

**SECTION I – TECHNICAL SPECIFICATIONS
COMMUTER COACH
CRUISER BUS PURCHASE
SOLICITATION # 88 FOLDER # 20340**

TECHNICAL SPECIFICATION

1.1 SCOPE

These specifications represent a coach ideally suited to public commuter transit operations in terms of performance.

1.2 DEFINITIONS

The following are definitions of special terms used in Part II.

- (1) dBA. Decibels with reference to 0.0002 microbar as measured on the "A" scale.
- (2) Audible Discrete Frequency. An audible discrete frequency is determined to exist if the sound power level in any 1/3-octave band exceeds the average of the sound power levels of the two adjacent 1/3-octave bands by 4 decibels (dB) or more.
- (3) Standee Line. A line marked across the coach aisle in line with the driver's barrier to designate the forward area which passengers may not occupy when the coach is moving.
- (4) Free Floor Space. Floor area available to standees, excluding ingress/egress areas, area under seats, area occupied by feet of seated passengers, and the vestibule area.
- (5) Curb Weight. Weight of vehicle, including maximum fuel, oil, and coolant; and all equipment required for operation and required by this Specification, but without passengers or driver.
- (6) Seated Load. One hundred fifty (150) pounds for every designed passenger seating position and for the driver
- (7) Gross Load. Total of curb weight, seated load and standees at 150 pounds per individual passenger
- (8) SLW (Seated Load Weight). Curb weight plus seated load.
- (9) GVWR (Gross Vehicle Weight Rated). Curb weight plus the maximum vehicle weight that the bus can be safely loaded to.
- (10) Driver's Eye Range. The 95th-percentile ellipse defined in SAE Recommended Practice J941, except that the height of the ellipse shall be determined from the seat at its reference height.

- (11) Fireproof. Materials that will not burn or melt at temperatures less than 2,000 degrees F
- (12) Fire-Resistant. Materials that comply with Federal motor Vehicle Safety Standard (FMVSS) 571.302 - Flammability of interior materials, or having a flame spread index less than 150 as measured in a radiant panel flame test per ASTM-E162-75.
- (13) Human Dimensions. The human dimensions used are defined in SAE Recommended Practice J833.
- (14) Classes of Failures. Classes of failures are listed below:
 - (a) Class 1: Physical Safety. A failure that could lead directly to passenger or driver injury and represents a severe crash situation.
 - (b) Class 2: Road Call. A failure resulting in an enroute interruption of revenue service. Service is discontinued until the coach is replaced or repaired at the point of failure.
 - (c) Class 3: Coach Change. A failure that requires removal of the coach from service during its assignments. The coach is operable to rendezvous point with a replacement coach.
 - (d) Class 4: Bad Order. A failure that does not require removal of the coach from service during its assignments but does degrade coach operation. The failure shall be reported by driver, inspector, or hostler.

1.3 ABBREVIATIONS

The following is a list of abbreviations used in these specifications.

- (1) ASTM: American Society of Testing and Materials.
- (2) SAE: Society of Automotive Engineers
- (3) ANSI: American National Standards Institute.
- (4) ASHRAE: American Society of Heating, Refrigerating, and Air Conditioning.
- (5) SPI: Society of the Plastics Industry.
- (6) USDHEW: United States Department of Health, Education, and Welfare
- (7) JIC: Joint Industrial Council.
- (8) BMCS: Bureau of Motor Carrier Safety.
- (9) FMCSR: Federal Motor Carrier Safety Regulations

- (10) FMVSS: Federal Motor Vehicle Safety Standards
- (11) ABS: Antilock Braking System

1.4 LEGAL REQUIREMENTS

The coach shall meet all applicable Federal Motor Vehicle Safety Standards and regulations as established by the U.S. Department of Transportation and all applicable FMCSR regulations in effect at the date of manufacture.

The manufacturer shall comply with all applicable Federal and State regulations. In event of any conflict between the requirements of this Specification and any applicable legal requirement, then the legal requirement shall prevail.

1.5 OVERALL REQUIREMENTS

1.5.1 DIMENSIONS

1.5.1.1 PHYSICAL SIZE

With the exceptions of exterior mirrors, marker and signal lights, bumpers, flexible portions of the bumper, fender skirts, and rubrail, the coach shall have the following overall dimensions.

- (1) Length: 45 feet, 0 inches (+0, -1 inch)
- (2) Width: 8 feet, 6 inches (+0, -1 inch)
- (3) Height: 137" maximum loaded or unloaded.
- (4) First Step Height: 15.5" Maximum

1.5.1.2 UNDERBODY CLEARANCES

The coach provided shall meet the following underbody clearances.

Approach angle	11°	
Breakover angle	8.5°	<i>(measured per SAE J689)</i>
Departure angle	6.2°	and 13° in high rise mode
Ground clearance	10"	
Axle clearance, as measured	6.50"	

1.5.2 WEIGHT AND AXLE LOADING

Each vehicle, at a capacity load, shall not exceed the gross vehicle weights or maximum axle weights

specified. In no case shall the axle weight exceed 22,400 pounds. In the interest of economy in construction and operation it shall be the goal to manufacture the coach as light as possible without degradation of safety, performance, appearance, comfort and reliability. Total vehicle weight shall not exceed the gross vehicle weight rating nor axle weight rating at ground as specified. GVWR shall not exceed 48,000 pounds for a 45-foot bus.

1.5.3 CAPACITY

Rated passenger capacity of the coach shall be as outlined below. Provisions to secure two wheelchair passengers shall also be provided. The overall seating capacity may be reduced when the securement positions are being utilized.

45 foot/102 inch bus	57 seats
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1.5.4 SERVICE LIFE AND MAINTENANCE

1.5.4.1 SERVICE LIFE

The coach shall be designed to operate in commuter service for at least 12 years or 500,000 miles of revenue service whichever comes first.

1.5.4.2 MAINTENANCE AND INSPECTION

Scheduled maintenance tasks shall be related and shall be grouped in maximum mileage intervals. Routine scheduled maintenance actions, such as filter replacement and adjustments, shall not be required at intervals of less than 6,000 miles, except for routine daily service performed during the fueling operations. Higher levels of scheduled maintenance tasks shall occur at even multiples of mileage for lower level tasks.

The manufacturer shall provide a preventive maintenance schedule covering all components upon delivery of the first production vehicle. Each schedule shall be complete and shall adhere to frequency intervals considered normal industry standards.

1.5.4.3 MEAN MILEAGE BETWEEN FAILURES

The following are design goals for mean mileage between failures by failure class, provided that all specified preventive maintenance procedures are followed.

- (1) Class 1: Physical Safety. Mean mileage shall be greater than 1,000,000 miles.
- (2) Class 2: Road Call. Mean mileage shall be greater than 20,000 miles.
- (3) Class 3: Coach Change. Mean mileage shall be greater than 16,000 miles.
- (4) Class 4: Bad Order. Mean mileage shall be greater than 10,000 miles.

1.5.4.4 ACCESSIBILITY

All systems or components serviced as part of periodic maintenance or whose failure may result in Class 1 or Class 2 failures shall be readily accessible for service and inspection. Removal or physical movement of components unrelated to the specific maintenance and/or repair tasks involved shall be minimized. Relative accessibility of components, measured in time required to gain access, shall be inversely proportional to frequency of maintenance and repair of the components.

1.5.4.5 INTERCHANGEABILITY

Components with identical functions shall be interchangeable with the exception of windows and baggage bay doors. Components with non-identical functions shall not be, or appear to be, interchangeable.

1.5.5 OPERATING ENVIRONMENT

The coach shall achieve normal operation in temperature ranges of -10 degrees to 115 degrees F., at relative humidity between 5 percent and 100 percent and at altitudes up to 5,000 feet above sea level. Degradation of performance due to atmospheric conditions shall be minimized at temperatures below -10 degrees F., and above 115 degrees F. or at altitudes above 5,000 feet. Special equipment or procedures may be employed to start the coach after a 12 hour or more exposure to temperatures below +30 degrees F. without the engine in operation. Speed, gradability, and acceleration performance requirements shall be met at, or corrected to, 85 degrees F., 29.00 inches Hg, dry air. Performance degradation at conditions other than the test standard shall not exceed 1 % for each 3 degrees F. and 4 % for 1,000 feet of altitude above the standard.

1.5.6 MATERIALS AND CONSTRUCTION

For economy in maintenance, it is essential that parts and units be arranged so that rapid assembly and disassembly will be possible for the coach being provided. The dimensions of all parts, unless particularly specified, will be in accordance with current standards of the Society of Automotive Engineers, or the metric equivalents. All units or parts not specified shall be Manufacturer's standard units or parts and shall conform in material, design and workmanship to industry standards and shall meet or exceed all Federal and State motor vehicle safety standards. During the manufacturing of the coaches all parts shall be new and in no case will used, reconditioned or obsolete parts be accepted. No advantages shall be taken by the Manufacturer in the omission of any parts or details that make the coach complete and ready for service, even though such parts or details are not mentioned in these specifications.

Workmanship throughout shall conform to the high standard of commercially accepted practice for the class of work and shall result in a neat and finished appearance. All exposed surfaces and edges shall be smooth, free from burrs and other projections, and shall be neatly finished. Exposed metal surfaces, prior to paneling or covering shall be properly prepared and coated with protective material to insure against corrosion or deterioration.

All lubrication points, unless otherwise specified, shall be capable of accepting a high pressure grease

gun operated on fittings that permit grease to travel into the lubrication point but does not permit the grease to escape and designed so that when the grease gun is withdrawn, there is a positive barrier preventing dirt from entering the fitting. These fittings shall be of one manufacture and shall be accessible for a grease gun while the vehicle is being serviced on either a lift or a pit.

2.0 BODY

2.1 DESIGN

The coach shall have a clean, smooth, simple design, primarily derived from coach performance requirements and passenger service criteria. Body construction shall not be of a body on chassis type. The coach shall be painted down to the street surface. The exterior and body features, including grilles and louvers, shall be shaped to allow complete and easy cleaning by automatic bus washers without snagging washer brushes. The retention of water and dirt in or on any body feature or the freezing or bleeding out of this dirt and water after leaving the washer shall be minimized. Body and windows shall be sealed to prevent leaking of air, dust, or water under normal operating conditions and during cleaning in automatic bus washers for the service life of the coach. Accumulation of spray and splash on any window of the coach generated by its wheels on a wet road shall be minimized. Corners, especially at windows, shall be rounded. The undercarriage of the coach shall be sealed off to the maximum extent practicable to significantly reduce the intrusion of road spray.

2.2 MATERIALS

Body materials shall be selected and the body fabricated to reduce maintenance, extend durability, and provide consistency of appearance throughout the life of the coach. Detailing shall be kept simple; add-on devices and trim shall be minimized and, where necessary, integrated into the basic design.

2.3 FINISH AND COLOR

All exterior surfaces shall be smooth and free of wrinkles and dents. Exterior surfaces to be painted shall be properly cleaned and primed as appropriate for the paint used, prior to application of paint to assure a proper bond between the basic surface and successive coats of original paint for the service life of the coach. Paint utilized shall be Dupont Imron 5000, 3.5 VOC two part polyurethane enamel that exhibits excellent color and gloss retention, chip, abrasion, stain and mar resistance, chemical and solvent resistance and excellent cleanability per industrial standards. Paint shall be applied smoothly and evenly with the finished surface free of dirt, runs, orange peel, and other imperfections. All exterior finished surfaces shall be impervious to diesel fuel, gasoline, and commercial cleaning agents. Finished surfaces shall not be damaged by controlled applications of commonly used graffiti-removing chemicals. The bidder that is awarded the contract will be given the final design requirements.

2.5 NUMBERING AND SIGNING

Monograms, numbers and other signing shall be applied to the inside and outside of the coach as required. Signs shall be durable and fade, chip, and peel-resistant; they may be decals, or pressure-sensitive appliques.

EXTERIOR

Lettering, color black, shall be as follows:

1. Warning name plates to be installed in condenser fan compartment.
2. Fuel fill location – on inside of fuel door to read #1 and #2 ULSD fuel only.
3. Electric Terminal Compartment - indicate correct voltages for all terminals.
4. Two wheelchair lift decals; one installed on the curbside of coach in front and one installed at the wheelchair lift sliding door.
5. No manufacturing logos shall be permitted on the front and sides of coach.

INTERIOR

1. Emergency exit instructions as necessary.
2. 4” interior fleet numbers white in color (numbers to be supplied to after award).
3. Header Decal “Video Surveillance may be in use”
4. "Upon Request Of The Operator Or Other Authorized Person, please vacate these seats to make room for senior citizens, people with disabilities or pregnant passengers" to be provided in compliance with ADA requirements.
5. Install a pressure sensitive "no " decal with the following heading and three statements - "Please - No Smoking - No eating or drinking - radios silent." Do not include any foreign language. The decal is 13 1/2" long, 6" wide, white background with the appropriate 3 1/2" diameter red, black and white visual symbol under each statement. Location to be determined by transit system.
6. Both the “Watch Your Step” and “Welcome Aboard” signs shall be incorporated in the same nameplate permanently mounted to the second step riser with black letters with yellow background.
7. "No Solicitation", “No Standing forward of the yellow line”, “No Smoking” and “Remain Seated Do Not Talk to Driver” decal. Additional header decals and signs shall be applied as necessary to comply with all Federal and State laws governing same.
6. "Please Do Not Cross In Front of Bus" - on the back of the run number box.

7. Seat numbers will be supplied

2.6 PEDESTRIAN SAFETY

Exterior protrusions greater than ½-inch and within 80 inches of the ground shall have a radius no less than the amount of the protrusion. The left and right side rear view mirrors, windshield washer nozzles and required lights and reflectors are exempt from the protrusion requirement. Grilles, doors, bumpers and other features on the sides and rear of the coach shall be designed to minimize the ability of unauthorized riders to secure toeholds or handholds.

2.7 STRUCTURE

2.7.1 STRENGTH AND FATIGUE LIFE

The structure shall be of a sufficiently strong and efficient design to withstand the conditions of transit service throughout the service life of the coach. The design shall incorporate all severe service, heavy-duty features available from the contractor.

Any manufacturer whose bus is or has been involved in a structurally related fleet failure (number of failures exceeding ten percent (10%) of the fleet) in any transit property in the U.S. in the last six (6) years or who has been directed by the National Highway Transportation Safety Administration to make repairs of any bus must have completed a detailed investigation of the failure, a detailed structural analysis of the complete bus structure to rule out related defects on any part of the structure, and shall supply a complete copy of the corrective actions to be undertaken. All failures involving basic body, structure, axles, and suspension are considered structural related failures for the purposes of this specification.

The investigation of a failure and structural analysis must be carried out by a reputed independent Transit Industry Consultant and shall not be limited to finite element analysis or appropriate test but shall be confirmed by an actual track test evaluation with suitable time concentration to demonstrate the ability of the modified structure to perform for the specified 500,000.

2.7.2 DISTORTION

The coach at GVWR and under static conditions, shall not exhibit deformation or deflection that impairs operation of doors, windows, or other mechanical elements. Static conditions include the vehicle at rest with any one wheel or dual set of wheels on a 6-inch curb or in a 6-inch-deep hole.

2.7.3 RESONANCE

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

2.7.4 MATERIAL

Reinforced fiberglass and plastic materials shall be excluded from structural body construction, except for replaceable panels or doors and for non-load bearing front and rear roof caps and the front lower panel below the windshield and the A-pillar covers and transom panels.

2.7.5 CORROSION

The coach shall resist corrosion from atmospheric conditions and road salts. It shall maintain structural integrity and nearly maintain original appearance throughout its service life, provided it is maintained in accordance with the procedures specified in the service manual. All exposed body panels above and below the floor line shall be aluminum or stainless steel except for the front end upper and lower panels, the rear end upper panels and the upper sidewall galvanized panel which are made of fiberglass or galvanized steel. Materials exposed to the elements and all joints and connections of dissimilar metals shall be corrosion-resistant and shall be protected from galvanic corrosion. Bidders proposing steel tubing for frame construction are required to use stainless steel tubing of comparable cross section. Proposals shall contain the manufacturer's complete corrosion protection plan including a specific identification and illustration of structural and exterior material and their relative corrosion resistance.

All frame members below the passenger floor that are subject to road splash and are less than .10 inch shall be stainless steel for maximum corrosion protection. All other frame members exposed to splash are to be High Strength Low Alloy steel and are to be .10 inch thick minimum and shall be coated with Tectyl 127CG on all surfaces exposed to road splash for maximum corrosion protection.

Plywood floor supports in the passenger and drivers area, the sidewall structures and roof structures that are not exposed to road spray shall be High Strength Low Alloy and primed prior to incorporation into the coach assembly.

The floor supports and sidewall components shall be painted with a suitable finish coat.

Outer sidewall panels above the passenger floor and below the windows shall be galvanized steel, galvanized inside and preprimed outside. The roof panels shall be preprimed aluminum both sides and the front and rear roof caps fiberglass.

The upper rear engine door and louvers may be made of fiberglass.

The wheelchair lift door may be made of an aluminum frame or other acceptable lightweight material and aluminum exterior panel.

Non-structural underbody panels used for baggage bay floors and to retain insulation in other areas, shall be Tectyl coated aluminum or stainless steel for maximum corrosion protection. In the wheelwell areas, non-structural closeout panels shall be stainless steel.

Before assembling, all metal body parts must be given a thorough anti corrosion treatment. Joints between dissimilar metals shall be properly insulated with an inert plastic tape to avoid corrosion due to electrolytic action. All nuts, bolts, clips, washers, clamps, and like parts shall be zinc or cadmium plated, phosphate coated, black oxide coated, stainless steel, or nylon to prevent corrosion. All exterior joints and seams must be sealed.

Dissimilar metals must be separated by a non-conductive barrier.

Barriers may consist of one of the following:

- a) a black elastic compound tape
- b) a mylar tape
- c) a double sided structural adhesive tape

Where tape barriers are not feasible an appropriate sealant shall be used to provide a protective barrier and a water tight seal. This sealer must be used on all panels and assemblies that are susceptible to water leaks.

2.7.6 TOWING

Towing devices shall be provided and be permanently mounted on the front and rear of the coach. The coach may be towed from the front only, however must be able to recover from the rear. Recovery shall mean to move the bus into the clear so it can be hooked up and towed from the front. Lift and tow is not required.

Front towing device shall withstand, without permanent deformation, tension loads up to 1.2 times the curb weight of the coach within the 20° of the longitudinal axis of the coach. Towing device shall accommodate a crane hook with a 1-inch throat. A minimum of two steel rear skid plates measuring approximately 15.2 x 3.3 shall be welded to the underside of the engine rails. Skid design shall be durable construction to adequately protect mechanical or other body components from damage due to the coach bottoming out.

2.7.7 JACKING & HOISTING

It shall be possible to safely jack up the bus, at curb weight, with an 8.5 inch-high hydraulic hand jack or a 10-ton floor jack when a tire or dual set is completely flat and the bus is on a level, hard surface. Jacking from a single point shall permit raising the bus sufficiently high enough to remove and reinstall any wheel and tire assembly. The bus shall be fitted with jacking pads for each tire/wheel locations and shall permit easy and safe jacking with the flat tire or dual set on a 3.5-inch high run-up block not wider than a single tire. The bus will withstand such jacking at any one or any combination of wheel locations without permanent deformation or damage. The bus axles or jacking plates shall accommodate the lifting pads of a post hoisting system. Jacking plates shall be approximately 2.00 inches square, with a turned-down flange not less than 0.5 inch deep on each side to prevent the bus from falling off the hoist. Other pads shall be provided to support the bus on jack stands independent of the hoist

2.7.9 FIRE PROTECTION

The passenger and engine compartments shall be separated by a bulkhead(s) which shall, by utilization of fire resistant materials in its construction, be a firewall. This firewall shall preclude or retard propagation of an engine compartment fire into the passenger compartment. Only necessary openings shall be allowed in the firewall, and these shall be fire resistant. Any passageways for climate control

system air flow shall be separated from the engine compartment by fire resistant material. Piping through the bulkhead shall be copper, steel, or brass, and shall be sealed with fire-resistant material at the firewall. Wiring may pass through the bulkhead only if connectors or other means are provided to prevent or retard fire propagation through the firewall. The conduit and bulkhead connectors shall be sealed with fireproof material at the firewall. Engine access panels in the firewall shall be fabricated of fireproof material and secured with fireproof fasteners. These panels, their fasteners, and the firewall shall be constructed and reinforced to minimize warping of the panels during a fire that will compromise the integrity of the firewall. The coach body shall be adequately sealed to prevent the intrusion of smoke, fuel, and fumes into the coach interior.

2.7.10 FIRE SUPPRESSION SYSTEM

An Amerex V-25 or approved equal fire suppression system shall be provided. Each nozzle will provide at least 240 cubic feet of flooding coverage with application coverage of at least 900 square inches. Cast iron fittings may not be used. All hoses shall be secured to prevent rubbing/contact with suspension/chassis components.

Actuation of the agent the cylinder valve used to distribute the extinguishing agent shall be accomplished by a mechanical control header/lever. The lever shall lock in only the fully open or fully closed position. Remote actuation shall be accomplished by a pneumatic control head releasing nitrogen gas by striking a push button. The tanks shall have an operating pressure of 1800 psig and shall be equipped with a pressure gage with a green area showing acceptable operating range.

The presence of fire shall be detected by devices approved by Factory Mutual Research Corporation as heat actuated fire detectors. A circuit monitor shall provide electrical supervision of the power, heat detection and system actuation. The enclosure shall be watertight. The control shall indicate Normal, Fire and Fault conditions. A red LED shall clearly be labeled fire. The circuit monitor shall also be equipped with an audible alarm that is activated in either the Fire or Fault situation. A method to silence the alarm shall be provided.

