PUBLICATION

TECHNICAL SPECIFICATIONS-DEDICATED PROPANE (ULSD option available) LIFT-EQUIPPED TRANSIT VEHICLES

1.0 GENERAL REQUIREMENTS

1.1 The purpose of this specification is to provide a transit quality vehicle manufactured on a standard cutaway chassis with provision for stand-up entry, a wheelchair lift and tie downs as depicted on the floor plan attached to these specifications. All body, floor and roof joints must be tightly sealed to eliminate drafts and water leaks. Vehicle shall exhibit attention to workmanship and detail. Used, shopworn, or prototype vehicles are not acceptable. Vehicles furnished to these specifications must meet or exceed all requirements herein.

ALL VEHICLES DELIVERED IN ACCORDANCE WITH THIS SPECIFICATION MUST MEET THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT (ADA).

1.2 Vehicle components, assemblies, and accessories shall be standard production items unless otherwise specified herein. These features include but are not limited to: adjustable instrument lights, interior sun visor, exterior backup lamps, variable speed windshield wipers, windshield washers, windshield defroster, coolant recovery system, etc. Standard and other common features if not specifically stated shall not be interpreted as items that can be omitted to reduce price or to provide any other bidding advantage. The vehicles and all related equipment shall be designed to permit ready accessibility for maintenance purposes with minimal disturbances of other components and assemblies. All vehicles supplied under these specifications shall be in full compliance with Federal Motor Vehicle Safety Standards (FMVSS) as established by the Department of Transportation and FTA guidelines.

1.3 The BIDDER has sole responsibility for, and shall provide the vehicle as specified with all certifications, warranties, and special equipment to the Agency as a completed vehicle.

2.0 Reserved

3.0 GENERAL DIMENSIONS

Wheelbase.....…138" min.
Interior height from floor to ceiling.....72" min.
Interior height from floor to ceiling at aisle.....75" min.
Height at first step.....12" max.
Height at passenger door entrance.....78" min.
Aisle width.....16" min.
Interior width at floor level.....76" min.

3.1 In order to assure a smooth ride, wheelbase and overall body length should be selected to avoid excessive overhang behind rear wheels, (not more than 50% of the wheelbase).

4.0 SUSPENSION AND GROSS VEHICLE WEIGHT

Gross Vehicle Weight Rating.....10,500 lbs. min.
Front Axle Capacity.....4,600 lbs. min.
Rear Axle Capacity..... 7,500 lbs. min.
Front Springs.....3,800 lbs. min.
Rear Springs..... ...7,800 lbs. min.

4.1 Minimum of ten thousand and five hundred (10,500) pounds, or higher if required, to support the loaded weight of the completed vehicle including any optional equipment selected. It is the bidder's responsibility to calculate the actual loaded weight and to provide a heavier chassis, tire, wheel, spring or axle combination if required.

4.2 Shock absorbers shall be gas type, heaviest available as specified by chassis manufacturer.

4.3 Suspension system shall have conventional leaf springs on the rear and coil type springs on the front. Suspension shall be of proper design and suitable capacity. Springs shall have anti-squeak characteristics. The suspension system shall accommodate the additional weight of the lift on the curb side of vehicle.

4.4 Reserved

4.5 The rear axle and final drive must be of conventional construction, a truck-type rear axle using heavy tubes pressed into cast center section or one-piece casting.

4.6 Ring gear should be bolted, not riveted, to differential carrier.

4.7 A differential with the appropriate gear ratio to match the power train is required. The vehicle should be designed to operate at sixty (60) M.P.H. at 3500 RPM or less.

5.0 ENGINE

5.1 Engine shall be of the latest design electronic controlled five point four liter (5.4) incorporating all features which will minimize emissions and maximize the life of the engine.

5.2 Engine shall be emissions certified and shall comply with all Federal and State laws and regulations with regard to air and noise pollution and safety that are in effect on the date of manufacture.

5.3 The noise level generated by the engine and other vehicle systems shall not exceed sixty (60) decibels at any point inside the passenger compartment, under normal operating conditions, with the windows closed.

5.4 The engine and components are to be arranged and mounted so as to provide convenient access for servicing the engine and all of its accessories.

6.0 FUEL SYSTEM: Gasoline to Liquefied Petroleum Gas Conversion.

6.1. **Conversion Features** - The engine shall be fueled to operate on liquefied petroleum gas. The engine, fuel system, and all related components shall meet all applicable requirements. Conversion system shall incorporate an adaptive learn system which automatically compensates for variations in fuel composition, altitude, and temperature. Fuel system shall be computer controlled through OEM interface or using an auxiliary system. Fuel delivery shall be accomplished through computerized fuel injection.

6.1.1 LPG fuel system - Throttle-body air/ fuel controller, single exhaust system

6.1.2 LPG fuel tank: - 37 Gas-Gallons Equivalent tank. The tank shall be a specialty tank manufactured by the Sleeger Group, Manchester Tank, or approved equal, with dimensions: 14 x 14 x 34.

6.1.3 Fuel level sensor - Electronic

6.1.4 LPG fill valve - Side fuel door

6.1.5 ~~Fuel selection switch~~ ~~- An electrical fuel selection switch is to be provided on the instrument panel or in a location convenient to the vehicle operator. This switch shall allow the operator to select gasoline operation or LPG operation and shall be permanently marked. The operator shall not have to operate any other controls in switching from one fuel to the other, unless required by the conversion system manufacturer.~~

6.1.6 Refueling Receptacle - The vehicle refueling receptacle shall be the industry standard. The receptacle must be protected with a dust cap, permanently attached to the vehicle. All conversion systems will have a remote refueling receptacle unless otherwise specified by the ordering agency. The remote fill receptacle shall be enclosed in a hinged remote fill box unless otherwise specified by the ordering agency. The remote refueling receptacle shall be located as near to the gasoline filler location as possible.

6.1.7 Shut-off Valve - A manual shut-off valve to isolate the fuel tank from the rest of the LPG system must be provided and labeled as required by the Railroad Commission of Texas.

6.1.8 Fuel Gauge - The OEM fuel gauge is to be utilized to provide accurate available fuel readings for ~~both gasoline and~~ LPG ~~selectively with the fuel in use~~. ~~A separate OEM quality fuel gauge with numerical (Digital Preferred) display for LPG is to be installed and mounted so that is can be easily observed by the seated driver if the OEM fuel gauge is incompatible with the LPG system~~.

6.1.9 Filter - An in-line disposable fuel filter shall be provided featuring welded stainless steel, high strength construction and integral fittings, 3/8" SAE 45 degree flare. Preventive maintenance instructions are to be provided in accordance with Section 50.

6.1.10 Vaporizer - A vaporizer shall be provided equipped with a two-stage hi-flow regulator that provides the system with a fuel at a consistent operating pressure and temperature. The vaporizer shall feature a high-efficiency heat exchanger, balanced output pressure regulation, and an integral pressure relief valve.

6.2. **Installation and Operation** - The installation of the LPG fuel system and the operation of the vehicle after conversion shall be in accordance with the following:

6.2.1 **Installation** - The installed conversion system is to present a neat, OEM quality appearance and shall be free of all defects affecting appearance, useful life, or serviceability. The installed systems must not interfere with routine maintenance tasks such as tune ups, checking of fluid levels, the replacement of spark plugs, distributor caps and rotors, or drive belts nor render inoperative the functions of the air filter, air connection, or any component of the emission control system of the vehicle unless approved under EPA guidelines. All electrical wiring is to be insulated and enclosed in a fibrous loom, plastic loom, or flexible conduit for protection from external damage and short circuits. Wiring is to be securely fastened at sufficient intervals to prevent sagging and ensure clearance of mechanical parts. Routing of the wiring through the sub-frame, body, etc., shall not interfere with normal operation or present a safety hazard. Rubber/plastic grommets are be used wherever wires, harness or fuel lines pass through metal. Workmanship shall be comparable to that of the vehicle OEM. The systems shall be installed to conform to the system manufacturer's instructions and recommendations.

6.2.2 **Connections -** All hose connectors and fittings shall be compatible. All electrical connections to the vehicle OEM wiring shall be accomplished with stainless steel, brass or copper connectors or soldered. Aluminum connectors are not acceptable. Interconnecting wires shall be uniquely color coded and identified in the alternative fuel system electrical schematic.

6.2.3 **Engine Tune-up** - Each conversion system installation is to be made only after the engine has been tuned to OEM specifications.

6.2.4 **Engine Operating Characteristics** - The engine, after conversion, is to operate on LPG without hesitation, stalling, power loss of more than 15%, or surging. The OEM's recommended maximum operating temperature, horse-power, engine speed, etc. shall not be compromised or surpassed. The engine shall start on either gasoline or LPG within 5 seconds after cranking.

6.2.5 **Safety -** The engine, after conversion, is to meet all federal and state safety rules and regulations, all applicable EPA emission standards, DPS Vehicle Inspection Rules, and TNRCC Regulation IV.

6.2.6 **OEM Engine Speed Governor** - Any OEM engine speed governor is not to be made inoperable during conversion to LPG. It shall remain operable when the vehicle is operating on LPG as well as on gasoline.

6.2.7 ~~**OEM Fuel Injection System** - The fuel delivery system of gasoline engines, if used, shall be made inoperable by means which will not damage the injectors and associated components, while the engine is operating on LPG and shall not be damaged by the use of LPG.~~

6.2.8 **OEM Air Canister** - Whenever the OEM air canister is removed and replaced, a fully enclosed all metal air canister shall be provided. The use of silicon sealer to provide air tightness on an air canister/air filter assembly is prohibited. Modifications to OEM air canister/air filter assemblies shall be restricted to minor modifications required in the conversion system manufacturer's installation instructions.

