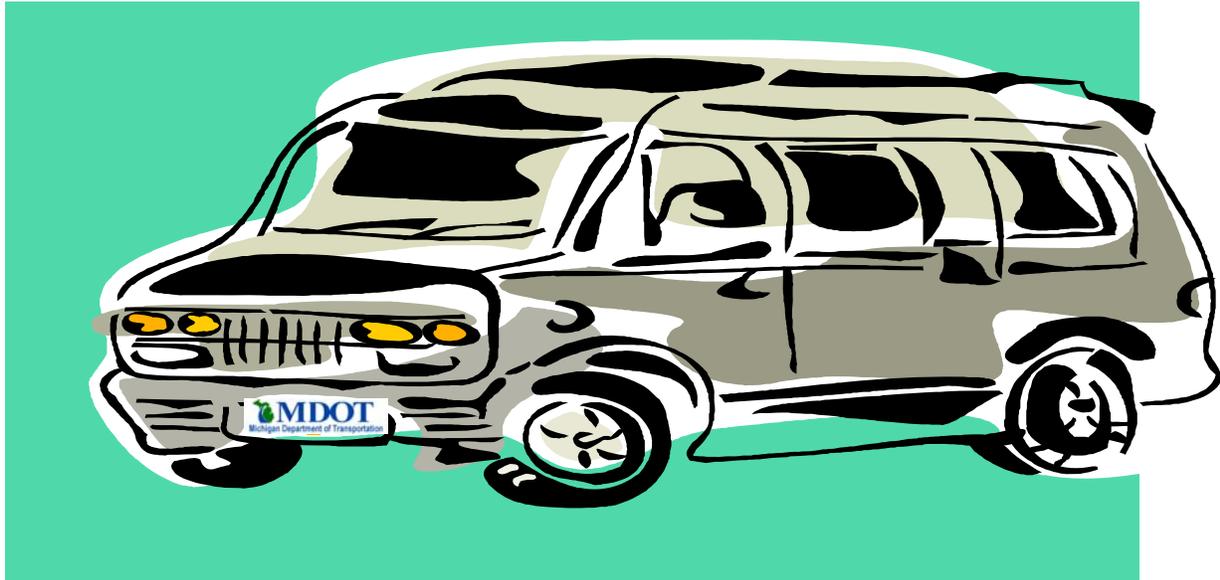


**APPENDIX B  
STATE OF MICHIGAN  
PUBLIC TRANSPORTATION**



**MODIFIED CONVERSION VAN SPECIFICATIONS  
Minimum 4-Years/100,000 Miles  
Passenger Nonlift Vehicle & Lift Vehicle with Alternate Seating**



**Office of Passenger Transportation  
Program Administration Section**

Version Date: 10/27/2011

**State of Michigan**  
**MODIFIED CONVERSION VAN SPECIFICATIONS**  
**Minimum 4-Years/100,000 Miles**  
**Passenger Nonlift Vehicle & Lift Vehicle with Alternate Seating**

**Table of Contents**

I.	PURPOSE OF SPECIFICATIONS:	4
II.	CHASSIS SPECIFICATIONS:	5
	A. Chassis	5
	B. Gross Vehicle Weight Rating (GVWR):	5
	C. Wheelbase:	5
	D. Vehicle Overall Length (OAL):	5
	E. Engine:	5
	F. Transmission:	5
	G. Axle Capacity:	5
	H. Tilt Wheel / Power Steering:	6
	I. Alignment:	6
	J. Alternator:	6
	K. Battery:	6
	L. Brakes:	6
	M. Fuel Tank Capacity:	6
	N. Hazard Flashers:	6
	O. Speed / Cruise Control:	7
	P. Shock Absorbers:	7
	Q. Suspension:	7
	R. Exhaust:	7
	S. Wheels and Tires:	7
	T. Windshield Wipers / Horn:	7
	U. Radiator and Coolant System:	8
	V. Fluids:	8
	W. Drive Shaft Guard:	8
III.	BODY AND EQUIPMENT SPECIFICATIONS:	8
	A. Bumpers:	8
	B. Doors and Locks:	8
	C. Interior Panels:	9
	D. Interior Flooring:	9
	E. Gauges:	10
	F. Donation Box:	10
	G. Mud Flaps:	10
	H. Running Boards:	11
	I. Undercoating / Rust Proofing:	11
	J. Mirrors / Sunvisor:	11
	K. Seating / Seat Belts / Grab Handles:	11
	L. Lighting:	15
	M. Radio:	16
	N. Keys:	16

O.	Safety Equipment:	16
P.	HVAC (Heating and Air Conditioning):	17
Q.	Windows:	17
R.	Painting and Paint Codes	17
S.	Lift (Platform Type):	18
T.	Stanchions:	20
U.	Stabilizer System	20
V.	Electrical:	20
W.	Equipment Mounting:	21
X.	Insulation Package:	21
Y.	Raised Roof:	21
IV.	WHEELCHAIR SECUREMENT AREA	21
V.	OPTIONS (ALTERNATE QUOTES):	23
A.	Power Base for Driver's Seat:	23
B.	Fairbox:	23
C.	Fairbox Electrical Prep Only:	24
D.	Heated Remote Mirrors:	24
E.	Paint (Optional Design):	24
F.	Folding Platform Lift (Meet ADA Requirements):	24
G.	Two-Way Radio Antenna / Power:	24
H.	Smooth Anti-Slip Flooring:	<b>Error! Bookmark not defined.</b>
I.	Single Point Wheelchair Securement System:	26
J.	Seating – Additional:	26
K.	Power Door Locks:	<b>Error! Bookmark not defined.</b>
VI.	VENDOR/MANUFACTURER REQUIREMENTS:	26
A.	Vehicle Information Furnished:	26
C.	Purchaser Inspection:	29
D.	Warranty:	29
VII.	BID DOCUMENTS:	29
VIII.	TABLE 1:	31

**State of Michigan**  
**MODIFIED CONVERSION VAN SPECIFICATIONS**  
**Minimum 4-Years/100,000 Miles**  
**Passenger Nonlift Vehicle & Lift Vehicle with Alternate Seating**

**I. PURPOSE OF SPECIFICATIONS:**

These specifications are setting forth the minimum requirements for a two-axle commercial non-lift vehicle or Paratransit type commercial vehicle equipped with a commercial wheelchair lift. The body shall be mounted on a commercial or recreational vehicle (RV) chassis. The vehicle must be capable of meeting all seating requirements (see Section X. Vehicle Seating Requirements). As a minimum, vehicles must meet all applicable Michigan Motor Carrier Vehicle Codes, all applicable Federal Motor Vehicle Safety Standards (FMVSS) and the Americans with Disabilities Act (ADA).

Any successful bidder supplying these vehicles shall quick title and deliver the vehicle and the title to the location specified by the State of Michigan, Bureau of Passenger Transportation. Chassis serial number, body number, axle ratio, gross vehicle weight rating (GVWR), seating capacity and paint codes shall be imprinted on a permanent decal(s) or stamped on a metal plate(s) and affixed in the driver's area of the vehicle (location to be approved by the State).

The bidder shall be capable of handling final inspection and corrections required by the State prior to acceptance of the vehicles after a contract is awarded. The successful bidder must be capable of providing parts and service for a period of seven years after the vehicles have been placed in service throughout the State of Michigan. The successful bidder must be able to supply body replacement parts within five working days of a request by a transit agency unless the bidder notifies the transit agency that the part is not available for shipment and provides the shipping date when the part will be available.