A circuit supervision and control capability shall be provided for the fire suppression system shall be visible to and accessible by a seated operator. The control shall supervise the automatic fire suppression system electrical circuits, facilitate the connection for these various circuits and provide auxiliary contacts that control external vehicle shutdown or safety devices in the event of activation of the fire suppression system. This panel shall also control the nitrogen cylinder by showing pressure. A battery backup shall be provided. An internal test circuit and internal diagnostic capability shall be supplied.

A dry chemical fire suppression agent distribution system with two (2) nozzles shall be installed. The entire system shall be approved by the Factory Mutual Research Corporation for mobile equipment operating between -65 degrees F and +150 degrees F. Nozzles shall be brass and equipped with dust caps that are displaced by the chemical flow and fall in an area so that they do not add fuel for a fire.

2.7.11 EXTERIOR AND APPLIED PANELS

2.7.11.1 STRENGTH AND INSTALLATION

Exterior panels above and below the rubrail may be structural components. Panels shall be secured to structural members and shall have a smooth finish with no sharp edges.

2.7.11.2 REPAIR AND REPLACEMENT

Exterior panels below the rubrail shall be divided into sections that are repairable or replaceable by a mechanic. Baggage doors shall be two part with the joint at or below the rubrail.

2.7.11.3 RAIN GUTTERS

Gutters shall be provided to minimize water flowing from the roof onto the side windows and passenger doors. When the coach is decelerated, the water shall not drain onto the windshield, driver's side window, the passenger boarding area or into the lift door area.

2.7.11.4 LICENSE PLATES

Provisions shall be made to mount standard size U.S. license plates on the front and rear of the coach. These provisions shall recess the license plate so that they can be cleaned by automatic coach washing equipment without being caught by the brushes. Four fasteners shall be utilized to retain license plate. License plate shall be mounted to the left of the coach center. Provision shall be made to illuminate the surface of the rear license plate only.

2.7.11.5 RUBRAILS

Rubrails shall have a minimum height dimension of 2.5 inches and shall be composed of flexible, resilient material shall be provided to protect both sides of the coach body from damage caused by minor sideswipe accidents. The rubrail may be discontinued at doorways and the condenser intake grille. A damaged portion of the rubrail shall be replaceable without requiring removal or replacement of the entire rubrail.

2.7.11.6 PACKAGE RACKS

A minimum 10 module package rack without compartment doors shall be furnished over all two-passenger seating positions except in the wheelchair door area. The rack end facing the aisle shall incorporate a concealed handhold, running full length, for use by standees. Passenger headroom measured from the rack end to the top of the seat headrest, shall be a minimum 19". Interior window post caps shall be ABS, thermo formed plastic, off-white in color to provide a clean finished appearance. The interior of the rack shall be vinyl covered aluminum to complement the interior. Rack shall be supported by polycarbonate glass filled hangers spaced approximately 40" apart. Total capacity shall be a minimum 109 ft.³ to allow for ample storage space for carry-on items.

A cluster panel mounted on the underside of the package rack shall include minimum 10 watt, 6 c.p. individually controlled and adjustable passenger reading lights, and an exit signal push button, red in color and individual air distribution outlets receiving air from the coach HVAC system. These outlets shall be adjustable from fully closed to full open position. A minimum of twenty-six (26) 5", 40 watt, 4-ohm speakers shall also be provided in the cluster panels for the dash mounted, driver controlled public address system. Speakers shall broadcast, in a clear tone, announcements that are

clearly perceived from all seat positions at approximately the same volume level. Passengers utilizing the securement systems shall be provided identical amenities as provided for all other passengers except that the parcel rack shall be deleted in the area of the wheelchair lift door. Separate and independent notification will be provided on the dashboard indicator panel for stop request notification from securement positions. The portion of the parcel rack behind the driver shall include a separate enclosed driver's compartment. The compartment door shall include a keyed alike lock to secure the radio/video equipment. The portion of the front parcel rack on the curbside of the coach shall include a separate enclosed driver's compartment. No light shall be included in this parcel rack compartment.

2.7.11.7 UNDERFLOOR BAGGAGE COMPARTMENTS

Full width underfloor baggage compartments shall be provided between the front and rear axles. Each compartment shall be separated by an aluminum panel but the front and rear bulkheads shall be stainless steel. The compartment doors shall be a two part with the joint at or below the rubrail, fully sealed vertical lift pantograph type. Each door shall include an aluminum frame with an aluminum outer panel. Doors shall be spring counter balanced for ease of operation. Each door shall be equipped with a keyed alike baggage door lock. They will have a key lock for the manual controls for the wheelchair lift and a 4" x 10" flush mounted breakaway type latch handle located with a center point approximately 38" off the ground.

Each underfloor compartment shall be pressurized and illuminated automatically with two (2) 21 c.p. incandescent lamps when the doors are opened. The lights shall be wired to the engine run switch. The lamp fixtures shall be sealed to preclude the intrusion of dust and moisture into the fixture. The floor of the baggage compartments shall be corrugated aluminum.

2.8 INTERIOR

2.8.1 HEADROOM

Headroom above the aisle shall be no less than 78 inches.

If a Jake brake is to be provided, a "hump" ahead of the rear cross seat will decrease headroom to approximately 74".

2.8.2 DRIVER BARRIER

A barrier or bulkhead between the driver and street side front passenger seat shall be provided. The barrier shall eliminate glare and reflections in the windshield directly in front of the barrier from interior lighting during night operation. The drivers barrier shall extend from below the level of the passenger or driver seat cushion, whichever is lower, to above the level of the seated driver's head and shall fit within 1.5 inches from the coach side window/wall to prevent passengers from reaching the driver or his/her personal effects. The barrier design shall accommodate a minimum of 9 inch fore and aft travel of the specified operator's seat.

The driver's barrier shall be constructed of clear .472" thick Lucite glazing. The barrier shall be a

shatter-proof clear acrylic sheet that meets AS standards AS-4 or AS-5. The glazing shall be indelibly marked with the manufacturer's name and type of material. On the aisle side, the barrier shall be cut out from the vertical stanchions to permit passengers to use the stanchion as a handhold. Any panels above and below the glazing shall be complementary in color to the sidewall material. A schedule holder will be supplied and installed on the passenger side of the driver's modesty panel clear plexiglass.

2.8.3 MODESTY PANELS

Sturdy modesty panels constructed of durable, unpainted, corrosion-resistant material complementing the interior trim shall be provided at the rear of the stepwell. The modesty panel and its mounting shall withstand normal kicking, pushing, and pulling loads of 200-pound passengers without permanent visible deformation. Curb side modesty panel is to be cutback at the top to provide maximum clearance for farebox.

2.8.4 REAR BULKHEAD

The rear bulkhead paneling shall be contoured to fit the ceiling, side walls, and seat backs so that any litter, such as a cigarette package or newspaper, will tend to fall to the floor or seating surface when the coach is on a level surface.

2.8.5 CONSTRUCTION

Interior panels may be integral with, or applied to, the basic coach structure. They shall be decorated in accordance with and compliment the interior specified. Use of moldings and small pieces of trim shall be minimized, and all parts shall be functional. Panels shall be of backed melamine, vinyl-clad aluminum or vinyl-clad steel. Front closure shall be fiberglass with color molded in, and there shall be no painted surfaces. The rear enclosure panel shall be Bus Tex 2339-761 fabric covered panels. The lower sidewall shall be BusTex 1781-761 fabric covered panels sectionalized for ease of repair.

2.8.6 FASTENING

Interior panels shall be attached so that there are no exposed edges or rough surfaces. Panels and fasteners shall not be easily removable by passengers. Interior trim fasteners, where required, shall be rivets, Phillips, or tamper-proof screws. Removal of all interior fasteners, except for rivets, shall only require the use of two tool types to remove.

2.8.7 FLOOR

2.8.7.1 STRENGTH

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

2.8.7.2 EDGES

The floor shall be essentially a continuous flat plane, except at the stepwell. Where the floor meets the walls of the coach, the surface edges shall be blended with a circular section of radius not less than 1 inch and a molding or cover shall prevent debris accumulation between the floor and wall.

Interior flooring shall be flat throughout except for an 8 ft. long welded ramp in the aisle section at the front which is sloped 5.35 degrees and has a 3 inch riser under the #1 RH passenger seat. The floor is attached to the underframe with adhesive and monobolt rivets. Wheel housings may not extend above floor line.

Rubber flooring adhesion procedure includes butt cut type edges that are securely bonded to the plywood floor with a waterproof adhesive. Flooring areas which are edge-bound with stainless steel shall include the sidewall on each side, the ramp in the center aisle, the base of rear cross seat, and the step up under the #1 seat.

Access openings in the floor shall be sealed to prevent entry of fumes and water into the coach interior. Flooring material shall be flush with the floor and shall be edgebound with stainless steel to prevent the edges from coming loose. Access openings may be symmetrical if the fasteners are arranged to ensure alignment of the flooring. Fasteners shall be flush with the floor when secured.

2.8.7.3 FLOOR PROTECTION

The floor, as assembled, including the sealer, attachments, and covering, shall be waterproof, non-hygroscopic, resistant to heat, dry rot, mold growth, and impervious to insects. Plywood shall be no less than 1/2 inch 5 ply thick, water resistant Douglas Fir Canadian Standard Association and shall be installed with all edges sealed. The floor in the aisle shall be no less than an overall thickness of 1/2 inch water resistant Douglas Fir Canadian Standard Association. The flooring shall have Grade "A" one side with the "A" side facing up.

2.8.8 STEPS AND STEPWELL

2.8.8.1 STEPS

There shall be no more than 4 steps and no step shall be located between the vestibule and passenger compartment. A ramp shall be provided in this area with the rate of rise not to exceed 3/4-inch per foot with a maximum vertical rise of 9 inches.

All step treads shall be of uniform depth no less than 11 inches and a uniform height of no less than 9.5 inches. The plane of the step treads shall be parallel to the plane of the floor. Treads shall be covered with Altro D2502 Cobalt flooring or approved equal that shall remain effective in all weather conditions. Color of the tread covering shall match the vestibule flooring. The edge of the vestibule floor shall have no overhang at the step riser. The edge of the vestibule floor and the edge of each of the step treads shall have a bright, contrasting yellow band, 2 inches wide, the width of the step. This band shall be uniform in width across the entire step and vestibule edge.

2.8.8.2 STEPWELL CONSTRUCTION

Stepwell shall be constructed entirely of stainless steel. The steps shall simultaneously support 300-pound loads evenly distributed over the center half of each step tread without permanent deformation and with elastic deflection of no more than 0.0625 inches. Each step tread shall support a load of 500 pounds evenly distributed over the center half of the tread without permanent deformation. A minimum 1" (25.4 mm) thick Tuf-Coat self-adhesive insulation shall be provided behind the stepwell area for added control of interior temperature variances and to minimize road noise.

2.8.9 WHEEL HOUSING

2.8.9.1 CONSTRUCTION

Wheel housings shall be constructed of stainless steel. Wheel housing, as installed and trimmed, shall withstand impacts of a 2-inch steel ball with at least 200 foot-pounds of energy without penetration.

2.8.9.2 CLEARANCE

Sufficient clearance and air circulation shall be provided around the tires, wheels, and brakes to preclude overheating. Tire chain clearance shall be provided on all outer wheels in accordance with SAE Information Report J683. Interference between the tires and any portion of the coach shall not be possible in maneuvers up to the limit of tire adhesion with weights from wet to GVWR.

2.8.9.3 FENDER SKIRTS

Front and rear wheelwells shall be fully skirted with rubber to minimize spray and splash. The fender skirts shall be unbreakable and easily replaceable. They shall be flexible if they extend beyond the allowable body width. Wheels and tires shall be removable without disturbing the fender skirts.

2.8.12 SPLASH APRONS

Splash aprons, composed of ¼-inch minimum composition or rubberized fabric or 3/16-inch nylon reinforced rubber, shall be installed behind each front wheel and the rearmost wheels and shall extend downward to within 4" above the road surface. Apron widths shall be no less than tire widths. Splash aprons shall be bolted to tapping plates which are welded to the coach understructure. The tapping plates shall support the splash apron across its entire width. Splash aprons and their attachments shall be inherently weaker than the structure to which they are attached. Splash aprons and their attachments shall not be included in the road clearance measurements. Other splash aprons shall be installed where necessary to protect coach equipment.

2.8.13 PASSENGER DOORS

The passenger door shall be an air power operated transit type two section BI-part door with a switch convenient to the left of the operator. Door projection shall not exceed 7" out from the side of the coach while in the fully open position and shall not exceed 10 inches while going through the opening and closing cycle. The forward front door leaf leading edge shall rest within one inch of the front

bumper when fully opened. All door glazing shall be ¼ inch laminated safety-glass tinted the same as the windshield and indelibly marked AS-2 Door glazing shall make up 65% of the surface area of the door. No entrance door key lock shall be provided.

2.8.14 SERVICE COMPARTMENTS AND ACCESS DOORS

2.8.14.1 INTERIOR

Access for maintenance and replacement of equipment shall be provided by panels and doors that appear to be an integral part of the interior. Removal of fixtures or equipment unrelated to the repair task to gain access shall be minimized. Access doors, if hinged, shall be hinged with props, as necessary, to hold the doors up and out of the mechanic's way with the exception of the destination sign box door which hinges down and is held by chains in the open position. Panel fasteners shall be standardized so that only two tools are required to service all special fasteners within the coach. These fasteners shall be captive in the panel except for the engine compartment access hatches. Access doors for the door actuator compartments shall be secured with hand screws or latches, and shall be sealed to prevent entry of mechanism lubricant into the coach interior. All hinges and props must be designed to preclude accidental closure when the panels are opened.

2.8.14.2 EXTERIOR

Vertically hinged doors shall be used for the engine compartment and for all auxiliary equipment compartments including doors for checking the quantity and adding to the engine coolant, engine lubricant, transmission fluid and the windshield washer reservoir. The upper engine radiator/C.A.C. compartment door may be horizontally hinged. Access to these compartments shall be from outside the coach. Access openings shall be sized for easy performance of tasks within the compartment including tool operating space. Access doors shall be of rugged construction and shall be capable of withstanding severe abuse throughout the life of the coach. They shall close flush with the body surface. All doors shall be hinged at the top or on the forward edge and shall be prevented from coming loose or opening during transit service or in coach washing operations. Doors with top hinges shall have safety props stored behind the door or on the door frame. All access doors (except vertically hinged access doors) shall be sufficiently retained in the open position by props or counterbalancing. Gas springs shall only be permitted on the rear upper engine cooling door. Springs and hinges shall be corrosion-resistant and shall last throughout the service life of the coach. Latch handles shall be sized to provide an adequate grip for opening. Large access doors shall hinge up and out of the way or fold flat against the coach body and shall be easily operable by one person. These doors, when opened, shall not restrict access for servicing other components or systems. Retention devices utilized to hold the engine compartment access doors in the open position shall be heavy duty and designed to last the service life of the coach. No locks shall be supplied on the battery door or the master switch access door.

2.9 OPERATING COMPONENTS

2.9.1 DOORS

2.9.1.1 CONTROL

Operation of, and power to, the passenger door shall be completely controlled by a switch located in close proximity to the driver to the left of the steering wheel. A control or valve in the driver's compartment shall shut off the power to, and/or dump the power from the front door mechanism to permit manual operation of the front door with the coach shut down. A toggle switch on the exterior of the coach shall permit opening of the front door. The switch shall be concealed behind an unmarked door. The door switch cover shall be spring loaded so as to be held in the closed position and be located just behind the entrance door.

2.9.1.2 ACTUATORS

The nominal door opening and closing speed shall be in the 3-5 second range. The maximum door opening and closing speeds will be regulated using fixed, maintenance free orifices and airline sizes. If required, door speeds can be decreased with the addition of a flow-restricting device. Actuators and the complete door mechanism shall be concealed from passengers, but shall be easily accessible for servicing.

2.9.1.3 MANUAL OPERATION

In the event of an emergency, it shall be possible to open the doors manually from inside the coach after actuating an unlocking device. Any signage detailing the method of operation of door in an emergency shall not reference the "emergency operation" of the door. All references shall detail the "manual" operation of the door.

2.9.2 WINDSHIELD WIPERS AND WASHERS

2.9.2.1 WINDSHIELD WIPERS

The coach shall be equipped with variable speed electric windshield wipers for each half of the windshield with separate controls for each side. No part of the windshield wiper mechanism shall be damaged by manual manipulation of the arms. Both wipers shall park along the center vertical edges of the windshield glass. Windshield wiper motors and mechanisms shall be easily accessible for repairs or service from outside the coach only and shall be removable as complete units. Mounting shall preclude cracking or damage to the windshield frame. Power supply to the wiper motors shall be provided through a dedicated circuit.

An intermittent operation feature for each wiper shall be provided with a variable time delay. After each pause, the wiper shall make one complete cycle across the windshield surface and return to the park position automatically.

2.9.2.2 WINDSHIELD WASHERS

The windshield washer system shall deposit washing fluid on the windshield and, when used with the wipers, shall evenly and completely wet the entire wiped area. Two separate washer pumps are to be provided. Wet type wiper arms shall not be permitted.

The windshield washer system shall have a minimum 4 gallon translucent reservoir, located for easy refilling. Reservoir pumps, lines and fittings shall be corrosion-resistant, and the reservoir itself shall be translucent for easy determination of fluid level. The windshield washer system shall be protected with an anti-freeze washer solution to -20°F (-29°C), regardless of season of delivery. The protected solution shall be tinted to provide easy visual indication that anti-freeze is present.

2.9.3 LIGHTING, CONTROLS, INSTRUMENTS

2.9.3.1 EXTERIOR LIGHTING

All exterior lighting systems shall be nominal 12VDC. The use of LED lamp assemblies shall be maximized to the extent practicable. All exterior lighting fixtures shall be sealed to prevent entry and accumulation of moisture or dust and each lamp shall be replaceable in less than 5 minutes by a mechanic. Lights if mounted on the engine compartment doors shall be protected from the impact shock of door opening and closing. Lamps, lenses and fixtures shall be interchangeable to the extent practicable, and fixtures shall be corrosion resistant with sockets to be brass or stainless steel or plastic housings. Lamps at the rear of the coach, except the license plate lamp, shall be visible from behind when the engine service doors are opened. Sockets shall comply with SAE Standard J576C. A pre-trip inspection of all exterior lights shall be accomplished by placing the transmission in neutral, setting the park brake, and activating both floor mounted signal lights simultaneously.

Visual and audible warnings shall inform following vehicles or pedestrians of reverse operation. Visual reverse operation warning shall conform to SAE Standard J593. Audible reverse operation warning shall conform to SAE Recommended Practice J994-Type C or D. Daytime running lights are to be provided.

Amber colored turn signal lamps shall be provided on the center, front (incandescent) and rear (LED) of the coach. All lighting shall meet Federal standards (including amended 49 CFR Part 571 effective December 26, 1984). The front right lamp shall be near the front wheelwell, above the rubrail line and no higher than the wheelwell. The front left side lamp shall be located at the same height and forwardness as the right. Two amber LED auxiliary side turn lights to include stainless steel guards shall be provided on both sides of the coach. The rear side signal lamps shall be generally located in the vicinity of the rear wheelwell and shall have amber lens. The two center signal lights shall be generally located in the vicinity of the center of the vehicle even with the signal light on the front and rear of the vehicle and shall have amber lens.

Coach hazard warning lights shall be automatically activated upon opening of the passenger door or selection of the reverse gear function of the transmission or the wheelchair operation. The hazard warning lights shall not include the upper incandescent lights.

Two flush mounted curb lights shall be provided on the curbside of the coach in close proximity of the front and drive wheels. The curb lights shall be halogen work lamps with illumination pattern C.

The curb lights shall project lighting to the street surface around the front and drive wheels and shall be activated in conjunction with the opening of the passenger door. These lights shall extinguish within 15 seconds after closing of the passenger door and shall only operate with the master switch in the on position and the door circuit energized. The timer used to extinguish the curb lights shall be adjustable between 0 and 30 seconds.

LED roof marker lamps shall be provided at each end of the coach with amber front and red rear lens being provided. Intermediate LED marker lamps with amber lens shall be provided on each side of the roof line at the center of coach.

Reflectors on the sides and rear of coach shall be provided. The front and center side reflectors shall be amber. The rear side and rear reflectors shall be red. The reflectors shall be permanently affixed to the coach, glue on or pressure sensitive mountings are not acceptable.

Two incandescent stop lamps shall be mounted on the upper rear corners of the coach. The lamps shall have a projected luminous area of at least 4 square inches. The additional stop lamps shall be activated upon application of the service brakes, and shall operate in conjunction with the standard coach stop lamps. Two LED red stop lights shall also be installed at the rear of the coach in between the two incandescent lights.

2.9.3.2 SERVICE AREA LIGHTING

Four lamps shall be provided in the engine compartment to generally illuminate the area for night emergency repairs or adjustments. The lamps shall be controlled by a switch located near the rear start controls in the engine compartment. These lamp assemblies shall be adequately sealed to prevent the intrusion of moisture or debris during coach operation or normal servicing operations such as steam cleaning. Necessary lights, also sealed, shall be located in other service compartments, and shall be provided with momentary contact switches on the light fixture or convenient to the light.

2.9.3.3 PASSENGER INTERIOR LIGHTING

Indirect interior illumination of the coach shall be provided by a minimum of 38 fluorescent tubes controlled by a 3-position switch on the driver's right hand control panel. Sixteen 40 watt tubes shall be located under the package rack by the side windows. A minimum twenty-two 30-watt tubes shall be located overhead at each side of the central ceiling. Lighting intensity, measured at a vertical plane 24" (610 mm) above the seat cushion, shall be a minimum 15 foot candles.