6.2.9 **Engine Electronics** - All electronics are required to properly interface with the original vehicle electronics to meet vehicle performance and emission objectives. The vehicle OEM engine management computer and its permanent control memory shall not be modified, removed, replaced or otherwise altered. The computer and electronic systems must be of closed loop design with adaptive learn capabilities and self-adjusting strategies built into the system allowing for the optimization of the ignition system's timing curve for LPG. The learning algorithms must enable the unit to learn its power and idle points automatically. The mixer must be fixed venturi type with no moving parts. On-Board OEM diagnostics are not to be adversely affected or over-ridden by the conversion system. Electrical Wiring is to be color coded to match the vehicle

manufacturer's electrical wiring color scheme.

6.2.10 Alternative Fuel Decals - A decal is to be located under the hood, easily visible to the operator upon opening. The decal shall state that this is a LPG fueled vehicle. A second decal is to be added under the hood showing name, address, and phone number of the conversion vendor. The vehicle shall also be furnished with a diamond LPG alternative fuel decal in accordance with National Fire Protection Association # 58 (LPG gas code).

6.2.11 Anti-Tampering - Conversion system shall comply with EPA anti-tampering rules, and shall be designed so as to prohibit tampering, and shall not have an adjustable converter.

6.3 Warranty Requirements

6.3.1 INTEGRATED CONVERSION SYSTEM - All conversion system components including all electronic fuel management controls are warranted as an integrated system. All conversion systems are warranted against all defects in material and workmanship for a period of not less than 12 months or 12,000 miles, whichever comes first, and shall cover 100 percent parts and labor. If the manufacturer's standard warranty period exceeds 12 months or 12,000 miles, then the standard warranty period shall be in effect. The warranty begins on the day the purchaser accepts the vehicle.

6.3.2 WARRANTY PERIOD RESPONSIBILITIES - During the warranty period the vendor will be responsible for labor, materials, and other costs as outlined below associated with required warranty repair. It is the intent of this warranty that the vendor performs all warranty repair work. However, should the vendor fail to complete the required warranty repairs within three working days of notification of the reported failure, at the purchasing entity's option, the purchasing entity may perform warranty repairs or have them performed commercially at the vendor's expense.

6.3.3 WARRANTY REPAIRS - When warranty repairs are required, the purchasing entity will notify a representative of the vendor's Texas dealer by telephone at the location and the telephone number designated by the vendor on the Warranty Certification as the point of contact. Major warranty repair work for the purpose of this specification means major repairs to the alternative fuel system and major repairs to any other components of the system. Diagnosis of the actual repairs required will be the responsibility of the vendor. The unit will be made available at the purchasing entity's facility within a 100-mile (161 km) radius of the FOB point shown on the purchase order. The repair work may be performed by the vendor or their authorized representative.

6.3.4 TOWING COSTS - The purchasing entity may transport the unit to the vendor's location or authorized repair facility (within the boundaries of the state of Texas), in accordance with the warranty agreement, which should allow for vendor to perform diagnostics and provide alternative remedies prior to third party towing at the vendor’s expense.

6.3.5 RESPONSE TIME - Warranty repair action shall begin within five working days after the vendor is notified of the need for warranty repairs. A representative of the vendor's Texas dealer will be notified by telephone with a letter or fax confirmation at the location, telephone and fax number designed by the vendor on the warranty certification as the point of contact. The vendor shall notify the purchasing entity immediately of any change in this location, telephone with a letter or FAX confirmation at the location, telephone and/or FAX number. The warranty repairs should be completed and the unit returned to the purchasing entity (or picked up by the purchasing entity at the vendor's expense as outlined above) within a reasonable period of time (three working days).

6.3.6 PARTS AND SERVICE - The manufacturer of the equipment furnished shall have an authorized dealer within the state of Texas. The authorized dealer shall have factory-trained personnel available for warranty repairs and the performance of service. The dealer shall maintain an inventory of high-usage parts and a quick source of low-usage parts.

6.3.7 **WARRANTY DISPUTES** - If there is any dispute between the vendor and OEM on the cause of an LPG conversion malfunction, it shall automatically become the vendor's responsibility to determine the cause and provide necessary repairs. If the question is not resolved within seven (7) working days from the date of notification to the vendor by the purchasing entity, the vendor will arrange, with the permission of the purchasing entity, for the vehicle to be repaired by a duly licensed technician, at an EM dealership or other facility selected by the purchasing entity, at no cost to the purchasing entity. The vendor may then negotiate with the EM if the repair is covered by the EM warranty or pay for the repairs if it is not, unless it can be determined that the malfunction was due to improper operation such as low oil, low water, etc.

6.3.8 **GENERAL ENGINE WARRANTY** - The vendor shall warrant converted engines for a minimum of six (6) months or 6,000 miles, whichever occurs LATER against damages due to the operation of the engine on LPG. This warranty shall be equal to or exceed the OEM original warranty on the engine and shall be limited to damages caused by the alternative fuel used.

7.0 EXHAUST SYSTEM

7.1 The vehicles shall be equipped with an exhaust system that meets Federal and State noise level and exhaust emission requirements. The exhaust pipe shall terminate just ahead of the rear corner of the vehicle, exhausting to the street side, and shall be constructed so that it will not cause back pressure in the motor or damage to the paint, bumper, chassis or wiring components of the vehicle. Flexible tubing will not be permitted in exhaust system. An adequately sized, aluminized steel, long-life muffler shall be used.

7.2 The exhaust system shall be secured in place with a hanger system. No part of the exhaust shall hang below the departure angle to the rear bumper bottom.

8.0 COOLING SYSTEM

8.1 Heavy duty to manufacturer's recommended standards. Coolant recovery system shall be factory installed. It shall be super cooling or heavy duty cooling. The cooling system shall have a permanent glycol base antifreeze to protect the system to -20º F. and shall maintain engine temperature not to exceed manufacturer's recommended normal operating temperature.

8.2 The cooling system shall have a high temperature warning buzzer and light and shall shut the engine off in 45 seconds from initial warning.

9.0 TRANSMISSION

9.1 Transmission shall be an automatic shift, four (4) speed forward and a reverse gear with an auxiliary oil cooler capable of handling extreme temperature associated with transit type operations.

9.2 The transmission shift lever shall be interlocked with the starting motor to prevent engagement of starter in any gear position other than park.

9.3 The transmission shall be equipped with an interlock feature that prevents the vehicle from being shifted out of the park position until the lift doors are closed, the lift master switch is off, and the parking brake is released.

9.4 A backing warning signal shall be provided in accordance with section 41.5.

10.0 DRIVE SHAFT

A drive shaft yoke and guard shall be provided to prevent the drive shaft from dropping to the ground or from whipping through the vehicle floor if it becomes broken or separated.

11.0 STEERING AND CONTROLS

11.1 Heavy duty power steering linkage type shall be provided.

11.2 The steering shall be power assist and shall incorporate a tilt feature. Steering from full left to full right turn shall be accomplished in no more than five (5) complete turns of the wheel.

11.3 The steering wheel shall be no less than fifteen (15") inches nor more than twenty (20") inches in diameter. The wheel ring shall be of all plastic or synthetic resin construction, molded over metal. It shall be provided with puller holes in the hub so to permit use of a standard or Universal puller.

11.4 All steering linkage wear points, including tie rod ends, shall be fitted with lubrication fittings and replaceable bushings or inserts.

11.5 The following controls, in addition to normal steering, braking, and transmission functions are to be provided:

11.5.1 Column-mounted turn signal lever.

11.5.2 Emergency flasher control facing driver and clearly visible.

11.5.3 Master exterior light switch including clearance or marker lights.

11.5.4 Switches and temperature controls for passenger compartment heaters, defrosters.

11.5.5 Separate switch and temperature controls for driver heaters, defrosters.

11.5.6 Heavy duty electric variable speed windshield wipers controlled by a variable speed switch or two speed wipers with intermittent feature shall be furnished. Wiper motor shall be mounted in an easily accessible location for ease in inspection, maintenance and removal. Minimum eighteen (18") inch wiper blade and arm providing 1,037 square inches of wiped area with one hundred and ten degrees (110^{o}) of wiping arc. Windshield washer reservoir shall be mounted in an accessible area and pump shall be electronically operated.

11.6 All controls are to be within arm's reach of a five foot (5'0") driver with seat belt fastened.

11.7 All body switches are to be of uniform type, either push-pull or rocker type, mounted in convenient grouping in a panel near the driver.

11.8 All controls and switches shall be plainly and permanently marked. Painted masking is unacceptable.

11.9 The control panel and a supplemental driver's control panel shall be located convenient to the driver's seated position and in full view of the driver.

11.10 Lift power master switch shall be protected by a switch cover. No switches or instruments shall be obstructed controls, trim panels, or other appurtenances, and shall be arranged in a consistent and uniform manner.

12.0 ELECTRICAL SYSTEM

12.1 The vehicle is to be equipped with a twelve (12) volt extreme duty electrical system. All components are to be selected and integrated to function in an environment characterized by low engine (alternator) speeds and high amperage draws (due to lights, wheelchair lift, flashers, air conditioning or heater, and other accessories operating constantly and simultaneously.)

12.2 An alternator of at least two hundred (200) amperes output at normal engine speed and an idle output of at least one hundred twelve (112) amperes is required. The idle output shall be achieved at an engine speed of no more than seven hundred (700) R.P.M. At no time should the ampere output be less than one hundred and ten percent (110%) of loaded draw.

12.3 Starter shall be capable of turning over engine with SAE 40W oil after ten (10) hour cold soak at zero degrees Fahrenheit (0°F).

12.4 The vehicle shall be equipped with a fast idle solenoid with manual switch, volt sensor and light that will automatically shut off when brake is applied and transmission is placed in gear. Solenoid is to be original equipment manufacturer parts (OEM) only.

13.0 BATTERIES

13.1 Two (2) twelve (12) volt batteries delivering 1275 CCA shall be provided. Battery cables shall be color-coded as positive and negative number two (#2) battery cables. Cables shall be sleeved with high abrasive resistant flex-guard loom and supported with lined steel clamps on a maximum of fifteen inch (15") centers. All battery terminals shall be coated with anti-corrosion and sealant protector.

