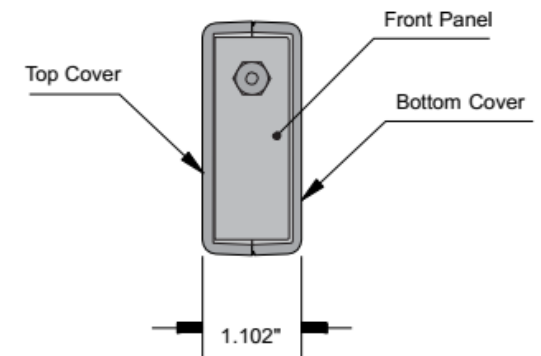
Top View of TX55 Assembly



Side View of TX55



End View of TX55



Function	Wire Color	Pin
RESET	White	1
READY	Orange	2
POWER	Brown	3
ON	Green	4
GROUND	Black	5
MOSI	Blue	6
CMD	Yellow	7
MISO	Red	8

TX55 8 Pin Serial Connector
(receptacle - to JX55 Transceiver Unit)

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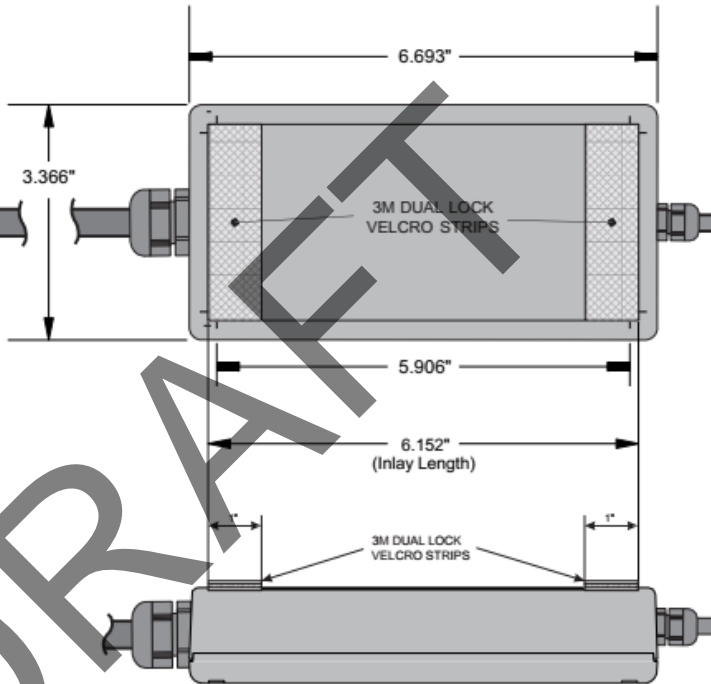
**FLEETWATCH JX55
INSTALLATION DIAGRAMS**

**JX55 TRANSCEIVER UNIT (TX55)
DIMENSIONS & CABLE PIN-OUTS
INCLUDED WITH ALL
JX55-XXXX-X-DB**

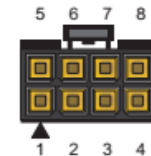
SCALE	DATE	DRAWN BY	APPROVED BY	ISSUE	DRAWING NUMBER
NONE	02/21/2012	MSG		1.0	JXSBOEM03

JX55 1939 CAN Connector
(to Vehicle 1939 CAN Network)

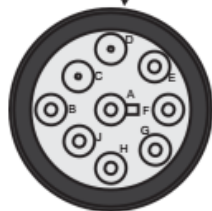
1939 Cable
Length »10"



Function	Wire Color	Pin
RESET	White	1
READY	Orange	2
POWER	Brown	3
ON	Green	4
GROUND	Black	5
MOSI	Blue	6
CMD	Yellow	7
MISO	Red	8



JX55 8 Pin Serial Connector
(plug - to TX55 Transceiver Unit)



View into 1939 CAN Connector
Deutsch Part # HD16-9-1939S (mates to
Deutsch Part# HD10-9-1939P)

Function	Wire Color	Pin
Battery (-) GND	Black (ONE)	A
Battery (+)	White (ONE)	B
CAN_H	Black (TWO)	C
CAN_L	White (TWO)	D
CAN_SHLD	Bare (silver)	E
J1708 (+) Data (A)	N/C	F
J1708 (-) Data (B)	N/C	G
Proprietary	N/C	H
Proprietary	N/C	J

Side View of JX55

End View of JX55

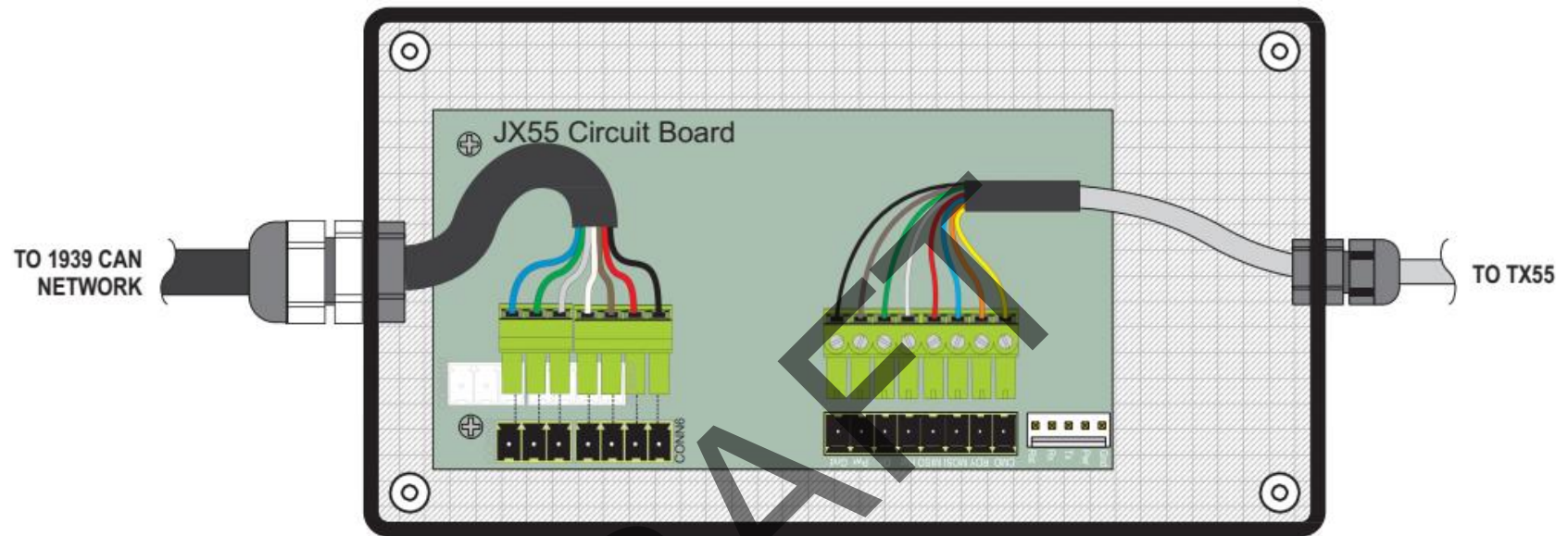
SYSTEMS, INC.