All passenger seats except for center seat of rear cross seat shall have a flush mounted, adjustable LED light made up of multiple clear LED lights. A minimum of 6 candlepower will be provided by each LED reading light cluster to insure adequate visibility with a button for passenger control. A switch to test the function of the reading lamps shall be located on the driver's side console and be labeled "Test." This switch shall be wired so as to override the function of all passengers reading lamp switches and illuminate all reading lamps when it is moved to the test position. A separate dimmer for the operator shall be provided for the front two rows of reading lights

A minimum of six blue LED aisle lights shall be provided on the underside of the street side passenger seats. These lamps shall be mounted in such a manner so as to prevent passengers from damaging the light's when they are illuminated.

Additional general lighting required to illuminate the interior for passenger exits and shall be interlocked to activate only when the passenger door is opened.

The middle rear cross seat shall be illuminated by a blue LED lamp installed and recessed in the coach overhead ceiling panel. There shall also be two blue LED lamps installed in the rear underside of the parcel racks. These lamps shall be illuminated whenever the coach exterior marker lamps are illuminated.

A stepwell lighting system shall be wired to illuminate when the front door is opened. The system shall provide no less than 2 foot candles of illumination of the step treads with the doors open. These lights shall not glare in the passengers' eyes. Lamp fixtures shall be totally enclosed, splash-proof, designed to provide ease of cleaning as well as lamp and housing removal, and shall not be easily removable by passengers. Stepwell lamps shall be protected from damage caused by passengers kicking lenses or fixtures and shall not be a hazard to passengers.

Four lamps shall be provided; a dome at the top of the stepwell, one on each side of the stepwell and one to provide illumination of the ground area located inside and above the entrance door.

2.9.3.4 DRIVER'S LIGHTING

The driver's area shall have a lamp to provide general illumination of the driver's area and shall illuminate the half of the steering wheel nearest the driver to a level of 15 foot-candles. This lamp shall be controlled by a switch that is convenient to the driver.

2.9.3.5 DRIVER CONTROLS

All switches and controls necessary for the operation of the coach shall be conveniently located in the driver's area and shall provide for ease of operation. Switches and controls shall be essentially within the hand reach envelope described in SAE Recommendation Practice, J287, Driver Hand Control Reach. Controls shall be located so that boarding passengers may not easily tamper with control settings.

These switches shall be of high quality stainless steel toggle type design suitably selected for signal switching or power loads with a design life of over 100,000 cycles. Engine Run/Stop/Headlights and Clearance Lights will be combined into one rotary switch. Door control switch shall also be of toggle type design. The following controls shall have longer length toggle switch wands to provide ease of operation; door operation, hazard and fast idle. A guard shall be installed on the Hi-Rise switch.

Accelerator and brake pedals shall be designed for ankle motion. Foot surfaces of the pedals shall be faced with wear-resistant, nonskid, replaceable material that is either slipped or glued on.

Controls for engine operation shall be closely grouped within the driver's compartment

The door control, kneel control, windshield wiper/washer controls, and run switch shall be in the most convenient driver locations. They shall be identifiable by shape, touch, and markings. Door shall be operated by a single control, conveniently located by the driver's left hand. The location of this control shall be easily determined by position and touch. The turn signal and high beam switches shall be floor-mounted, foot-controlled, waterproof, heavy-duty, on-off contact switches. The retarder on/off switch shall be mounted under dash to left of driver.

All switches and controls shall be marked with easily read identifiers. All panel-mounted switches and controls shall be replaceable, and the wiring at these controls shall be serviceable from the vestibule or the driver's seat.

A silent alarm switch to be "OTTO" style, located on the side of the driver's left hand panel. When activated, the "Emergency Call Police" sign posting shall be displayed on the front and side destination signs as well as provide a signal to the mobile radio system.

A momentary engine override switch shall be provided on the driver control panel to permit the driver to move the coach off the road. The override switch shall be a spring loaded switch with a guarded cover. All labeling of controls shall be permanent.

2.9.3.6 INSTRUMENTATION

The speedometer, air pressure gauge(s), and certain indicator lights shall be located on the front cowl immediately ahead of the steering wheel. The steering wheel spokes or rim shall not obstruct the driver's vision of the instruments when the steering wheel is in the straight-ahead position. Illumination of the instruments shall be simultaneous with the marker lamps. Glare or reflection in the windshield, side window, or front door windows from the instruments, indicators, or other controls shall be minimized. Instruments and indicators shall be easily readable in direct sunlight.

Indicators immediately in front of the driver shall at a minimum include:

- Headlamp Highbeam
- Right Turn - may use same indicator as left turn
- Left Turn - may use same indicator as right turn
- Hazard warning
- Parking brake applied
- Service brakes applied (may be common with parking brake indicator)

The instrument panel shall include a speedometer indicating no less than 80 mph and calibrated in maximum increments of 5 mph. The speedometer shall be a rotating point type, with a dial deflection of 220° to 270° and 40 mph near the top of the dial. The speedometer shall be sized and accurate in accordance with SAE Recommended Practice J678. A Dixon programmable electronic speedometer with odometer indicating vehicle speed in miles per hour, between 0 mph and 80 mph, shall be supplied. Speedometer speed and odometer mileage readings must be accurate within limits of plus nothing to minus 2% when coaches are equipped with new tires. The speedometer shall be equipped with an odometer with a capacity reading no less than 999,999 miles.

The instrument panel shall also include air brake reservoir pressure gauge(s) with indicators for front and rear air tanks and fuel gauge. The instrument panel and wiring shall be easily accessible for service from the driver's seat or top of the panel. Wiring shall have sufficient length and be routed to permit service without stretching or chafing the wires. The oil pressure, water pressure, and voltmeter(s) to indicate the operating voltage across the coach batteries shall be relocated to the rear electrical J-box in the #3 baggage compartment

2.9.3.7 VISUAL AND AUDIBLE WARNING DISPLAY

Critical systems or components shall be monitored with a built-in diagnostic system. This diagnostic system shall have visual and audible indicators. The diagnostic indicator lamp panel shall be located in clear sight of the driver but need not be immediately in front of the operator and shall incorporate LED tell tale lights. The intensity of indicator lamps shall permit easy determination of on/off status in bright sunlight but shall not cause a distraction or visibility problem at night. An audible alarm shall sound when certain malfunctions are detected by the diagnostic system. The audible alarm shall be loud enough for the driver to be aware of its operation and is inclined to discontinue operation of the coach. Malfunction warnings and other indicators listed in Figure 2 shall also be supplied on the coach. Space shall be provided on the panel for future additions of no less than 4 indicators as the capability of onboard diagnostic systems improves.

All diagnostic indicators shall be simultaneously tested by the activation of master switch.

FIGURE 2: OPERATOR'S STATUS PANEL INDICATORS

VISIBLE INDICATOR	AUDIBLE ALARM
BACK-UP INDICATOR (a)	BACK-UP ALARM

CHECK ENGINE INDICATOR	NONE
CHECK TRANSMISSION INDICATOR	NONE
ANTILOCK CONDITION LAMP	NONE
NOT GENERATING	NONE
HAZARD INDICATOR	CLICK
HEADLIGHT HIGH BEAM INDICATOR	NONE
HOT ENGINE INDICATOR (b)	BUZZER
KNEEL INDICATOR	SONALERT
LEFT TURN SIGNAL INDICATOR	CLICK
LOW AIR INDICATOR	BUZZER
LOW OIL PRESSURE INDICATOR (b)	BUZZER
LOW COOLANT INDICATOR (b)	NONE
PARKING BRAKE INDICATOR	NONE
RIGHT TURN SIGNAL INDICATOR	CLICK
STOP ENGINE INDICATOR	NONE
STOP REQUEST INDICATOR	CHIME
WHEELCHAIR LIFT INDICATOR	HORN
WHEELCHAIR STOP REQUEST INDICATOR	CHIME
REAR RISE INDICATOR	SONALERT

NOTE:

- (a) This indicator may be located on electronic transmission control panel
- (b) These indicators may be combined with CHECK ENGINE indicator provided by engine manufacturer.

2.10 INTERIOR TRIM

2.10.1 GENERAL REQUIREMENTS

The interior trim shall be generally pleasing, simple, modern, and free from superficial design motifs. It shall have no sharp depressions or inaccessible areas and shall be easy to clean and maintain. To the extent practicable, all interior surfaces more than 10 inches below the lower edge of the side windows or windshield shall be shaped so that objects placed on them fall to the floor when the coach is parked on a level surface. Water and soap should not normally be sprayed directly on the instrument and switch panels. Handholds, lamps, air vents, armrests, and other interior fittings shall appear to be integral with the coach interior. There shall be no sharp, abrasive edges and surfaces and no unnecessary hazardous protuberances. All plastic and synthetic materials used inside the coach shall be fire-resistant.

Materials shall be selected on the basis of maintenance, durability, appearance, safety, flammability, and tactile qualities. Trim and attachment details shall be kept simple and unobtrusive. Materials shall be strong enough to resist everyday abuse and vandalism; they shall be resistant to scratches and markings. Interior trim shall be secured to avoid resonant vibrations under normal operational conditions.

2.10.1.1 TRIM PANELS

Interior side trim panels and driver's barrier shall be textured stainless steel, anodized aluminum, plastic, melamine type material, vinyl-clad aluminum or fiberglass reinforced plastic. The material shall permit easy removal of paint, greasy fingerprints, and ink from felt tip pens. Panels shall be easily replaceable and tamper resistant. They shall be reinforced, as necessary, to resist vandalism and other rigors of commuter coach service. Interior mullion trim, molding, and trim strips shall be textured stainless steel, vinyl-clad aluminum, anodized aluminum or vacuum formed plastic. The lower sidewall interior trim shall be covered with BusTex 1781-761 fabric or approved equal covered sectionalized panels.

2.10.1.2 HEADLINING

Headlining shall be supported to prevent buckling, drumming, or flexing and shall be secured without loose edges. Headlining materials shall be treated or insulated to prevent marks due to condensation where panels are in contact with metal frame members. Molding and trim strips, as required to make the edges tamper-proof, shall be stainless steel, aluminum, or plastic, colored to compliment the ceiling material. The access panel for the antenna base does not require to be hinged but shall be mounted with tamper-proof screws. Materials for the headlining shall be white vinyl clad aluminum, except that the front interior cap may be finished in gray fiberglass.

2.10.1.3 FRONT END

The entire front end of the coach shall be sealed to prevent debris accumulation behind the dash and to prevent the driver from kicking or fouling wiring and other equipment with his feet. The front end shall be free of protrusions that are hazardous to passengers standing or walking in the front of the coach during rapid decelerations. Formed metal dash panels shall be painted and finished to exterior quality

or may be ABS, fiberglass or vinyl-clad. All parts forward of the driver's barrier shall be finished with a dull matte surface. Colors shall match or coordinate with the balance of the coach interior.

2.10.1.4 REAR END

The rear bulkhead and rear interior surfaces shall be paneled with fiberglass reinforced plastic, trimmed with stainless steel, aluminum, vinyl-clad aluminum, covered with Bus Tex 2339-761.

2.10.2 PASSENGER SEATS

2.10.2.1 ARRANGEMENTS

Passenger seats shall be arranged in a transverse, forward facing configuration.

No more than ten seated positions shall be lost on any bus configuration to accommodate two wheelchair passengers occupying the securement positions. Plastic grab handles shall be supplied mid-point on the sliding seats in the securement area.

Each transverse, forward facing seat, except the rear seats, shall accommodate two adult passengers. Floor seat tracks shall be stainless steel and shall be welded to the coach frame and be nearly flush with the finished floor. The wall tracks shall be stainless steel or aluminum and shall be bolted or riveted to the sidewall.

2.10.2.2 STRUCTURE AND DESIGN

Seats shall be American Seating Model W2005SQ reclining seats or approved equal. Seat frames shall be constructed of high strength, fatigue resistant, welded steel with a durable powder coated, corrosion resistant colored finish which compliments the coach interior. The seat frame shall be wall mounted with heavy gauge steel brackets and shall be attached to the coach floor with a heavy duty stainless steel T pedestal. The seat back shall recline 8 inches maximum with an infinite number of stops. The reclining seat backs shall be provided with a dress up feature to facilitate coach cleaning. Seat width shall be nominal 40.5 inches. Aisle shall not be less than 14 inches wide. Footrests shall not be supplied on any seats.

Seat cushions shall be supported by steel serpentine springs. Seat covering shall be Holdsworth, or similar high quality wool fabric. Seat covering weight shall be 24 ounces/square yard. Overall composition shall be 54% wool, 9% nylon, and 37% cotton. Abrasion from a 28 ounce loading shall not affect appearance with 60,000 rubs. The front face of the headrest and side boxing shall be rugged carpet material, fleck gray with acrylic backing. Seat armrest shall be dark gray in color.

Seat foam padding shall be polyurethane, which shall be cover with a removable cover with a zipper for ease of maintenance.

Seat foam padding shall be polyurethane, which shall be covered with a removable cover with a J strip for the seat cushion and Velcro for the seat back for ease of maintenance. Tufting shall be omitted from seat cushions.

The flammability and smoke characteristics of this material shall be demonstrated to be permanent by subjecting the foam specimen to ASTM D-3574 J1 Steam Autoclave Aging and Dynamic Fatigue Test by the Toller Shear at Constant Force, before conducting the flammability and smoke tests.

2.10.3 DRIVER'S SEAT

2.10.3.1 DIMENSIONS

The driver's seat shall be a Recaro Ergo Metro or approved equal. The driver's seat shall be adjustable and shall have up to 9.05 inches of adjustment fore and aft direction. The seat back and cushion shall be adjustable. The seat shall have cushion depth adjustment, height adjustment (5.5 inches maximum), seat back adjustment, rear cushion and lumbar adjustment so that the operators ranging in size from the 98th percentile male to the 5th percentile female may operate the coach. The suspension control shall be ergonomically designed so that the operator can adjust the seat without looking. The suspension height adjustment and lumbar switches shall be operated with a rocker switch, no rotating knobs are acceptable. The seat suspension shall be capable of dampening varying frequencies that are transmitted through the vehicle caused by varying road conditions. The seat shall be cushioned by a dual shock absorber design. One shock shall be adjustable to allow the operator to control the ride settings. A rubber bumper is required to prevent bottoming out of the seat.

A rubber bellow boot shall be provided to cover the suspension to keep dirt, dust, and driver's fingers away from suspension system. All air lines are to be ¼ inch diameter and have quick disconnect at the back of the seat. The suspension shall have a minimum of 15 degrees of seat cushion tilt. The rake adjustment shall be dual-sided and be accomplished without leaving the seat. The seat cushion shall adjust from 18-20 inches for varying size drivers. Double locking seat tracks with stainless steel bearings shall be provided. The seat tracks durability and improve rearward travel. The seat shall come equipped with an air track release and a manual center release. All controls are to be on the right-hand side of the seat.

The seat shall be equipped with manual dual recliner gears. The seat back shall be adjustable with dual sided hand controls and include a 24.5 degree recline stop. Recline stop is to prevent the seat from interfering with the driver's barrier. The seat back shall be infinitely adjustable from 90 to 114.5 degrees. The seat back shall come with a full protective back shell

2.10.3.2 STRUCTURE AND DESIGN

The driver's seat cushion shall be made of polyurethane foam. The foam shall be constructed to provide lateral support to provide better operator stability in curves and turns. All exposed metal on the driver's seat, including the pedestal, shall be painted steel. Required seat belts shall be fastened to the seat so that the seat may be adjusted by the driver without resetting the seat belt. Seat belts shall be stored in automatic, inertia locking type retractors that do not tighten up during operation. The retractor shall be located to the left of the driver; the latch mechanism shall be located on the right. The seat belt shall be designed to allow the operator to "set" the tension on the belt. The belt shall be designed to not creep, making the belt tighter or loose. The seat belt shall be long enough to secure a 98% male driver.

2.10.4 FLOOR COVERING

2.10.4.1 VESTIBULE

The floor in the vestibule shall be covered with Altro D2502 Cobalt flooring or approved equal. The floor covering shall remain effective in all weather conditions for a minimum of seven years. The floor covering as well as transitions of floor material to the main floor and to the stepwell area, shall be smooth and present no tripping hazards. The standee line shall be yellow and 2 inches wide and shall extend across the coach aisle in line with the driver's barrier. The width of this line shall be uniform in width across its entire length. This line shall be yellow, same color as the edge of the steps. Color shall be consistent throughout the floor covering.

2.10.4.2 DRIVER'S COMPARTMENT

The floor in the driver's compartment shall be easily cleaned and shall be arranged to prevent debris accumulation. Floor covering material, dimensions and color shall match the vestibule area of the bus.

2.10.4.3 PASSENGER AREA

The floor covering in the passenger area shall be the same material, dimensions and color specified for the vestibule. Composition material that remains effective in all weather conditions. Flooring shall be installed to minimize the quantity of seams and a one-piece center strip shall extend from the rear seat between the aisle sides of transverse seats to the standee line with the exception of the ramp which will include a separate piece. The floor under the seats shall closely fit the sidewall cove or extend to the top of the cover.

2.11 WINDOWS

2.11.1 WINDSHIELD

The windshield shall be designed and installed to minimize external glare as well as reflections from inside the coach. When the coach is operated at night with the passenger interior lighting on, essentially no reflections shall be visible in the windshield immediately forward of the driver's barrier. Reflections in the remainder of the windshield shall be minimized, and no reflection of any part of the coach interior behind the driver's barrier shall be visible in the windshield.

The windshield shall be easily replaceable by removing zip-locks from the windshield retaining moldings. Bonded-in-place windshields shall not be used. The glazing material shall have single density tint.

2.11.2 DRIVER'S SIDE WINDOW

The driver's side window section shall be divided vertically and the forward section shall slide fore and aft in tracks or channels designed to last the service life of the coach. The driver's side window shall not be bonded in place and shall be easily replaceable. The glazing material shall be nominal

¼”laminated, safety glass with single density tint, the same as the windshield. The side window shall be rated AS-2.

2.11.3 SIDE WINDOWS

Eight large rectangular passenger side windows with a nominal clear glass opening of 32" x 52" (813 mm x 1,321 mm) shall be provided on each side of the 45 foot coaches. The window in the wheelchair lift door is smaller, measuring nominally 32 X 37 inches. Each window on both sides shall be single glazed laminated safety float glass, one piece fixed and interchangeable type and mounted in black anodized aluminum frames. Side windows shall be a nominal 1/4" (6 mm) uniform grey tinted glass, allowing approximately 28% light transmittance.

All sashes shall be top hinged with push out at bottom, with the exception of the wheelchair lift door sash. All top-hinged sashes shall be emergency escape type and include a single motion release bar running the entire width of the window at the lower edge to permit emergency egress. Emergency operating instructions etched on metal plates shall be provided at each seat position for operating the push-out sash. The rear roadside window will include a prop rod at the bottom to assist in coach cleaning.

2.12 INSULATION

2.12.1 MATERIAL

2.12.1.1 PROPERTIES

The insulating materials may be of differing thicknesses and materials to achieve thermal insulating properties and low interior noise levels. These are described following:

- Roof: 2 inch thick, compressed at installation, resin coated, medium density non bagged fiberglass
- Sidewall: Rigid molded polyurethane foam of varying thickness.
- Driver’s area: Minimum ½-inch, high-density fiberglass under the floor in the driver’s area.
- Stepwell area: 1-inch thick urethane foam insulation with Mylar face to minimize interior temperature variances during severe external climatic conditions and for sound deadening.
- Below windshield: 2-inch thick, high density fiberglass
- Complete rear lounge seat area shall be heavily insulated with fiberglass blankets and sound-dampened panels for both noise and heat protection as follows:
- Behind the rear cross-seat riser and rear cross seat back and cushion are a minimum total of 1 ½” thick high-density fiberglass blankets.
- An additional 5/8” fiberglass blanket is added behind the rear cross seat back to further impede engine noise propagation to coach interior.
- Sound barrier with ¼” urethane foam layered on either side of a 1/8” urethane elastomer loaded with barium sulfate.
- Cover panel behind rear cross-seat is 1” thick foamed polyurethane with Mylar facing
- Area behind and below this rear area is 2” medium density fiberglass with a ¾” thick heavy density fiberglass batt cemented to the inner face of the fiberglass rear window panel.

2.12.1.2 THERMAL INSULATION

The combination of inner and outer panels on the sides, roof, and ends of the coach, and insulating materials shall provide a thermal insulation sufficient to meet the interior temperature requirements. The coach body shall be thoroughly sealed so that drafts cannot be felt by the driver or passengers during normal operations with the passenger doors closed.

2.12.1.3 SOUND INSULATION

The combination of inner and outer panels and any material used between them shall provide sufficient sound insulation so that a sound source with a level of 80 dBA measured at the outside skin of the coach shall have a sound level of 60 dBA or less at any point inside the coach. These conditions shall prevail with all openings, including doors and windows, closed and with the engine and accessories switched off.

The bus generated noise level experienced by a passenger at any seat location in the coach shall not exceed 80 dBA and the driver shall not experience a noise level of more than 70 dBA under the following test conditions. The coach shall be empty except for test personnel, not to exceed 4 persons, and the test equipment. All openings shall be closed and all accessories shall be operating during the test. The coach shall accelerate at full throttle from a standstill to 35 mph on level commercial asphalt or concrete pavement in an area free of large reflecting surfaces within 50 feet of the coach path. During the test, the ambient noise level in the test area shall be at least 10 dB lower than the coach under test. Instrumentation and other general requirements shall conform to SAE Standard J366. If the noise contains an audible discrete frequency, a penalty of 5 dBA shall be added to the sound level measured.