13.2 Chassis manufacturer supplied battery that is located on the frame rail shall be mounted on a stainless steel roller mounted pull-out tray with battery hold down secured with bolts. Inside of compartment should be covered with a durable insulating material to prevent shorts. Battery compartment should be vented and the battery shall be easily serviceable without removal from vehicle by extending tray out of body. Door to compartment shall have a non-corrosive material (foam core is not acceptable) and shall be lockable with a ¼" square or hex key locks.

13.3 A rotary type battery disconnect switch shall be located near the driver side step well within the driver's reach and located in such a manner as to be protected from accidental disconnection.

14.0 WIRING

14.1 All wiring shall be cross-linked polyethylene insulated, to two hundred degrees Fahrenheit (200ºF), shall meet SAE standards, shall be color coded, numbered and function coded for positive identification every six inches (6"), and shall be permanently labeled in words to their function. Precaution shall be taken to avoid damage from heat, water, solvents or chafing by proper routing, clamping, and the use of grommets or suitable elastomeric cushion materials. Harnesses shall be designed to resist abrasion by the use of nylon slit flex loom that has a maximum temperature resistance of four hundred and ten degrees Fahrenheit (410ºF). Harnesses shall be sectional terminating at insulated multi-pin quick disconnects or junction blocks. Heavy duty circuit board junction panel shall be provided inside the vehicle. The circuit box shall be conveniently mounted and have a secure cover. Board shall be equipped with heavy duty twelve (12) volt DC relays, and twelve (12) volt automatic reset circuit breakers and blade fuses. Inside the circuit box shall be a legend identifying each circuit and wire by color, number, function and location. This legend shall be permanently mounted to the vehicle.

14.2 All connectors shall meet the requirements of the Society of Automotive Engineers (SAE) recommended practice J878a, Types GXL and SGX.

14.3 All vehicles shall be identically wired.

14.4 Bidder shall furnish complete wiring diagram with wire size, maximum current flow in each wire, type of insulation, and code used. Wire diagrams must be vehicle specific, body and chassis combined, and shall correctly show all specified options.

14.5 Bidder shall provide one 18" x 24" copy of the wiring diagrams described above, mounted on card stock, and laminated in clear vinyl with each vehicle.

14.6 No "T" splices or butt connections shall be made in wiring. Harness and wiring shall terminate at appropriate junction terminals set in Bakelite, molded plastic material, or approved equal.

14.7 Devices such as lamps and wiring requiring periodic checking and servicing shall be readily and easily accessible. All exterior devices shall be sealed to prevent entry of water.

15.0 INSTRUMENT GAUGES

The following instruments shall be provided:

15.1 Speedometer/Odometer - Chassis manufacturer's standard design with trip set feature.

15.2 Fuel Gauge - Chassis manufacturer's standard fuel gauge.

15.3 Oil Pressure Gauge - In addition to the manufacturer's standard gauge, an audible alarm **and** light shall be installed that will activate when low oil pressure is detected.

15.4 Water Temperature Gauge - In addition to the manufacturer's standard gauge, an audible alarm **and** light shall be installed that will activate when overheating engine is detected.

15.5 Voltmeter - In lieu of the chassis manufacturer's standard voltmeter, an additional voltmeter shall be installed with graduated charge and discharge indications.

16.0 BRAKES

16.1 Service brakes shall be hydraulic, self-adjusting power disc front and rear. Vehicle shall include a cable-activated parking brake.

16.2 The braking system shall be heavy duty and the largest offered by the manufacturer for the GVWR specified.

16.3 The brakes shall be free of noise or squeal when applied.

17.0 WHEELS AND TIRES

17.1 Vehicles shall be equipped with the heaviest available ventilated wheels, 16.0" x 6.00" minimum. Rear wheels shall be dual and all wheels are to be interchangeable. Rated capacity shall equal or exceed GVWR of the vehicle.

17.2 Tires shall be LT225/75Rx16D radial ply, all season, with steel-cord reinforcement and highway type tread. Wheels and tires to be of adequate capacity, as determined by reference to the Tire and Rim Association Yearbook, to support the fully loaded vehicle.

17.3 One matching spare wheel and tire shall be provided and shipped loose with each vehicle.

17.4 Mud flaps shall be included for each wheel well of the vehicle.

18.0 BUMPERS

18.1 Front bumper shall be chassis manufacturer's standard front chromed bumper.

18.2 Rear bumper shall be bus manufacturer's standard rear bumper equipped with an anti-ride feature.

19.0 HORN

Dual 12 volt electrically operated horns shall be installed so as to be protected from wheel-wash.

20.0 CRASH WORTHINESS

20.1 The body structure shall be built as an integral vehicle adequately reinforced at all joints and corners where stress concentration may occur to adequately carry required loads and withstand road shock. The following items are representative of the minimum requirements of the vehicle. Body assembly shall meet or exceed FMVSS 220, for roll-over protection.

20.2 The vehicle body and roof structure shall withstand a static load equal to one hundred fifty percent (150%) of the curb weight evenly distributed on the roof with no more than a six inch (6") reduction in any interior dimension. Windows shall remain in place and shall not open under such a load.

20.3 The vehicle, at GVWR and under static conditions, shall not exhibit deformation or deflection that impairs operation of doors, wheelchair lift, or other mechanical elements. Static conditions include the vehicle at rest with any one wheel on a six inch (6") curb or in a six inch (6") deep hole.

20.4 Upon request of Agency, the Bidder will present certified actual test results which have been conducted to ensure that the vehicle offered meets the FMVSS.

21.0 BODY CONSTRUCTION

21.1 The body may be constructed of a matrix of fiberglass reinforced plastic (FRP) with an inner thickness of resin-hardened honeycomb craft material. The matrix assembly shall be as follows: Exterior surface shall be a minimum .020" thickness of high gloss gel-coat to prevent moisture penetration and corrosion. Secondary surface shall be a minimum one eighth inch (1/8") thickness of resin-hardened fiberglass reinforced plastic. The center composite layer consists of a one inch (1") thickness of resin-hardened "Vertical" honeycomb, or approved equal, laid on edge to allow a maximum column strength of each cell. Wall structure shall include a minimum of two (2) three inch (3") wide longitudinal sections of eighteen (18) gauge flat steel extending from the forward body seam to the rearward body seam to provide an additional attachment point for the integrally welded sidewall seat rail. Final surface of body structure is a minimum three thirty seconds inch (3/32") thickness of resin-hardened fiberglass reinforced plastic. Window framing in sidewall shall be a steel ladder-type assembly. Window pillars are minimum of one and one half inches (1 ½") by one inch (1") fourteen (14) gauge dipped, zinc-plated tube. Top and lower horizontal ladder bridge rails are minimum one inch (1") by two inch (2") twelve (12) gauge zinc-plated angle section. Attachment of ladder assembly to roof and lower wall section shall be grade five (5) 1/4" x ¾" mechanical fasteners on not more than eight inch (8") center. In addition, interface of wall and roof to window ladder assembly surfaces shall include a high contact adhesive, Sikaflex 255 or approved equal to provide a one hundred percent (100%) bonding and sealing at these locations. Interior panels shall be one tenth inch (1/10") thick Melamine material having the physical properties of twenty-four (24) gauge

steel. Side panels around and below passenger windows shall be same Melamine material with the color being bright white. Any barriers or modesty panels shall be medium grey. Ceiling panels shall also be bright white. Purchaser to approve color and quality prior to production from samples provided by vendor.

21.2 The body may be constructed of vertical support columns that shall be eighteen (18) gauge steel. All non-supporting members shall be sixteen (16) gauge steel tube or sixteen (16) gauge steel C-channel. The roof structural support members shall be the equivalent of sixteen (16) gauge hot rolled steel hat section roof bows. The entire body steel cage frame (floor, walls roof, front and rear) shall be securely jig-welded together to provide an integral one-piece body structure. Fastening of roof and side walls by any other means other than welding will not be acceptable. All metal parts shall be given a thorough multiple stage anti-corrosion treatment prior to assembling. The exterior panels shall be continuous panels of twenty-five (25) gauge galvanized steel or other metal of the same mechanical properties. Exterior panels are to be riveted or welded to body framing. Sheet metal screws will not be acceptable for fastening the exterior panels. All panels shall be installed so that they will shed water: the leading panel shall be lapped over the following panel and in no case shall the sealing of the panels be dependent on caulking alone. All exterior joints and seams shall be protected by zinc chromate caulking, butyl rubber tape (or approved equal). Side panels below the floor line shall be non-corrosive ABS material and easily removable for service and repair. These panels shall be installed using methods that create a smooth surface and minimal exposed fasteners. Nuts, bolts, clips, and fasteners shall be zinc or cadmium plated or phosphate coated. Sheet metals screws are not permitted.

21.2.1 All steel body parts shall be galvanized. Zinc chromate paint shall be applied to aluminum and steel.

21.2.2 The primer utilized shall be compatible with finish paints. Interior surfaces of body panels and posts which are covered by trim materials shall be given protection against corrosion. In the case of interior body posts, all four (4) sides shall be treated to prevent corrosion.

21.2.3 The galvannealed welds shall be wire brushed and treated with cold galvanizing compound.

21.2.4 Side and end frame sections shall be designated for maximum strength. End posts shall be designated to resist shear. To increase tolerance for added strength, frame sections are to be jig-welded. Each frame section is to be tube-grid network constructed of 1" x 2" 14 gauge steel tubing to be used in all stress areas - especially around the passenger entrance door and at all points where stress may occur.

21.2.5 Gun installed mono-bolt fastenings or rivets shall be utilized on all exterior body panels, rub-rails, and all other locations where stress is concentrated. When mono-bolts cannot be used, all nuts, bolts, clips, washers, clamps, and like fasteners on the exterior and interior of the unit shall be zinc or cadmium plated to prevent corrosion.