PO BOX 1928 ROCKWALL, TEXAS 75032-2028

**FLEETWATCH JX55
INSTALLATION DIAGRAMS**

**DUAL BOX JX55 DIMENSIONS
& 1939 CAN
CABLE PIN-OUTS
FLEETWATCH PN: JX-1939-DB**

SCALE	DATE	DRAWN BY	APPROVED BY	ISSUE	DRAWING NUMBER
NONE	02/21/2012	MSG		1.0	JXSBOEM04



1939 CAN Plug Wiring

Function	Wire Color	Pin	ALT A	ALT B
Battery (-) GND	Black	A	Black	Black
Battery (+)	Red	B	Red	Red
CAN_H	Green	C	Green	Green
CAN_L	Blue	D	Black	Blue
CAN_SHLD	Gray	E	Drain	Gray
J1708 (+) Data (A)	Brown	F	Black	Brown
J1708 (-) Data (B)	White	G	White	White
Proprietary	N/C	H	White	Yellow
Proprietary	N/C	J	Black	Orange

TX55 Plug Wiring

Function	Wire Color	Pin
RESET	White	1
READY	Orange	2
POWER	Brown	3
ON	Green	4
GROUND	Black	5
MOSI	Blue	6
CMD	Yellow	7
MISO	Red	8

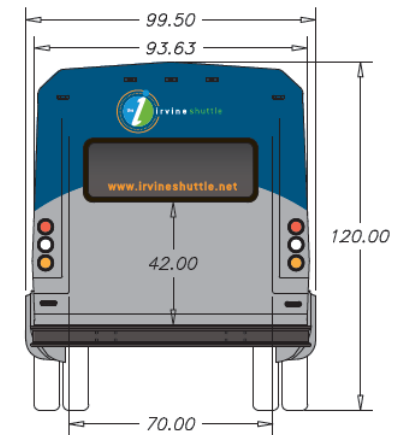
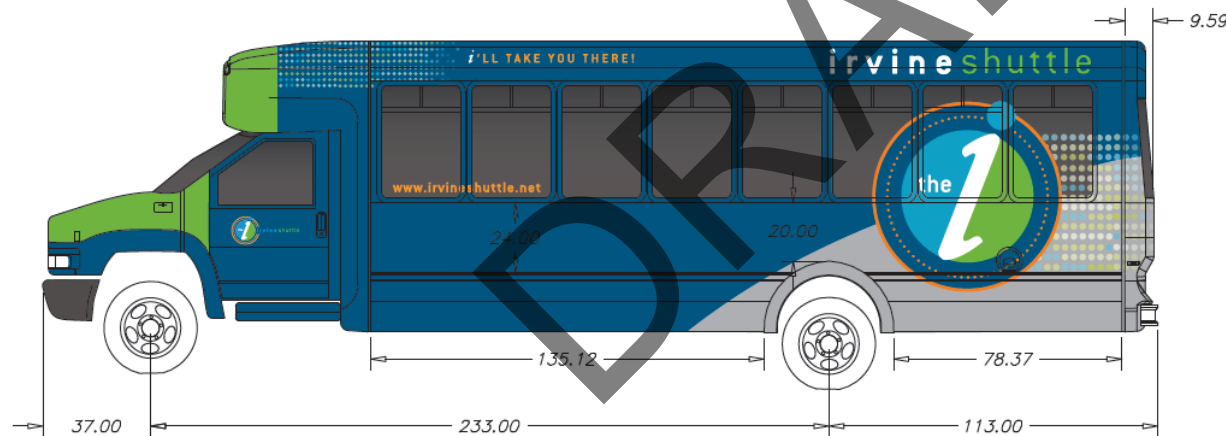
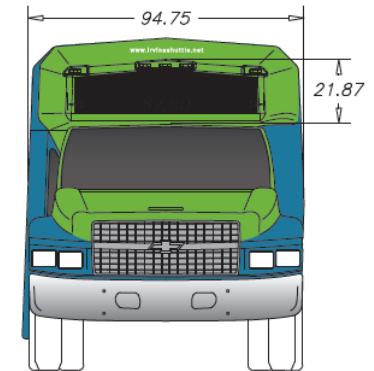
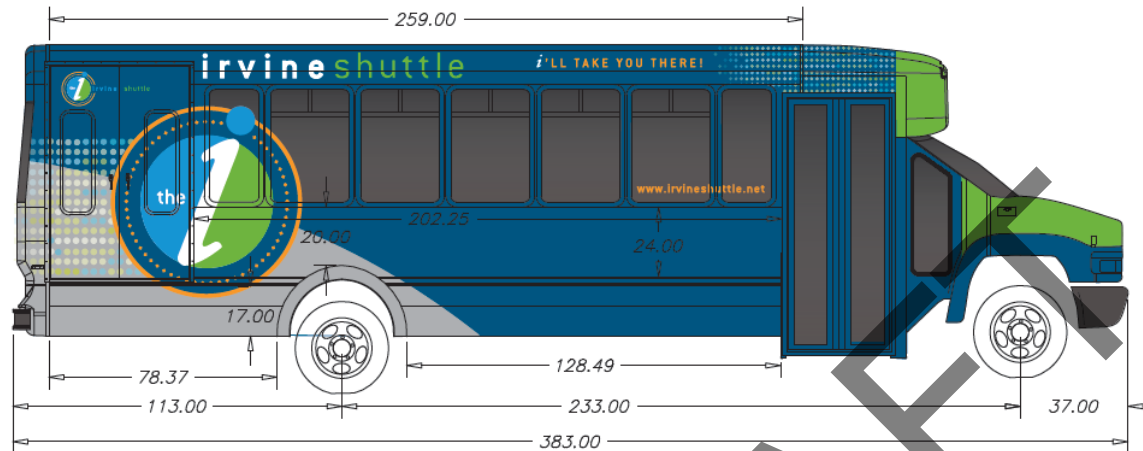
SYSTEMS, INC.