2.12.1.4 REAR SEAT INSULATION

Special design consideration shall be given to insulation in the area above the engine compartment. Fiberglass or other suitable material shall be applied, together with adequate ventilation, to provide temperatures consistent with the remainder of the coach.

Seat cushions and seat backs shall be suitably insulated to prevent elevated temperature of the seat itself and no cushion or back shall be measurably hotter as compared to any other seat in the coach.

2.13 ANCILLARY FEATURES

2.13.1 DRIVER'S AREA

2.13.1.1 VISORS

Three roller type sunscreens shall be provided at the right and left hand windshield and at the driver's side window. Guide rods shall be located at each end of each screen to allow for infinite positioning. The sunscreens shall be shaped to minimize light leakage between the sunshades and windshield pillars. The sunscreens shall not obstruct air flow from the climate control system or obstruct the operation of

other equipment such as the radio handset or the destination sign control. Deployment of the sunscreens shall not restrict the vision of the rearview mirrors. Sunscreen adjustments shall be made easily by hand.

2.13.1.2 EXIT SIGNAL AND TALKING BUS

A passenger chime signal audible to the driver and to the passengers anywhere inside the coach shall be provided. The chime shall be a push button convenient to seated passengers and standees. A driver controlled switch shall deactivate the chime system. A talking bus system will be provided. The system will consist of a Twin Vision or approved equal, 1 line LED sign located in the front center of the coach and fastened to the coach ceiling to permit viewing by all passengers. A Twin Vision Operator Control Unit (OCU) or approved equal shall be mounted in a convenient location for the driver to utilize.

2.13.1.3 DRIVERS STORAGE

A double prong hook shall be provided for the drivers' coat in the driver's area with a retention strap. There shall also be a driver's beverage holder supplied in the driver's area.

2.13.2 MIRRORS

2.13.2.1 OUTSIDE MIRRORS

The coach shall be equipped with B & R or approved equal corrosion resistant, heated remote controlled outside rear view mirrors, on each side of the coach. The mirrors shall be mounted so as to permit the driver to view the highway along both sides of the coach, including the rear wheels. Mirrors shall be firmly attached to the coach to prevent vibration and loss of adjustment, but not so firmly attached that the coach or its structure is damaged when the mirror is struck in an accident. Outboard maximum overall mirror width dimension shall not exceed 122 inches while providing maximum visibility to the operator. Mirrors shall also be of the "auto-return" break-away type.

2.13.2.2 INSIDE MIRRORS

A mirror shall be provided for the operator to observe passengers throughout the coach without leaving his seat and without shoulder movement. With a full standee-load, including standees in the vestibule, the operator shall be able to observe passengers in the rear of the coach and anywhere in the aisle. Inside mirror shall be 6 x 10.5" mounted just below the destination sign box and above the driver's line of sight.

2.13.3 PASSENGER ASSISTS

2.13.3.1 GENERAL REQUIREMENTS

Passenger assists in the form of full grip, vertical stanchions or handholds shall be provided for the safety of standees and for ingress/egress. Passenger assists shall be convenient in location, shape, and size for both the 95th-percentile male and the 5th-percentile female standee. Starting from the entrance door and moving anywhere in the coach, a horizontal assist shall be provided at the aisle side of the

luggage rack that runs the full length of the luggage rack so that a 5th-percentile female passenger may easily move the length of the aisle using one hand and then the other without losing support. Excluding those mounted on the luggage racks, the assists shall be between 1.25 and 1.50 inches in diameter or width with radii no less than 0.25 inches and be yellow powder coated. All passenger assists except for the luggage rack nosing shall permit full hand grip with no less than 1.50 inches of knuckle clearance around the assist.

2.13.3.2 FRONT DOORWAY

Front doors, or the entry area, shall be fitted with assists no less than 3/4 inch in width. Assists shall be as far outward as practicable, but shall be no further than 6 inches from the outside edge of lower step tread and shall be easily grasped by a 5th-percentile female boarding from street level. Door assists shall be functionally continuous with the horizontal front passenger assist and the vertical assist on the front modesty panel.

2.13.3.3 VESTIBULE

The aisle of the driver's barrier panel shall be fitted with vertical passenger assists that are functionally continuous with the overhead assists that extend to within 36 inches of the floor. These assists shall have sufficient clearance from the barrier to prevent inadvertent wedging of a passenger's arm and shall be in complete compliance with ADA requirements.

A horizontal passenger assist shall be located in the front of the coach adjacent to the driver's area. The horizontal passenger assist maximum will be no more than 35".

The assists at the front of the coach shall be arranged to permit a 5th percentile female passenger to easily reach from the front door assist to the horizontal assist, then to the vertical assist.

2.13.4 PASSENGER INFORMATION SYSTEMS

2.13.4.1 DESTINATION SIGNS

The destination sign system shall be a Twin Vision multi-color all LED or approved equal. The sign message shall be readable by a person with 20/20 vision from 250 feet. The characters formed by the LED's shall meet the requirements of the Americans with Disabilities Act of 1990 (ADA) reference 49 CFR Section 38.39. The sign shall be legible from 65 degrees on either side of a line perpendicular to the center of the display. The readings of the front and side destination signs shall be posted by an electronically controlled mechanism. The electronic control shall be operable by the driver and the posting shall be completed within 10 seconds from the time the driver actuates the control. The system shall be required to store no less than 10,000 message lines, based upon an average of up to 12 characters per message line. This memory shall be easily programmable from inside the coach for message revisions by means of a portable memory transfer unit. The front sign shall contain a matrix of 1792 pixels, 16 rows by 112 columns on a display area not less than 9.5 inches high and 67.8 inches wide. All alpha numerical characters shall be capable of being displayed in each position. A complete list of readings will be supplied to the successful bidder.

A front run number box shall also be installed on the dash to the right of the driver. The front run

number box would be a 4 digit LED type and worked through the ODK for the destination signs.

Each system shall have a System Processor Board (SPB) mounted in the Operator's Display Keypad (ODK), capable of controlling up to 10 components to allow for future expansion. A Flash SPB/Interface Assembly shall be the central control for the entire sign system. The Flash SPB shall be capable of storing up to approximately 320K bytes (approximately 16,000 message lines) of memory containing message and sign system programming data. The Flash SPB shall also retain preset message codes and last message(s) displayed information indefinitely. The Flash SPB shall extract and process message writing data from its memory according to the codes it receives from the ODK, or other controlling device. The system shall be capable of operating additional information displays or signs, such as interior information signs and voice annunciators.

Multiple line posting shall be designed so that no blank time is displayed between posting. All characters shall be equally illuminated. Cleaning shall also be accomplished without removing the sign or front windshield. Posting shall have a variable font format and allow the sign to automatically space out letters so they do not blend together when viewed from a distance.

The sign shall be mounted in the coach in such a manner as to eliminate vibration and to isolate noise caused by the sign moving around in the sign compartment. The sign shall be equipped with a blanking feature that shall operate automatically when the destination sign power switch is in the "off" position or when the master switch is turned off.

A means shall be provided to enable the driver to verify the sign display (run number and destination) from inside the coach. The access door shall have blind catches to prevent the door from falling on mechanics while repairs or inspections are performed. Sign shall be capable of accepting 2 pre-selected destinations with selection controlled by the tactile feel rubber switch.

The Operator's Display Keypad (ODK) shall be located within easy reach of the operator when seated. The code selector shall utilize a 28 key rubber pad keyboard with tactile feel designed especially for the harsh transit environment. The ODK shall contain a two line by 20 character vacuum fluorescent display which will inform the operator on the status of the sign system. The ODK shall contain an audio enunciator that beeps to alert the operator to view the display for a message, or beeps indicating that a key is depressed. The ODK shall continuously display the message associated with the selected destination readings. The unit shall be located to the left of the driver and shall be an integral part of the front junction box.

A programming software package shall be provided to generate message lists for the destination sign system. A software package shall be provided with delivery of the first production bus. The software shall be completely compatible with the destination sign programming software. The programming software shall use techniques that require minimum operator training and that are intended for use by operators that are not trained in complex computer operations. All operator screens shall utilize pull down and pop-up menus.

The destination sign glazing shall be glass and shall have a defroster grid that cleans the sign of condensation, snow and ice. The grid shall be activated whenever the defroster is activated. A suitable thermostat/time delay circuit shall be provided to prevent overheating of the grid and glazing.

A Flash Card, measuring 2-1/8 inches W X 3-1/8 inches D shall be used to download messages into the ODK through the Flash SPB/Interface Assembly PCMCIA connector port.

2.13.5 FARE COLLECTION

Contractor shall provide provisions including a 12 volt 15 amp power source under dash, a split A/C filter and panel for front dash. Ship loose grab rail for the type fare box used by the transit system

2.13.6 LIFT

A RICON Mirage or approved equal dedicated access extended travel lift, model F9A-S020 and two forward facing mobility device securement areas to accommodate a maximum 30" (762 mm) wide mobility device shall be provided. The lift assembly shall comply with all current ADA requirements. The lift shall be installed below the floor line at the #2 right-hand luggage bay on the curbside of the coach.

The lift shall be controlled by a dash mounted toggle switch and a rear lift area toggle switch, and operated by up/down switches pendant mounted at the lift structure wall.

The wheelchair loading system shall provide safe, comfortable and rapid ingress and egress for applicable passengers from the street level or a curb. When not in use, the lift shall stow in the luggage bay. The lift mechanism shall include a device to provide "passenger on platform" information and prevent stowing the lift platform when a passenger is sensed. The outer barrier shall be automatically controlled and shall be such that it cannot be overridden by the loading system operator. A dash mounted indicator light shall be provided and shall be illuminated when the loading system is activated. The interlock shall apply, the bus shall not move and the engine throttle shall be disabled whenever the wheelchair loading system is activated. If the lift door is open or ajar, the interlock shall remain engaged. Brackets, clamps, screw heads and other fasteners used on the passenger assists shall be anodized aluminum or stainless steel and shall be flush with the surface and free of rough edges.

The lift control mounted on the lift structure shall have push button up/down switches. The toggle electrical supply switch shall be located in close proximity to the controller. This toggle switch must be turned "ON" prior to the lift operation. All lift control switches shall be permanently labeled. Decals shall not be permitted. Both the stow guard switch and the stow/deploy switch shall be red in color. These switches shall be incorporated in a hand held pendant

The lift shall include the following specifications:

Lifting capacity (main platform).....	660 pounds
Vertical travel	55" (1,397 mm) maximum
Platform width (chair capacity)	30" (762 mm) minimum
Platform depth (chair capacity).....	48" (1,219.2 mm) minimum
Platform side height	3.75" (95.25 mm)
Handrail height - two (2)	30" (762 mm) minimum
Stowed dimension (depth)	85.5" (2171.7mm) total
Operating controls	Dual pushbutton
Power source	Electro- hydraulic

Voltage.....	24 volts DC
Back up system	Emergency hand pump
Construction.....	Steel and aluminum
Stow level to ground cycle time.....	15.3 seconds
Ground to floor level cycle time	11.5 seconds
Floor level to stow cycle time	18.6 seconds
Total cycle time.....	45.4 seconds
Hydraulic system fluid capacity.....	1.4 quarts
Hydraulic system operating pressure	2000 psi minimum

The lift shall be designed to meet the Federal Department of Transportation Regulations 49 CFR 38.

The lift shall include a hinged platform to bridge the coach floor to the lift platform. Bridge shall be hinged and locked in an upward position to act as a barrier when the lift is in use. Bridge shall also allow the lift passenger to ingress/egress easily from the platform. Lift travel speeds and lift operation shall be adjusted to the lift manufacturer's specifications upon completion of the lift installation into each coach and before coach delivery. The individual handrails shall incorporate a visual aid to insure that they are folded in the proper order.

The lift shall include an emergency system in case of driver operation malfunction. Should an emergency situation occur, the lift operator shall release the pushbutton switch on the controller to immediately stop the lift operation. Loss of electrical power shall also stop the lift operation regardless of switch position. An emergency auxiliary hydraulic hand pump shall be used to complete the lift cycle. The emergency hand pump handles and pump shall be located in an enclosed box at the rear wall of the #1 right-hand baggage bay to prevent the accumulation of dust and dirt. The pump shall be easily accessible through baggage bay door. The handle shall be stored adjacent to the pump to allow immediate usage.

2.13.6.1 LIFT DOOR

The lift door shall be a single leaf design that operates in a sliding track mounted both above and below the door leaf. The door shall open by sliding to the rear of the coach and shall remain on a horizontal plane throughout the opening and closing process. No pin hinged doors shall be provided. The transmission must be in neutral and the parking brake activated for the lift to operate. The accelerator shall be automatically disabled and the fast idle system activated when either the lift master switch is turned "On" or the lift door is open, for maximum safety. These features shall be wired to the lift master switch to allow activation only when the transmission is in neutral. The coach directional (Hazard) lights will also flash on/off. After the lift operation is completed, the lift shall be properly stored and secured, with the access door closed and the lift master switch at the dash in the "OFF" position in order to move the coach.

The lift door shall have a window in line with the other passenger windows and shall not detract from the appearance of the coach. The door latch mechanism shall be located in the lower section of the door so that operators in the 5th percentile female range can operate the lift door.

The lift storage door shall not block the visual observation of the lift assembly while utilizing the

manual override mode of the lift. A lift door design consisting of a horizontally hinged lift platform egress door mounted within a vertical motion pantograph baggage door is a preferred design.

2.13.6.2 LIFT INSTALLATION

The installation of the RICON Mirage model F9F-DE001 lift or approved equal to the coach structure as well as the installation of the lift door into the sidewall of the coach shall not affect the structural integrity of the coach. There shall be no tray above the wheelchair lift.

The parcel rack module above the wheelchair lift platform area shall be permanently removed to provide additional headroom. The modified rack shall be professionally finished at all ends.

The heating and air ducts shall be rerouted around the lift area to ensure proper interior air conditioning/heating airflow and distribution.

A passenger chime tape switch shall be mounted on the sidewall at the two (2) wheelchair securement positions.

Each coach shall have adequate information decals installed which details the proper lift operation in both the normal and manual modes of operation.

2.13.6.3 LIGHTING REQUIREMENTS

Lighting for the lift areas shall be designed to exceed Title 13 and ADA standards. Lighting shall be provided to effectively illuminate the lift area. Light shall be wired through the keyed master switch on the driver's dash and shall automatically illuminate when this switch is in the "ON" position. The lighting design shall minimize the effect of glare on passengers entering the bus through the wheelchair lift door. During lift operation, the street surface shall be illuminated to a minimum of six candlepower a distance of 3 feet beyond the external dimensions of the lift platform once deployed and lowered. Additional lighting shall be provided to insure illumination of the instruction placard and the manual override pump when it is in use.

2.13.6.4 SECUREMENT SYSTEM

The vehicle interior shall permit the securement of two (2) forward facing wheelchair passengers in which the primary position shall be on the street side of coach directly across from lift. Securement areas shall be a minimum 30" x 48" (762 mm x 1,219 mm) as required by ADA.

The securement system shall be a Q-Straint "QRT Plus" wheelchair restraint system or approved equal. A separate three-point belt securement shall be provided to effectively secure the occupant.

To further secure the passenger during the lift operation, a retractable seat belt strap shall be provided at the ingress/egress area of the lift platform. A minimum 10.5" (267mm) high barrier shall also be provided at the rear of lift area for additional passenger protection.

2.14 ROOF VENTILATORS/ESCAPE HATCH

Two roof ventilators shall be provided and designed to perform as an escape hatch. One ventilator/escape hatch shall be located in the roof at the front of the coach, another in the roof at the rear of the coach.

3.0 CHASSIS

3.1 PROPULSION SYSTEM

3.1.1 VEHICLE PERFORMANCE

3.1.1.1 POWER REQUIREMENTS

The propulsion system and drive train shall provide power to enable the coach to meet the defined acceleration, top speed, and gradability requirements. Sufficient excess power shall be available to operate all accessories without jeopardizing coach performance or safety.

3.1.1.2 TOP SPEED

The coach shall be governed at 70 mph road speed, for emergency and passing maneuvers, on a straight, level road at SLW.

3.1.1.3 GRADABILITY

Gradability requirements shall be met on grades with a surface friction coefficient of 0.3 and above at SLW with all accessories operating. The standard configuration power plant shall enable the coach to maintain a speed of 44 mph on a 2-percent grade and 7 mph on a 16-percent grade.

3.1.1.4 ACCELERATION

Vehicle shall accelerate from 0 to 15 mph in five seconds, with the coach at S.L.W.

3.1.1.5 OPERATING RANGE

The operating range of the coach run on the design operating profile shall be at least 450 miles on a single fill-up of diesel fuel.

3.1.2 POWERPLANT MOUNTING AND ACCESSORIES

3.1.2.1 MOUNTING

The powerplant shall be mounted in a compartment in the rear of the coach. All powerplant mountings shall be mechanically isolated to minimize transfer of vibration to the body structure. Clamps required for securing or supporting lines shall be rubber or plastic coated and properly sized for the line being clamped.

3.1.2.2 SERVICE

The powerplant shall be arranged so that accessibility for all routine maintenance is assured. No special tools, other than dollies and hoists shall be required to remove the powerplant. The powerplant shall be mounted on a cradle which can be slid into and out of the coach. Two mechanics shall be able to remove, replace and prepare the engine and transmission assembly for service in less than 25 total combined man-hours.

The muffler, exhaust system, air cleaner, air compressor, starter, turbocharger, alternator, radiator, including charge air circuit, all accessories, and any other components requiring service or replacement shall be installed in or above the engine compartment.

The turbocharger, alternator, air compressor, and starter shall be replaceable without dismounting or removing other coach parts and without gaining access through the coach interior.

The cooling system filler caps shall be hinged to the filler neck and be held closed with spring pressure or positive locks. The transmission filler tube shall employ a combination dipstick and cap and shall be the minimum length permissible to discourage daily fluid checking. All fluid fill locations shall be properly labeled to help ensure correct fluid is added and all shall be easily accessible with standard funnels, pour spouts, and automatic dispensing equipment. All lubricant sumps shall be fitted with magnetic-type, external, hex head, drain plugs of a standard size except for the transmission which uses a recessed square socket type plug. The powerplant shall be equipped with provisions for displaying engine and transmission data.

The engine and transmission shall be equipped with sufficient heavy-duty fluid filters for efficient operation and to protect the engine and transmission between scheduled filter changes. To the extent practicable, the filters shall be of the spin-on, disposable type with the exception of the engine which shall have a fuel pro 382 without heater in lieu of dual fuel filters. All filters shall be easily accessible and the filter bases shall be plumbed in a manner so as to assure correct reinstallation. Flexible lines shall be teflon hoses with braided stainless steel jackets except in applications where premium hoses are required and shall have standard SAE or JIC brass or steel, reusable, swivel end fittings. Hoses shall be individually supported and shall not touch one another or any part of the coach.

3.1.2.3 AIR CLEANER

The air cleaner shall be a dry type, be horizontally mounted, and be equipped with a pre cleaner system. Airflow through the filter element shall be from the outside in. To service the filter shall take less than 5 minutes, disconnecting an engine air intake duct, air compressor intake duct, or filter housing shall not be necessary. The access cover of the air filter assembly shall be retained to the filter housing with a single wing nut. A Filter Minder air filter restriction indicator, part #1875-325, manufactured by Engineered Products Co. shall be provided and calibrated to 25 inches of water/vacuum.

3.1.2.4 ACCESSORIES

These accessories shall be unit mounted for quick removal and repair. These accessories shall be driven at speeds sufficient to assure adequate system performance during extended periods of operation. The

power steering pump and air compressor shall be flange mounted and gear driven from engine. The power steering reservoir shall be remotely mounted to the bus chassis and shall not be mounted on the drivetrain. The alternator shall be a Neihoff air cooled rated no less 450 amp or approved equal. Only the 24 volt alternator, A/C compressor and cooling system fans may employ belt drives. Tension on all belt driven components shall be maintained by manually adjusted turnbuckles or idlers.

3.1.2.5 HYDRAULIC DRIVE

Hydraulic system service tasks shall be minimized and scheduled not more frequently than scheduled tasks for other major coach systems. All elements of the hydraulic system shall be easily accessible for service or unit replacement. All lines shall be compatible with the hydraulic fluid and maximum pressures of the system. Flexible lines shall be minimized in quantity and length. Lines of the same size and with the same fittings as those on other piping systems of the coach, but not interchangeable, shall be tagged or marked for use on the hydraulic system only. Hydraulic lines shall be individually and rigidly supported to prevent chafing damage, fatigue failures, and tension strain on the lines and fitting. Hydraulically driven radiator and charge air cooler fan drive systems are not acceptable.

The hydraulic system shall be configured and/or shielded so that failure of any flexible line shall not allow hydraulic fluid to spray or drain onto any component operable above the auto-ignition temperature of the fluid.

3.1.3 POWERPLANT

3.1.3.1 ENGINE

Engine to be certified at time of manufacture to meet EPA Clear Air Act.

3.1.3.2 COOLING SYSTEM

The cooling system shall be sized to maintain fluids at safe, continuous operating temperatures during the most severe operations possible with the coach loaded to GVWR and with ambient temperatures up to 110 deg. F. Sufficient reserve capacity shall be provided by the cooling system to provide efficient cooling for the coolant and engine charge air with 25% of the system in a degraded condition. Radiator shall be Modine or approved equal . Radiator, complete with charge air cooling circuit shall be provided, mounted above the engine compartment. The charge air cooler and the radiator shall be mounted at least 60 inches above the road surface. The physical size and heat rejection capacity of the radiator along with the charge air cooling capacity shall be tested and approved by the engine manufacturer for this application. The radiator system shall be easily serviced through a top hinged access door. The radiator and charge air cooler shall not be stacked in front of one another. Door shall include gas-filled cylinders and a manual prop to hold the door in the upright/open position.