21.2.6 Roof bows shall be constructed from eleven (11) gauge and sixteen (16) gauge steel welded into a parabolic-Z structure. The longitudinal framing from front to rear shall consist of two (2) hatch-shaped members formed of sixteen (16) gauge steel. Exterior roof panels shall be .063 aluminum. The interior panel for the roof within the unit shall have strength equivalent to twenty-four (24) gauge steel. All metal parts shall be given a thorough multiple stage anti-corrosion treatment prior to assembling.

21.3 The vehicle shall be rust proofed with premium quality rust-proofing material. The entire body frame under-structure of the vehicle is to be fully undercoated with non-flammable resin type material, polyoleum or equivalent, applied after final assembly at the manufacturing facility.

21.4 Gutters shall be provided to prevent water flowing from the roof onto the side windows and

passenger doors. When the vehicle is decelerated, the gutters shall not drain onto the windshield or driver's side window, or into the door boarding area. Cross sections of the gutters shall not be less than 0.25 square inches.

22.0 ROOF

22.1 The roof shall have sufficient strength and stiffness to prevent vibration, drumming, or flexing under normal use. Roof structure shall include a minimum of three (3) longitudinal sections of eighteen (18) gauge flat steel extending from the forward body seam to the rearward body seam. All flat steel sections shall be fully integrated into the roof matrix and shall provide additional structural integrity and a secure attachment surface for ceiling panels, handrails and stanchion fixtures.

22.2 The roof is to be constructed to provide an aesthetically pleasing design to the vehicle. The sills, when matched, will provide a clean, clear surface at least two inches (2") wide for secure and sufficient roof mounting.

23.0 INSULATION

Vertical core insulation shall provide for a minimum of an “R-6" thermo-barrier and sound absorption. Side, roof, and front and rear crowns shall be insulated by the vertical core of the body assembly composite.

24.0 FLOOR

35.8 The vehicle floor assembly shall be a lateral body support, structural design, incorporating longitudinal stringers welded in a perimeter structure of steel angle iron. The entire floor assembly shall be a jig welded steel structure. Floor construction with wood studs running the length, width, and outside perimeter with foam core insulation is not acceptable.

24.2 The substructure shall be comprised of the following: a combination of fourteen (14) gauge steel lateral outriggers reinforced at each mounting point, eleven (11) gauge steel C-channel longitudinal support members, and a perimeter of fourteen (14) gauge steel angle welded into a ladder type structure.

24.3 The substructure shall be bolted through the lateral outriggers, two (2) per outrigger to the chassis through rubber isolator grommets as provided by the chassis manufacturer. Welding of any body understructure to the chassis frame will not be acceptable.

24.4 Over the sub floor structure shall be fastened a minimum five eighths of an inch (5/8"), seven (7) ply, marine grade plywood which is pattern cut, edge sealed, and attached with quarter inch (1/4") diameter counter sunk Tek screws. Sub floor understructure shall be completely undercoated and sealed prior to being installed on steel frame understructure.

24.5 Floor shall be level throughout and all joints between the floor and vertical surfaces shall be equipped with a cover of molding. Flooring shall be laid in a manner that prevents squeaks.

24.6 All edges of the plywood shall be sealed prior to installation to resist moisture. All floor joints will be filled and sanded level to result in a smooth, flat floor ready for installation of the flooring material. The entire floor shall be thoroughly sanded and then completely cleaned of all sanding dust and foreign material.

24.7 The floor in the under-seat area and wheelchair position area shall be covered with RCA #TR766, smooth rubber floor covering having a minimum thickness of .125 inch (1/8").

24.8 Floor covering in aisle and on steps shall be RCA #TR766, non-skid, wear-resistant, and ribbed. Minimum overall thickness shall be .1875 inch (3/16") measured from top of ribs.

24.9 Floor covering shall be laid without gaps or openings between sheets. Seams shall be filled with color matching material so as to be tight against any influx or seepage of water. Seams shall be covered with aluminum trim. The floor covering material shall be thoroughly cemented into position throughout the entire area and will be free of bubbles and blisters.

24.10 The installation of the floor rubber shall be done in a manner so that the flooring rolls up the side wall of the vehicle to the seat track. There shall be no seams for water to penetrate the floor where the wall meets the floor.

24.11 The floor covering in the platform or standee area shall be three sixteenths inch (3/16") thick top ribbed single piece, with composition covering. The single piece floor covering in the platform area shall have longitudinal and transverse ribs metered at 45 º to face the door. The vertical face and top section of the platform step edge backing shall be anchored with A.I.S.I. Type 304 stainless steel screws.

25.0 ROOF LINER

Interior walls shall provide a finish that is durable, easily cleaned and coordinates with the vehicles' interior color scheme. Roof liner shall be molded fiberglass, ABS plastic, or vinyl clad covered sheeting, neatly installed the full length so as to cover all protrusions.

26.0 WHEELHOUSE

Wheelhouse shall be constructed of sixteen (16) gauge steel, aluminum or equivalent and shall be covered with RCA transit rubber to match the specified flooring.

27.0 DOORS AND STEPWELL

27.1 The passenger entry door and step well shall be located at right front of passenger area, located directly across from the driver's seat at a ninety (90°) degree angle for maximum viewing on entry way.

27.2 The door shall be a manually operated, outward folding type, and both door panels shall be actuated together by a single manually operated door control. The control mechanism shall be of high quality and durability, designed for repeated use over an extended period. The door shall be controlled from the driver's seated position.

27.3 The step well and doorframe shall be formed and weld fabricated using cold rolled eleven (11) gauge steel in a two-step design. Step assembly shall be cleaned and powder coated prior to installation. It shall be the two-piece transit type and shall have a minimum horizontal opening of thirty-two (32") inches and a minimum vertical opening of eighty (80") inches.

27.4 Both vertical closing edges of the door shall be equipped with neoprene bulb seals. At the meeting edge of each door leaf, a two (2") inch neoprene seal shall be installed so that the edges form a tight overlapping seal when closed. Seals shall overlap front over rear to provide an air and water shade.

27.5 To prevent accidental opening while the vehicle is in motion, the door opening system shall require at least a one hundred, twenty-five (125) pound force applied at its center in order to manually separate the leaves.

27.6 Passenger door windows shall be installed with two (2) piece black ozone treated extruded rubber, lock and key of one (1) piece fixed design. Entrance door windows shall be glazed with three sixteenths inch (3/16") thick, thirty-one (31%) percent gray density, tempered safety glass. Each window shall be installed in the upper and lower portions of the passenger door panels in line with the passenger side windows.

27.7 A driver's door shall be provided to the left of the driver's area. This door shall be accessible from inside or outside the vehicle. The driver door shall incorporate an opening window and arm rest.

27.8 The steps shall be designed so that the top of the first step is no more than twelve (12") inches above the ground with the vehicle loaded. Step well is to have a minimum first step depth of nine (9") inches and a minimum second step depth of nine (9") inches and shall be at least thirty-two (32") inches in width. The surface of all entrance steps shall be covered with eighth inch (1/8") thick rubber flooring on all risers and sides and three sixteenths inch (3/16") thick ribbed rubber step treads. All step edges shall have a two inch (2") yellow safety band running the full width of each step. Step wells shall incorporate lights to illuminate step tread area and outside of step well shall be protected from splashed material by door and rubber for tight fit.

28.0 STANCHIONS, GRAB RAILS, HANDRAILS, and MODESTY PANELS

A one and one-quarter inch (1¼") stainless steel grab bar, a minimum of thirty-six (36") in length, shall be securely fastened to the interior of the doorway to assist passengers in entering or exiting the vehicle. Vertical stanchions shall be provided at the aisle immediately behind the driver's seat and at the step well. A horizontal grab rail with padded modesty panel attached shall extend from the wall to each stanchion. An overhead handrail shall be installed in the roof of the vehicle on both the driver and curb sides and shall run the length of the seating area.

29.0 WHEELCHAIR LIFT DOOR

Side opening double outward opening doors shall be provided for the platform type wheelchair lift. Lift shall be mounted within the vehicle body on the curb side, behind the passenger entry door. Wheelchair door frame structure shall consist of minimum eleven (11) gauge steel, cleaned and powder coated to match vehicle exterior base color. A water deflector shall be integrated into door frame structure at the top. Door panels shall be made of non-corrosive material. ***Foam core doors with wood frame supports are not acceptable.*** Door panel hinges shall be piano type with a minimum three sixteenth (3/16") inch diameter pivot pin. Hinges and hinge fasteners shall be stainless steel to resist rust and corrosion. Door latch shall be vertical, rotating, two point type with latch rod at top and bottom. Each door panel shall have its own lockable latch assembly with two (2) keys, which shall consist of a pistol grip twist handle located at the inside center of the door panel. Door latch shall compress perimeter door seal to prevent leaks. Latch adjustment plates shall be located at the top and bottom of the door frame structure. Door panel holders shall be gas shock type mounted at the top and shall allow door panels to open a minimum of one hundred degrees (100º) from the closed position. Wheelchair door clear opening dimensions shall be a minimum of thirty-nine (39") inches by fifty-six (56") inches. Lift doors shall be interlocked by a panel door switch controlling the transmission that requires the transmission to be in the "Park" position before lift can be operated. Door windows shall be installed with two (2) piece black ozone treated extruded rubber, lock and key of one (1) piece fixed design. Windows shall be glazed with three sixteenth (3/16") inch thick, thirty-one percent (31%) gray density, tempered safety glass. Each window shall be installed in the upper portion of the lift door panels in line with the passenger side windows.

30.0 WHEELCHAIR LIFT (Braun, Ricon, or approved equal)

30.1 The complete wheelchair lift vehicle shall be fully automatic, including folding of platform and be electro-hydraulically powered with a minimum test-net load capacity of eight hundred (800) pounds. The lift shall be totally self-contained and installed without modifications to the vehicle body or frame inside of the curbside double service doors. The entire assembly shall be installed with adequate protection to prevent accidental injury to passengers.

30.2 The attachment of the wheelchair lift assembly to the vehicle shall allow easy removal and be readily accessible for repair and maintenance. The lift assembly shall be mounted in such a manner that in the fully raised position it shall not interfere with the opening of the double side doors, passenger seating, and passenger/wheelchair movement within the vehicle.