PO BOX 1928 ROCKWALL, TEXAS 75032-2028

**FLEETWATCH JX55
INSTALLATION DIAGRAMS**

**INTERNAL WIRING DIAGRAM
FLEETWATCH PN: JX-1939-DB**

SCALE	DATE	DRAWN BY	APPROVED BY	ISSUE	DRAWING NUMBER
NONE	02/21/2012	MSG		1.0	JXSBOEM05



CONTRACTOR'S IN-PLANT QUALITY ASSURANCE REQUIREMENTS

1. QUALITY ASSURANCE (QA) REQUIREMENTS

Contractor, Contractor's manufacturing plant and organization shall be certified to the appropriate QS-9000/ISO 9000 series of standards.

2. QUALITY ASSURANCE ORGANIZATION

a. ORGANIZATION ESTABLISHMENT

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.

b. 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.

c. 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.

3. QUALITY ASSURANCE ORGANIZATION FUNCTIONS

The quality assurance organization shall include the following minimum functions.

a. WORK INSTRUCTIONS

The quality assurance organization shall verify inspection operation instructions to ascertain that the manufactured product meets all prescribed requirements.

b. 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 (1) year after inspections and tests are completed.

c. **CORRECTIVE ACTION**

The quality assurance organization shall detect and promptly assure 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.

4. **QUALITY ASSURANCE ORGANIZATION FUNCTIONS**

a. **BASIC STANDARDS AND FACILITIES**

The following standards and facilities shall be basic in the quality assurance process.

b. **CONFIGURATION CONTROL**

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.

c. **MEASURING AND TESTING FACILITIES**

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.

d. **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.

e. **EQUIPMENT USED BY RESIDENT INSPECTORS**

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.

5. CONTROL OF PURCHASES

Contractor shall maintain quality control of purchases.

a. SUPPLIER CONTROL

Contractor shall require that each supplier maintains a quality control program for the services and supplies that it provides. 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.

b. PURCHASING DATA

Contractor shall verify that all applicable specification requirements are properly included or referenced in purchase orders of articles to be used on transit buses.

6. MANUFACTURING CONTROL

a. CONTROLLED CONDITIONS

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.

b. 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.

c. 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.

d. STATISTICAL TECHNIQUES

Statistical analysis, tests, and other quality control procedures may be used when appropriate in the quality assurance processes.

e. 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.

7. INSPECTION SYSTEM

a. INSPECTION SYSTEM SCOPE

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.

b. 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.

c. 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.

- (1) 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, the Authority shall approve the modification, repair, or method of correction to the extent that the contract specifications are affected.

d. 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 Authority.

INSPECTIONS

8. INSPECTION STATIONS

- a. 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.
- b. 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 before interior trim and insulation installation, 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.

9. RESIDENT INSPECTOR

- a. **RESIDENT INSPECTOR ROLE**
The Authority shall be represented at the Contractor's plant by resident inspectors. They shall monitor, in the Contractor's plant, the manufacture of transit buses built under the procurement. The presence of these resident inspectors in the plant shall not relieve the Contractor of its responsibility to meet all of the requirements of this procurement. The Authority shall designate a primary resident inspector, whose duties and responsibilities are delineated in "Pre-Production Meetings", "Authority" and "Pre-Delivery Tests". Contractor and resident inspector relations shall be governed by the "Guidelines" and "Quality Assurance" Provisions.
- b. **PRE-PRODUCTION MEETINGS**
The primary resident inspector shall participate in design review and pre-production meetings with the Authority. At these meetings the configuration of the buses and the manufacturing processes shall be finalized, and all contract documentation provided to the inspector.
 - (1) No less than thirty (30) days prior to the beginning of bus manufacture, the primary resident inspector shall meet with the Contractor's quality assurance manager and shall 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 (2) weeks prior to the start of bus fabrication.

c. **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 (1) year after inspections and tests are completed.

- (1) 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.
- (2) 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, the Authority shall approve the modification, repair, or method of correction to the extent that the contract specifications are affected.
- (3) 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.

d. **SUPPORT PROVISIONS**

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, file cabinet, chairs, and clothing lockers sufficient to accommodate the resident staff.

ACCEPTANCE TESTS

10. RESPONSIBILITY

Fully-documented tests shall be conducted on each production bus following manufacture to determine its acceptance to the Authority. These acceptance tests shall include pre-delivery inspections and testing by the Contractor and inspections and testing by the Authority after the buses have been delivered.

11. PRE-DELIVERY TESTS

- a. Contractor shall conduct acceptance tests at its plant on each bus following completion of manufacture and before delivery to the Authority. 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 Authority.
- b. Additional tests may be conducted at the Contractor's discretion to ensure that the completed buses have attained the desired quality and have met the Authority's requirements. The Authority may, prior to commencement of production, demand that the Contractor demonstrate compliance with any requirement in "Technical Vehicles Specifications", if there is evidence that prior tests have been invalidated by 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 approval of bus delivery to the Authority.
- c. The pre-delivery tests shall be scheduled and conducted with 15 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.