Regardless of options and seating plan ordered, the successful bidder shall be responsible for certifying that all vehicles delivered: 1) shall not exceed the GVWR of chassis as bid (determined by engineering calculated loaded vehicle axle weights), and 2) single wheelchair securement area vehicles shall not exceed 21' 11" in length measured bumper to bumper excluding the energy absorbing portion of the bumper (distance of travel allowed for compression of the bumper without body deformation). Manufacturers shall comply with the chassis company's quality vehicle manufacturing program such as Ford's Quality Vehicle Modifier (QVM).

In these specifications any required approvals shall be made by the State. Wherever brand, manufacturer, or product names are used, they are included only for the purpose of establishing a description of minimum quality of the item. This inclusion is not to be construed as advocating or prescribing the use of any particular brand or item or product. For this bid, requests/questions can be submitted, in writing, and be considered as approved equals and exceptions to the

bid specifications. An addendum/written response will be made for all bidders prior to the bid due date. The State must be able to determine whether the bidder's offered product is or is not equal to the product described in the specifications from information (technical data, test results, and the like) contained in the bid or provided at the pre-bid meeting. All detailed descriptions and specifications provided in the bid must match the product offered for use in the bid.

## **II. CHASSIS SPECIFICATIONS:**

Manufacturers shall comply with the chassis company's quality vehicle manufacturing program such as Ford's Quality Vehicle Modifier (QVM) and ISO9000

### **A. Chassis**

The chassis shall be a mass-produced, rear-wheel, drive van with body-on-frame architecture. Suggested Source: Ford Motor Company E-350 Super Duty Extended Length Wagon.

### **B. Gross Vehicle Weight Rating (GVWR):**

Chassis GVWR: 9,500-lb, minimum

### **C. Wheelbase:**

The vehicle shall have a wheelbase of 138 inches, minimum

### **D. Vehicle Overall Length (OAL):**

The vehicle shall have an OAL of 236 inches, minimum

### **E. Engine:**

The vehicle shall be equipped with a 5.4L, V-8 with 255 horse power, minimum.

### **F. Transmission:**

The vehicle shall be equipped with an automatic transmission, which is the heaviest duty supplied for this chassis.

### **G. Axle Capacity:**

#### **i) Front Axle:**

The front axle shall be 5,000-lb, minimum

ii) Rear Axle:

The rear axle shall be 6,300-lb, minimum

**H. Tilt Wheel / Power Steering:**

Vehicle shall be equipped with power steering and a tilt steering column. The steering column shall be adjustable for various up and down positions. The steering gear shall be a full hydraulic assist type

**I. Alignment:**

The vehicle shall have a four wheel alignment at final point of inspection, just prior to delivery.

**J. Alternator:**

Vehicle shall be equipped with heaviest duty alternator available.

**K. Battery:**

The vehicle shall be equipped with two batteries, heaviest duty available.

- i) 12 Volt, 600 CCA, minimum
- ii) Heavy-Duty Auxiliary

**L. Brakes:**

Foundation brakes shall be a power-actuated four wheel disc type or a disc front/drum-type rear, anti-lock braking system. The system shall be the heaviest-duty available for stop and go operation. Brake system shall include a low brake fluid warning system provided by chassis manufacturer.

**M. Fuel Tank Capacity:**

Vehicle shall be equipped with the largest available from manufacturer. Tank, fuel lines and hardware must meet all current FMVSS, including FMVSS 301, as well as all current EPA requirements. Fuel level remaining in tank shall be calibrated with the OEM dash fuel gauge.

**N. Hazard Flashers:**

The vehicle shall be equipped with OEM hazard flasher switch.

**O. Speed / Cruise Control:**

The vehicle shall be equipped with OEM Speed / Cruise Control.

**P. Shock Absorbers:**

The vehicle shall have gas filled shock absorbers front and rear, heaviest duty available from manufacturer.

**Q. Suspension:**

The chassis shall be equipped with a heavy-duty spring front suspension to match the specified gross axle weight rating.

**R. Exhaust:**

Any modification to the exhaust system shall be made with stainless steel.

**S. Wheels and Tires:**

i) Wheels:

The Vehicle shall be equipped with 16" wheels minimum.

ii) Tires & Jack:

(1) All tires (4) shall be from the same manufacturer and be all season, tubeless, steel radial blackwall. The tires shall be the largest size available from the vehicle manufacturer to meet the GVWR rating.

(2) Spare Tire: Limited service tire and wheel. Manufacturer standard mounting.

(3) Jack: All vehicles shall be furnished with a standard OEM jack.

iii) Wheel Covers:

All vehicles are to be equipped with wheel covers.

**T. Windshield Wipers / Horn:**

Electric wipers shall be two speed, delay style, dual jet washers (electric), with OEM standard arms and blades.

(i) Horn: OEM standard

**U. Radiator and Coolant System:**

The vehicle shall be equipped with the maximum size available from the OEM, including the heaviest duty radiator with anti-freeze protection, to -30°F.

**V. Fluids:**

Fluids shall be checked and filled from inside front hood where applicable. Engine oil fill / check, transmission oil fill / check, and coolant fill / check shall be located for easy access.

**W. Drive Shaft Guard:**

The drive shaft shall be OEM and have guards of sufficient strength to prevent the drive shaft from striking the floor of the van or the ground in the event of a tube or universal joint failure. Drive shaft guards (OEM chassis equipment preferred, or installed by the chassis manufacturer) shall be secured properly and be equal in materials and design to drive shaft guarding installed on a school bus chassis.

**III. BODY AND EQUIPMENT SPECIFICATIONS:**

**A. Bumpers:**

The front and rear bumper shall be a chrome Original Equipment Manufacture (OEM) bumper.

**B. Doors and Locks:**

i) Driver and Passenger:

The vehicle shall have standard OEM driver and passenger front doors and power locks.

ii) Passenger Side & Rear Access Doors:

(1) The side access (cargo) doors shall provide a minimum of 60" head clearance and shall be at least 43" wide (combined).

(2) The rear access doors shall provide a minimum of 60" head clearance and shall be at least 46 ½" wide (combined).

(3) The extended portion of the doors shall be constructed of 11-gauge steel. The extended doorframe shall have vertical members constructed of 16-gauge steel and the horizontal members constructed of 11-gauge steel. All components are to be of welded construction.

- (4) The side access (cargo) and rear doors shall be equipped with power locks.
- (5) The rear access doors shall be equipped with stops to hold the doors open during loading. The stops shall be constructed of a non-corrosive metal material (stainless steel or chrome).

**C. Interior Panels:**

All interior panels shall be OEM or OEM equivalent. Panel fastening devices shall match the color of the panels. The interior shall provide a pleasant atmosphere, be aesthetically pleasing, and contain smooth finishes without any unprotected sharp edges. The basic vehicle interior shall be gray.

**D. Interior Flooring:**

i) Sub Flooring:

- (1) The floor deck may be integral with the basic structure or mounted on the structure securely to prevent chafing or horizontal movement. All floor fasteners shall be corrosion resistant steel and shall remain secured and corrosion resistant for the service life of the vehicle. The floor deck shall be 3/4 "A/B plywood of marine grade material, minimum, with sealed edges to prevent moisture intrusion. The floor deck upper surface shall have all cracks and voids filled and the whole surface rough sanded before installing the flooring material. A layer of sealer shall be installed between floor deck edges that butt against structural members and other deck sections to prevent dust and moisture intrusion. Passage holes provided for wiring and hoses in the floor deck shall be thoroughly sealed to prevent dust and moisture intrusion and be sufficiently protected to ensure against wear from friction and the elements. The floor deck, including the sealer, attachments, and coverings, shall be waterproof, non-hygroscopic, resistant to wet and dry rot, resistant to mold growth, and impervious to insects.

ii) Stepwell:

- (1) A partial, filler plate shall be installed on the left-side cargo door stepwell entrance. The stepwell filler plate shall be covered with installed subflooring and floor covering.
- (2) A 1" wide band of reflective yellow tape shall be provided at the top of the access doorway stepwell.

iii) Vehicle Flooring:

- (1) The entire passenger area including the wheelchair securement area and entrance steps area shall be overlaid with smooth, slip resistant flooring material (in lieu of standard rubber flooring). The resilient sheet flooring system (2.7 mm thickness minimum) shall be a high quality vinyl constructed with aluminum oxide , silicon carbide grains and PVC chips blended in a high quality wear layer with a non woven polyester/cellulose backing with glass fiber reinforced center scrim. The flooring shall extend up the sidewall to the seat rail line and shall be coved at the floor/wall joint to form a smooth water tight transition. Installation of flooring must be done strictly according to the flooring manufacturer's directions using the proper accessories, tools, and adhesives. Suggested sources: Altro Transflor™ Meta, Altro Transflor™ Chroma.
- (2) Color of all flooring and step tread shall be equal to Altro Transflor genome (grey) or bison (tan) as requested by the agencies.as requested by the agencies.