30.3 The wheelchair lift shall have a bridge plate designed for a smooth transition from the vehicle floor level to the lift platform level when the platform is in the raised loading position.

30.4 Bridge plate and platform shall be coated to resist rusting. Platform, bridge plate, and area between bridge plate and aisle shall be skid resistant.

30.5 The lift platform shall have a usable width of not less than thirty-two inches (32") and a usable length of not less than forty-eight inches (48"), less the handrail which is also required.

30.6 The wheelchair lift cam handrail shall be permanently installed for use of occupant during lift operation. The handrail shall be twenty-six inches (26") high from lift platform. The handrail shall be automatic folding to prevent any obstructions into the vehicle passenger area.

30.7 The overall depth of the lift assembly in the stored position inside the vehicle shall not exceed seventeen inches (17") when measured at the floor level from the lift entry doors. No component accessory to the lift shall extend more than twenty-one inches (21") from the lift entry door.

30.8 Bolting of any part of the lift assembly directly to the vehicle's walls is not acceptable.

30.9 The installation of the wheelchair lift assembly shall not cause excessive unbalanced loading of the vehicle.

30.10 The lift platform shall be designed so as to stop downward movement upon contact with the ground.

30.11 The lift platform shall have an end barrier at least four inches (4") in height that will fold outward to provide a ramp for loading of wheelchairs. The ramp shall fold out automatically upon platform contact with the ground.

30.12 The vehicle shall be equipped with the following wheelchair lift safety features:

30.12.1 A door cut-off switch shall be installed which prevents the operation of lift when the door is closed.

30.12.2 The lift shall be equipped with an occupant restraint system consisting of a retractable safety belt that will prevent the passenger from rolling off of the front of the lift.

30.12.3 The maximum capacity in pounds shall be posted on the wheelchair lift within easy view of the operator and wheelchair passenger.

30.12.4 The lift platform shall be fitted with a device to prevent the platform from touching or leaning against door after being returned to stored position.

30.13 Lift shall be equipped with a manual override to permit lift to be raised or lowered manually in the event of a power failure or emergency. The manual override system shall provide a complete operation of the lift without electrical power being supplied. The manual override hydraulic pump and bleed down valve are to be located inside the vehicle. A detachable hand lever to operate the system is to be stored next to the hand pump. The bleed down valve shall have a flow compensator valve that will limit the maximum descent speed. Manual override instructions shall be visible from inside and outside the vehicle with door open.

30.14 The wheelchair lift shall comply with all Federal ADA requirements.

31.0 LIFT CONTROL, ELECTRICAL CIRCUITS, AND WIRING

31.1 The complete wheelchair lift assembly shall operate from the vehicle's electrical system, and shall have one hand-held lift control station with a minimum five foot (5') cable attached so lift may be operated from inside or outside of vehicle.

31.2 The control switches on the lift control shall have permanently applied labels identifying their functions.

31.3 The power to the lift system shall be controlled through an ON/OFF master switch located on the supplemental driver's control panel.

31.4 When the parking brake is properly applied and the master switch is placed in the "ON" position, an electric solenoid shall be activated that will connect the lift's electrical system to the vehicle's electrical system.

31.5 The vehicle lifts shall be protected by a one hundred, five (105) amp circuit sentry system. The electrical power cord shall be loomed to protect cable from outside elements.

32.0 WHEELCHAIR SECUREMENT AND SEATBELTS

32.1 Each wheelchair position shall be provided with restraint devices that will secure the wheelchair and its passenger while in the wheelchair. These devices shall be adjustable to accommodate varying track widths of wheelchairs. Each wheelchair shall have a four (4) point securement (2 front, 2 back) in the vehicle with recessed anchor points of sufficient strength to secure a wheelchair and/or three wheel scooter. The entire securement system shall comply with all applicable regulations including ADA.

32.2 Securement system must safely secure manually **and** electrically operated wheelchairs, (including 3-wheel scooters), and provide ample space for foot rests and proper wheelchair securement.

32.3 Floor mounted tracks shall be a series type "L" track floor plate (**Example: Kinedyne FE200769 , Heavy Duty L Track, Q-straint L-series track 6,000 or 7,000 series), Sure-Lok Solo Floor Anchor, or approved equal.** These plates shall be recessed mounted in the floor with three-eighths inch minimum (3/8") diameter, SAE Grade 5 bolts, using washers and self-locking nuts with National Fine Threads.

32.4 No anchoring points shall project more than one-eights inch (1/8") above the finished floor. For the purposes of this section, the floor is the entire passenger area of the vehicle. If the Sure-Lok Sol floor anchor is used, a protrusion of no more than one-quarter inch (1/4") is acceptable due to the reduced overall protrusion of the anchor point.

32.5 Where mounting bolts do not pierce or attach through the vehicle frame, sub-frame, body posts or equivalent metal structure, a metal plate not less than one-sixteenth inch (1/16") thick is required.

32.6 There shall be four (4) retractor assemblies for each wheelchair position in the vehicle to secure the wheelchair to the tracks. **Example: Kinedyne Sure-Loc System, FE 612 Series, Q-Straint QRT 8200** or approved equal**.** Each retractor assembly shall consist of a heavy duty series "L" track fitting, the front left and right retractor shall be equipped with manual tension knobs for manual tightening and/or release. Each retractor assembly shall be equipped with a quick release, push-button buckle and buckle connector. All straps shall be red in color.

32.7 Two (2) seat belts shall be provided for each wheelchair passenger. The torso belts shall be two inches (2") wide, seventy-two inches (72") long, adjustable, with a strength rating of not less than three thousand pounds (3,000 lbs.). One end of the belt shall be secured to a female seat belt fitting and the other end shall have a male seat belt fitting. The seat belt assembly shall provide for a

quick-release and also provide for a snap locking to connect both ends together.

32.8 A wall mounted height adjustable of approximately twelve inches (12") shoulder harness system shall be provided at each wheelchair securement location that is compatible with the specified restraints. The harness system shall be installed in accordance with all structural requirements established by the restraint supplier and all applicable regulations, including 49 CFR part 571.

32.9 All belts, straps, and harness assemblies shall be supplied in bundled sets and shall include a container in which to store them.

33.0 EXTERIOR LIGHTING

33.1 All exterior lighting; tail lights, brake lights, turn signals, collision avoidance lights and marker lights shall be Light Emitting Diode (LED) and be in accordance with Federal Motor Carrier Safety Regulations 393.12. All lights shall have wire long enough to move the light at least six inches (6") from vehicle for service. Lights shall be grounded to body framing structure. All lights shall be sealed from moisture. Fixtures which are surfaced mounted to the body shall be sealed from moisture.

33.2 Headlights shall be sealed beam type, high and low beam controlled with foot switch or hand switch. Headlights and headlight supports and mountings shall be sufficiently rugged to maintain adjustments under road shock and service conditions. Headlight high beam indicator shall be installed on instrument panel. An audible "headlight on" warning buzzer shall be installed to notify the operator that the lights are on with the engine turned off.

33.3 Tail lamps shall be mounted on the rear-end vehicle panels, so as not to be affected by engine exhaust heat. Rear tail lamps shall include a pair of amber combinational hazard and signal lights. Rear tail lamps shall also include a pair of red tail lights and red stop lights, which may be a combination of a directional signal, tail light and stop light. Lamp lens shall not protrude from body more than two inches (2"). Light shall be a sealed, single vehicle light fixture.

33.4 Brake lights shall not override emergency flashers or turn signals. Light shall be a sealed, single light fixture.

33.5 Two (2) back-up lights, one mounted on each side of the body rear cap to provide illumination for visibility when vehicle is backing up, shall be furnished. Lamps shall be the sealed beam design.

33.6 Directional signal lamps with amber lens to function with directional signals shall be provided, one on each side of vehicle approximately halfway from front to rear. Side signal lamp lens shall incorporate a brushed aluminum guard to protect lens from damage. All side signal lamps to be same height above ground.

33.7 Passenger entry door area shall be lighted by a hooded exterior door light, mounted so that the entire ground area immediately outside the entry door is sufficiently illuminated to comply with ADA.

33.8 Vehicle shall be equipped with an exterior curb lamp. Light shall be positioned in manufacturer's standard location in such a manner as to illuminate the ground area in the immediate vicinity of the area of operation of the wheelchair lift. Light shall be automatically activated only when the wheelchair lift doors are opened. Illumination shall be sufficient to comply with ADA requirements.

33.9 Roof marker lights, red or amber, one at each corner shall be provided and protected with brushed aluminum guards.

33.10 Clearance marker lights, three (3) lamp cluster, surface mounted, amber in front, red lens in rear, shall be provided and protected with brushed aluminum guards.

33.11 Vehicle shall be equipped with daytime running lights.

34.0 INTERIOR LIGHTING

34.1 The overhead lights and the step well lights shall provide no less than five foot-candles of illumination on the entrance step area with the door open. This system shall be illuminated automatically when the door is open.

34.2 Driver courtesy light shall light when driver door is opened. Overhead and step well lights shall be wired to activate automatically when passenger door is opened. A separate dash mounted switch shall be provided to operate the overhead lights when the door is closed.

34.3 Front step well area shall be lighted by a hooded step well light, suitably mounted so that the entire step well area of the vehicle is sufficiently illuminated. Step well light shall be on side away from wheel splash.

34.4 All interior lighting shall be incandescent type with the master control located on the dash or near the driver for easy operation by the driver. Lighting in the passenger area shall be mounted in the ceiling cove at the sidewall with a minimum of two (2) fixtures on each side of the vehicle. Lighting intensity for all cross seat lights shall have a minimum average of fifteen (15) foot candles at the seated passenger reading plane. In addition, an effective lighting level shall be provided for all other seated passengers. The lighting components shall be located and constructed so as to prevent the entrance of water, contaminants and insects. Lighting fixtures shall be reasonably flush with the interior walls and ceiling so as not to present a hazard to the passengers.