The charge air/cooling system radiator shall be Modine or approved equal and shall be of durable corrosion-resistant construction with welded-on tanks. Radiator plumbing shall be stainless steel, copper, aluminized steel or brass tubing and if practicable, rubber hoses shall be eliminated. Necessary hoses shall be premium, silicone rubber type that are impervious to all coach fluids. All CAC hoses and coolant hoses shall be secured with Oetiker hose clamps. Fan speed shall be regulated to minimize fan noise. No heat producing components or climate control system components shall be mounted between

the engine cooling air intake aperture and the radiator. All cooling system fittings are to be cast iron, brass or copper.

Dual fans, belt driven from engine shall pull outside air through an exterior panel and across the radiator and charge air cooler at a minimum rate approved by the engine manufacturer for maximum cooling efficiency. Radiator/intercooler belt tension shall be maintained by an automatic belt tensioner to prevent belt slippage and ensure longer belt life.

Radiator surge tank shall be made of heavy-duty stainless steel. A sight glass to determine satisfactory engine coolant level shall be provided and shall be accessible by opening the engine and/or blower compartment access doors. A spring-loaded, push-button type valve shall also be provided to safely release pressure or vacuum in the cooling system. The cap shall also include a positive locking device to prevent opening of filler cap until pressure is released. Filler cap shall be hinged to the filler neck and held closed by a spring. A temperature output for the alarm system meeting the approval of the engine manufacturer shall be provided to allow for proper cooling system function during warmer weather operation. If possible, cooling system function shall be controlled electronically through the engine control system.

A coolant recovery system shall be provided to prevent loss of engine coolant in the event of overheating. Coolant that would normally escape shall be collected in a coolant recovery tank. Coolant shall be recirculated back to the surge tank via an electric motor driven pump controlled by a switch in the engine compartment as system returns to normal operating temperatures.

Engine thermostats shall be easily accessible for replacement. The engine cooling system shall be equipped with a properly sized Nalcool Need Release cooling system filter with a spin-on, disposable borate element. The engine coolant shall be Penray fully formulated phosphate free extended service interval coolant.. Quarter-turn ball type shutoff valves shall be provided on the coolant filter base which allow filter replacement without coolant loss. Quarter turn valves shall also be provided and installed in the entire cooling system which permit complete shutoff of both lines for the heating and defroster units.

All low points in the water-based cooling system shall be equipped with drain cocks. Air vent valves shall be fitted at high points in the cooling system unless it can be demonstrated that the system is self-purging.

3.1.3.3 TRANSMISSION

The transmission shall be an ALLISON WT series B500R six speed transmission or approved equal with an internal retarder activated by brake pedal only. Maximum input horsepower shall be 450 horsepower. Maximum input torque capability shall be 1460 pound feet of torque. The transmission shall have a one stage, three element, polyphase torque converter and a lock up clutch with a torsional damper. The transmission shall be fully automatic with six forward gear ratios. Shift calibration shall be set so that shifts shall be smooth under all operating conditions. The transmission shall only have one maintenance dipstick, and no other secondary service lane dipsticks. The transmission will also include a Probalyzer, brass Mini-gauge plug to permit transmission fluid analysis sampling.

The transmission shall be dynamometer tested during the assembly process utilizing Transynd synthetic

transmission fluid. An extended transmission warranty shall be supplied for 5 years/300,000 miles.

The gearing shall be of the constant mesh, helical, planetary type with the following ratios:

<u>RANGE</u>	<u>RATIO</u>
First	3.51:1
Second	1.91:1
Third	1.43:1
Fourth	1.00:1
Fifth	0.74:1
Sixth	0.64:1
Reverse	4.80:1

A function of the electronic controls shall be provided to prevent premature engagement and operation of the automatic transmission reverse gear.

The transmission shall be governed by electronic controls, which contain a programmable read-only memory (PROM) that will provide basic transmission control functions. All cabling and electronic devices utilized by the electronic transmission control system shall be adequately shielded against interference.

The transmission electronic module shall be capable of communicating with the engine electronic module to maintain maximum efficiency. The control module shall be equipped with a self-diagnostic system. A failure shall be retained by the control module for evaluation by garage personnel using a diagnostic reader.

The electronic controls shall be completely sealed from the environment. The transmission electronic control unit shall be located in a weatherproof box that is protected from environment or potential damage from underfloor baggage.

3.1.3.4 ELECTRIC STARTER

The contractor shall provide a heavy duty Delco model MT 50, 24 volt electric engine or approved equal starting system. The starter will have a pre-engaged drive, which will engage into the ring-gear before the starter begins to turn. The starting system shall be inoperable whenever the master control is in the OFF position, and whenever the emergency shut-off switch is activated or the engine is running. A starter interlock shall be provided that shall prevent the starter motor from engaging the flywheel after the engine is started.

3.1.4 EMISSIONS

3.1.4.2 MOTOR VEHICLE POLLUTION REQUIREMENTS

The manufacturer shall provide in writing that:

The engine being provided complies with the Clean Air Act when operated on diesel fuel.

The horsepower of the vehicle is adequate for the speed, range and terrain in which it will be required to operate, and also to meet the demands of all auxiliary power equipment.

3.1.4.3 EXHAUST LOCATION

Exhaust gases and waste heat from the radiator shall not be discharged on the curbside and shall be directed generally left of centerline of the coach. Exhaust piping shall not restrict the underbody clearances. Exhaust shall not be through the body of the coach, as through a stack, but should be directed toward the street surface. A stainless steel muffler shall be provided on each coach.

3.2. FINAL DRIVE

3.2.1 GENERAL REQUIREMENTS

The two rear axles shall have a load rating sufficient for the coach loaded to GVWR. Transfer of gear noise to the coach interior shall be minimized.

3.2.1.1 DRIVE AXLE

The drive axle shall be a Meritor World Axle or approved equal rated at 23,000 lbs. The bearing journals on each spindle shall be induction hardened for greater durability. Ring gear shall be bolted to case. The drive axle wheel bearings shall be oil lubricated. Rear axle ratio shall be 4.30:1.

3.2.1.2 TRAILING AXLE

A trailing axle shall be provided behind the drive wheels and shall be a separate and independently sprung, swing arm type. The 45 foot coaches shall have a coach body rear rise feature which through a dash mounted switch, permit the redirection of suspension system air pressure which will raise the rear of the coach for maneuverability purposes. The third axle shall have single tires with tires being the same size as the tires on the other axles. Tag axle weight shall not exceed 12,000 pounds on 45-foot buses. In no event, with a full seated passenger load shall the load on any axle exceed 22,400 pounds. Combined weight on the rear tandem axles shall not exceed 34,400 pounds. Brake shoes and drums are not required to be the same for the tag and front axle. Wheel bearings shall be tapered roller type and oil lubricated.

3.2.1.3 DRIVE SHAFT

The drive shaft shall be a minimum 3 inches outside diameter, heavy-duty type Meritor 1810 series. The drive shaft shall be guarded to prevent it from striking the floor of the coach or the ground in the event of a tube or universal joint failure. U-joint end cap retaining bolts shall be retained by metal locking plates. Both half-round yoke ends shall be attached using self-locking bolts.

3.3 SUSPENSION

3.3.1 GENERAL REQUIREMENTS

The front and rear axle suspension shall be pneumatic and equipped with straight side lobe air suspension bellows. Four suspension bellows shall be provided on the rear axles and two suspension bellows on the front axle. Each trailing axle swing arm shall be equipped with a straight side lobe type air spring, 9.5" for the 45'. Pressure in the trailing axle suspension shall be automatically adjusted as required by the load-sharing system. Manual air dump valves shall also be provided in the engine compartment.

The basic suspension system exclusive of bellows, height control valves, bushings and shock absorbers, shall last the life of the coach without major overhaul or replacement. Four (4) heavy-duty rubber bushed silent block sleeve type radius rods shall be provided at both the front and rear drive axles to control lateral, longitudinal, and torsional movement. Radius rod bushings shall be Clevite part # 8365201. One transverse stabilizing rod shall be provided on front axle for additional support during coach lane changing or turning of corners. The rear suspension system shall be equipped with a sway bar designed to reduce body lean and increase bushing life. Castle nuts shall be installed on sway bars.

Items such as bushings and air springs shall be easily and quickly replaceable. Adjustment points shall be minimized and shall not be subject to a loss of adjustment in service. Necessary adjustments shall be easily accomplished without removing or disconnecting the components.

3.3.2 SPRINGS AND SHOCK ABSORBERS

3.3.3 TRAVEL

The suspension system shall permit a minimum wheel travel of 3.5 inches in jounce and 3 inches in rebound. Elastomeric bumpers shall be provided at the limit of jounce travel. Rebound travel may be limited by elastomeric bumpers or hydraulically within the shock absorbers.

3.3.4 KNEELING

A driver-actuated kneeling device shall lower the coach floor 3" to 6" during loading or unloading operations regardless of load to a floor height of 42 inches measured at the longitudinal centerline of the front door. The park brake shall prevent movement when the coach is kneeled. The coach shall kneel and rise at a maximum rate of 1.5 inches per second at essentially a constant rate. After kneeling, the coach shall rise within 2 seconds to a height permitting the coach to resume service and shall rise to the correct operating height within 9 seconds. During the lowering and rising operation, the maximum acceleration shall not exceed 0.2g and the jerk shall not exceed 0.3g/second measured on the front door step tread. A flashing indicator visible to the driver shall be illuminated until the coach is raised to a height adequate for safe street travel. An audible warning device that operates with the kneeling system shall be provided. A visual indicator meeting ADA requirements shall be provided on the curbside of the coach, visible to the boarding passenger who activates during the kneeling operation. This indicator shall be appropriately marked.

3.3.5 DAMPING

Vertical damping of the suspension system shall be accomplished by hydraulic shock absorbers mounted to the suspension arms or axles and attached to an appropriate location on the chassis. Damping shall be sufficient to control coach motion to 4 cycles or less after hitting road perturbations. Shock absorbers shall maintain their effectiveness for at least 50,000 miles in normal service. The coach shall be equipped with four shock absorbers on the drive axle and two on each side of the front axle and one on each end of the tag. Shock absorbers shall be interchangeable on each axle, side to side.

3.3.6 LUBRICATION

All elements of steering, suspension, and drive systems requiring scheduled lubrication shall be provided with grease fittings conforming to SAE Standard J534. These fittings shall be located for ease of inspection, and shall be accessible with a standard grease gun without flexible hose end from a pit or with the coach on a hoist. Each element requiring lubrication shall have its own grease fitting with a relief path. Lubricant specified shall be standard for all elements on the coach serviced by standard fittings. All fittings shall be standard pipe thread.

3.3.7 UNDERCOATING

Tectyl 127CG undercoating shall be applied to the underside of the body, frame, and wheelwells. Undercoating overspray on the exterior of the coach shall be removed prior to delivery. Underbody components such as air suspension bellows and height control valves, shock absorbers, lubrication fittings, air brake system valves, brake lining, muffler and exhaust system components, drive shaft, and engine and transmission sumps shall be protected from undercoating overspray.

3.4 STEERING

3.4.1 STRENGTH

Fatigue life of all steering components shall exceed 1,000,000 miles. No element of the steering system shall fail before suspension system components when one of the tires strikes a severe road hazard. Inadvertent alternations of steering as a result of striking road hazards are steering failures. The steering column shall be manufactured by TRW and shall provide both tilt and telescope features. The steering column shall also include a cover for the horn wire. The steering wheel includes hard plastic transit bus style rim. Finger grips shall be provided on the wheel, down and away from the driver. Steering systems that utilize an intermediate shaft to connect the main axle mounted steering box to the steering column shall utilize intermediate steering shafts manufactured by Dana Corporation.

The front axle shall be a non driving Meritor axle or approved equal rated at 16,000 pounds and shall be equipped with Q-Plus brakes and spring brake chambers with a load rating sufficient for the coach loaded to GVWR. Front axle shall be a Meritor Standard or approved equal, drop center type. King pins shall be the low friction, "Easy Steer" type for longer maintenance intervals.

3.4.2 TURNING EFFORT

The steering wheel shall be not less than 19.5 inches in diameter and shall be shaped for firm grip with comfort for long periods of time and shall not be padded. The steering wheel shall be removable with a standard or universal puller. Hydraulically assisted power steering shall be provided. The steering gear shall be an integral type with flexible lines eliminated or the number and length minimized. Steering torque applied by the driver shall not exceed 10-foot-pounds with the front wheels straight ahead to turned 10 degrees. Steering torque may increase to 70-foot-pounds when the wheels are approaching the steering stops. Steering effort shall be measured with the coach at SLW, stopped with the brakes released and the engine at normal idling speed on clean, dry, level, commercial asphalt pavement and the tires inflated to recommended pressure. Power steering failure shall not result in loss of steering control. With the coach in operation, the steering effort shall not exceed 55 pounds at the steering wheel rim and perceived free play in the steering system shall not materially increase as a result of power assist failure.

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

3.5 BRAKES

3.5.1 SERVICE BRAKE

3.5.1.1 ACTUATION

Service brakes shall be controlled and actuated by an air system. Force to activate the brake pedal control shall be an essentially linear function of the coach deceleration rate. The angle of the pedal shall be ergonomically designed to minimize fatigue. At least six (6") inches of slack in the airlines shall be available to allow for change out of the brake treadle valve and pedal assembly. The brake pedal shall be slightly lower than the accelerator. Provisions at the front shall be made to activate the brakes from the towing vehicle. Release of the emergency/parking brake shall require one full application of the service brake once the emergency/parking brake release valve is depressed. A protective bracket shall be added to the secondary emergency release valve.

3.5.1.2 FRICTION MATERIAL

Brake lining shall be non-asbestos Carlisle brake lining, and must be designed and approved for use on the vehicle being proposed. All brake linings shall be standard tapered Q-Plus lining. Brake lining must provide optimum performance with the brake system being used and shall minimize brake noise under all weather conditions. Riveted linings are acceptable. The brake system shall be equipped with Meritor, automatic slack adjusters.

3.5.1.3 HUBS AND DRUMS

Wheel bearing seals shall have integral replaceable wear surfaces. Wheel bearings and hubs shall be oil lubricated. Use of disc brakes shall not be permitted on any axle.

3.5.1.4 ANTILOCK BRAKE SYSTEM

The coach shall be equipped with a Meritor Wabco antilock brake system. The system shall utilize a Meritor Wabco D-CAB 4S/4M electronic controller assembly that will provide full vehicle wheel control braking for the coach. The design of the digital electronics shall provide a high degree of protection from radio and electromagnetic interference.

The Wabco ECU shall be remote mounted from the brake valve in a location that permits easy access of the controller for maintenance functions.

The antilock brake system shall provide individual wheel control by using a wheel speed sensor and modulator at each front axle and drive axle hub. The drive axle brakes shall be controlled completely independent of each other and therefore brake application pressure at an individual wheel shall be adjusted solely on the basis of its behavior on the road surface on which it is traveling. Wheel speed sensors shall be provided on the drive axle and will simultaneously control the wheels on the trailing axle. A single modulator shall be provided that controls both rear curbside wheels and another modulator shall control the rear streetside wheels.

Inputs to the Wabco ECU shall be generated from a tone ring (exciter) by wheel sensors, which generate a signal, which varies in voltage and frequency as the speed of the wheel increases or decreases. The wheel sensor shall provide wheel speed information at the rate of 100 pulses per wheel revolution. The Wabco ECU shall simultaneously receive, and individually interpret speed signals from four wheel sensors.

Outputs from the Wabco ECU shall be provided to Meritor Wabco brake modulators. The modulator shall be capable of receiving signals from the Wabco ECU and shall be designed to modify operator applied air pressure to the service brakes. The modulator shall be located near the service actuator(s) it controls and shall be the last air valve through which air passes on its way to the brake actuator. A wiring harness shall connect each modulator to the Wabco ECU. Solenoid valves contained in the modulator shall provide the electrical interface between the controller electronics and the air brake system. The Wabco ECU shall be capable of simultaneously and independently controlling four individual modulator assemblies.

The antilock brake system logic shall be designed to respond to component equipment failure using a conservative fail safe philosophy. Any single electrical failure of a component devoted to antilock braking shall result in simultaneous illumination of the antilock condition lamp on the dash, a disabling of all or part of the antilock system, and reversion to standard braking on wheels no longer under the control of antilock. When wheel equipment (speed sensor/exciter) fails, the controller shall divide and separate the brakes diagonally. In the event of a power or controller failure the entire antilock system shall disable and reversion to standard braking shall take place. Two or more failures, regardless of their position or occurrence shall also result in the immediate disabling of the entire system.

All electrical harnesses utilized to provide the antilock brake system shall be separate and independent of all other coach wiring. Under no circumstances shall antilock brake wiring harnesses be combined with or retained in existing harness looms, tape or trunks. The wires that carry information and power into and out of the controller shall be terminated with a weatherproof connector with the wiring sealed to the connector with the exception of the ECU connectors. The wire gauge used shall be sized specifically for the task which it is designed to perform. A dashboard mounted antilock condition lamp

shall be provided which shall be controlled by the Wabco ECU via the I/O controls multiplex modules and shall serve as a means of providing the operator with the operating condition of the antilock brake system. All electrical connections on the antilock system shall be Meritor Wabco molded connectors. The Wabco ECU shall utilize 4 amp “JUNIOR-POWER-TIMER” series connectors.

The Data Link function shall be provided which enables the Wabco ECU to report its operating condition to an external source. The controller data link configuration shall conform to SAE standard J1708 and the coded language used shall conform to SAE J1587. Two connections in the controller shall be provided.

The Meritor Wabco D-Cab 4S/4M ABS system is an approved equal.

3.5.1.5 AIR SYSTEM

The coach air system shall operate all accessories and the braking system with reserve capacity.

The engine drive air compressor shall be sized to charge the air system from 0 psi. to the governor cutoff pressure (130 psi.) in less than 3 minutes while not exceeding the engines rated speed. The air compressor shall be set to cut in at 105 psi.

Regardless of the systems air pressure, idle up to the rated engine speed shall be available to the driver with the transmission in neutral and the parking brake applied.

With the air system fully charged and the engine shut off, the reservoir capacity shall be sufficient to permit four full brake applications to maintain 60 psig. The pressure relief valve shall be mounted in the compressor cylinder head. The muffler or ping tank shall be mounted in the engine compartment relative to the air compressor discharge port. A drain mounted on the muffler or ping tank shall be directed or piped so as to discharge below the engine cradle or bulkhead level.

Air lines, except necessary flexible lines, shall conform to the installation and material requirements of SAE Standard J844-Type 1 or ASTM B-75 for copper tubing with standard, brass, flared or ball sleeve fittings, or SAE Standard J844-Type 3B for nylon tubing or ASTM

D-1248, Type 1, Class C Grade E5 for polyethylene tubing if not subject to temperatures over 200⁰ F. Accessory and other noncritical lines may use Type 3A tubing. Nylon tubing shall be installed in accordance with the following color coding standards:

Green	Indicates primary brakes and supply
Red	Indicates secondary brakes
Brown	Indicates parking brake
Yellow	Indicates compressor governor signal
Black	Indicates accessories
Blue	Indicates suspension

Line supports shall prevent movement, flexing, tension strain, and vibration. Copper lines shall be supported by looms, grommets, or insulated clamps to prevent the lines from touching one another or any component of the coach. To the extent practicable and before installation, the lines shall be pre-bent on a fixture that prevents tube flattening or excessive local strain. Copper lines shall be bent only

once at any point, including pre-bending and installation. Rigid lines shall be supported consistent with standard automotive practice. Nylon lines may be grouped and shall be continuously supported.

The compressor discharge line between powerplant and body mounted equipment shall be flexible convoluted copper or stainless steel line, or may be flexible teflon hose with a braided stainless steel jacket. Other lines necessary to maintain system reliability shall be flexible teflon hose with a braided stainless steel jacket. End fittings shall be standard SAE or JIC brass or steel, flanged, reusable, swivel type fittings. Flexible hoses shall be as short as practicable and individually supported. They shall not touch one another or any part of the coach except for the supporting grommets. Flexible lines shall be supported at 2 foot intervals or less. Airlines shall be installed to minimize air leaks. Each coach shall not leak down more than 6 psi. as indicated on the instrument panel mounted air gauges, within 15 minutes from the point of governor cut-off.

All reservoir supply and delivery airlines shall be sloped toward reservoirs and routed to prevent water traps. Grommets shall protect the airlines at all points where they pass through understructure components. Provision shall be made to apply shop air to a convenient location in the engine compartment and at the front of the coach and shall include a Schrader standard bore valve. The engine compartment Schrader valve shall be located ahead of a quarter turn valve. Air for the compressor shall be filtered through the main engine air cleaner system. All air reservoirs shall meet the requirements of SAE Standard J10 and shall be equipped with clean-out plugs and quarter-turn drain valves. These valves and any automatic moisture ejector valves shall be protected from road hazards by major structural members. Reservoirs shall have an internal siphon hose for the drain valve. The air system shall be protected by a pressure relief valve set at 150 psi and shall be equipped with check valves and pressure protection valves to assure partial operation in case of line failures.

The main airline check valve located between the air compressor and the first reservoir must be accessible for maintenance. Means shall be provided to establish the check valve to be in working order.

A model Bendix AD-IP air dryer shall be provided and installed according to component manufacturer's recommendations. The air drier shall be rated at 90 watts. A Bendix Puraguard filter, shall be provided. The Puraguard filter shall be installed between the air dryer and the wet tank. Separator shall be within four feet of the air dryer. Inlet air temperature is not to exceed 150 degrees F from the compressor.