**E. Gauges:**

- i) Chassis (OEM) gauges shall be used in the driver's instrument cluster. Each vehicle shall have an instrument cluster with the following non-glare needle-type gauges which are easily monitored by sight from the driver's position (lights in lieu of gauges are not acceptable).
- ii) Voltmeter and its wiring shall be compatible with generating capacities.
- iii) Engine oil pressure gauge.
- iv) Engine coolant temperature gauge.
- v) Fuel gauge.

**F. Donation Box:**

A donation box (farebox is optional) shall be mounted on an adequately braced stanchion; shall be located over a flat floor surface near the driver; and shall be accessible to passengers entering the vehicle (meet ADA requirements). The lockable donation box shall be supplied with two keys. (Location shall be approved by the ordering agency.) Suggested source: Main Farebox Model C91M

**G. Mud Flaps:**

The vehicle shall be equipped with anti-sail type, when required, are to be plain, rubber 1/4" thick, without advertising on either side.

**H. Running Boards:**

A driver and passenger side running board shall be constructed of either stainless or galvanized steel. The running board shall be securely attached to the chassis and have the capacity to support 300 pounds.

**I. Undercoating / Rust Proofing:**

The underside of the vehicle, exposed to the elements, shall be treated with an undercoating material except those areas of the OEM chassis where undercoating is not recommended (Suggested source: Tectyl 121-B.).

**J. Mirrors / Sunvisor:**

i) **Interior Mirrors:**

Interior mirrors shall be OEM

ii) **Exterior Mirrors:**

The vehicle shall be equipped with the OEM standard mirrors.

iii) **Sunvisor:**

Windshield sun visor system shall be standard (OEM) chassis visor(s). If the OEM chassis is not equipped with a windshield sun visor, large transit-type, fully adjustable arm-type plexiglass sun visor(s) shall be provided (Suggested source: Manufacture's standard).

**K. Seating / Seat Belts / Grab Handles:**

i) **OEM Seating:**

(1) **Driver and Front Passenger:**

The front driver and passenger seats shall be OEM.

(2) **Passenger Seating:**

(a) All passenger seats shall be mid-back and are required to meet the following:

(i) All applicable FMVSS testing including FMVSS 210

(ii) Two passenger, forward facing seats shall be a minimum width of 33.5" with a non foam yellow, energy-absorbent, vandal-proof grab handle mounted to the top of each seat back (two per double

seat). Grab handles are not required on seats that have a back against a wall.

(iii) Single passenger seats shall be 17 ½" minimum width with a yellow, energy-absorbent, vandal-proof grab handle mounted to the top of the seat back.

(iv) On vehicle floor plans with double seats, the first double seat shall have an integrated child restraint seat capable of safely carrying children of 20 to 50 pounds.

(v) Forward facing seats shall have 27" minimum knee to hip room.

(vi) Seats shall be individually contoured to each passenger for occupant comfort and retention.

(vii) The seating arrangements and configuration shall be furnished by the State in the document titled Standard Vehicle Floor Plans.

(viii) All seats shall be supported on the floor with high carbon steel support brackets. Seat frame shall be cold-roll steel tubing. Floor anchorage shall be neat and not interfere with entering and exiting the seat. All seat mounting bolts shall be corrosion resistant coated/plated fasteners. Passenger seating floor rail/track shall not be installed in the wheelchair lift or wheelchair securement areas. The bidders shall provide certification test data that the installation of the seats, seat mountings including floor anchorage and floor fasteners shall meet all applicable FMVSS including FMVSS 207, 208, 209, and 210 for the vehicle model being offered in this bid. (see Section VI. J).

(ix) All metal components of the seat assembly shall be coated with a powder coat epoxy paint finish that shall meet the following tests:

Salt Spray	1000 hrs	ASTM D117
Humidity Resistance	1000 hrs	ASTM D2247
Impact Resistance	to 80 in-lbs	ASTM D2794

(x) All testing is to be performed on standard metal seating materials that have coating thickness of 1.3 to 1.8 mils. Certified test documents are required with bid proposal.

(xi) Suggested sources: American Seating Horizon™ 8535 Mid-Back Series; C.E. White LE Series; Freedman Feather Weight.

(3) **Seat Material:**

(a) Seats shall be covered with cloth-type or vinyl material at the ordering agency's option. Cloth-type or vinyl shall completely enclose the seat cushion and the seat back. Cloth-type or vinyl shall comply with test and performance criteria of the Federal Register dated October 20, 1993 (see Section VII., table1). Seat background colors shall be approved by the State.

(i) Cloth-type Woven Requirements (with flame resistant qualities):

1. Minimum weight 23 ounces per linear yard.
2. 50,000 minimum double rubs (ASTM-3597-77 Wyzewbeek Method).
3. Color fastness to light 300 hours minimum (AATCC-16-1977 Carbon Arc.)
4. Comply with California BLT-117
5. All cloth-type woven material except Holdsworth Wool shall be treated with a flame proofing solution following the manufacturer's specifications, No-Flame by Amalgamated Chemical Inc., or equal.
6. Suggested source: Flame Resistant Fabrics by Holdsworth Wool, or LaFrance Mills.

(ii) Vinyl:

1. Seat vinyl shall be transportation grade expanded vinyl, 36 ounces per linear yard minimum.
2. Suggested source: Flame Resistant vinyl by CMI D-90 or Omnova.
3. Seat and back cushion shall be molded high resilient (HR) polyurethane foam padding and supported with a spring-type support system. Seat cushion indentation load deflection shall be 35 pounds minimum, with compression to 15 percent maximum, and tensile-strength of 15 minimum. Seat and back cushion shall meet the physical properties of ASTM D-3574 and the flammability requirements of FMVSS 302, minimum. Seat back depth shall not exceed 3 ½" overall. The technical data sheet for the foam supplied shall be included in the bid

proposal with the seat information. Suggested source: Manufacturer's standard.

(4) **Wheelchair Lift-Equipped Vehicles:**

Forward facing (double) fold-away with seat belts shall be provided in the wheelchair securement area per seating arrangements (see Section IV, Wheelchair Securement Area). Fold-away seats shall include all dimensional, structural and testing requirements of the standard seat specification. Seat locking/latching devices shall be of high quality and be easy to latch and unlatch. Seats must positively latch in the seated and folded position to prevent inadvertent folding or unfolding of the seat. Any support legs resting on flooring shall be non-marring or rest on metal plates flush mounted with flooring. All fold-away seats shall be able to pass FMVSS 210 without having to fasten additional latches or cables. All fold-away seats shall fold against the wall when wheelchair space is required (no further than 12" from wall in the vertical folded position). Seat may not extend into vehicle more than 37 ½" (two passenger) and 18 ½" (1 passenger) when folded down for passenger seating. Aisle space may be reduced to 14@ inches where fold-up seating is placed on each side of the aisle or 15 ½" where placed opposite a stationary seat. The seat bottom cushion shall be a 5 degree tilt up from level, minimum, and back cushion shall be at 95 degrees, minimum. The seats shall be of the same design as the other passenger seats. All seat backs and all seat bottoms of fold-away seats shall be covered with material matching seat cushion color and fabric. Suggested source: American Seating Horizon™ Mid-Back Series; C.E. White LE Series; Freedman Feather Weight; Braun 325-02LW.