34.5 Light installation shall be designed to illuminate the wheelchair lift platform for night operation. Light shall be positioned in manufacturer's standard location in such a manner as to illuminate the area in the immediate vicinity of the wheelchair lift. Light shall be automatically activated only when the wheelchair lift doors are open. Light switch shall have a driver override. Illumination shall be sufficient to comply with ADA requirements.

35.0 AIR CONDITIONING

35.1 The installed air conditioning system shall cool the interior of the vehicle to seventy two degrees (72ºF) measured at a minimum of three points, located four feet above the floor at the longitudinal centerline of the vehicle. The three points shall be (1) near the driver's location; (2) at the mid-point of the body; and (3) two feet forward of the rear of the vehicle.

35.8.4 The test conditions under which the above performance must be achieved shall consist of: (1) placing the vehicle in a room (such as a paint booth) where ambient temperature can be maintained at one hundred and ten degrees (110ºF); (2) heat soaking the vehicle at one hundred and ten degrees (110ºF) with windows open for at least one hour; and (3) closing windows, turning on the air conditioner and cooling the interior of the vehicle at seventy two degrees (72ºF) plus or minus two degrees (2ºF) within a maximum of 30 minutes while maintaining 110ºF. The system shall have a dash driver's area evaporator vehicle.

35.1.2 The test shall be performed at the vehicle manufacturer’s recommended fast idle speed.

35.2 Driver's in-dash heavy-duty air conditioning shall be chassis manufacturer supplied system. Substitution of other than the chassis air conditioner is acceptable provided that the front and rear systems are compatible and warranty work is performed at one location. The system shall be separately controlled from the passenger area system and shall have a three-speed continuous duty permanently lubricated motor. Air from vehicle’s dash shall have provision to divert air to defrosters. In-dash vehicle shall not interfere with removal or replacement of the engine cover or be blocked by the door control mechanism.

35.3 The passenger area air conditioning vehicle shall be A/C Carrier Model AC 553MAX, 67,000 BTU/hr supplied system. The system shall be separately controlled from a supplemental driver's control panel located at the driver's position. Controls shall include on and off, three (3) speed blower switch and a rotary thermostat switch.

35.4 Front and rear systems shall operate independently of each other.

35.8 Dual compressors shall be provided. Compressors shall have a nominal ten (10) cubic inches of displacement. The compressors shall be protected by high and low pressure switches. Compressors shall be driven off the vehicle's engine. Compressor will be tagged.

35.6 Condenser shall be a minimum of seventy six thousand (76,000) BTU rating. The condenser fans and motors shall be enclosed within the condenser housing. Coil shall be copper tube, expanded into aluminum fins. Integral high/low pressure cut outs to be wired in to the clutch circuit or low pressure cut out to be wired to suction line and high pressure cut out to be wired to liquid or discharge line. The fans shall be dynamically balanced with permanent magnet totally enclosed motors. The condensers shall blow air on an angle down from the vehicle chassis to prevent re-circulation of hot air. The condenser shall have a sight glass and a filter dryer. The system shall be skirt mounted located on driver (road) side, in front of rear wheels, and installed to minimize collection of road dirt and facilitate maintenance. Condenser will be tagged.

35.7 The rear mounted evaporator shall be a minimum of fifty two thousand (52,000) BTU rating. Three-speed continuous duty permanently lubricated motors shall be provided. The blower assembly shall be rated at a minimum of five hundred and seventy (570) Cubic Feet per Minute. Coil shall be copper tube, expanded into aluminum fins three (3) rows deep. Thermostatically controlled expansion valve shall be provided. Frame shall be galvanized heavy-duty metal with integral drain pan and washable filter. The cover shall be made of durable ABS plastic.

35.7.1 Evaporator shall be equipped with two (2) independent drain lines, each with a check valve to maintain positive condensation drain flow.

35.7.2 Evaporator filter shall be installed in a manner that it may be routinely removed, serviced, or replaced for maintenance without damaging the filter.

35.8 Installation of the air conditioning system(s) shall be by the vehicle body manufacturer or by an authorized factory air conditioning dealer who normally stocks, sells, installs and services a vehicle of the type being furnished.

35.8.1 All air conditioning systems shall use 134A refrigerant.

35.8.2 The components of the air conditioning system shall be readily accessible for maintenance. Refrigerant hoses shall meet the latest revision of SAE J-2064, double-braided Barrier type and shall be completely enclosed in loom over their entire length to prevent chafing. The refrigerant lines shall be supported at a minimum of every twelve inches (12"), with fully insulated "P" clamps. The use of insulated split "P" clamps is not acceptable.

35.8.3 Two (2) back-seated valves shall be installed at the dryer to facilitate evacuation and charging of the air conditioning system and replacement of the dryer vehicle. The system shall also be equipped with Schrader valves to promote efficient testing and servicing.

35.8.4 Refrigerant fittings shall be ATCO, Aeroquip, and (OR APPROVED EQUAL).

35.8.5 Air Conditioning Circuits shall be protected with auto-resetting circuit breakers or thermal relays. The total electric current required by the two (2) systems in high fan speed mode shall not exceed sixty (60) amperes.

35.8.6 Poor quality of installation shall be grounds for immediate rejection of the complete vehicle.

35.9 **Bidder shall submit data with bid** that encompasses design criteria, evaporator coil size and location, condenser size and location, and performance and reliability studies of the entire system.

35.10 Air Conditioning System(s) shall have affixed a legible and durable nameplate posted on the door jamb or under the hood with the following information:

35.10.1 Name, phone number, and address of A/C manufacturer, including information on the compressor, condenser, and evaporator subsystems.

35.10.2 Cooling capacity (BTU/hr.) and blower capacity (CFM).

35.10.3 Type of refrigerant and recommended operating charge.

35.10.4 Type of refrigerant oil and amount.

35.11 Availability of Service and Repair Parts

Bidder shall provide a list of companies or individuals and their addresses who stock repair parts in the purchaser's area and who can perform service on the products furnished.

35.12 Instruction Books
The bidder shall furnish one copy of complete installation, maintenance and operating instructions for each different model, size and type of equipment furnished to each purchaser. The instructions shall accompany the vehicle when delivered.

35.13 A replacement parts list shall be provided.

35.14 The entire rear air conditioning system shall be warranted for 24 months and shall cover 100% parts and labor.

36. HEATING AND DEFROSTING

36.1 Vehicle shall be equipped with a combination fresh air and recirculating air heaters. The heater controls shall be mounted in the dash panel and in the supplemental control panel, located conveniently to the driver's position and properly labeled. Heater hose connections shall be installed above the floor of the vehicle body and through the fire wall to the engine compartment. The length of the hot water hoses shall be as short as possible consistent with good installation practices; however, the hoses shall not be installed in such a manner so as to interfere with normal motor maintenance operations, such as the removal of the air filter. The hoses shall not dangle or rub against the chassis or sharp edges and shall not interfere with or restrict the operation of any motor function. Heater hose shall conform to SAE 2083, Class C, as defined in SAE Standard J20E, or latest revision thereto.

36.2 The front heater shall be a hot water type having a minimum free-flow output of the highest capacity offered by the chassis manufacturer.

36.3 A second hot water heater with blower fan shall have a BTU rating of at least thirty thousand (30,000) installed under a seat near the rear of the vehicle.

36.4 **Easily accessible** all brass gate valve(s) shall be furnished to cut off the flow of coolant water to the rear heater.

36.5 Defrosting equipment shall keep the windshield, the window to the left of the driver and glass in the service door clear of fog, frost, and snow, using heat from the heater and circulation from fans. All defrosting equipment shall meet the requirements of FMVSS No. 103 or latest revision thereto.

37.0 WINDSHIELD AND WINDOWS

37.1 The windshield is to be a one-piece design as is provided by the vehicle chassis manufacturer. Windshield shall be laminated, tinted safety glass.

37.2 Driver's window shall be chassis manufacturer's standard window. The window shall permit unobstructed side vision and shall have a sufficient opening to permit arm signaling. Provisions shall be made to draw in or exclude outside air from the driver's compartment.

37.3 Side windows shall be provided the full length of the vehicle. These windows shall be thirty-six inches (36") tall and twenty-four inches (24") wide, transit type upper T-slider ventilating design windows. The upper T-slider shall have a positive lock in the closed position. The glazing shall be a minimum of one eight inch (1/8") thick with thirty one percent (31%) gray density, tempered safety glass. ***Tinted window film is not acceptable.*** Windows shall be installed in black powdered or anodized aluminum frames with an interior clamp ring attachment design.

37.4 At least one (1) window on each side and the rear window of the vehicle shall be equipped with emergency release latches to provide emergency exits. Release instructions shall be provided at or near the release handles. An audible alarm shall be activated when any emergency window is opened. Emergency egress windows shall be designed to meet FMVSS 217.

38.0 MIRRORS

38.1 Exterior

Rearview mirrors shall be #304 stainless steel. Mirror shall be fully adjustable, a minimum of seven inches by nine inches (7" x 9"). Additionally minimum five inch (5") convex mirrors shall be mounted with brackets on the top of the main mirrors on the left and right sides.

38.2 Passenger Mirror

An additional mirror shall be furnished for the driver to view the passengers. The mirror shall have a minimum of ninety six (96) square inches of clear vision. Dimensions shall be approximately six inches (6") by sixteen inches (16") of reflective surface area.

38.3 Sun Visor

Chassis manufacturer's standard sun visor shall be provided at the driver's position.