3.6 GENERAL CHASSIS

3.6.1 WHEELS AND TIRES

3.6.1.1 WHEELS

Wheels shall be Alcoa hub piloted polished aluminum wheels with Durabrite coating. All wheels shall be interchangeable and shall be removable without a puller. Wheels shall be compatible with tires in size and load-carrying capacity. Front wheels and tires shall be balanced as an assembly. Wheels shall be capable of accommodating Michelin, Load Range L radial tires. One spare wheel, complete with mounted tire shall be provided.

The wheel nuts shall meet all physical property requirements defined in ASTM A 194-2H, ISO and SAE standards. The nut shall be phosphate coated for corrosion resistance. The bench testing requirements for the lug nuts shall satisfy MIL-STD 1312 vibration test 7 and the Junkers dynamic test. Front and tag axle lugnuts shall be standard Meritor components.

3.6.1.2 TIRES

The tires shall be determined by the ordering.

3.6.2 FUEL SYSTEM

3.6.2.1 FUEL TANK

An aluminum fuel tank shall be provided and securely mounted to the coach to prevent movement during coach maneuvers, and shall be easily removable for cleaning or replacement. Fuel tank capacity shall be 182 useable gallons. The fuel tank shall be equipped with an external, hex head, brass drain plug. The drain plug shall be at least 3/8 inch size and shall be located at the lowest point of the fuel tank. The tank shall have a removable filler neck to permit cleaning and inspection. Access covers shall not be provided. The tank shall be baffled internally to prevent fuel sloshing noise regardless of fill level. Baffles shall run the full height and length of the tank.

The baffles and fuel pickup location shall assure continuous full power operation on a 6-percent upgrade for 15 minutes starting with no more than 25 gallons of fuel over the unusable amount in the tank. The fuel pickup tube shall be perforated and mounted to the bottom face of the tank to insure the pickup screen stays at the bottom of the tank. Fuel shall be drawn through the fuel tank pickup tube fitted with a screen that will prevent debris from entering the fuel line.

The fuel tank shall have a permanently affixed plaque stating manufacturer, certification, capacity and date of manufacture. The plaque shall be clean and legible after the undercoating process, and shall comply with EPA requirements. The plaque shall be substantially visible when the fuel fill door is opened.

3.6.2.2 FUEL FILLER

An Emco-Wheaton Posi-Lok 105 mechanically closed fuel filler system shall be located on the right side of the coach that provides a positively sealed connection between the refueling nozzle and the fuel neck of the tank. The following components shall be Emco Wheaton; pressure relief valve, level control valve, audible whistle, dust cap and filler neck assembly with four (4) bolt popped adaptor. The fuel filler shall be designed to fill the fuel tank to the fill point, shall automatically shut off when fueling is complete, and shall eliminate foaming and blow back. The filler cap shall be recessed into the body so that spilled fuel will not run onto the outside surface of the coach. The filler shall accommodate a fill rate of forty (40) gallons per minute of foam-free fuel without causing the nozzle to shut off before the tank is full. An audible signal shall indicate when the tank is essentially full. A

conical shaped screen shall be installed to reduce entry and dirt and debris into the fuel tank.

3.6.3 BUMPER SYSTEM

3.6.3.1 LOCATION

Bumpers shall provide impact protection for the front and rear of the coach up to 26 inches above the ground. The bumpers shall wrap around the coach to the extent practicable without exceeding allowable coach width.

3.6.3.2 FRONT AND REAR BUMPER

Front and rear bumpers manufactured by Romeo Rim, shall be provided and shall consist of energy absorbing modules that are self restoring, integral black urethane, with a minimum 1700 PSI tensile strength, 250 % elongation, and 350 PSI tear strength. Bumper support structure is to be constructed of aluminum or high strength steel, and provide a single, full length structural support for bumper modules.

The bumpers and modules shall be shaped to preclude unauthorized riders standing on the bumper and shall wrap around the coach to protect the engine compartment doors and radiator. Bumper construction shall provide for disassembly and service of the modules and structural components independently of one another.

3.6.4 ELECTRICAL SYSTEM

3.6.4.1 GENERAL REQUIREMENTS

The basic coach electrical control and wiring system shall be I/O Controls DINEX Multiplex System. Versatility and future expansion of the system shall be provided for by expandable system architecture. The system shall be SAE J1708 compatible. Gateway devices used to interface the vehicle level control system shall utilize the above recommended industrial standard with the communication protocol being either full or half duplex.

The system components shall be capable of reliable operation in an environment of between minus 30C to plus 80C while encountering mobile shock and vibration. Each module shall be adequately shielded to prevent interference by EMI and RFI. Each I/O Controls DINEX module that requires an ID shall be equipped with an Intelligent Key feature. This eliminates the need of electronically writing the ID or the need to provide a unique wire harness for each module. At the time a module needs to be replaced, the Intelligent Key can be transferred to the new module by hand further eliminating the need for special tools at all maintenance intervals.

The multiplex power source is isolated thereby avoiding any ground noise. A built in self test (BIST) system utilizes the left and right turn signal tell tales to flash diagnostic codes when activated. The BIST will check for module communication failures or output feedback problems within the system, and display module faults on the right turn signal tell tale or module output faults on the left turn signal

tell tale. The BIST is activated with the engine override switch and will self terminate after it has completed one cycle.

The components of the multiplex system shall be of modular design thereby providing for ease of replacement by field maintenance personnel. Furthermore, each module shall utilize LED's to indicate circuit integrity and assist in rapid circuit diagnostics and verification of the load and wiring integrity. Each circuit shall be capable of providing a current load of up to 10 amperes of continuous load or 20 Amperes intermittent. The internal controls device shall be a solid state device, providing an extended life service cycle. Protection to each individual circuit shall be provided be either non-self-resetting circuit breakers or fuses. Programmable time delay functions and integrated flasher capabilities shall be contained in the control module.

The electrical system shall provide and distribute power to ensure satisfactory performance of all electrical components. The system shall supply a nominal 24 volts of direct current. Precautions shall be taken to minimize hazards to service personnel. Transient voltages above 220 volts may be used in fluorescent lighting systems. The power generating system shall be rated sufficiently higher than the total possible electrical load to maintain the charge on the batteries at all operating conditions including the engine high at idle. The alternator(s) shall be sized to provide the electrical load plus 15% reserve. All circuits shall be protected by circuit breakers or fuses. Fuses shall be used only where it can be demonstrated that circuit breakers are not practicable, and they shall be easily accessible for replacement. Redundant grounds shall be used for all electrical equipment except where it can be demonstrated that redundant grounds are not practical. One ground may be the bus body and framing and shall be attached to ground studs. No screw fastening of grounds to the coach frame shall be accepted. Grounds shall not be carried through hinges, bolted joints (except those specifically designed as electrical connectors), or powerplant mountings. Major wiring harnesses shall not be located under the coach floor and under-floor wiring shall be eliminated to the extent practicable. Wiring and electrical equipment necessarily located under the coach shall be insulated from water, heat, corrosion, and mechanical damage.

3.6.4.2 MODULAR DESIGN

Design of the electrical system shall be modular so that each major component, apparatus panel, or wiring bundle is easily separable with standard hand tools or by means of connectors. Each module, except the main body wiring harness, shall be removable and replaceable in less than 30 minutes by a mechanic. Powerplant wiring shall be an independent wiring module. Replacement of the engine compartment wiring module(s) shall not require pulling wires through any bulkhead or removing any terminals from the wires.

3.6.4.3 JUNCTION BOXES

All relays, controller, flashers, and other electrical components shall be mounted in easily accessible junction boxes. The boxes shall be sealed to prevent moisture from normal sources, including engine compartment cleaning, from reaching the electrical components and shall prevent fire that may occur inside the box from propagating outside the box. If a rear junction box is required, it shall be located away from the surge tank or properly protected from coolant overflows. The components and circuits in each box shall be identified and their locations recorded on a schematic drawing permanently glued to or printed on the inside of the box cover or door. The drawing shall be protected from oil, grease,

fuel, and abrasion. A rear start and run control box shall be mounted in an accessible location in the engine compartment. No electrical controls shall be located where spillover from the surge tank can wash over the electrical controls or enter junction boxes.

Care shall be taken to route electrical harnesses from junction boxes to facilitate troubleshooting and to reduce defects. Terminal strips not blocks shall be used to make connections. Wiring under the coach floor in the baggage area shall be routed in an enclosed, accessible trough.

3.6.4.4 WIRING AND TERMINALS

All wiring between major electrical components and terminations, except battery wiring, shall have double electrical insulation, shall be waterproof, and shall meet specification requirements of SAE Recommended Practice J555 and J1128 Type SXL or GXL. All wiring harnesses manufactured for buses purchased under this contract shall be designed/manufactured specifically for the operation of all sub components installed on the buses. Absolutely no additional wires/component circuits shall be externally added to existing assembled and insulated harnesses. Harnesses shall be properly designed and sized to the bus. Battery wiring shall conform to specification requirements of SAE Standard J1127-Type SGX or SGT and SAE Recommended Practice J541. All wiring shall be properly grouped, numbered, and color-coded full length. Numbering shall be stamped every at least every three inches (3"). Installation shall permit ease of replacement. All wiring harnesses over 5-feet long and containing at least two (2) wires shall include at least 2 or 10 percent excess wires whichever is greater for spares that are the same size as the largest wire in the harness excluding the battery cables. In addition, twelve (12) spare wires distributed proportionally between the lightest and heaviest gauge used (excluding battery cables) shall be provided between the front and rear junction boxes. Wiring harnesses shall not contain wires of different voltages unless all wires within the harness are sized to carry the current and insulated for the highest voltage wire in the harness. Double insulation shall be maintained as close to the terminals as practicable. The requirements for double insulation shall be met by wrapping harnesses with plastic electrical tape or by sheathing all wires and harnesses with nonconductive, rigid or flexible conduit. Grommets of elastomeric materials shall be provided at points where wiring penetrates metal structure. Wiring supports shall be nonconductive. Precautions shall be taken to avoid damage from heat, water, solvents, or chafing. Wiring length shall allow replacement of end terminals twice without pulling, stretching, or replacing the wire. Battery cables and alternator/generator output cables shall utilize AMP terminal ends. Except for those on large wires such as battery cables, terminals shall be crimped to the wiring. Terminals shall be full ring type or interlocking and corrosion-resistant. T splices may be used when it is less than 25,000 circular mills of copper in cross-section: a mechanical clamp is used in addition to solder on the splice; the wire supports no mechanical load in the area of the splice; and the wire is supported to prevent flexing.

3.6.5 ELECTRICAL COMPONENTS

3.6.5.1 GENERAL REQUIREMENTS

All electrical components, including switches, relays, flashers, and circuit breakers, shall be heavy-duty designs. To the extent practicable, these components shall be designed to last the service life of the coach and shall be replaceable in less than five (5) minutes by a mechanic. Sockets of plug-in components shall be polarized where required for proper function and the components shall be positively retained. Any manual reset circuit breakers critical to the operation of the coach shall be

mounted in a location best suited to the application with visible indication of open circuits. The electric motor shall be heavy-duty either wound field type or permanent magnet, as listed below. Electric motors shall be located for easy replacement and except for the cranking motor the brushes shall be replaceable in less than fifteen (15) minutes without removing the motor. Provision shall be made to ensure that the lubrication line for alternator bearing is secured to prevent lubricant leaks.

Main Evaporator	Wound field
Condenser Motors	Permanent Magnet
Driver's Heater and Defroster	Permanent Magnet
ProHeat	Permanent Magnet
Coolant Recovery Pump Motor	Permanent Magnet
Windshield Wiper Motor	Permanent Magnet
Windshield Washer Motor	Permanent Magnet or air

Dual electric horns shall be provided. Horns shall be positioned to be protected from road hazards and the elements. The horn trumpets shall be down turned to assure drainage of any moisture that may have entered.

3.6.5.2 BATTERIES

Batteries shall be easily accessible for inspection and serviceable only from outside the coach and shall be securely mounted on a sliding tray. The battery tray shall accommodate a lead-acid battery system and shall properly support the batteries during service, filling with automatic equipment, inspection, and replacement. A positive lock shall retain the battery tray in the normal position. Batteries shall be of premium construction and shall be fitted with threaded stud terminals. Batteries shall be 4, group 31, model 1150 maintenance free with 1350 cold cranking amp capacity with 450 CCA reserve minimum. Positive and negative terminals shall have different size studs, and the battery terminals and cables shall be arranged to prevent incorrect installation. Battery terminals shall be located for access in less than thirty (30) seconds with jumper cables. Battery cables shall be flexible and sufficiently long to reach the batteries in extended positions without stretching or pulling on any connection and shall not lie on top of the batteries. The battery terminals and cables shall be color-coded with red for the 12V and 24V positive and black for negative. A slave connection to the batteries shall provide a direct connection to the batteries for jump starting. A battery jumping connection cable supplied by systems material handling model SY6320GI shall be supplied in addition to the basic battery boosting posts.

3.6.5.3 MASTER BATTERY SWITCHES

A master battery switch shall be provided near the batteries to provide complete, simultaneous disconnecting of the batteries from all bus 12 & 24 volt electrical systems. The master switch shall be a "knife" type switch. Rotary style switches are not acceptable. The master switch shall be located behind a dedicated access door and shall be accessible in less than ten (10) seconds for operation. The master switch shall be capable of carrying and interrupting the total circuit load. Opening the master switch with the powerplants operating shall not damage any component of the electrical system.

3.6.5.4 RADIO NOISE SUPPRESSION

Proper suppression equipment shall be provided in the electrical system to eliminate interference with

radio and television transmission and reception. This equipment shall not cause interference with any electronic system on the coach. Suppression shall be in accordance with SAE Practice J1708 and FCC standards.

3.7 INTERIOR CLIMATE CONTROL

3.7.1 CAPACITY AND PERFORMANCE

The climate control system shall be highly reliable since most failures are Class 2. Manually controlled shut-off valves shall be installed in the refrigerant lines before and after the filter dryer to allow isolation of the dryer for service. Manually controlled shut-off valves in the refrigerant lines shall allow isolation of the receiver and compressor for service. Self-sealing couplings or manual shut-off valves shall be used to break and seal the refrigerant lines during removal of major components such as the refrigerant compressor or condenser. Condenser and evaporator fans shall have a safety guard to prevent contact between mechanics and rotating fan blades. The appropriate safety warning labels shall be permanently affixed at this location.

Interior climate control system shall be provided and operate on refrigerant 134a. It shall maintain the interior of the coach at a level suitable for all climatological conditions found in the continental United States. The heating, ventilating, and cooling systems shall maintain an average passenger compartment temperature between 60°F and 80°F with a relative humidity of 50 percent or less. The system shall maintain these conditions in ambient temperatures of 10°F to 100°F, with ambient humidities of 5 to 100 percent while the coach is running. In ambient temperatures of 95°F to 115°F with relative humidities greater than 50 percent, the system shall maintain a temperature gradient of 20°F while the coach is running. In ambient temperatures of 10°F to -10°F, the average interior temperature shall not fall below 55°F when the coach is running with no passengers. All individual components of the entire HVAC system shall either be supplied or approved by Carrier.

Air conditioning compressor shall be a 41 cubic inch displacement Carrier Model 05G. The compressor shall be belt driven through an electric clutch and electronic unloaders. The air conditioning compressor clutch shall be hub mounted not crankshaft mounted and the clutch bearing shall be able to be lubricated without the need for disassembly. Compressor drive belts shall be manufactured from Kevlar material to provide longer service life. A manually adjustable belt tensioning device shall be provided to maintain proper belt tension at all times.

The main air conditioning system capacity shall be at least 10 tons or 120,000 BTU's/HR with R134a. Driver's A/C capacity shall be at least 0.9 tons or 10,800 BTU's/HR.

The condenser fan motors with shrouded axial fans shall be a permanent magnet type with totally enclosed grease lubricated bearings. Motor shall be 24 volt, minimum 2 horsepower (1.5 kw) and operate only when the A/C is on for maximum efficiency. The condenser core shall be located to the rear of the #2, baggage bay and include copper tubes and copper fins and have approximately 1,200 in.² (7,742 cm²) of condensing surface. The receiver tank shall be equipped with a refrigerant sight gauge to be viewed through a window in the left-hand #3 baggage compartment.

The evaporator shall be mounted under floor in the same compartment as the heater core for "Reheat Cycle" and humidity control and shall include copper tubes and copper fins.

An internal ventilation system with individualized air outlets shall be provided and connected directly to the main heat/AC air distribution system, to provide conditioned or recirculated air at each two-passenger seat. Individual air outlets shall be mounted in the console at the underside of parcel racks. Outlets shall be passenger controlled by twisting off or on, and by directing the air flow. Air shall enter the power ventilation system through inlet vents.

A separate control shall be provided for the front dash heating and air conditioning, as well as for the main underfloor unit. A rheostat control is required for the main underfloor system. Control shall be within easy reach of the operator. System shall allow the driver to set a specific interior coach temperature within an approximate 20° F (11°C) range. The outside temperature can be displayed by pressing a knob on the thermostat. The HVAC controller shall monitor the temperature so that the interior temperature selected is maintained consistently. All controls shall be solid state designs.

The system shall be designed with return air ducts at both front and rear of coach for balanced airflow. The system shall introduce a minimum of 10% fresh outside air when the fresh air intake is open.

Heat shall be applied to the front step tread to prevent accumulation of snow, ice, or slush. Stepwell heat shall be supplied and controlled by the driver's heater and defroster system. The manufacturer shall provide and install two Schraeder or MADDEN valves with caps near the air conditioning compressor.

All electric motors which are part of the climate control system, except the evaporator motor, shall be permanent magnet type. Motors shall have double sealed, pre-lubricated anti-friction, replaceable ball bearings with moisture resistant grease. 3/8 and 5/16 diameter zinc terminal studs with bonded internal motor leads and anti-rotation insulators shall be used except driver's evaporator and parcel rack evaporators.

3.7.2 CONTROLS

The heating, cooling, ventilating and off operational modes of the interior climate control system shall be controlled by switches conveniently located to the driver. In the heating and cooling modes, the system shall be governed by a linear potentiometer control that regulates the amount of cooling and heating capacity available to the passenger area. The temperature will be completely adjustable between 60°F and 80°F. The temperature sensors used must be suitable for transit service and accurate to +/- 1°F. All system controls shall be solid state designs.

3.7.3 AIR FLOW

3.7.3.1 PASSENGER AREA

The cooling mode of the interior climate control system shall introduce air into the coach up along the sidewall at a minimum rate of 25 cubic feet per minute per passenger based on the standard configuration coach with full standee load. This air shall be composed of no less than 10 percent outside air. Airflow shall be evenly distributed throughout the coach with air velocity not exceeding 60 feet per minute on any passenger.

Airflow may be reduced to 15 cubic feet per minute per passenger when operating in the heating mode with full standee load. Heated air introduced into the coach shall contain no less than 10 percent outside air. In the heating mode, the fans will activate immediately to assure an air outlet temperature of 70 degrees F. Outside airflow may be cut off during initial warm up/cool down, provided that manual manipulation is not required.

3.7.3.2 DRIVER'S AREA

The coach interior climate control system shall deliver at least 200 cubic feet per minute of air to the driver's area when operating in the ventilating and cooling modes. Adjustable nozzles shall permit variable distribution or shut down of the airflow. A separate heater or windshield defroster unit shall be capable of diverting heated air to the driver's feet and legs. The defroster motor shall be a permanent magnet type motor. The defroster or interior climate control system shall maintain visibility through the driver's side window. A separate evaporator, fan and control shall supply conditioned air to the driver's area.

3.7.3.3 AIR INTAKE

Outside openings for air intake shall be located to ensure cleanliness of air entering the climate control system, particularly with respect to exhaust emissions from the coach and adjacent traffic. All intake openings shall be baffled to prevent entry of snow, sleet, or water. Outside air shall be filtered before discharge into the passenger compartment. More efficient air filtration may be provided to maintain efficient heater and/or evaporator operation. The air filter shall be easily removed for service. Moisture drains from air intake openings shall be located so that they will not be subjected to clogging from road dirt, but shall be accessible for cleaning and inspection.

3.8 RADIO AND PUBLIC ADDRESS

3.8.1 MOBILE RADIO SYSTEM

A radio compartment, antenna, conduit, electrical and other requirements shall be provided to support a 2-way mobile radio system.

3.8.6 PERIPHERAL DEVICES

3.8.6.1 SURVEILLANCE SYSTEM

To added as optional equipment by property ordering vehicles.

3.8.6.2 EMERGENCY ALARM

To work with Surveillance System ordered and current radio system used by the property ordering the vehicles

3.8.9 PUBLIC ADDRESS SYSTEM

An AM/FM/CD radio with PA shall be installed in the RH parcel rack at the front of the coach. A public address system shall be installed that enables the driver to address passengers either inside or outside the coach. A minimum of 26 interior speakers shall broadcast, in a clear tone, announcements that are clearly perceived from all seat positions at approximately the same volume level. Speaker shall be provided outside above the entrance door so that announcements can be clearly heard by passengers standing near the door(s). A driver controlled switch shall select inside or outside announcements. A separate volume control shall be provided for the outside system if volume adjustment would otherwise be necessary when switching from inside to outside. The system shall be muted when not in use. The microphone shall not interfere with the operation of the mobile radio system.