1. INSPECTION – VISUAL AND MEASURED

Visual and measured inspections shall be conducted with the bus in a static condition. The purpose of the inspection testing is to verify overall dimensional and weight requirements, to verify that required components are included and are ready for operation, and to verify that components and subsystems that are designed to operate with the bus in a static condition do function as designed.

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. 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. Results shall be pass/fail for these bus operation tests.

12. POST-DELIVERY TESTS

- a. The Authority may conduct vehicle inspection tests on each delivered bus. These tests shall be completed within thirty (30) calendar 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 Authority. 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).
- b. Buses that fail to pass the post-delivery tests are subject to rejection. The Authority shall record details of all Defects on the appropriate test forms and shall notify the Contractor of each bus status within thirty (30) calendar days according to "Acceptance of Bus" after completion of the tests. The Defects detected during these tests shall be repaired according to procedures defined in the Agreement, "Repairs After Non-Acceptance."

1. VISUAL INSPECTION

The post-delivery inspection is similar to the inspection at the Contractor's plant and shall be conducted with the bus in a static condition. Any visual delivery damage shall be identified and recorded during the visual inspection of each bus.

2. BUS OPERATION

Road tests will be used for total bus operation similar to those conducted at the Contractor's plant. In addition, the Authority may elect to perform chassis dynamometer tests. Operational deficiencies of each bus shall be identified and recorded.

GUIDE FOR INSPECTION

The following provides the Authority's general criteria of the manufacturing and bus inspections intended for each one of the buses procured under this solicitation, including product quality assurance, audit, certifications required by Federal Transit Administration

(FTA), Buy America regulations pertaining to rolling stock purchases and the Authority's on-site inspection tests and acceptance guidelines.

This inspection is intended to be in compliance with all Code of Federal Regulations (CFR), 49 CFR 661 Buy America, 49 CFR 668 Pre-Award and Post Delivery Audits of Rolling Stock purchases, 49 CFR 668 Bus Testing, United States Code (USC) 49 USC 5323 (j) Buy America, Federal Acquisitions Regulations, FTA Master Agreement, FTA Circular 4220.1F, FTA Circular 5000 Grants Management, FTA Handbook Conducting Pre and Post-Delivery Audits, FTA Best Practices Procurement manual to include Buy America Certification, Buy America and Buy America Requirements and all applicable standards set forth in 49 CFR, Part 571 – Federal Motor Vehicle Safety Standards.

13. TASKS

- a. Pre-production meeting in Orange County, California, with representatives from the Authority and the Contractor prior to the manufacturing of First Article bus.
- b. Authority's issuing of the Notice to Proceed with the manufacturing of the First Article bus.
- c. In-plant inspection of the First Article bus at the Contractor's facility/location, to include configuration review of the Authority's first article, Buy America Audit.
- d. Contractor's presentation of a fully completed First Article bus at the manufacturer's location.
- e. The Authority personnel perform the in-plant review of the First Article bus and, if in compliance with all the requirements, approval for shipment is provided to the Contractor.
- f. Contractor performs licensing and registration of the First Article bus prior to delivery to the Authority.
- g. Continued inspection at the final delivery location, any of the Authority facilities in Orange County, California, including forty (40) hours of uninterrupted revenue service testing.
- h. Completion of First Article testing and review after all discrepancies are corrected to Authority's satisfaction.
- i. Authority issues Notice to Proceed with the Production Run.
- j. Same above listed steps are followed with the Production Run.

14. PRE-PRODUCTION PHASE

- a. The Authority personnel or its on-site inspector will conduct a review of Contractor's supplied documents for areas such as Buy America Pre-Award Compliance audit, Buy America Pre-Award Purchasers Requirements Certification, Buy America Pre-Award FMVSS Certification, DOT Safety requirements/specifications/regulations; and Quality Control/Quality Assurance procedures. Formal reports to the Authority in these areas are required.
- b. The Authority personnel and its on-site inspector will be provided with all contract documentation with bus manufacturer prior to start of manufacture.
- c. The Authority personnel and/or its on-site inspector will attend a pre-production audit meeting with the bus manufacturer. At this meeting, primary contact persons from the Authority, the bus manufacturer and In-Plant inspection representatives are expected to be present to finalize vehicle configuration decisions/documentation; and review manufacturing processes and schedule.

15. MANUFACTURING PHASE

- a. Authority personnel or its on-site inspectors will be on site at the manufacturer's location during all phases of manufacture, unless otherwise instructed by the Authority in writing.
- b. The Authority personnel or its on-site inspectors will provide continuity of inspectors during each vehicle acquisition for the Authority.
- c. The Authority or its on-site inspectors will ensure sufficient staffing on site based on the production schedules and quantity of buses to ensure expedited production. Inspection delays cannot be allowed to slow down the manufacturing process, except for documented quality problems.
- d. On-site inspectors will be available during all normal work hours of the manufacturer.
- e. On-site inspectors will work cooperatively with manufacturers and the Authority representatives. The expected result is a high-quality transit vehicle completed on schedule, and in conformance with federal, state & local specifications, with minimal changes in configuration during manufacture.
- f. The Authority or its on-site inspectors will designate a project "Team Leader" (in the event more than one inspector is assigned to a project). This person will be the primary point of contact for the Authority staff, and will be the direct liaison with the manufacturer's personnel, and the only person delegated to make "stop work" or "stop ship" decisions on behalf of the Authority, based on

pre-agreed criteria. The Authority will similarly appoint a single point of contact.