(5) **Seat Belts:**

- (1) All seats shall be equipped with a 3-point restraint system for each designated seating position. Belts shall have:
  - (a) The latch end of the belt will have an emergency locking retractor. The retractor will be mounted underneath the seat to the seat frame. No lap retractors.
  - (b) A push button latch release mechanism.
- (2) Two universal "Buckle Up" decals approximately 3" by 3" shall be furnished loose with each vehicle. Decals shall indicate that seat belt use is recommended.

(6) **Grab Handles:**

Grab handles shall be installed on the passenger seats. OEM grab handles are acceptable

**L. Lighting:**

i) Interior:

- (1) Stepwell lights shall be LED and provide no less than two foot-candles of illumination on the entrance step tread, lift or ramp with the door open. This system shall provide illumination automatically when the door is open and meet ADA requirements. Location shall be determined at pilot.
- (2) Stepwell lights shall be wired to and be automatically activated by a door controlled switch. Lights shall operate any time the ignition key is on and the door is opened.
- (3) Interior lighting shall be LED and provide a minimum of two foot-candles of illumination at a reading level. Interior lighting fixtures shall be reasonably flush with the interior walls and ceiling so no hazard exists for the passengers. All lights shall have lead wire long enough to remove light at least 6" from vehicle for service. All interior lights shall be grounded by an in-harness ground attached in the fuse panel to a common grounding point.
- (4) Light installation shall be designed to illuminate the lift platform when deployed at floor level at no less than two foot-candles of illumination. Outside light(s) shall be LED and provide at least 1 foot-candle of illumination on the street surface within 3 feet of step tread outer edge. This system shall provide illumination automatically when the lift door is open and meet ADA requirements. On-off light switch shall be lift door-actuated.

ii) Exterior:

- (1) Rear center brake light shall be LED and installed above the rear doors.
- (2) Headlights shall be Halogen lamps with daytime running lamps and the standard front park/turn lights may be a part of the OEM headlight assembly.
- (3) Rear lights shall be standard OEM turn, brake, and reverse lights.
- (4) The vehicle shall be equipped with two, round four (4) inch, flashing amber LED lights mounted on the inside of each rear lift door. The lights shall be mounted above the rear door windows and shall be activated when

the lift doors are open and the hazard flashers are activated. Suggested Sources: Dialight, Grote, Maxxima, Optronics, Peterson, Trucklite

**M. Radio:**

The vehicle shall be equipped with OEM standard AM/FM radio with clock and a minimum of (4) four speakers.

**N. Keys:**

The vehicle shall be supplied with two (2) sets of keys with coded numbers at the time of delivery.

**O. Safety Equipment:**

- i) All safety equipment provided by the manufacturer shall be secured to each vehicle and be easily accessible to the driver.
- ii) The safety equipment shall be:
  - (1) One UL listed 5 pound, 2A-10BC dry chemical fire extinguisher. Fire extinguisher shall have a metal head, a gauge to indicate state of charge, and a bracket with strap for securement. The fire extinguisher shall be mounted in a vertical (upright) position unless specified by the manufacturer. Source: Manufacturer's Standard.
  - (2) One container of bi-directional emergency reflective triangles that meets FMVSS 125.
  - (3) One web cutter shall be provided from the supplier of the wheelchair securement belts for use in an emergency.
  - (4) Additional safety items to be provided on each vehicle:
    - (a) A 12-volt 97-db sealed solid state electronic warning alarm that is readily audible from outside the vehicle when transmission is in reverse. The alarm shall: be steam cleanable; have passed a 1 million cycle test; and meet SAE J994, OSHA, Bureau of Mines and all State Regulations. The alarm shall be mounted with bolts and properly grounded in a protected location in the rear of the vehicle (location shall be approved by the ordering agency). Suggested source: OEM standard.
  - (5) Clearance decals indicating the height of the bus shall be mounted in the driver's dash area in a location approved by the state.

**P. HVAC (Heating and Air Conditioning):**

i) **Heating:**

- (1) Front heating unit shall be automotive in-dash type (OEM or equal) and shall be capable of delivering heat, fresh air ventilation, and air conditioning to the driver's area (maximum BTU rating available). The front heater shall have a temperature control valve which can be regulated from the driver's area. The driver's area shall have air circulation in each mode of defrost, heat, fresh air ventilation, and air conditioning.
- (2) A rear heating unit shall be provided; floor mounted and offer 12,900 BTU minimum. This unit shall be installed out of the way of any passenger traffic. The heating unit shall be operated from the driver's area control unit.

ii) **Air Conditioning:**

(1) **Front Air Conditioning:**

The air conditioning system shall be integrated with a compatible in-dash driver's area evaporator unit and compressor (OEM) capable of delivering tempered air for windshield defrosting. The systems shall use refrigerant type R-134A and be warranted from in service date for one full year, minimum.

(2) **Rear Air Conditioning:**

The rear air conditioning and heater system shall be OEM and be operable from the driver's area control unit.

**Q. Windows:**

Swing-out side doors and fixed, swing-out rear windows – Deep tinted or privacy, all around, movable side door window(s), fixed or movable rear door windows.

**R. Painting and Paint Codes:**

i) **Painting:**

- (1) Standard paint color for all vehicles shall be the manufacturer's pre-finished white exterior panels (OEM white), with other OEM factory colors available upon request. Color scheme on all vehicles shall be provided at the time of ordering.
- (2) Pre-clean and metal prep, any bare metal surfaces prior to applying a compatible red oxide or zinc chromate primer.

- (3) When painting over a manufacturer's standard paint, metal prepping and primer may be omitted, provided an acceptable bond can be achieved

ii) **Paint Codes:**

- (1) Factory paint codes shall be furnished with all vehicles.
- (2) After market painting - both the brand and paint code shall be furnished.

**S. Lift (Platform Type):**

i) Type I Lift, (Platform Type)( Shall Meet ADA Requirements)

- (1) All vehicles equipped with lifts must meet FMVSS 403 and 404 requirements. All costs required to meet these requirements shall be included in the bid price.
- (2) The Type I platform lift shall be mounted in the rear of the vehicle. The lift installer must provide documentation that the lift installation complies with the lift manufacturer's lift installation requirements.
- (3) The lift shall be an electro-hydraulic type. If the lift has a crossbar, it shall be above the door opening and well padded. The platform lift equipment shall be a double "C" channel parallel arm construction, hydraulically operated by two single-acting cylinders with gravity unfold, gravity down, power up, and power fold (stow) operation. No part of the lift platform shall exceed 6 inches/second during the lowering and lifting of an occupant, and shall not exceed 12 inches/second during deploying or stowing. The lift shall have a mechanical outboard safety wheel stop (minimum 6" height) to prevent wheelchair from rolling off the platform during the lifting cycle (Suggested sources: Braun, Maxon, Ricon).
- (4) A manual safety override shall be provided that will remain operable. Lift shall have manual override instructions visible from inside and outside the vehicle with door open.
- (5) The entire lift assembly shall be installed inside the vehicle body and shall have adequate protection installed on all sharp corners or items that protrude into the passenger area to prevent accidental injury to passengers. Wall and floor mounting points shall be reinforced and shall be attached with fasteners having a thread locking feature. Lift installation shall insure that no lift rattling exists when the vehicle is operated while the lift is stowed.