39.0 SEATS AND SEAT LAYOUT

The seating arrangements and configuration will be as per the attached floor plan. All seats, excluding flip seats shall be recessed track mounted with inverted T-type pedestal support legs and hardware. Seat tracks shall be welded to the body structure and shall not rely on screws alone. Floor anchorage shall be neat and of a non-tripable design. The seat frames shall be cold-roll one inch (1") steel tubing and be sixteen (16) gauge or metal of equal mechanical properties. The front seat cushions shall have foam padding and be individually wedged to each passenger for occupant's comfort and retention. The indentation load deflection shall be sixty five (65) to eighty five (85) pounds. Seat cushion shall meet the flammability requirements of FMVSS-302. Seats shall be covered with Herculon fabric or vinyl fabrics. Color combination shall be determined by the purchaser from samples provided by the bidder. All seats shall be manufactured by Freedman Seating Company, CE White, American Seating or approved equal. The agency reserves the right to pre-approve seat colors.

39.1. Ambulatory Passenger Seats

39 1.1. Forward facing seats shall be provided that has a minimum width of seventeen and one half inches (17.5") per passenger seat.

39.1.2. Passenger Seats shall have a minimum of twenty-nine inches (29") of hip to knee room.

39.1.3. Aisles shall not be less than sixteen inches (16") wide.

39.1.4. Aisle seats shall include an energy absorbent grab bar three quarter inch (¾"), twenty (20) gauge steel covered with custom molded, wear and vandal resistant eight (8) pound density, self-skinning polyurethane foam. Grab bar shall be located at the top of the seat frame except in the rear-most row.

39.1.5. Flat-woven fabric shall be one hundred percent (100%) polyester face. Minimum weight shall be twenty-three (23) ounces per linear yard. Fabric shall be able to withstand a minimum of two hundred and fifty thousand (250,000) double rubs (ASTM 3597-77 Wyzewbeek Method). Color fastness to light shall be three hundred (300) hours minimum (MTCC-16-1977 Carbon Arc). Fabric shall be Level 3, puncture resistant, and treated for soil and stain resistance. Agency reserves the right to pre-approve all colors.

39.1.6. Vinyl material shall be expanded, thirty-six (36) ounces / linear yard minimum, transportation grade, able to withstand a minimum of fifty thousand (50,000) double rubs (ASTM 3597-77 Wyzewbeek Method). Color fastness to light shall be three hundred (300) hours minimum (MTCC-16-1977 Carbon Arc). Material shall be Level 3, puncture-resistant, treated for soil & stain resistance. Agency reserves the right to pre-approve all colors.

39.1.7 Seat backs shall be high impact ABS material which are recessed to provide one and one half inches (1-1/2") of additional passenger hip to knee room.

39.2 Flip Seats / Foldaway Seats in Wheelchair Lift Equipped Vehicles

Each wheelchair position will have flip-seats installed as per the floor plan for use when the wheelchair position is not occupied by wheelchairs. Flip-seats shall be provided with seat belts. Seat belt locking devices shall be of high quality, easy to latch and unlatch. The seats shall be of the same design as the other passenger seats. The bottom of the flip-seats shall be aluminum, ABS or carpeted. The seating arrangements and configuration shall be as per the required floor plan referenced on the invitation for bid. The type of flip-seat shall be indicated on the floorplan.

39.3 Passenger Seatbelts

Ambulatory Passenger seats and wheelchair positions shall be equipped with retractable “A” type one seat belt assembly and shall be provided for each seated and wheelchair passenger. Non-retractable lap belts shall be provided for flip and foldaway seats.

39.3.1 The retractor shall be emergency locking with anti-cinch capability.

39.3.2 Each seat shall include retractable seat belts in which the retracting mechanism attaches directly to the floor track structure or seat base.

39.3.3 Each seat belt shall have a push-button release mechanism.

39.3.4 Final approval of the interior layout including passenger seating, wheelchair positions, driver's seat, location of stanchions, hand holds, driver's barrier, modesty panels, and cargo rack will be made by Agency.

40.0 DRIVER'S SEAT

Driver's seat shall be an adjustable pedestal type or the platform type giving approximately four inches (4") "Fore and Aft". Seat shall be provided with an armrest and shall recline. A three (3) point safety belt with an emergency locking retractor shall include a flow-through style tongue for comfort. The lap portion shall be mounted to the seat frame.

41.0 SAFETY EQUIPMENT

41.1 First Aid Kit

The first aid kit shall be a OSHA 50 First Aid Kit and a one way airway apparatus. The kit shall be securely mounted near the driver's seat.

41.2 Fire Extinguisher

A ten (10) pound rechargeable, type 210 ABC extinguisher with metal head, shall be bracket mounted and easily accessible near the driver's seat.

41.3 Web Cutters

To be provided for each vehicle and stored in the driver's compartment described in 41.9.

41.4 Reflectors

Three (3) triangle reflectors with storage container shall be securely mounted near the driver seat.

41.5 Back Up Alarm

Back-up alarm that is electrically operated and produces an intermittent sound when the vehicle is shifted into reverse shall be furnished to warn others during vehicle movement. Alarm shall be in compliance with SAE J994B with respect to acoustical performance for Type B device (IE107db) (A) and plus or minus 4db with a supply voltage of fourteen (14) volts.

41.6 Fresnel Lens

Fresnel lenses shall be provided on the rear window of the vehicle.

41.7 Storage Compartment

A driver's storage compartment shall be located above the driver's seat above the driver's door. The compartment shall be at least twelve inches (12") wide, twelve inches (12") tall and eight inches (8") deep.

42.0 EMERGENCY EXITS

42.1 A heavy duty emergency door shall be provided at the rear of the vehicle. The door frame structure shall consist of minimum eleven (11) gauge steel, cleaned and powder coated to match vehicle exterior base color. A water deflector shall be integrated into door frame structure at the top. Door panels shall be made of non-corrosive material. ***Foam core doors with wood frame supports are not acceptable.*** Door panel hinges shall be piano type with a minimum three sixteenth (3/16") inch diameter pivot pin. Hinges and hinge fasteners shall be stainless steel to resist rust and corrosion. Door latch shall be vertical, rotating, two-point type with latch rod at top and bottom. The door panel shall have a key

lockable latch assembly consisting of a pistol grip twist handle located at the inside center of the door panel. Door latch shall compress perimeter door seal to prevent leaks. Latch adjustment plates shall be located at the top and bottom of the door frame structure. Door panel holder shall be a gas shock type mounted at the top allowing door panels to open a minimum of one hundred degrees (100º) from the closed position. Door windows shall be installed with two (2) piece black ozone treated extruded rubber, lock and key of one (1) piece fixed design. Two windows shall be installed on the back of the vehicle, one on each side of the emergency door. The windows shall be glazed with three sixteenth (3/16") inch thick, thirty-one percent (31%) gray density, tempered safety glass. Door window height shall match the top of the rear windows on each side of the emergency door.

42.2 A combination roof ventilator and emergency escape hatch shall be provided towards the rear of the vehicle. (Trans-Spec Ventilator Hatch, Specialty Manufacturing Co. (or approved equal)).

43.0 PAINTING

The vehicle body shall be white with one eight inch (8") painted stripe (vinyl tape is not acceptable) located nine inches (9") below the windows. Color of stripe to be determined by agency at time of purchase order to vendor.

44.0 DECALS

Decals shall be furnished as follows:

44.1 "NO FOOD, DRINK, OR TOBACCO USE ALLOWED" at the centerline or right of center on the front header.

44.2 "WATCH YOUR STEP" to be mounted on the front top riser step.

44.3 "WELCOME ABOARD" to be mounted on the front lower riser step.

44.4 Safety decal(s) shall be furnished and shall be affixed at any applicable area; emergency exit, steps, wheelchair lift, etc. The vehicle shall be equipped with a sign or decal on the rear of the vehicle station “Caution - Children may be exiting”. The decals shall include necessary warnings and precautions. Permanent decals are required.

44.5 The vehicle shall display the international symbol of accessibility on the rear, left side, and on the right side of the vehicle on the lift door.

44.6 The maximum capacity in pounds shall be posted on the wheelchair lift within easy view of operator and wheelchair passenger.

44.7 Plaque or decal indicating vehicle height to be posted within easy view of the driver.

45.0 DELIVERY

All vehicles must be serviced prior to delivery in accordance with the manufacturer's "New Vehicle Pre-delivery Service" requirements and with Part II, Paragraphs 3.3 and 3.4 of this specification.

46.0 REGISTRATION

Successful bidder shall provide necessary documents to enable the purchaser to register the vehicle in the State of Texas. Necessary fees and state taxes will be paid by the purchaser; do not include such fees and taxes in bid price.

47.0 MANUALS

A line setting sheet and manual(s) containing operating and servicing instructions for the vehicle and lift shall be provided with each vehicle. The manual(s) shall be as detailed as possible outlining all necessary operating and servicing instructions for each vehicle and lift including the vehicle's driveline components. Necessary warnings and safety precautions shall be included. In addition, manual(s) containing illustrated parts lists, operating and servicing instructions for related and special equipment supplied with the vehicle and lift shall be provided with the vehicle.

48.0 WARRANTY

The vehicle shall be warranted against defects in material and workmanship for a period of not less than twelve (12) months or twelve thousand (12,000) miles, whichever occurs first and shall cover one hundred percent (100%) parts and labor for the vehicle. If the manufacturer's standard warranty exceeds twelve (12) months then the standard warranty period shall be in effect. Bidder shall furnish manufacturer's warranty to the purchaser at time of delivery.

49.0 PARTS AND SERVICE

The bidder providing the vehicle shall be an authorized dealer for the vehicle manufacturer and hold the required current license(s) with the Texas Motor Vehicle Commission. The dealer shall have factory-trained personnel available for warranty repairs and the performance of service. The dealer shall also maintain an inventory of high-usage parts and a quick source for low-usage parts. The using purchaser will assume the expense for replacement filters, fuel, cleaning, painting and other minor items normally consumed in day to day operations. The purchaser will assume responsibility for cost of repairs resulting from collision, theft, vandalism, operator negligence and/or acts of God.

50.0 INSTRUCTION ON SAFETY, OPERATION AND PREVENTIVE MAINTENANCE

The bidder shall provide the purchaser sufficient instruction on safety, operation and preventive maintenance of the vehicle after it has been delivered and is ready for operation. If the vehicle is furnished with either conversion option for liquid petroleum gas (LPG), The following additional training is required: Instruction on any changes to the information provided in the owner's manual as a result of the conversion, instruction on the care and maintenance of the conversion components. Alternative fuel instruction should be approximately two hours of fueling and vehicle operation training and four hours of diagnostic and maintenance training.