- g. The on-site inspector will provide daily and weekly summary reports by e-mail or facsimile to the designated Authority Project Manager. The written reports will include, at a minimum, the following items:
 - 1. Production progress during the period.
 - 2. Production schedule.
 - 3. Vehicle shipment status.
 - 4. Production line movement identified by stage and Authority vehicle numbers.
 - 5. Specific problems encountered during the period.
 - 6. Status of problems/issues reported during the previous reporting periods.
 - 7. Recommended solutions to problems/issues reported.
 - 8. Request for input from the Authority to make a decision or support the on-site inspector's position.
 - 9. General comments.
- h. The on-site inspector will ensure that the manufacture of the vehicles is in a manner consistent with all 49 CFR Part 571 & California State regulations (Title 13 CCR and specifications; as well as Authority's specifications incorporating any approved changes).
- i. The on-site inspector will meet with the Authority Project Manager at the end of production of the First Article, to conduct a configuration audit on the First Article bus. Once the configuration has been established, the on-site inspector will produce the required Buy America post-delivery audit documents prior to Authority's issuing of the Notice to Proceed to the Manufacturer.
- j. The on-site inspector will inspect and certify that each bus complies with the Buy America content/requirement, and Authority's configuration requirements, as approved with the first article.
- k. The on-site inspector will maintain and distribute meeting minutes for any formal meeting (i.e., pre-production audit meeting) held with the manufacturer and/or the Authority.
- l. Except for those differences among vehicles in a single order that might be required for in the specifications, the on-site inspector will ensure that all transit vehicles manufactured are identical and interchangeable within the same order. The on-site inspector will similarly ensure that vehicle manuals and other documentation are updated with any changes to match actual vehicle configuration.
- m. During the production of the first buses, the production line will be thoroughly evaluated for its conformity to the agreements set forth during the initial audit process. This will include compliance to the quality assurance program, testing

requirements, documentation of certification testing, including but not limited to fastener testing, steel treatment, torque wrench calibration, welding testing (ultra sound and die penetrant testing), paint adhesion testing, paint thickness testing, electrical wiring and component ratings, etc.

- n. All final operating tests will be checked during the final buy-off stage to help ensure that all of the appropriate testing has been completed. If the tests fail to meet the standard of the technical specifications, the on-site inspector will develop a list that will be forwarded to the manufacturer requesting adjustments in the process. The goal is to adjust the testing within the final stages of the first two to five buses.
- o. As part of the final inspection phase, the on-site inspector will perform a road test, riding each bus and listening for abnormal power train noises, interior rattles, and observing for proper shift points, acceleration, braking performance, ride quality, and appropriate functioning of other bus systems.
- p. Upon completion of manufacture of each unit, the on-site inspector will perform a full inspection test at the manufacturer's location prior to shipment to the Authority. Any defects noted will be made known to the manufacturer and tracked for correction prior to shipment to the Authority. Upon approval for shipment by the on-site inspector, the on-site inspector will transmit a copy of the inspection sheet to the Authority for each vehicle as quickly as practical to expedite final vehicle inspection at the Authority. On-site inspector will not allow the manufacturer to ship any vehicle that has not successfully passed this inspection, unless approved in writing by the Authority.
- q. Specific emphasis will be placed on undercarriage, electrical installation, brakes, wheelchair lift, air conditioning, differential, and interior seating. It cannot be over-emphasized that the production line is a critical point for identification and documentation of non-compliant matters and to clarify and resolve noted discrepancies and issues to including but not limited to:
 - 1. QC production procedures.
 - 2. Weld integration (Zyglow, ultrasound test methods, etc.)
 - 3. Frame undercoating thickness.
 - 4. Sheet metal application, fit and finish, sidewall trueness as well as sheet metal quality.
 - 5. Paint adherence pull test and thickness tests.
 - 6. Paint Quality (orange peel, fish eye, sagging, and dirt)
 - 7. Detailed Inspection to include hydraulic lines, fuel lines and electrical harnesses.
 - 8. Electrical component ratings and proper grounding.
 - 9. Proper clamping, routing and spacing of air lines from making contact with other components.
 - 10. Proper clamping, routing and spacing of electrical wire harnesses from making contact with other components.
 - 11. Etc.

- r. The on-site inspector will be responsible for providing at a minimum, the following (as applicable) with each individual bus record:

1. Inspection Report verifying conformity to all specifications
2. Methane Detection System Test
3. Wheel alignment
4. Fire Suppression System Test
5. Water test certification
6. Front end alignment and steering stop adjustment certification
7. "Completed Bus" inspection document
8. Copy of defects and corrections noted during bus inspection
9. VIN number (copy of bus data plate)
10. Manufacturer inspection records
11. Certificate of Origin
12. Certified Weight slip (curb weight)
13. On-Site Inspector's inspection documents
14. Final factory bus inspection Report
15. Road Test Function Report to Include:
 - a) Acceleration Test
 - b) Top Speed Test
 - c) Service Brake Test
 - d) Parking Brake Test
 - e) Turning Effort Test
 - f) Turning Radius Test
 - g) Shift Quality
 - h) Retarder Deceleration Test
16. During the road test, one vehicle should be taken to a weigh station to record the vehicle's front axle weight; rear axle weight and total vehicle (curb) weight.
17. A list of major component serial numbers will be documented for each bus; at a minimum the following components will be listed:
 - a) Engine
 - b) Transmission
 - c) Alternator
 - d) Starter
 - e) HVAC Unit
 - f) AC Compressor
 - g) Drive Axle
 - h) Power Steering Unit
 - i) Air Compressor
 - j) Engine Cooling System
 - k) All other components that the manufacturer will require in order to process warranty claims.

- s. The on-site inspector will be responsible for providing at a minimum, the following (as applicable) with each separate bus build:
 - 1. Pre-Award Purchasers Requirements certification, which certifies that the product meets the Authority's specifications and is being built within the requirements outlined in 49 CFR, Sections 663.27, 663.25 & 663.23.
 - 2. Copy of the Pre-Award and Post-Delivery manufacturer's self-certification of compliance with the FMVSS stating that the bus manufactured meets the requirements of those standards (49 CFR, Sec. 663.41).
 - 3. Post-Delivery Audit. The on-site inspector will certify that each bus was built to the specified FTA requirements/specifications and Authority configuration in accordance with 49 CFR, Sections, 663.33, 663.35, 663.37 & 663.39.
- t. The on-site inspector is not responsible for final bus acceptance. This task will be performed by Authority personnel.

16. POST PRODUCTION ACTIVITIES

- a. The on-site inspector will provide final written documentation to the Authority summarizing the production processes and issues supplemented for each bus; and copies of the inspection write-ups of each vehicle inspected.
- b. In addition to the bus production documents, and Road Test Sheets, all memoranda and QA correspondence will be stored and chronologically organized and provided in the final production report.