- (6) A lift control interlock system shall be installed that shall ensure that the vehicle cannot be moved when the lift is not stowed and that the lift cannot be deployed unless the interlock is engaged [to meet ADA regulation in 49 CFR Part 38, Subpart B--Buses, Vans and Systems, §38.23, (b)(2)(I)]. The interlock system shall engage when the lift operation sequence is followed. Interlock operating instructions shall be included with the vehicle at delivery. An interlock override system shall be installed that allows service personnel to move the vehicle to a safe area for repairs (Suggested Source: Intelligent Lift Interlock System (ILIS) by Intermotive Products).
- (7) All lift equipped vehicles shall display the international symbol of accessibility, one each on left and right side of the vehicle. Location shall be determined by ordering agency.
- (8) An indicator light (red and labeled) at driver's station that is activated when lift door is open and when the lift is in operation.
- (9) The lift shall meet ADA requirements as well as these minimum requirements.
  - (a) Capacity 800 pounds minimum.
  - (b) Usable platform width 33" minimum.
  - (c) Usable platform length 50" minimum
  - (d) Platform shall automatically stop at floor level.
  - (e) Platform shall automatically stop when lowered to ground level.
  - (f) Hand held controls shall be conveniently located on a flexible, cut resistant cable and shall be mounted with access from inside or outside the van. The cable shall be routed to eliminate being pinched in any moving parts and be wrapped with a flexible exterior protective conduit.
  - (g) Platform, bridge plate, and area between bridge plate and aisle shall be skid resistant.
  - (h) Bridge plate and platform shall be coated to resist rust.
  - (i) Platform shall have horizontal handrails (one each side) on platform to assist passenger during lift operations. Handrails (yellow) shall fold automatically to prevent any obstructions into the van passenger area.

- (j) Lift door operated interrupt switch shall prevent use of lift with lift door(s) closed. Heavy duty long life switches shall be used in this application.
- (k) The outside edges of the platform shall either be painted yellow or use 3M™ vinyl safety stripe tape to enhance visibility when extended on the ground.
- (l) Sharp corners of lift platform shall be padded (remove for lift use) when in the stored position.
- (m) The wheelchair lift shall comply with all Federal, Americans with Disabilities Act (ADA), and Veterans' Administration regulations.
- (n) Lift platform shall be fitted with device to prevent the platform from touching or leaning against door after being returned to stored position when the lift assembly is not in use.

**T. Handrails and Stanchions:**

- i) The stanchions shall be a minimum of 1 ¼ " outside diameter. All stanchions shall be positioned so as not to interfere with wheelchair movement and shall meet ADA requirements for position and size. All stanchions in the passenger entrance area shall be highly visible yellow in color. Mounting brackets and fittings shall be composed of the same kind of material used for the stanchion.
- ii) Floor-to-ceiling vertical stanchion shall be provided in close proximity to the passenger side entrance (cargo door) in a location approved by the state. Stanchions shall not restrict any passengers' seat adjustments.
- iii) A yellow handrail shall be installed on the right passenger side cargo door.

**U. Stabilizer System**

The chassis shall be equipped with a suspension stabilizer system to minimize the following; vehicle sway, bouncing after road bumps, motion sickness, affects from cross winds and passing vehicles and propensity to roll. The suspension stabilizer system shall improve handling and driver control, braking, ride quality, payload capacity, tire, brake, shock and suspension life.

**V. Electrical:**

- i) Wiring: All wiring passing through holes in metal or non-metal wearing surfaces, which could cause wear of the insulation, shall be adequately protected by rubber or plastic grommets, and/or non-metallic conduit. Ends of all wires shall be adequately anchored to prevent loosening.

ii) Lift equipped vehicles shall have a circuit breaker with a manual reset in the lift feed circuit. The circuit breaker shall be mounted to provide easy accessibility, with the positive power cable leading to the lift power pack.

iii) 12 Volt auxiliary outlet

**W. Equipment Mounting:**

For equipment mounted on the vehicle body and chassis, all holes shall be drilled or punched. There shall be no flame cutting or welding on the frame side rails.

**X. Insulation Package:**

Fiberglass insulation shall be included in the walls. A minimum of one and a one-half inch (1 ½") thick blanket fiberglass or other fire resistant material shall be provided to insulate the side walls.

**Y. Raised Roof:**

The standard roof shall be removed and replaced with a fiberglass roof. The raised roof shall be completely joined and be an integral part of the basis chassis. The new top must be completely sealed with an anti-fungus sealant and over a 69" minimum center aisle height. The roof shall contain a collapse-resistant steel rollover cage consisting of 1" x 1" tubular steel frame. The steel frame must consist of no less than five (5) horizontal stringers and three (3) longitudinal members. The raised roof shall be insulated to prevent heat loss in cold weather, and cool air in hot weather with a 1-1/2" fiberglass blanket. The interior of the roof shall be a smooth-finished one-piece seamless fiberglass liner, not less than 1/16" in thickness. The roof conversion shall meet Federal Motor Vehicle Safety Standard No. 220 (part 571, section 220-1, 41 Federal Register 3874, January 27, 1976). Certification of compliance with requirements of FMVSS 220 of the vehicle roof shall be provided in writing, with the bid documents; prior to delivery vehicles.

**IV. WHEELCHAIR SECUREMENT AREA**

**A** The wheelchair securement system shall be installed according to ADA requirements. Securement location shall be installed as shown by the seating plan option. The integrated securement system shall restrain the occupant and the wheelchair separately and securely.

**B** Wheelchair securement shall meet these minimum requirements:

(1) Forward facing wheelchair tie down and occupant restraint shall consist of four floor attachment points for the chair and a combination, lap

belt/shoulder restraint with manual height adjuster for the occupant per location.

- (2) Securement floor anchorage points shall be anodized aluminum, stainless steel or other non-corrosive metal construction and consist of aircraft type insert pockets that can be flush mounted with the rubber flooring (Flanged "L" style track with end caps Q-Straint Q5-6100-FPD). Floor anchorage points for the first securement space shall be spaced at a minimum of 54" from front to rear. Floor anchorage points shall be located no closer than 8" from a stationary wall or obstruction (forward or rearward) that would hinder an operator from attaching the securement system. Anchorage points can be used for the front tie downs, the rear tie downs, and can be shared by the center run of anchorage track. Width of anchorage track shall be no less than 30" wide allowing for the widest of mobility devices.
- (3) Securement wall anchorage point for shoulder restraint shall be stainless steel or other aircraft quality non-corrosive metal. Wall anchorage device shall provide vertical adjustment (approximately 12") for differences in height of the secured mobility aid. Wall anchor shall be permanently fastened to the body structure in the wall according to the belt assembly manufacturer's installation instructions.
- (4) The belt components shall be permanently marked to identify their location as follows: "floor", "lap", or "shoulder". The four belts that attach to the wheelchair from the floor anchorage points shall use a simple speed hook end ("J" or "S" style) for chair attachment and have automatic heavy duty retractors with a hard metal cover and manual knob control. One securement space shall have a fifth retractor to aid in the securement of scooters or difficult mobility devices. All floor attachment belts shall be the same and work in any of the four floor attachment points and be equipped with connector brackets for the lap belt assembly. Automatic self tensioning and self locking retractors with metal covers shall be part of the four floor belt assemblies for automatic belt tensioning. Belt ends with floor anchor attachments shall be easily identified for placement in the floor track.
- (5) All belt components shall meet ADA requirements and random static testing forces equal to:

Rear Belt Assembly	6,000 lbs. each, minimum
Front belt Assembly	2,000 lbs. each, minimum
Lap Belt Assembly	2,500 lbs. each, minimum
Shoulder Belt Assembly	2,500 lbs. each, minimum
Floor Insert Assembly	6,000 lbs. each, minimum

- (6) All components shall be installed to the securement manufacturer's recommended specifications.