The microphone shall be a Clever Devices SpeakEasy hands-free microphone. The unit shall be composed of a microphone, electronics, tamper resistant metal housing including conduit and wiring from the housing to the coach PA system and existing speakers. The microphone shall provide hands-free operation. A foot switch shall be provided for activating SpeakEasy for inside announcements. The system shall use the existing PA amplifier for the inside announcements. The inside audio will be controlled with existing PA volume controls. An LED shall be provided for indicating that the system is recording.

An outside announcement shall be recordable via a push button on the SpeakEasy metal housing. Once recorded, the outside announcement shall be triggered automatically upon opening the door by a 24 volt DC discrete signal input. No external amplifier shall be required for the outside announcement. An LED shall be provided for indicating that the system is recording.

An additional on/off switch will give the operator the ability to disable playing the outside message and re-enable it at the operator's discretion. Audio quality must be sufficient to be heard clearly throughout the coach without any feedback and shall have a minimum of background noise. The length of the messages shall be 30 seconds maximum each for inside and outside messages with only two repeats per door activation. SpeakEasy shall play clearly with the operator speaking from a normally seated position. SpeakEasy shall minimize background noise.

3.9 GLOBAL POSITIONING SYSTEM (GPS) ANTENNA

To be an added optional feature at the request of the purchasing property.

3.10 SAFETY EQUIPMENT

On board safety equipment, per Federal Motor Carrier Safety Regulations Part 393, shall be provided with each coach. The equipment shall be mounted out of the way of passengers but shall be readily accessible:

Fire Extinguisher - 5 pound capacity, Underwriter's Laboratories rating of A, B, C or more, marked as such with charge indicator, mounted in a bracket with a round bottom

Safety Triangles - Three bi-directional emergency reflective triangles conforming to the FMVSS 125 in a case and mounted in the battery compartment

First Aid Kit - 24 piece kit mounted in the parcel rack is not required

3.11 SHIP LOOSE ITEMS

The contractor must send the following items (quantity per total order):

- 50 dzus fastner keys
- 50 reading light tools

SECTION II OPTIONS

1. Surveillance System
2. Global Positioning System (GPS) Antenna
3. CT Version
4. Caterpillar C13 12.5-Liter 410 HP with Engine Brake
5. S4.5.1.2106 Alcoa Durabrite Aluminum Wheels
6. Twin Vision LED color Destination Sign
7. Luminator LED color Destination Sign
8. LED Route/Block box connected to Destination Sign
9. S31.1.309.2 Two Round LED Red Stop lights at rear
10. Wiring for Farebox and Radio with antenna
11. S4.1.161.2 EX225 Disc Brakes on all axles
12. S4.7.376 Gladhands at front for towing
13. Air Horn with foot control
14. 1.14.2 Keyed alike locks
15. 3.1.28 Six (6) interior LED aisle light (Blue)
16. 3.1 LED Reading Lights
17. Auxiliary Heater- A Proheat X45 45,000 BTU heater or approved equal

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FEDERAL CONDITIONS OF MANUFACTURE/VENDOR

Federal conditions of Manufacturer/Vendor: As a requirement of FTA Circular 4220.1C “Third Party Contracting Requirements”, the following federal conditions apply as a condition of proposal review and award. The attached certifications must be including in vendors bid proposal.

A. No Federal Government Obligations to Third Parties.

The Recipient agrees that, absent the Federal Governments express written consent, the Federal Government shall not be subject to any obligations or liabilities to any sub-recipient, any third party contractor, or any other person not a party to the Grant Agreement or Cooperative Agreement in connection with the performance of the Project. Notwithstanding any concurrence provided by the Federal Government in or approval of any solicitation sub-agreement, or third party contract, the Federal Government continues to have no obligations or liabilities to any party, including the sub-recipient and third party contractor

B. Debarment and Suspension

The Recipient agrees as follows:

(1) The Recipient agrees to comply with the requirements of Executive Orders 12459 and 12689, “Debarment and Suspension,” 31 U.S.C. 6101 note; and U.S. DOT regulations on Debarment and Suspension at 49 C.F.R. Part 29.

(2) Unless otherwise permitted the FTA, the Recipient agrees to refrain from awarding any third party contract of any amount to or entering into any sub-agreement of any amount with a party included in the “U.S. General Services Administrations (U.S.GSA) List of Parties Excluded from Federal Procurement or Non-procurement Program,” implementing Executive Orders Nos. 12549 and 12689, “Debarment and Suspension and 49 C.F.R. Part 29. The list also includes the names of parties debarred, suspended, or otherwise excluded by agencies, and contractors declared ineligible for contract award under statutory or regulatory authority other than Executive Order No. 12549 and 12689.

(3) Before entering into any sub-agreement with a sub-recipient, the Recipient agrees to obtain a debarment and suspension certification (**ATTACHMENT I**) from each prospective sub-recipient containing information about the debarment and suspension status and other specific information about the sub-recipient and its “principals”, as defined at 49 C.F.R. 29.105(p). An example of the appropriate certification is contained in 49 C.F.R. Part 29,

(4) Before entering into any third party contract exceeding \$100,000, the Recipient agrees to obtain a debarment and suspension certification from each party contractor containing information about debarment and suspension status of that third party contractor and its “principal”, as defined at 49 C.F.R. 29.105(p). The Recipient also agrees to require each third party contractor to refrain from awarding any third party subcontract of any amount (at any tier) to a debarred or suspended subcontractor, and obtain a similar certification from any third party subcontractor (at any tier) seeking a contract exceeding

\$100,000. An example of the appropriate certification in 49 C.F.R. Part 29.

(5) The Recipient agrees to provide FTA a copy of each conditioned debarment or suspension certification provided by a prospective third party contractor at any tier or sub-recipient provided by a prospective third party contractor at any tier or sub-recipient at any tier. Until FTA approval is obtained, the Recipient agrees to refrain from awarding a third party contract or entering in a sub-agreement with any party that has submitted a conditioned debarment or suspension certification.

C. Restrictions on Lobbying.

The Recipient agrees as follows:

(1) The Recipient agrees it will not use Federal assistance funds to support lobbying.

(2) In accordance with 31 U.S.C. 1352 and U.S. Dot regulations. "New Restrictions on Lobbying," 49 C.F.R. Part 20, if the Recipients Project exceeds \$100,000, FTA will not make any Federal assistance available to the Recipient until FTA has:

(a) Received the Recipients certification that the Recipient has not and will not use Federal appropriated funds to pay any person or organization to influence or attempt to influence an officer or employee of any Federal department or agency, a member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal grant, cooperative agreement, or any other Federal award from which funding for the Project is originally derived, consistent with 31 U.S.C. 1352, and (b) if applicable, the Recipients statement disclosing any lobbying with non-Federal funds that has taken place in connection with obtaining any Federal financing ultimately supporting the Project.

(3) The Recipient agrees to provide FTA a copy of each lobbying disclosure statement with the accompanying lobbying certification provided by a prospective third party contractor at any tier or sub-recipient at any tier. **(ATTACHMENT II)**

D. Interest of Members of or Delegates to the United States Congress. In accordance with 41 U.S.C. 22, the Recipient agrees that it will not admit any member of a delegate to the United States Congress to any share or part of the Project or any benefit there from.

E. False or Fraudulent Statements and Claims.

The Recipient and agrees as follows:

(1) The Recipient recognizes that the requirements of the Program Fraud Civil Remedies Act of 1986, as amended, 49 U.S.C. 3801 et seq. and U.S.Dot regulation,"Program Fraud Civil Remedies," 49 C.F.R. Part 31, apply to its action pertaining to the Project. Accordingly, by signing the Grant Agreement or Cooperative Agreement, the Recipient certifies or affirms the truthfulness and accuracy of any statement it has made it makes, or it may make pertaining to the covered by the Grant Agreement or Cooperative Agreement. In addition to other penalties that may be applicable, the Recipient also acknowledges that if it makes a false, fictitious, or fraudulent claim, statement, submission, or certification, the Federal Government reserves the right to impose the penalties of the Program Fraud Civil Remedies Act of 1986, as amended, on the Recipient to the extent the Federal Government deems appropriate.

(2) The Recipient also acknowledges that if it makes a false, fictitious, or fraudulent

claim, statement, submission, or certification to the Federal Government in connection with an urbanized area formula financed with Federal assistance by 49 U.S.C. 5307, the Government reserves the right to impose on the Recipient the penalties of 18 U.S.C. 1001 and 49 U.S.C. 5307(n) (1), to the extent the Federal Government deems appropriate.

F. Reporting, Record Retention, and Access.

The Recipients agrees as follows:

(1) Reports: At a minimum, the Recipient agrees to provide to FTA those reports required by U.S. Dots grant management rules and any other reports the Federal Government may require.

(2) Record Retention. The Recipient agrees that, during the course of the Project and for three years thereafter, it will maintain intact and readily accessible all data, documents,

Reports, records, contracts, and supporting materials relating to the Project as the Federal Government may require for the Project.

(3) Access to Records. Upon request, the Recipient agrees to permit the Secretary of Transportation and the Comptroller General of the United States, or their authorized representatives, to inspect all Project work, materials, payrolls, and other data, and to audit the books, records, and accounts of the Recipient and its contractors pertaining to the Project. In accordance with 49 U.S.C. 5325(a), the Recipient agrees to require each third party contractor whose contract award is not based on competitive bidding procedures as defined by the Secretary of Transportation to permit the Secretary of Transportation and Comptroller General of the United States, or their duly authorized representatives, to inspect all work, material, payrolls, and other data and records involving that third party contract and audit the books, records and accounts involving that third party contact as it affects the Project.

G. Procurement

(1) Exclusionary or Discriminatory Specifications. Apart from inconsistent requirements imposed by Federal statute or regulations, the Recipient agrees that it will comply with the requirements of 49 U.S.C. 5323(h)(2) by refraining from using any Federal assistance awarded by FTA to support procurement using Exclusionary or discriminatory specifications.

(2) Geographic Restrictions. The Recipient agrees to refrain from using state or local geographic preferences, except those expressly mandated or encouraged by Federal statute, and as permitted by FTA, such as stated in Subsection 17.n of this Master Agreement.

H. Equal Employment Opportunity.

The Recipient agrees to comply with the following equal employment opportunity (EEO) requirements. The Recipient agrees as follows:

(1) The Recipient agrees that it will not discriminate against for employment because of race, color, creed, sex, disability, age, or national origin. The Recipient agrees to take affirmative action to ensure that applicants are employed and that employees are treated during employment, without regard to their race, color, creed, sex, disability, age,

or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Recipient also agrees to comply with any implementing requirement FTA may issue.

(2) If the Recipient is required to submit and obtain Federal Government approval of its EEO program, that EEO program approved by the Federal Government is incorporated by reference and made part of the Grant Agreement or Cooperative Agreement. Failure by the Recipient to carry out the terms of that EEO program shall be treated as a violation of the Grant Agreement or Cooperative Agreement. Upon notification to the Recipient of its failure to carry out the approved EEO program, the Federal Government may impose such remedies, as it considers appropriate, including termination of Federal financial assistance in accordance with Section 10 of this Master Agreement, or other measures that may affect the Recipients eligibility to obtain future Federal financial assistance for transportation projects.

I. Environmental Requirements

The Recipient recognizes that many Federal and state laws imposing environmental and resource conservation requirements may apply to the Project. Some, but not all, of the major Federal laws that may affect the Project include: the National Environmental Policy Act of 1969, as amended, 42 U.S.C. 4321 et seq. the Clean Air Act, as amended, 42 U.S.C. 7401 et seq. and scattered sections of 29 U.S.C.; the Clean Water Act, as amended, scattered sections of 33 U.S.C. and 12 U.S.C.; the Resource Conservation and Recovery Act, as amended, 42 U.S.C. 6901 et seq.; and the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, 42 U.S.C. 9601 et seq. The Recipient also recognizes that U.S. EPA, FHWA and other agencies of the Federal Government have issued and are expected in the future to issue regulations, guidelines, standards, orders, directives, or other requirements that may affect the Project. Thus, the Recipient agrees to adhere to, and impose on its sub-recipients and third party contractors, any such Federal requirements as the Federal Government may now or in the future promulgate. Listed below are requirements of particular concern FTA and the Recipient. The Recipient acknowledges that this list does not constitute the Recipients entire obligation to meet all Federal environmental and resource conservation requirements.

1. Environmental Protection. The Recipient agrees to comply with the applicable requirements of the National Environmental Policy Act of 1969, as amended, 42 U.S.C. 4321 et seq. in accordance with Executive Order No. 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, □ 59 Fed Reg. 7629 Feb. 16, 19964; FTA statutory requirements on environmental matters at 49 U.S.C. 5324(b); Council on Environmental Quality regulations on compliance with the National Environmental Policy Act of 1969, as amended, 40 C.F.R. Part 1500 et seq.; and joint FHWA/FTA regulation, Environmental Impact and Related Procedures, □ 23 C.F.R. Part 771 and 49 C.F.R. Part 622.

2. Air Quality. The Recipient agrees as follows:

The Recipient agrees to comply with all applicable standards, orders, or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. 7401 et seq. Specifically:

(a) The Recipient agrees to comply with applicable requirements of U.S. EPA regulations, “Conformity to State or Federal Implementation Plans of Transportation Plans, Programs, and Projects Developed, Funded or Approved Under Title 23 U.S.C. or the Federal Transit Act, 40 C.F.R. Part 51, Sub-part T; and Determining Conformity of Federal Actions to State or Federal Implementations Plans,” 40 C.F.R. Part 93. To support the requisite air quality conformity for the Project, the Recipient agrees to implement each air quality mitigation and control measure incorporated in the Project. The Recipient agrees that any Project identified in an applicable State Implementation Plan (SIP) as a Transportation Control Measure, will be wholly consistent with the description of the design concept and scope of the Project described in the SIP.

(b) U.S. EPA also imposes requirements the Clean Air Act, as amended, that may apply to transit operators, particularly operator’s of large transit bus fleets. Thus, the Recipient should be aware that the following U.S. EPA regulations, among others, may apply to its Project: “Control of Air Pollution from Motor Vehicles and Motor Vehicle Engines,” 40 C.F.R. Part 85, Control of Air Pollution from New and In-Use Motor Vehicles and New and In-Use Motor Vehicles Engines: Certification and Test Procedures, “40 C.F.R. Part 86, and “Fuel Economy of Motor Vehicles,” 40 C.F.R. Part 600.

The Recipient agrees to report and require each third party contractor and sub-recipient at any tier to report any violation of these requirements resulting from any Project implementation activity of a third party contractor, sub-recipient or itself to FTA and appropriate U.S. EPA Regional Office.

(3) Clean Water: The Recipient agrees to comply with all applicable standards, orders, or regulations issued pursuant to Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq.

J. Buy America Provision

This procurement is subject to the FTA Buy America Requirements in 49 CFR 661 and as identified in Section 12j, 182, of the Federal Transit Act. **Attachment A-3.**

The bidder must also submit a list or component breakdown to certify the domestic content of product components and sub-components.

K. Pre-Award and Post-Delivery Audit of Bus Purchases –

Pursuant to 49 CFR Part 663 each transit agency will conduct a pre-award and post-delivery audit of their bus purchases. This provision of this bid document is a responsibility of the transit agency or the Department of Rail and Public Transportation (DRPT); however, the awarded bidder by this reference agrees to supply or submit the appropriate information captioned by this rule upon request of the auditing transit agency.

L. Bus Testing Requirements

This procurement is subject to Federal Transit Administration Requirements in 48 CFR 665. All new model buses and vans acquired with Federal assistance, either by purchase or lease, are now subject to the testing requirements as defined in Bus Testing regulations. **Documentation certifying that said testing has been completed and a**

copy of the tests results shall be submitted with bid proposal.**M. Federal Changes**

Contractor shall at all times comply with all applicable FTA regulations, policies, procedures and directives, including without limitation those listed directly or by reference in the Federal Transit Administration Master Agreement (attached) dated October 1995, between Purchaser and FTA, as they may be amended or promulgated from time to time during the term of this contract. Contractor's failure to so comply shall constitute a material breach of this contract.

N. Contract Work Hours and Safety Standard Act

40 U.S.C. 327-333 (1995)

29 C.F.R. 5 (1995)

29 C.F.R. 1926 (1995)

(1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in

paragraphs (1) of this section the contractor and any subcontractor responsible therefore shall be liable to the United States for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clauses set forth in paragraph (1) of this section, in the sum \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set in paragraph (1) of this section.

(3) Withholding for unpaid wages and liquidated damages. The grantee or recipient shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable or account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2) of this section.

(4) Subcontracts. The contractor shall insert in any subcontracts the clauses set forth in this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in this section.

(5) Payrolls and basic records. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of

three years thereafter for all labors and mechanics working at the site of the work (or under the United States Housing Act of 1937, or under the Housing Act of 1949, in the construction or development of project). Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount if any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the labors or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

O. TERMINATION

a. Termination for Convenience (General Provision) **TRANSIT AGENCY OR DRPT** may terminate this contract, in whole or in part, at any time by written notice to the Contractor when it is in the Governments best interest. The Contractor shall be paid its costs, including contract closeout costs, and profit on work performed up to time of termination. The Contractor shall promptly submit its termination claim to DRPT to be paid the Contractor. If the Contractor has any property in its possession belonging to TRANSIT AGENCY OR DRPT, the Contractor will account for the same, and dispose of it in that TRANSIT AGENCY OR DRPT directs.

b. Termination for Default - If the Contractor does not deliver supplies in accordance with the contract delivery schedule, the contract may be terminated. Serving a notice of termination on the contractor setting forth the manner in which the Contractor is in default shall effect termination. The contractor will be paid the contract price supplies delivered and accepted.

If the contractor has an excusable reason for not performing, such as a strike, fire, or flood, events which are not the fault of or beyond the control of the Contractor, TRANSIT AGENCY OR DRPT after setting up a new delivery of performance schedule, may allow the Contractor to continue work, or treat the termination as a termination for convenience.

c. Opportunity to Cure: TRANSIT AGENCY OR DRPT in its sole discretion may, in the case of a termination for breach or default, allow the Contractor a short period of time in which to cure the defect. In such case, the notice of termination will state the time period in which cure is permitted and other appropriate conditions.

If the Contractor fails to remedy the Recipients satisfaction the breach or default or any of

the terms, covenants, or conditions of this Contract within ten (10) days after receipt by Contractor or written notice from the Recipient setting forth the nature of said breach or default, the Recipient shall have the right to terminate the Contract without any further obligation to Contractor. Any such termination for default shall not in any way operate to preclude TRANSIT AGENCY OR DRPT from also pursuing all available remedies against the Contractor and its sureties for said breach or default.

d. Waiver of Remedies for any Breach: In the event TRANSIT AGENCY OR DRPT elects to waive its remedies for any breach by Contractor of any covenant, term or condition of this Contract, such waiver by TRANSIT AGENCY OR DRPT shall not limit TRANSIT AGENCY OR DRPT's remedies for any succeeding breach of that or of any term, condition, or condition of this Contract.

e. Termination for Default: If the Contractor fails to deliver supplies or to perform the services within the time specified in this contract or any extension or if the Contractor fails to comply with any other provisions of this contract, TRANSIT AGENCY OR DRPT may terminate this contract for default. TRANSIT AGENCY OR DRPT shall terminate by delivering to the Contractor a Notice of Termination specifying the nature of the default. The Contractor will only be paid the contract price for supplies delivered and accepted, or services performed in accordance with the manner or performance set forth in this contract.

If, after termination for failure to fulfill contract obligations it is determined that the Contractor was not in default, the rights and obligations of the parties shall be the same as if the termination had been issued for the convenience of TRANSIT AGENCY OR DRPT.

f. Termination for Convenience of Default: TRANSIT AGENCY OR DRPT may terminate this contract, or any portion of it, by serving a notice of termination on the Contractor. The notice shall state whether the termination is for convenience of TRANSIT AGENCY OR DRPT or for the default of the Contractor. If the termination is for default, the notice shall state the manner in which the contractor has failed to perform the requirements of the contract. The Contractor shall account for any property in its possession paid for from funds received from TRANSIT AGENCY OR DRPT, or property supplied to the Contractor by TRANSIT AGENCY OR DRPT. If the termination is for default, TRANSIT AGENCY OR DRPT may fix fee, if the contract provides for a fee, to be paid the contractor in proportion to the value, if any, of work performed up to time of termination. The Contractor shall properly submit its termination claim to TRANSIT AGENCY OR DRPT and the parties shall negotiate the termination settlement to be paid the Contractor.

If the termination is for the convenience of TRANSIT AGENCY OR DRPT, the Contractor shall be paid its contract closeout costs, and a fee, if the contract provided for payment of a fee, in proportion to the work performed up to the time of termination.

If, after serving a notice of termination for default, TRANSIT AGENCY OR DRPT determines that the Contractor has an excusable reason for not performing, such as strike, fire, flood, events which are not the fault of and are beyond the control of the contractor, TRANSIT AGENCY OR DRPT after setting up a new work schedule, may allow the Contractor to continue work, or treat the termination as a termination for convenience.

P. Disadvantage Business Enterprise Provision

1. The Federal Fiscal Year goal has been set by TRANSIT AGENCY OR DRPT in an attempt to match projected procurements with available qualified disadvantaged businesses. TRANSIT AGENCY OR DRPT goals for budgeted service contracts, bus parts, and other material and supplies for Disadvantaged Business Enterprise have been established by TRANSIT AGENCY OR DRPT as set forth the Department of Transportation Regulations 49 C.F.R. Part 23, March 31, 1980, and amended by Section 106(c) of the Surface Transportation Assistance Act of 1987, and is considered pertinent to any contract resulting from this request for proposal.

If a specific DBE goal is assigned to the contract, it will be clearly stated in the Special Specifications, and if the contractor is found to have failed to exert sufficient, reasonable, and good faith efforts to involve DBE's in the work provided, TRANSIT AGENCY OR DRPT may declare the Contractor noncompliance an in breach of contract. If goal is not stated in the Special Specifications, it will be understood that no specific goal is assigned to this contract.