17. VEHICLE INSPECTION PHASE AT AUTHORITY

- a. Upon delivery of the bus to the Authority's facilities, Authority personnel shall perform a complete delivery/vehicle inspection/verification to include, among others, recording of all vehicle serialized components, e.g., VIN number, transmission serial number, engine, serial number, axles, etc.
- b. Visual checks to include, among others, all exterior lights, body finish, paint, decals, installation of bike rack, operation of all interior and exterior access panels and doors, latches, condition of tires, etc.
- c. Mechanical checks to include verification of lug nuts torque, belt tensions, lubrication of chassis, lubrication of driveshaft, lubrication of components, re-torquing of components, testing of fire suppression and methane detection systems, drain and replace engine oil, check of transmission and engine mounts, etc.

- d. Operational checks to include, among others, seat belts, steering column, horn, sun visors, mirrors, windows, parking brake, wiper blades, ventilation system, transmission shifting quality, air conditioning, parking brake, fluid and fuel leaks, plumbing, radio system, on board video surveillance system, passenger counters, voice announcement, destination signs, sun visors, driver's controls, passenger circulation, lights, switches, knobs, emergency releases, etc.
- e. Drivability tests to include, among others, at a minimum, 40-hours of continuous uninterrupted service testing to evaluate performance, driving ability, steering response, cooling system's performance, vehicle speed, system's operation and interaction, acceleration, engine compartment temperature, braking distances, etc.
- f. Dimensional and performance tests to include complete electrical system audit, dimensional requirements audit, seating capacity, water test, water runoff test, function test of systems and subsystems and components, sound/noise level tests, airflow test, PA function, silent alarm, interior lighting, exterior lighting, gradability test, kneeling, HVAC pull-down test, wheelchair ramp, axle weight, engine and transmission performance test among others.
- g. Additional tests and/or verifications maybe included based on the outcome of previously listed tests, inspections and checks.
- h. If any discrepancies are noted, the bus shall be rejected and the list of discrepancies shall be provided to the bus manufacturer. The bus manufacturer shall be responsible for removing the bus from the Authority property, performing the corrections and repairs to the highlighted deficiencies and redelivering the bus to Authority for a secondary vehicle inspection.
- i. Upon receipt of the re-delivered bus, the Authority shall perform a new bus inspection to verify that all items are individually, and/or as a system, in working order to include all items provided in the discrepancy list. If existing or additional discrepancies are noted, the bus shall be rejected and the bus manufacturer will be required to remove the bus from Authority's property to perform the necessary repairs. Upon completion of the manufacturer's repairs, the bus will be re-delivered to Authority for a follow up inspection and at that point, if all repairs were performed to the Authority's satisfaction, the bus shall be released for revenue service and Authority personnel will start the necessary paperwork to add the bus to the revenue fleet and will complete the internal paperwork e.g., forms, approvals, signature of invoices, etc. If the bus is rejected, the bus manufacturer shall be required to remove the bus from Authority property and to continue the repairs until completion of a satisfactory and fully functional bus.

Warranty Provisions - Parts and Labor	OCTA Minimum		PROPOSED	
	Years	Mileage	Years	Mileage
Complete Bus				
The complete bus, propulsion system, components, major subsystems, and body and chassis structure, shall be warranted to be free from Defects and Related Defects for one (1) year or 50,000 miles, whichever comes first, beginning on the date of acceptance. The warranty is based on regular operation of the bus under the operating conditions prevailing in the Authority's locale.	1	50,000		
Body Chassis Structure				
The body, body structure, bolted and non-bolted components, frames, skeletal, cages, enclosures, structural elements of the suspension, such as the primary load carrying members of the bus structure, shall be warranted from corrosion, failure and/or fatigue, for the service life of the bus	12	500,000		
Engine	2	100,000		
Exhaust System in its entirety; pipes, clamps, brackets, insulation, mounting provisions, heat blankets, sensors, etc.	3	150,000		
Transmission	5	300,000		
Drive and Non-Drive Axles	5	300,000		
Heating Ventilation and Air Conditioning (HVAC)	3	Unlimited		
All Electric Cooling Systems and Components Including Alternator	3	Unlimited		
Headlights	6	Unlimited		
All LED Lights	12	Unlimited		
CNG Fuel System: including plumbing, fittings, valves, solenoids, gauges, pressure regulators, PRD's	2	100,00		
CNG Tanks - Certification	20	Unlimited		
CNG Tanks - Warranty	3	Unlimited		
CNG Cradles, mounting provisions, fasteners, brackets, etc.	3	150,000		
Kidde Fire Suppression and Methane Detection	5	300,000		
Decals	6	Unlimited		
Destination Sign	12	Unlimited		
Air Compressor and Dryer	3	150,000		
Wheelchair Ramp System	3	150,000		
Starter Motor	3	150,000		
Door Systems	3	150,000		
Brake System	3	150,000		
Electrical System (Multiplex, i.e. I/O, other)	3	150,000		
Operator's Seat	5	Unlimited		
Batteries and complete starting system	2	Unlimited		
Vapor Class and Rear Door Voice Annunciator Systems	3	Unlimited		
Power Steering Pump	2	100,00		
Passenger Seats: frames and mounting	5	Unlimited		
Passenger Seats: fabric and cushions	2	100,00		
Wipers and Wiper System	2	100,00		
Windows and Window Frames	2	100,00		
Fare Box	2	100,000		
Flooring and Materials	5	Unlimited		
Access doors, protective panels, walls	3	150,000		
Paint	5	Unlimited		
ADA Equipment: W/C seating stations, tie-downs, stop request	5	Unlimited		
Bicycle Rack	2	100,000		
Radio / PA System	2	100,000		

REQUEST FOR QUOTES NUMBER:

9-1001

DESCRIPTION:

CALACT CLASS H – 30 to 32-FOOT
(+/-6") COMPRESSED NATURAL
GAS BUSES

BIDDER'S NAME AND ADDRESS

NAME OF AUTHORIZED REPRESENTATIVE

TELEPHONE NUMBER

FAX NUMBER

EMAIL ADDRESS

I acknowledge receipt of RFQ and Addenda Numbers: _____

AUTHORIZED SIGNATURE TO BIND QUOTE:

PRINT SIGNATOR'S NAME AND TITLE:

DATE SIGNED:

BLANKET PURCHASE ORDER

Effective May 13, 2019 for the Authority's requirements as specified in Exhibit A, entitled "Scope of Work" and Exhibit E entitled "Price Summary Sheet" for up to twelve (12), 30 to 32-foot (+/- 6") compressed natural gas buses with the option to purchase an additional five (5) buses. Price quotes are firm for the life of the blanket purchase order.