(7) An anchorage single point securement system is optional

(8) Suggested sources: Q'Straint Model Q-8100-A1L, Sure-Lok's Retraktor™ Systems for L track.

### **C Restraint Storage System**

A wheelchair restraint storage system shall be positioned under the foldaway seats at each wheelchair space. Storage system shall:

(1) Keep restraints clean

(2) Provide easy accessibility to restraints

(3) Restraints shall be stored securely to prevent noise while the vehicle is in motion.

Restraint storage system shall be compatible with the installed securement system (L-Track or Single Point Securement System). Suggested Source: Freedman Tie-Down Storage System

## **V. OPTIONS (ALTERNATE QUOTES):**

### **A. Power Base for Driver's Seat:**

Provide a six-way power seat base for standard driver's seat that allows for fore and aft, up and down, front tilt and rear tilt for the driver (Suggested source: Chassis Original Equipment Manufacturer (OEM) Deluxe Power Seat Base).

### **B. Fairbox:**

- i) The farebox (in lieu of the donation box) shall be mounted with the trip handle toward the driver and within easy reach of the driver. The farebox shall be mounted on an adequately braced stanchion; shall be located over a flat floor surface near the driver; and shall be accessible to passengers entering vehicle (meet ADA requirements). An indirect farebox light shall be connected through an entrance door jamb switch to the running light circuit.
- ii) The farebox shall be lockable and supplied with two vaults that are interchangeable and lockable (2 keys for each lock). The vaults shall be keyed alike. The vault and farebox exteriors shall be marked with key reference. (Location shall be approved by the ordering agency.) Suggested source: Main Farebox Model M-4.

**C. Fairbox Electrical Prep Only:**

Electrical connections and wiring only (no donation / farebox) along with support stanchion shall be supplied to the area where the standard farebox would be mounted (location shall be approved by ordering agency).

**D. Heated Remote Mirrors:**

The vehicle shall be equipped with heated, remote controlled mirrors. Suggested Source: Velvac, Rosco

**E. Paint (Optional Design):**

- i) The vehicle shall have an 11" belt painted stripe (no decals). An example would be: an OEM white vehicle with an 11" belt stripe.
- ii) The vehicle shall be painted a full body color, including the roof, other than OEM white. An example would be: a vehicle painted all red.

**F. Folding Platform Lift (Meet ADA Requirements):**

The folding platform lift (in lieu of standard platform lift) shall meet all of the lift requirements stated in Lift Section except that the lift shall have a platform that folds in the center during stowage and the lift platform is 32" usable width. The folding platform lift provides an unobstructed view from inside the vehicle through the lift opening. Braun Vista, Ricon KlearVue model K-5005 ADA.

**G. Two-Way Radio Antenna / Power:**

- i) All material and labor required for a pre-installation package for two-way radio equipment shall be furnished by the manufacturer. All equipment and accessories installed as part of the vehicle shall have no measurable radio frequency (RF) interference. All equipment installed on the vehicle must operate in its normal mode while radio transmissions are being made from an on board transmitter producing 100 watts or more of transmit power while operating in the range of 43 Megahertz (Mhz) to 900 Mhz. Proper RF suppression to eliminate interference shall be provided by the manufacturer in any equipment and accessories that can produce interference. The vehicle frame and body shall be designed to provide no measurable radio interference (shielding) for improved radio emissions and reception performance.
- ii) Two (2) antenna mounting plates (.060" steel minimum) shall be mounted in the roof of the vehicle for the purpose of providing a connection to the ground plane and providing a secure mount for the antenna. Ground planes shall provide a comparable area of radio transmission coverage whether vehicles have a metal exterior body covering or have a FRP composite exterior. At each antenna access opening and mounting plate area, the ground planes shall be of proper size and shape for proper communication operations. The ground

planes shall be a solid piece and operate over the range of frequencies from 43 Mhz to 900 Mhz. The ground plane material used by the manufacturer must be a durable material that can be connected to the antenna mounting plate and grounded to the chassis frame. The ground plane shall be of the proper size to protect passengers in the vehicle from unnecessary radiation from the transmitting antenna at the vehicle's antenna access openings.

- iii) A 6" high branch deflector shall be installed on the roof of the vehicle 6" forward of the antenna mounting area.
- iv) A concealed thin wall plastic conduit, 5/8" I.D. minimum, (with antenna cable pull wire) shall extend from the antenna mounting plate locations (roof and above side window or in front cap) to the mounting location for the radio. When installed, the conduit shall have no sharp or right angle bends or be distorted to prevent insertion of the antenna lead. For both antenna mounting plate locations, sufficient space shall be left at each end of the conduit to allow easy removal and replacement of the devices attached to the cable. The antenna pull wire shall terminate behind the driver's seat with 2 feet of extra length extending into the vehicle interior.
- v) Two threaded type access holes with covers approximately 6" in diameter shall be installed at the following antenna mounting plate locations:
  - (1) For vehicles with metal exterior skin directly to the left (driver's) side above the side window line of the vehicle.
  - (2) For vehicles with FRP composite roof the screw-type access holes may be installed in the front cap of the vehicle, one centered in the roof section of the cap and one centered in the left side section of the cap. Adequate space shall be provided between the installed access cover and the inner body to allow for routing of the antenna lead and its connections without interference.
- vi) 12-volt power for the two-way radio - The positive lead (red 8 ga wire fused at 40 amperes) for the radio connection shall be provided directly from the battery positive post. The ground lead (black, 8 ga) shall be connected directly to the chassis frame with a bolt and nut for fastening. Proper suppression equipment shall be incorporated in the vehicle's electrical system to eliminate interference with radio and television transmission and reception shall not cause interference with any electronic system on the vehicle. The radio power and ground leads shall terminate directly behind the driver's seat with 12 feet of extra length extending into the vehicle interior.
- vii) A split loom or other flexible wire race-way (1" minimum) shall be installed from the radio location to the dash mounted microphone control location.

## **H. Single Point Wheelchair Securement System:**

A wheelchair single point securement system (in lieu of “L” track anchorage system) shall offer 360 degree directional usage “pucks” and shall be cast stainless steel with a 2 ½” bolt to be secured to the floor positions. The single point securement system shall meet the same requirements as listed in section III, subsection IV - WHEELCHAIR SECUREMENT AREA except the pucks shall not be shared in the center run of anchorage points (i.e. separate single point securement systems for each wheelchair securement area) and one securement space shall have an additional anchorage puck as to aid in the securement of scooters or difficult mobility devices. This additional anchorage puck shall be centered between the rear anchorages of the largest securement space. Suggested Sources: Q’Straint Slide N’ Click, Sure-Lok Solo Floor Anchor System.Restraint Storage System

## **I. Seating – Additional:**

- i) Ordering agencies shall have the ability to add or deduct seats from the provided floor plans.
- ii) All additional seats shall be of the same design and color as the other passenger seats, shall be equipped with passenger seat belts, and shall meet requirements stated in Section III, subsection K.

## **VI. VENDOR/MANUFACTURER REQUIREMENTS:**

### **A. Vehicle Information Furnished:**

Vehicle information in this section shall be reviewed at the pre-pilot model review meeting and at final pilot model production. Vehicle information identified by “\*” shall be supplied with each vehicle at delivery. All manuals shall be provided in a hardcopy and an electronic copy (CD or DVD). The vendor/manufacturer shall maintain record or proof that all vehicle information was supplied to the ordering agency.