OPTIONAL EQUIPMENT

The below listed equipment shall be furnished when specified on the Invitation to Bid. If not specified, it is not required and should not be included in the bid price.

OPTION 1, 158" Wheelbase

In addition to increased seating capacity, this vehicle shall have a GVWR of 14,050 and an increased fuel capacity of 43 gas-gallon equivalence. This will be accomplished through the use of the specified 37 GGE tank and an additional tank, 12 X 38 (specialty) manufactured by the Sleegers Group, Manchester Tank, or approved equal. Engine shall be 6.8L.

OPTION 2, 176" Wheelbase

In addition to increased seating capacity, this vehicle shall have a GVWR of 14,050 and increased fuel capacity of 50 gas-gallon equivalence. This will be accomplished through the use of the specified 37 GGE tank and an additional tank, 12 X 50 SEUO manufactured by the Sleegers Group, Manchester Tank, or approved equal. Engine shall be 6.8L.

OPTION 3, Larger Engine

Engine shall be 6.8L.

OPTION 4, Clean Diesel - LEV (low emission vehicle) Certification

6.0 L Powerstroke® Diesel Engine (or approved equal). The requirements of section 6.1 & 6.2 are waived if this option is selected. The vehicle shall be equipped with a 55 gallon tank if this option is selected.

OPTION 5,. **Clean Diesel** ULEV (ultra low emission vehicle) Certification

6.0 L Powerstroke® Diesel Engine (or approved equal) and the exhaust system shall be equipped with a particulate trap. A list of approved retrofit products can be found at the EPA web site:
http://www.epa.gov/otaq/retrofit/retroverifiedlist.htm
This option should be selected if the vehicle will be operated in an area of air quality non-attainment.. (Note: EPA list is provided as a reference for particulate traps only.) **The requirements of section 6.1 & 6.2 are waived with the selection of this option. The vehicle shall be equipped with a 55 gallon tank if this option is selected.**

OPTION 6, COMMON KEYING

All vehicles shall be keyed alike, with the same key operating the driver's door and ignition switch on all vehicles. One key shall operate all remaining locks on all vehicles, (excluding fare box keys). There shall be a maximum of two (2) keys to gain access and operate the vehicle. Bidder will supply two (2) complete sets of keys for each vehicle ordered

OPTION 7, CRUISE CONTROL DELETE

For agencies that do not want the standard cruise control due to safety concerns, this feature shall not be installed on the vehicle.

OPTION 8, reserved

OPTION 9, WHEEL INSERTS

Four (4) stainless steel, bolt-on wheel inserts shall be provided. The set shall be installed on the front wheels and rear dual wheels and be complete with all lug nut covers and centerpieces. ***Clip-type securement of wheel inserts are not acceptable***.

OPTION 10, REAR BUMPER

Rear bumper shall be black "Help" energy absorbent bumper as produced by Romeo Rim, Inc. (or approved Equal) and shall be equipped with an anti-ride feature. Bumpers shall be securely fastened to the chassis frame to adequately absorb shock from impact. In no case are the bumpers to be fastened directly to the body and allow shock from impact to be transmitted to the body of the vehicle.

OPTION 11, INTERIOR READING LIGHTS

Interior reading lighting shall be provided in the passenger area mounted in the overhead luggage bins. Lighting intensity for each seat shall have a minimum average of fifteen (15) foot candles at the seated passenger reading plane. The lighting components shall be located and constructed so as to prevent the entrance of water, contaminants and insects. Lighting fixtures shall be operated by an on/off switch at each fixture as well as an override in the master control panel near the driver for override operation by the driver.

OPTION 12, Reserved

OPTION 13, REMOTE CONTROLLED MIRRORS

Mirrors shall be remote controlled. The mirror glass shall be nine and three-quarters inch (9-3/4") in height by eight and five-eighths inch (8-5/8") in width. All parts including the mirror glass shall be replaceable. A remote control switch shall be provided and located in the operator's compartment; switch must be capable of controlling both right and left mirrors. Example: Ramco Mirrors Model #5500 w/o defrost feature.

OPTION 14, HIGHBACK PASSENGER SEATS

In lieu of the mid back seats with ABS seat backs and padded grab handles specified in paragraph 23.0, High back reclining passenger seats with an armrest on each seat shall be furnished for each of the seated passengers. All of the other requirements specified in paragraph 23.0 shall be provided.

OPTION 15, COMMUTER SEATING PACKAGE

The seating arrangements and configuration will be as per the attached floor plan. All seats shall be recessed track mounted with stainless steel inverted T-type pedestal support legs and hardware. The seats shall be high back reclining with footrest and adjustable fold down armrest on each seat. The armrest, recliner mechanism and setback cushion shall bolt directly to the seat frame. The front seat cushions shall have foam padding and be individually wedged to each passenger for occupant's comfort and retention. **Example: Freedman Coach Seat (OR APPROVED EQUAL).**

OPTION 16, UPGRADED DRIVER'S SEAT

A Magnum 200 (or approved equal) driver's seat provided by Freedman seating, or other supplier. A three (3) point safety belt shall be mounted to the seat frame and shall be equipped with an emergency locking retractor that has a feature that prevents it from progressively tightening the belt around the driver. Seat material shall be the same as the passenger seats.

OPTION 17, ELECTRIC POWERED PASSENGER ENTRY DOOR

In lieu of the manual door in paragraph 29.5, the passenger entry door panels shall be actuated together by a single electric powered overhead actuator. Actuator shall be equipped with an emergency manual release lever to allow manual opening in case of an emergency.

OPTION 18, LIFT PLATFORM COVER

Removable vinyl cover shall be provided for lift platform when in stored position.

OPTION 19, DESTINATION SIGNS *(REQUIRED ON FIXED ROUTE BUSES)*

Changeable Destination twelve (12) volt motor driven movable mechanism signs shall be furnished on the curb side above the passenger window and at the front of the vehicle above the windshield. Front sign curtain to be approximately 36 inches wide. Sign curtains to be illuminated. Front bulkhead or sign box shall have door to open for viewing sign curtain position. Door shall be positioned for ease of driver operation. Sign shall comply with ADA requirements. Example: Trans Sign, Model D-3110, or approved equal.

OPTION 20, PUBLIC INFORMATION SYSTEM *(REQUIRED ON FIXED ROUTE BUSES over 22 feet long)*

Driver activated PIS to announce stops and other passenger information. The system shall include four (4) speakers spaced throughout the vehicle above the passenger seating area enabling sound to reach each passenger. The system shall be integrated with AM/FM radio system so that the PIS will override the radio when activated.

OPTION 21, STOP REQUEST CHIME *(REQUIRED ON FIXED ROUTE BUSES over 22 feet long)*

A chime shall be provided that is activated by a pull cord. The pull cord shall be above the passenger windows within reach of each passenger.

OPTION 22, AM/FM RADIO & CASSETTE PLAYER

Radio shall be a standard brand AM/FM transistor radio with cassette player. *Antenna shall be furnished & mounted.*

OPTION 23, FAREBOX

Fare box shall be mounted with trip handle toward driver. It shall be mounted on a stanchion, adequately braced, located near the driver and easily accessible to passengers entering bus. An amber or indirect fare box light shall be connected to the dash instrument lights. Two interchangeable, lockable fare box vaults and fare box, keyed alike, with a double set of keys for each lock shall be supplied. Vault and fare box exteriors shall be marked with key reference. Vehicle shall be provided with wiring and structural support to install the fare box. Wiring for fare box circuit shall be two (2) No. 14 insulated wires in vinyl tubing, one energized directly from a battery positive feed protective circuit breaker and the other to ground.

Example: Main Fare box Model Treasury 1, Diamond, (or approved equal)

OPTION 24, PLEXIGLASS PANEL

A smoked Plexiglas 3/8 inch thick panel behind driver from top of driver's seat to within 6 inches of ceiling to be provided. Stanchion and panel shall not impair driver's seat adjustment.

OPTION 25, GROUND PLANE

A ground plane shall be installed during construction of the vehicle in anticipation of installation of a two-way radio. Coaxial leads shall be furnished. For additional information, contact the ordering agency.

OPTION 26, BILINGUAL SIGNS & DECALS

All safety and passenger assistance signs and decals shall also be provided in Spanish.

OPTION 27, EXTERIOR SIGN RACKS

Standard anodized aluminum ad racks measuring thirty inches (30") by ninety-six inches (96") shall be mounted on the left side of each vehicle.

OPTION 28, INTERIOR AD RACKS

Interior Ad Racks will be provided on each side of the vehicle interior. Racks will allow for slide-in placement of advertising copy and accommodate a minimum of nine (9), 11" x 14" plastic placards with advertising messages on EACH SIDE. Racks are not required to be back-lit but will be adequately illuminated for visibility of messages to passengers at all times.

OPTION 29, INTERLOCK MONITOR

In addition to the required interlock system, vehicle shall be equipped with a dash-mounted display panel provided by Intermotive Products which assists the operator in diagnosing interlock problems. This will require the use of the Intermotive Products interlock system.

OPTION 30, MorRyde Suspension

An enhanced rear suspension, (MorRyde or approved equal) will be provided.

OPTION 31, QRT Deluxe Wheel Chair Securement

In lieu of the specified securement system, the QRT deluxe model (8100 series) (or approved equal) will be provided..

OPTION 32, Sure Lok RTT System

In lieu of the specified securement system, the Sure-Lok Rapid Transit Tie-Down (RTT) system (or approved equal) will be provided.

OPTION 33, Child Safety Restraint Systems

This option should be selected by any agency providing Head Start transportation services in accordance with 45 CFR1310.2. The vehicle shall be equipped for the use of height- and weight –appropriate child safety restraint systems.