Contractor agrees to the terms and conditions stated in the CalACT / MBTA contract. In signing this form, Contractor acknowledges receipt of Exhibit F, entitled "Insurance Requirements" and Exhibit G, entitled "General Provisions" which by this reference is incorporated herein.

Deliveries will be made to 4301 West MacArthur Boulevard, Santa Ana, California 92704.

Enter onto the spreadsheet, pricing for each line item described in the Quotation Form, based on CalACT / MBTA pricing and the Authority's specifications. Prices shall include direct costs, indirect costs, and profits. The Authority's intention is to award a firm-fixed price contract.

Pricing shall remain firm for 120 days from the quotation submittal date.

Complete Excel Spreadsheet, included as a separate attachment, and submit electronically as part of the bid submittal. All line items on the spreadsheet must be acknowledged; if Bidder is not bidding on one or more line items, Bidder must indicate "No Bid" or "Not Applicable" on the spreadsheet next to that particular item.

Note: There are two tabs for completion on the Excel Spreadsheet; Initial Purchase and Optional Purchase.

PRICE SUMMARY SHEET - UP TO 12 BUSES	Sales Tax Included	Qty.	Extended
Low Floor 30-32' (+/-6") CNG POWERED		12	
Fire Supp & Methane Detection System, Armadillo With Optical Detectors		12	
Conduent/ITMS Radio Provisions		12	
IVU-4000 (Optional)		12	
Automatic Passenger Counter (APC) with Infrared Motion Analyzer (IRMA)		12	
Cradlepoint, or Approved Equal, Router, Model Number IBR1700 Plus 5 Year Advance Licensing		12	
Exterior Identity Package (Not-To-Exceed Amount)		12	
ADA/Accessibility Equipment		12	
Training Hours (56)		1	
Manuals (1 Package of 3 Sets)		1	
Optional:			
Diagnostic Software / Licensing		12	
Specialty Tools (Special Equipment / Tools Required for Diagnostics and Repair)		12	
Delivery Charge		12	
TOTAL PER BUS			
Total Contractual Value			

Note: Authority does not guarantee that the accessories, such as radios, passenger counters and others listed above will be purchased with each unit. The Authority reserves the right to increase or decrease accessory quantities as needed.

PRICE SUMMARY SHEET - UP TO 5 BUSES (OPTION PURCHASE)	Sales Tax Included	Qty.	Extended
Low Floor 30-32' (+/-6") CNG POWERED		5	
Fire Supp & Methane Detection System, Armadillo With Optical Detectors		5	
Conduent/ITMS Radio Provisions		5	
IVU-4000 (Optional)		5	
Automatic Passenger Counter (APC) with Infrared Motion Analyzer (IRMA)		5	
Cradlepoint, or Approved Equal, Router, Model Number IBR1700 Plus 5 Year Advance Licensing		5	
Exterior Identity Package (Not-To-Exceed Amount)		5	
ADA/Accessibility Equipment		5	
Training Hours (56)		1	
Manuals (1 Package of 3 Sets)		1	
Optional:			
Diagnostic Software / Licensing		5	
Specialty Tools (Special Equipment / Tools Required for Diagnostics and Repair)		5	
Delivery Charge		5	
TOTAL PER BUS			
Total Contractual Value			

Note: Authority does not guarantee that the accessories, such as radios, passenger counters and others listed above will be purchased with each unit. The Authority reserves the right to increase or decrease accessory quantities as needed.

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The Authority recognizes that the Contractor may be a dealer whose role is warranty and service of the vehicles. In such cases, the Contractor shall maintain in effect during the term of this Contract, including any warranty period, at its own expense, at least the following coverage and limits of insurance:

- Statutory Workers' Compensation and Employers Liability insurance covering Supplier's employees while on Authority property.
- Commercial General Liability Insurance:
 - Bodily Injury and Property Damage, including Contractual Liability covering the indemnification contained herein, \$1,000,000 combined single limits per occurrence, \$5,000,000 aggregate, where applicable.
 - Product liability: \$1,000,000 per occurrence, for a period of five (5) years after acceptance of the last bus delivered under this Contract (Products Liability coverage may be effected through one or more excess liability policies).
- Automobile Liability Insurance: Bodily Injury and Property Damage, \$1,000,000 combined single limits per occurrence.

In addition, the vehicle manufacturer whose role is to provide the vehicle shall maintain in effect during the term of this Contract, including any warranty period, at its own expense, at least the following coverage and limits of insurance:

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

Proof of such coverage, in the form of a certificate of insurance with the Authority, its officers, directors, employees and agents, designated as additional insureds as required by contract, must be received by the Authority prior to commencement of any work. Proof of insurance coverage must be received by the Authority within ten (10) calendar days from the effective date of the Agreement. Such insurance shall be primary and non-contributive to any insurance or self-insurance maintained by Authority. Furthermore, Authority reserves the right to request certified copies of all related insurance policies.

Contractor shall include on the face of the Certificate of Insurance the Agreement Number C91001; and, the Contract Administrator's Name, Kristen Mason, Section Manager, Maintenance Procurement.

Contractor shall also include in each subcontract the stipulation that subcontractors shall maintain insurance coverage in the amounts required from Contractor as provided in the Agreement.