1. Copy of manufacturer's statement of origin for a vehicle.
2. \* Warranty papers for chassis, body, and additional equipment with each vehicle.
3. \* As built drawings showing wiring schematics of all electrical circuits, body, and chassis with each vehicle.
4. \* Operator's manual for vehicle and all add-on equipment with each vehicle.

5. \* A complete set of repair manuals for the chassis and a manufacturer's parts manual for the body, and auxiliary equipment for the first vehicle of each model year delivered to each transit agency.
6. \* Powertrain emission diagnosis manual (for diagnosing drivability, emissions and powertrain control system symptoms) for the first vehicle of each model year and engine type delivered to each transit agency. Suggested Source: Helm Inc.
7. \* Maintenance and inspection schedule incorporating the required maintenance and inspection of the basic vehicle and its subsystems (i.e., wheelchair lift) with each vehicle.
8. \* Standard manufacturer's production option sheet(s)/decal(s) for chassis and body shall be installed in manufacturer's standard location, with no holes or rivets obscuring writing and numbers. Sheet shall include rear axle ratio. A paper copy of the service broadcast sheet for chassis shall also be provided with each vehicle.
9. Certification that the seating floor anchorage and floor fasteners shall meet all applicable FMVSS including FMVSS 207, 208, 209, and 210.
10. \* Proof of vehicle suspension alignment (work order or bill) at final vehicle inspection and with each vehicle. Four wheel alignments shall include adjustments to front and rear suspension and steering parts so that axle alignment, camber, caster, and toe settings are within manufacturer's desired limits.
11. \* Proof of undercoating (warranty) at final vehicle inspection and with each vehicle.
12. \* Front end and rear towing instructions with each vehicle.
13. \* Wheelchair securement product instructions and training program.

**B. Manufacturer Quality Control:**

Vehicle contractor/manufacturer shall provide a plan for quality control during vehicle construction and include the plan as part of the bid documents (ISO 9001:2000 Certification). Vehicle contractor/manufacturer shall also provide the name of the chief of quality control for vehicle construction.

The contractor shall establish and maintain an effective in-plant quality assurance organization. It shall be a specifically defined organization and should be directly responsible to the contractor's management and completely independent from production. The quality assurance

organization shall exercise quality control over all phases of production from initiation of design through manufacture and preparation for delivery. The organization shall also control the quality of supply articles. The quality assurance organization shall verify inspection operation instructions to ascertain that the manufactured product meets all prescribed requirements. The quality assurance organization shall detect and promptly assure correction of any conditions that may result in the production of defective transit vehicles. These conditions may occur in design, purchases, manufacture, tests or operations that culminate in defective supplies, services, facilities, technical data, or standards. The contractor shall maintain drawings and other documentation that completely describe a qualified vehicle that meets all of the options and special requirements of this procurement. The quality assurance organization shall verify that each transit vehicle is manufactured in accordance with these controlled drawings and documentation.

The contractor shall ensure that all basic production operations, as well as other processing and fabricating, are performed under controlled conditions. Establishment of these controlled conditions shall be based on the documented work instructions, adequate production equipment, and special work environments if necessary. A system for final inspection and test of completed transit vehicles shall be provided by the quality assurance organization. It shall measure the overall quality of each completed vehicle. A system shall be maintained by the quality assurance organization for identifying the inspection status of components and completed transit vehicle. Identification may include cards, tags, or other quality control devices. Inspection stations shall be at the best locations to provide for the work content and characteristics to be inspected. Stations shall provide the facilities and equipment to inspect structural, electrical, hydraulic, and other components and assemblies for compliance with the design requirements. Stations shall also be at the best locations to inspect or test characteristics before they are concealed by subsequent fabrication or assembly operations. These locations shall minimally include, as practical, under-body structure completion, body framing completion, body prior to paint preparation, water test before interior trim and insulation installation, engine installation completion, under-body dress-up and completion, vehicle prior to final paint touch-up, vehicle prior to road test, vehicle final road completion and presentation to resident inspectors. Tests shall be performed by the manufacturer to ensure that the unit is dustproof, water-tight, fumeproof, and that all vehicle fluids are per specifications. The quality assurance organization shall be responsible for presenting the completed vehicle to the resident inspectors. Sufficiently trained inspectors shall be used to ensure that all materials, components, and assemblies are inspected for conformance with the qualified design.

The State may be represented at the contractor's plant by resident inspectors. They shall monitor, in the contractor's plant, the manufacture of transit buses vehicles under this procurement. The contractor shall provide office space for the resident inspectors in close proximity to the final assembly area. This office space shall be equipped with desks,

chairs, outside and interplant telephones, and other items sufficient to accommodate the resident inspector staff. Inspectors shall have lifting equipment available for raising vehicles for under vehicle inspections.

**C. Purchaser Inspection:**

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

**D. Warranty:**

Warranty shall become effective on the date the vehicle is placed into service based upon agency notice to contractor. Warranty service performed at the manufacturer's facilities at the manufacturer's request shall have all costs covered by the manufacturer. Warranty for the vehicle shall be the following as a minimum:

- (1) Three (3) years/36,000 miles on chassis.
- (2) Three (3) years/36,000 miles on transmission.
- (3) Three (3) years on body structure, exterior and paint.
- (4) Eighteen (18) months on lift.
- (5) Manufacturer's standard warranty of one (1) year 12,000 miles, minimum, on other add-on components and items.
- (6) The chassis, body, and all add-on components shall be warranted by the successful contractor.

**VII. BID DOCUMENTS:**

**The bidder shall supply a copy of the following documents with the bid quotation:**

- a) The Michigan Vehicle Cost Model / Evaluation Form completed in detail.
- b) A floor plan of the vehicle shall be provided indicating dimensions and showing the interior layout of the vehicle. The plan shall include wheelchair placement,

engineering calculated loaded vehicle axle weights, and be drawn to scale for all configurations.

- c) Raised roof drawings showing structure and structural specifications indicating metal size and type used.
- d) A description of the manufacturer's chassis (specifications).
- e) All bidders must supply manufacturer's technical specifications for wheelchair lifts and wheelchair restraints. Manufacturer's sales literature is acceptable if it contains the technical specifications.
- f) The warranties for body, chassis, and drive train.
- g) The required Federal Transit Administration (FTA) clauses shall be attached to bid quotation.
- h) The technical data sheet including flammability and smoke emissions for the seat covering material supplied.
- i) Seat frame Salt Spray, humidity and impact resistance tests' results
- j) Certification test data showing that the seats, the seat belts, and the installation are in compliance with FMVSS-207, 208, 209, and 210 where applicable for the vehicle model being offered in this bid.
- k) Certification that the wiring and the switches for air conditioning and all add-on components are adequate to withstand transient loads expected.
- l) A copy of the dealer agreement between the Vehicle Conversion Manufacturer and the designated dealer.

## VIII. TABLE 1:

54254

Federal Register / Vol. 58, No. 201 / Wednesday, October 20, 1993 / Notices

1. Materials tested for surface flammability should not exhibit any flaming running, or flaming dripping.

2. The surface flammability and smoke emission characteristics of seat cushion materials should be demonstrated to be permanent after testing according to ASTM D-3574 Dynamic Fatigue Tests  $I_s$  (Procedure B).

3. The surface flammability and smoke emission characteristics of a material should be demonstrated to be permanent by washing, if appropriate, according to FED-STD-191A Textile Test Method 5830.

4. The surface flammability and smoke emission characteristics of a material should be demonstrated to be permanent by dry cleaning, if appropriate, according to ASTM D-2724. Materials that cannot be washed or dry-cleaned should be so labeled, and should meet the applicable performance criteria after being cleaned as recommended by the manufacturer.