(a) Policy

It is the policy of the Department of Transportation and TRANSIT AGENCY OR DRPT that Disadvantaged Business Enterprises, as defined in 49 CFR Part 23, and as amended in Section 106(c) of the Surface Transportation and Uniform Relocation Assistance Act of 1987, shall have the maximum opportunity to participate in the performance of Contract financed in whole or in part with federal funds under this Agreement. Consequently, the DBE requirements of 49 CFR Part 23 and Section 106(c) of the STURAA of the 1987, apply this Contract.

The Contractor agrees to ensure that DBEs as defined in 49 CFR Part 23 and Section 106(c) of the STURAA of 1987, have the maximum opportunity to participate in the whole or in part with federal funds provided under this Agreement. In this regard, the Contractor shall take all necessary and reasonable in accordance with the regulations to ensure that DBEs have the maximum opportunity to compete for and perform subcontracts. The Contractor shall not discriminate on the basis of race, color, national origin, religion, sex, age or physical handicap in the award and performance of subcontracts.

It is further the policy of TRANSIT AGENCY OR DRPT to promote the development and increase the participation of business owned and controlled by disadvantaged. DBE involvement in all phases of TRANSIT AGENCY OR DRPT procurement activities is encouraged.

(b) DBE obligation The Contractor and its subcontractors agree to ensure that disadvantaged businesses have the maximum opportunity to participate in the performance in the performance of contracts and subcontracts financed in whole or in part with federal funds provided under the Agreement. In the regard, all Contractors and subcontractors shall take all necessary and reasonable steps in accordance with 49 CFR

Part 23 as amended, to ensure that minority business enterprises have the maximum opportunity to compete for and perform contracts.

(c) Where the Contractor is found to have failed to exert sufficient reasonable and good faith efforts to involve DBE's in the work provided, TRANSIT AGENCY OR DRPT may declare the contractor noncompliance and in breach of contract.

(d) The Contractor will keep records and documents for a reasonable time following performance of this contract to indicate compliance with TRANSIT AGENCY OR DRPT DBE program. These records and documents will be made available at reasonable times and places for inspection by any authorized representative of TRANSIT AGENCY OR DRPT and will be submitted to TRANSIT AGENCY OR DRPT upon request.

(e) TRANSIT AGENCY OR DRPT will provide affirmative assistance as may be reasonable and necessary to assist the prime contractor in implementing their program for DBE participation. The assistance may include the following upon request:

- Identification of qualified DBE
- Available listing of Minority Assistance Agencies
- Holding bid conferences to emphasize requirements

DBE Program Definitions, as used in the contract:

(a) Disadvantaged business means a small business concern.

- i. Which is at least 51 percent owned by one or more socially and economically disadvantaged individuals, or, in the case of any publicly owned business, at One owns least 51 percent of the stock of which or more socially and economically disadvantaged individuals; and
- ii. Whose management and daily business operations are controlled by one or more of the socially and economically disadvantaged individuals who own it.
- iii. Which is at least 51 percent owned by one or more women individuals, or in the case of any publicly owned business, at least 51% of the stock of which is owned By one or more women individual; and
- iv. Whose management and daily business operations are controlled by one or more women and individuals who own it.

(b) Small business concern means a small business as defined by Section 3 have the Small Business Act and Appendix B-Section 106(c) Determination of Business Size.

- (c) Socially and economically disadvantaged individuals means those individuals who are citizens of the United States (or lawfully admitted permanent residents) and States (or lawfully admitted permanent residents) and who are black Americans, Native Americans, Asian-Pacific Americans, Asian-Indian Americans, or women, and other minorities or individuals found to be disadvantages by the Small Business Administration pursuant to section 8(a) of the Small Business Act.
- i. Black Americans, which includes persons having
 - ii. origins in any of the Black racial groups of Africa;

 - ii. Hispanic Americans, which includes persons of Mexican, Puerto Rican, Cuba, Central or South American, or other Spanish or Portuguese culture or origin, Regardless of race;

 - iii. Native Americans; which includes persons who are American Indians, Eskimos, Aleuts, or Native Hawaiians;

 - iv. Asian-Pacific Americans, which includes persons whose origins are from Japan, China, Taiwan, Korea, Vietnam, Laos, Cambodia, the Philippines, Samoa, Guam, the U.S. Trust Territories of Pacific, and the Northern Marinas;

 - v. Asian-Indian Americans, which includes persons whose origins are from India, Pakistan, and Bangladesh.

Q. Incorporation of Federal Transit Administration (FTA) Terms.

The preceding provisions include, in part, certain Standard Terms and Conditions required by DOT, whether or not expressly set forth in the preceding contract provisions. All contractual provisions required by DOT, as set forth in FTA Circular 4220.1C, dated May 1, 1995, is hereby incorporated by reference. Anything to the contrary herein notwithstanding, all FTA mandated terms should be deemed to control in the event of a conflict with other provisions contained in this Agreement. The Contractor shall not perform any act, fail to perform any act, or refuse to comply with any TRANSIT AGENCY OR DRPT requests, which would cause TRANSIT AGENCY OR DRPT to be in violation of the FTA terms and conditions.

R. Cargo Preference Requirements

The contractor agree: to use privately owned the United States-Flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment,

material, or commodities pursuant to the underlying contract to the extent such vessels are available at fair and reasonable rates for the United States-Flag commercial vessels; b. to furnish within 20 working days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating within the United States, a legible copy of a rated, "on-board" commercial ocean bill-of-lading in English for each shipment of cargo described in the preceding paragraph to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590 and to the FTA recipient (through the contractor in the case of a subcontractor's bill-of-lading).c. to include these requirements in all subcontracts issued pursuant to this contract when the subcontract may involve the transport of equipment, material, or commodities by ocean vessel.

S. Recycled Products

The contractor agrees to comply with all requirements of Section 6002 of the Resource Conservation and Recovery Act (RCRA), as amended (42 U.S.C. 6962), including but not limited to the regulatory provisions of 40 CFR Part 247, and Executive Order 12873, as they apply to the procurement of the items designated in Subpart B of 40 CFR Part 247.

T. Energy Conservation

The Successful Bidder will recognize mandatory standards and policies relating to energy efficiency, which is contained in the State energy conservation plan issued in compliance with the Energy Policy and Conservation Act (42 USC Section 6321 et seq.).

U. Clean Water Requirements

The Successful Bidder agrees to comply with all applicable standards, orders, or requirements issued under Section 306 of the Clean Air Act (42 USC 1857 (h)), Section 508 of the Clean Water Act (33 USC 1368), Executive Order 11378, and Environmental Protection Agency regulations (40 CFR, Part 15) which prohibit the use under nonexempt federal contracts, grants or loans, of facilities included on the EPA List for Violating Facilities. Furthermore, Motorola shall report violations to FTA and to the USEPA Assistant Administrator for Enforcement.

V. Clean Air Requirements

The Successful Bidder agrees to comply with all applicable standards, orders, or requirements issued under The Clean Air Act, as amended, 43 U.S.c.7401 et seq.; limitations on Federal assistance added by the Clean Air Act Amendment of 1990, 42 U.S.C 7506(a).

W. Privacy Act

The following requirements apply to the Contractor and its employees that administer any system of records on behalf of the Federal Government under any contract:

The Contractor agrees to comply with, and assures the compliance of its employees with, the information restrictions and other applicable requirements of the Privacy Act of 1974, 5 U.S.C. § 552a. Among other things, the Contractor agrees to obtain the express consent of the Federal Government before the Contractor or its employees operate a system of records on behalf of the Federal Government. The Contractor understands that the requirements of the Privacy Act, including the civil and criminal penalties for violation of that Act, apply to those individuals involved, and that failure to comply with the terms of the Privacy Act may result in termination of the underlying contract.

The Contractor also agrees to include these requirements in each subcontract to administer any system of records on behalf of the Federal Government financed in whole or in part with Federal assistance provided by FTA.

X. Civil Rights Requirements

Nondiscrimination: In accordance with title VI of the Civil Rights Act, as amended, 42 U.S.C. § 2000d; Section 303 of the Americans with Age Discrimination Act of 1975, amended, 42 U.S.C. § 6102; Section 202 of the Americans with Disabilities Act of 1990, 42 U.S.C. § 12132, and the Federal transit law at 49 U.S.C. § 5332, the Contractor agrees that it will not discriminate against any employee or applicant for employment because of race, color, creed, national origin, sex, age, or disability. In addition, the Contractor agrees to comply with applicable Federal implementing regulations and other implementing requirements FTA may issue.

Equal Employment Opportunity: In connection with this project, the Successful Bidder

will not discriminate against any employee or applicant for employment because of:

a) Race, Color, National Origin, Sex:

In accordance with Title VII of the Civil Rights Act, as amended, 42 U.S.C. § 2000e, and Federal transit laws at 49 U.S.C. § 5332, the Contractor agrees to comply with all applicable equal employment opportunity requirements of the U.S. Department of Labor (U.S. DOL) regulations, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor," 41 C.F.R. Parts 60 et seq., (which implement Executive Order No. 11246, "Equal Employment Opportunity," as amended by Executive Order No 11375," Amending Executive Order 11246 Relating to Equal Employment Opportunity," 42 U.S.C. § 2000e note), Title VI of the Civil Rights Act of 1964, as amended, and Title 47 Code of Federal Regulations (CFR), Part 21, as amended, of the U.S. Department of Transportation and with any applicable Federal statutes, executive orders' regulations, and Federal polices that may in the future affect construction activities undertaken in the course of the Project. The Contractor agrees to take affirmative action to ensure that applicants are employed and that employees are treated during employment, without regard to their race, color, creed, national origin, sex, or age. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

b) Age: In accordance with Section 4 of the Age Discrimination in Employment Act of 1967, as amended, 29 U.S.C. §§ 623 and Federal transit law at 49 U.S.C. § 5332, The Contractor agrees to refrain from discrimination against present and prospective employees for reason of age. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

c) Disabilities: In accordance with Section 102 of the Americans with Disabilities Act, as amended, 42 U.S.C. § 12112, the Contractor agrees that it will comply with the requirements of U.S. Equal Employment Opportunity Commission, "regulations to Implement the Equal Employment Provision of the American with Disabilities Act, "29 C.F.R. Part 1630, pertaining to employment of persons with disability. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

Y. State And Local Law Disclaimer

The use of many of the suggested clauses are not governed by Federal law, but are significantly affected by State law. The language of the suggested clauses may need to be modified depending on state law, and that before the suggested clauses is used in the TRANSIT AGENCY OR DRPT's procurement documents, the grantees should consult with their local attorney.

Z. Transit Vehicle Manufacturer (TVM) Certification

The contractor agrees to comply with all the requirements of 49 CFR 23.67, as they apply to the procurement of transit vehicles under this contract, including be not limited to, furnishing the vehicle purchaser with a certification that it is in full compliance with all the regulatory requirements of 49 CFR 23.67.

AA. Access Requirements For Persons With Disabilities (ADA)

The Contractor agrees to comply with the requirements of 49 U.S.C. § 5301(d) which expresses the Federal policy that the elderly and persons with disabilities have the same right as other persons to use mass transportation service and facilities, and those special efforts shall be made in planning and designing those services and facilities to implement those policies. The Contractor also agrees to comply with all applicable requirements of section 504 of the Rehabilitation Act of 1973, as amended, 29 U.S.C. § 794, which prohibits discrimination on the basis of handicaps, and with the Americans with Disabilities Act of 1990 (ADA), as amended, 42 U.S.C. §§ 12101 *et seq.*, which requires the provision of accessible facilities and services, and with the following Federal regulations, including any amendments thereto:

- a) U.S. DOT regulations, "Transportation Services for Individuals with Disabilities (ADA)," 49 C.F.R. Part 37;
- b) U.S. DOT regulations, "Nondiscrimination on the Basis of Handicap in Programs and Activities Receiving or Benefiting from Federal Financial Assistance," 49 C.F.R. Part 27;
 - a) Joint U.S. Architectural and Transportation Barriers Compliance Board/U.S. DOT regulations, "Americans With Disabilities (ADA) Accessibility Specifications for Transportation Vehicles," 36 C.F.R. Part 1192 and 49 C.F.R. Part 38;
 - b) U.S. DOJ regulations, "Nondiscrimination on the Basis of Disability in State and Local Government Services,"

28 C.F.R. Part 35;

- c) U.S. DOJ regulations, "Nondiscrimination on the Basis of Disability by Public Accommodations and in Commercial Facilities," 28 C.F.R. Part 36;
- d) U.S. GSA regulations, "Accommodations for the Physically Handicapped," 41 C.F.R. Subpart 101-19;
- e) U.S. Equal Employment Opportunity Commission, "Regulations to Implement the Equal Employment Provisions of the Americans with Disabilities Act," 29 C.F.R. Part 1630;
- f) U.S. Federal Communications Commission regulations, "Telecommunications Relay Services and Related Customer Premises Equipment for the Hearing and Speech Disabled," 47 C.F.R. Part 64, Subpart F; and
- g) FTA regulations, "Transportation for Elderly and Handicapped Persons," 49 C.F.R. Part 609; and
- h) Any implementing requirements FTA may issue.

BB. Notification Of Federal Participation

In the announcement of any third party contract award for goods or services (including construction services) having an aggregate value of \$500,000 or more, the Contractor agrees to specify the amount of Federal assistance to be used in financing that acquisition of goods and services and to express the amount of that Federal assistance as a percentage of the total cost of that third party contract.

CC. Ineligible Bidders

Each bidder certifies, (**Attachment I**), that it is not included in the U.S. Comptroller General's list of ineligible contractors.

ATTACHMENT A-1**1.2.23 CERTIFICATION OF PRIMARY PARTICIPANT
REGARDING DEBARMENT, SUSPENSION, AND OTHER RESPONSIBILITY
MATTERS**

The Primary Participant (applicant for an FTA grant or cooperative agreement, or potential contractor for major third party contract), _____ certifies to the best of its knowledge and belief, that it and its principals:

1. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
2. Have not within a three-year period preceding this proposal been convicted of or has a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
3. Are not presently indicated for or otherwise criminally or civilly charged by a governmental entity (Federal, State, or local) with commission of any of

the offenses enumerated in paragraph (2) of this certification; and

- 4. Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause of default.

(If the primary participant (applicant for an FTA grant, or cooperative agreement, or potential third party contractor) is unable to certify any of the statements in this certification, the participant shall attach and explanation to his Certification.)

THE PRIMARY PARTICIPANT (APPLICANT FOR AN FTA GRANT OR COOPERATIVE AGREEMENT, OR POTENTIAL CONTRACTOR FOR A MAJOR THIRD PARTY CONTRACT), _____, CERTIFIES OR AFFIRMS THE TRUTHFULNESS AND ACCURACY OF THE CONTENTS OF THE STATEMENTS SUBMITTED ON OR WITH THIS CERTIFICATION AND UNDERSTANDS THAT THE PROVISIONS OF 31 U.S.C SECTIONS 3801 ET SEQ. ARE APPLICABLE THERETO.

Signature and Title of Authorized Official

1.1.23

The undersigned chief legal counsel for the _____ hereby certifies that the _____ has authority under State local law to comply with the subject assurances and that the certification above has been legally made.

Signature of Applicant's Attorney

Date

1.1.23 CERTIFICATION OF LOWER-TIER PARTICIPANTS REGARDING DEBARMENT, SUSPENSION AND OTHER INELIGIBILITY AND VOLUNTARY EXCLUSION

The Lower Tier Participant (potential sub-grantee or sub-recipient under an FTA project, potential third party contractor, or potential subcontractor under a major third party contact,

_____ certifies by submission of this proposal, that neither it nor its principals are presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by and Federal department or agency.

(If the Lower Tier Participant (potential sub-grantee or sub-recipient under an FTA project, potential third party contractor, or potential subcontractor under a major third party contract) is unable to certify to any of the statements in this certification, such participant shall attach an explanation to this proposal.)

THE LOWER-TIER PARTICIPANT (POTENTIAL SUB-GRANTEE OR SUB-RECIPIENT UNDER AN FTA PROJECT, POTENTIAL THIRD PARTY CONTRACTOR OR POTENTIAL SUBCONTRACTOR UNDER A MAJOR THIRD PARTY CONTRACT) _____, CERTIFIES OR AFFIRMS THE TRUTHFULNESS AND ACCURACY OF THE CONTENTS OF THE STATEMENTS SUBMITTED ON OR WITH THIS CERTIFICATION AND UNDERSTANDS THAT THE PROVISIONS OF 31 U.S.C. SECTIONS 3801 ET SEQ. ARE APPLICABLE THERETO.

(Signature and Title of Authorized Official)

The undersigned chief legal counsel for the _____
_____ hereby certifies that the
_____ has authority under State and Local
law to comply with the subject assurances and the certifications above has been
legally made.

(Signature of Applicant's Attorney)

(Date)

**ATTACHMENT A-2
CERTIFICATION
OF
RESTRICTIONS ON LOBBYING**

I, _____, hereby certify of
(Name and Title of Grantee Official)
_____ that:
(Name of Grantee)

- (1) No federal appropriated funds have been paid or will be paid or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer/employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, loan, or cooperative agreement.**
- (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.**
- (3) The undersigned shall require that the language of this certification be included in the award documents for all sub awards at all tiers (including subcontracts, sub grants, and the contracts under grants, loans, and cooperative agreements) and that all sub recipients shall certify and disclose accordingly.**

This certification is a material representation of fact upon which reliance is placed when this transaction was made or entered into. submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$10,000 for each such failure.

Executed this _____ day of _____, 19__.

BY: _____
(Signature of authorized official)

(Title of authorized official)

ATTACHMENT A-3

CONTRACTOR: NUMBER

EQUIPMENT:

1.1.20 BUY AMERICAN PROVISIONS

This procurement is subject to the Urban Mass Transportation Buy American Requirements in 49 cfr 661.

A Buy American Certificate, as per below format, must be completed and submitted with the bid. A bid, which does not include the certificate, will be considered non-responsive.

The Virginia Department of Rail and Public Transportation may seek a waiver from the buy American Provision if grounds for the waiver exist.

BUY AMERICA CERTIFICATION

The bidder hereby certifies that it will comply with the requirements of Section 165(b)(3) of the Surface Transportation Assistance Act of 1982 and the regulation in 49CFR 661.

Date: _____

Signature: _____

Title: _____

or

The bidder hereby certifies that it cannot comply with the requirements of Section 165 (b)(3) of the Surface Transportation Assistance Act of 1982, but it may qualify for an exception to the requirement pursuant to Section 165 (b)(4) of the Surface Transportation Assistance Act of 1982 and regulations of 49 CFR 661.7.

Date: _____

Signature: _____

Title: _____

CONTRACTOR: NUMBER:

EQUIPMENT:

1.2.21 TRANSIT VEHICLE MANUFACTURE'S CERTIFICATION HAVE COMPLIANCE WITH SUBPART D, 49 CFR PART 23.

This procurement is subject to the provisions of Section 23.67 of 49 CFR Part 23. Accordingly, as a condition of permission to bid, the following certification must be completed and submitted with the bid. A bid, which does not include the certification, will not be considered.

TRANSIT VEHICLE MANUFACTURER CERTIFICATION

_____, a TVM, hereby certifies that it has complied with the requirements of Section 23.67 of 49 CFR Part 23 by submitting a current annual DBE goal to FTA. The goals apply to Federal Fiscal Year _____ (October 1, 19____ to September 30, 19____) and have been approved or not disapproved by FTA.

_____, hereby certifies that the manufacturer of the transit vehicle supplied _____ has complied with the above-reference requirement of Section 23.67 of 49 CFR Part 23.

Date: _____

Signature: _____

Title: _____

Firm: _____

ATTACHMENT 4

BIDDER'S CERTIFICATION OF DISADVANTAGED BUSINESS ENTERPRISE (DBE) SUBMISSION TO FTA

The _____
(name of Bidder) hereby certifies that it has submitted plans for the participation of Disadvantaged Business Enterprise (DBE) in conformation to the U. S. Department of Transportation's Minority business Enterprise Regulations (49 CFR, Part No. 26) and is eligible to bid on vehicle contracts awarded under assistance from the Federal Transit Administration (FTA).

Bidder's Name _____

Signature: _____
Authorized Agent

Date: _____

Printed Name & Title

Subscribed and sworn to before me this _____ day of _____, 20____.

Notary Public

My Commission expires _____, 20____.

ATTACHEMENT 5
Affidavit of Non-Collusion

I hereby swear (or affirm) under the penalty for perjury:

1. That I am the bidder (If the bidder is an individual, a partner in the bid (if the bidder is a partnership), or an officer or employee of the bidding corporation having authority to sign on its behalf (if the bidder is a corporation));
2. That the attached bid or bids has been arrived at by the bidder independently and have been submitted without collusion and without any agreement, understanding, or planned common course of action with any other vendor of materials, supplies, equipment, or service described in the invitation for bid, designed to limit independent bids or competition;
3. That the contents of the bid or bids has not been communicated by the bidder or its employees or agents to any person not an employee or agent of the bidder or its surety on any bond furnished with the bid or bids, and will not be communicated to any such person prior to the official opening of the bid or bids.
4. That I have fully informed myself regarding the accuracy of the statements made in the affidavit.

Bidder's Name: _____

Signature: _____

Date: _____

Authorized Signature

Print Name and Title

Subscribed and sworn to before me this _____ day of _____, 20_____.

Notary public

My Commission expires _____, 20_____.

Bidder's

E.I.

Number

(Number used on employer's Quarterly Federal Tax Return)