1. **INSPECTION AND ACCEPTANCE** - All items are subject to final inspection and acceptance by AUTHORITY at destination notwithstanding any payment or prior inspection at SELLER'S facilities. Final inspection will be made within a reasonable time after receipt of items hereunder.
2. **CHANGES** - By written notice or order. AUTHORITY may, from time to time, order work suspension or make changes in quantities, drawings, designs, specifications, place of delivery or delivery schedules, methods of shipment and packaging, and property and services furnished by A. If any such change causes an increase or decrease in the price of this agreement or in the time required for its performance. SELLER OR AUTHORITY shall promptly notify the other party thereof and assert its claim for adjustment within (30) days after the change is ordered, and an equitable adjustment shall be made. However, nothing in this clause shall excuse SELLER from proceeding immediately with the agreement as changed.
3. **DEFAULT AND EXCESS REPROCUREMENT LIABILITY** - AUTHORITY may terminate this agreement if a federal or state proceeding for the relief of debtors is undertaken by or against Seller, or if SELLER makes an assignment for the benefit of creditors, or if SELLER fails after reasonable notice by AUTHORITY to cure a deficiency in performance or lack of progress thereto, and AUTHORITY shall have, such additional remedies as may be available whether or not it so terminates this agreement, including but not limited to the payment by SELLER to AUTHORITY of expenses incurred by AUTHORITY in reprocurring elsewhere the same or similar items or services defaulted by SELLER hereunder provided such Seller's reprocurement expenses obligation shall be limited to the excess over the price specified herein for such items or services.
4. **INDEMNIFICATION** - SELLER shall indemnify, defend, and hold harmless AUTHORITY from and against any loss, damage, claim, or harm for bodily injuries, including death or damage to property caused by SELLER or its employees, subcontractors, or supplies in connection with the performance of this agreement.
5. **ASSIGNMENTS AND SUBCONTRACTORS** - Neither this agreement nor any interest herein nor claim hereunder may be assigned by SELLER either voluntarily or by operation of law, nor may all or substantially all of this agreement be further subcontracted by SELLER without the prior written consent of AUTHORITY. No consent shall not be deemed to relieve SELLER of its obligations to comply fully with the requirements hereof.
6. **FEDERAL, STATE, AND LOCAL LAWS** - SELLER warrants that in the performance of this agreement is shall comply with all applicable Federal, State and local laws and ordinances and all lawful orders, rules and regulations thereunder.
7. **INFRINGEMENT INDEMNITY** - In lieu of any other warranty by AUTHORITY or SELLER against infringement statutory, or otherwise, it is agreed that SELLER shall defend at its expense and suit against AUTHORITY based on a claim that any item furnished under this agreement or the normal use or sale thereof infringes any United States Letters Patent or copyright and shall pay cost and damages finally awarded in any such suit, provided that SELLER is notified in writing of the suit and given authority, information, assistance at SELLER'S expense for the defense of same. If the use or sale of said item is enjoined as a result of such suit, SELLER, at no expense to AUTHORITY, shall obtain for AUTHORITY the right to use and sell said item, or shall substitute an equivalent item acceptable to AUTHORITY and extend this patent indemnity hereto.
8. **TITLE AND RISK OF LOSS** - Unless otherwise provided in this agreement, SELLER shall have title to and bear the risk of any loss of or damage to the items purchased hereunder until they are delivered in conformity with this agreement at the F.O.B. point specified herein, and upon such delivery title shall pass from SELLER and SELLER'S responsibility for loss or damage shall cease, except for loss or damage resulting from SELLER'S negligence. Passing of title upon such delivery shall not constitute acceptance of the item by AUTHORITY.
9. **NOTICE OF LABOR DISPUTE** - Whenever SELLER has knowledge that any actual or potential labor dispute may delay this agreement, SELLER shall immediately notify and submit all relevant information to AUTHORITY. SELLER shall insert the substance of this entire clause in any subcontract hereunder as to which a labor dispute may delay this agreement. However, any subcontractor need give notice and information only to its next higher-tier subcontractor.
10. **EQUAL EMPLOYMENT OPPORTUNITY** - In connection with the execution of this agreement, the SELLER shall not discriminate against any employee or applicant because of race, religion, color, sex or national origin. The SELLER shall take affirmative action to ensure that applicants are employed, and that employees are treated during their employment without regard to their race, religion, color, sex or national origin. Such actions shall include pay, or other forms of compensation and selection for training, including apprenticeship.
11. **DISADVANTAGE BUSINESS ENTERPRISE** - In connection with the performance of this agreement, the SELLER will cooperate with the AUTHORITY in meeting its commitments and goals with regard to the maximum utilization of Disadvantaged business enterprises, and seller will use its best efforts to ensure that disadvantaged business enterprises shall have an equitable opportunity to compete for subcontract work under this agreement.
12. **PROHIBITED INTEREST** - A. SELLER covenants that no member of, or delegate to, the Congress of the United States shall have any interest, direct or indirect, in the agreement or the proceeds hereof.

B. SELLER further covenants that, for the term of this agreement, no director, member, officer, or employee of the AUTHORITY during his tenure in office or one (1) year thereafter shall have any interest, direct or indirect, in this agreement or the proceeds thereof.
13. **TERMINATION FOR CONVENIENCE** - the Authority may terminate this agreement at any time by giving written notice to SELLER of such termination, effective on the date of such notice. Upon receipt of said notice, SELLER shall immediately take action not to incur any further obligations, costs, or expenses, except as may be reasonably necessary to terminate its activities. All finished or unfinished documents and other materials procured or produced by SELLER hereunder shall, at the option of AUTHORITY, become AUTHORITY property upon the date of such termination.
14. **AUDIT AND INSPECTION OF RECORDS** - SELLER shall provide AUTHORITY such access to SELLER'S books, records, and facilities as may be deemed necessary to examine, audit, and inspect all work data, documents, and activities related to the goods or services described herein. SELLER shall maintain such books, records, data and documents on a generally accepted accounting basis and shall clearly identify and make such items readily accessible to such parties during SELLER'S performance hereunder and for a period of four (4) years from the date of final payment by AUTHORITY hereunder.