5. ASTM E-662 maximum test limits for smoke emission (specific optical density) should be measured in either the flaming or non-flaming mode, depending on which mode generates more smoke.

6. Flooring and Fire Wall assemblies should meet the performance criteria during a nominal test period determined by the transit property. The nominal test period should be twice the maximum expected period of time, under normal circumstances, for a vehicle to come to a complete, safe stop from maximum speed, plus the time necessary to evacuate all passengers from a vehicle to a safe area. The nominal test period should not be less than 15 minutes. Only one specimen need be tested. A proportional reduction may be made in dimensions of the specimen provided that it represents a true test of its ability to perform as a barrier against vehicle fires. Penetrations (ducts, piping, etc.) should be designed against acting as conduits for fire and smoke.

7. Carpeting should be tested in according with ASTM E-648 with its padding, if the padding is used in actual installation.

8. Arm rests, if foamed plastic, are tested as cushions.

9. Testing is performed without upholstery.

### Definition of Terms

1. Flame spread index ( $I_s$ ) as defined in ASTM E-162 is a factor derived from the rate of progress of the flame front (F) and the rate of heat liberation by the material under test (Q), such that  $I_s = F_s \times Q$ .

2. Specific optical density ( $D_s$ ) is the optical density measured over unit path length within a chamber of unit volume produced from a specimen of unit surface area, that is irradiated by a heat flux of 2.5 watts/cm<sup>2</sup> for a specified period of time.

3. Surface flammability denotes the rate at which flames will travel along surfaces.

4. Flaming running denotes continuous flaming material leaving the site of the burning material at its installed location.

5. Flaming dripping denotes periodic dripping of flaming material from the site of burning material at its installed location.

### Referenced Fire Standards

The source of test procedures listed in Table 1 is as follows:

(1) Leaching Resistance of Cloth, FED-STD-191A-Textile Test Method 5830.

Availability from: General Services Administration Specifications Division,

Building 197, Washington, Navy Yard, Washington, DC 20407.

(2) Federal Aviation Administration Vertical Burn Test, FAR-25-853.

Available from: Superintendent of Documents, US Government Printing Office, Washington, DC 20402.

(3) American Society for Testing Materials (ASTM)

(a) Surface Flammability of Materials Using a Radiant Heat Energy Source, ASTM E-162;

(b) Surface Flammability for Flexible Cellular Materials Using a Radiant Heat Energy Source, ASTM D-3675;

(c) Fire Tests of Building Construction and Materials, ASTM E-119;

(d) Specific Optical Density of Smoke Generated by Solid Materials, ASTM E-662;

(e) Bonded and Laminated Apparel Fabrics, ASTM D-2724;

(f) Flexible Cellular Materials—Slab, Bonded, and Molded Urethane Foams, ASTM D-3574.

Available from: American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

In all instances, the most recent issue of the document or the revision in effect at the time of request should be employed in the evaluation of the material specified herein.

Issued: October 14, 1993.

Grace Crumican,

Deputy Administrator.

[FR Doc. 93-25709 Filed 10-19-93; 8:45 am]  
BILLING CODE 4910-57-P

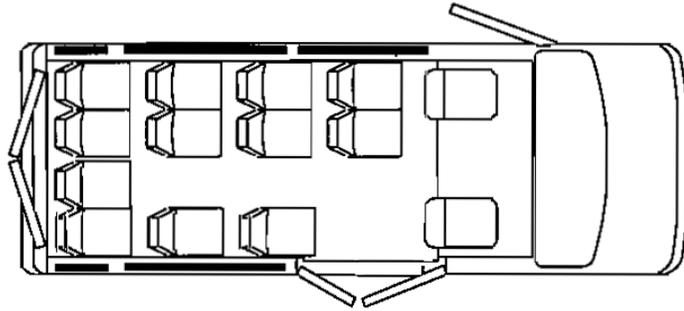
IX. TABLE 1

TABLE 1: RECOMMENDATIONS FOR TESTING THE FLAMMABILITY AND SMOKE EMISSION CHARACTERISTICS OF TRANSIT BUS AND VAN MATERIALS

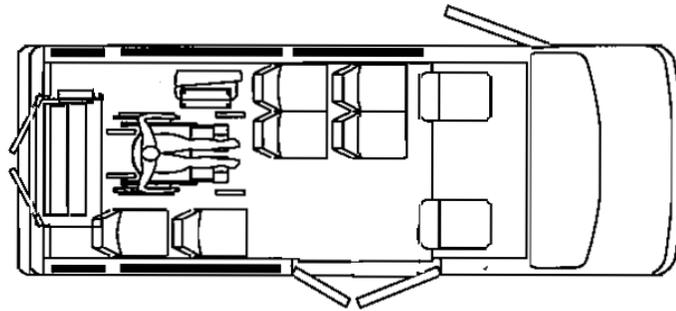
Category	Function of Material	Test Procedure	Performance Criteria
Seating	Cushion <sup>1,2,3,5,9*</sup>	ASTM D-3675	$I_s \leq 25$
		ASTM E-662	$D_s (1.5) \leq 100; D_s (4.0) \leq 200$
	Frame <sup>1,5,8</sup>	ASTM E-162	$I_s \leq 35$
		ASTM E-662	$D_s (1.5) \leq 100; D_s (4.0) \leq 200$
	Shroud <sup>1,5</sup>	ASTM E-162	$I_s \leq 35$
		ASTM E-662	$D_s (1.5) \leq 100; D_s (4.0) \leq 200$
	Upholstery <sup>1,3,4,5</sup>	FAR 25.853 (Vertical)	Flame time $\leq 10$ seconds; burn length $\leq 6$ inches
ASTM E-662		$D_s (4.0) \leq 250$ coated; $D_s (4.0) \leq 100$ uncoated	
Panels	Wall <sup>1,5</sup>	ASTM E-162	$I_s \leq 35$
		ASTM E-662	$D_s (1.5) \leq 100; D_s (4.0) \leq 200$
	Ceiling <sup>1,5</sup>	ASTM E-162	$I_s \leq 35$
		ASTM E-662	$D_s (1.5) \leq 100; D_s (4.0) \leq 200$
	Partition <sup>1,5</sup>	ASTM E-162	$I_s \leq 35$
		ASTM E-662	$D_s (1.5) \leq 100; D_s (4.0) \leq 200$
	Windscreen <sup>1,5</sup>	ASTM E-162	$I_s \leq 35$
		ASTM E-662	$D_s (1.5) \leq 100; D_s (4.0) \leq 200$
	HVAC Ducting <sup>1,5</sup>	ASTM E-162	$I_s \leq 35$
		ASTM E-662	$D_s (4.0) \leq 100$
	Light Diffuser <sup>5</sup>	ASTM E-162	$I_s \leq 100$
		ASTM E-662	$D_s (1.5) \leq 100; D_s (4.0) \leq 200$
Flooring	Wheel Well and Structural <sup>6</sup>	ASTM E-119	Pass
	Carpeting <sup>7</sup>	ASTM E-648	$C.R.F. \geq 0.5 \text{ w/cm}^2$
Insulation	Thermal <sup>1,3,5</sup>	ASTM E-162	$I_s \leq 25$
		ASTM E-662	$D_s (4.0) \leq 100$
	Acoustic <sup>1,3,5</sup>	ASTM E-162	$I_s \leq 25$
		ASTM E-662	$D_s (4.0) \leq 100$
Miscellaneous	Firewall <sup>6</sup>	ASTM E-119	Pass
	Exterior Shell <sup>1,5</sup>	ASTM E-162	$I_s \leq 35$
		ASTM E-662	$D_s (1.5) \leq 100; D_s (4.0) \leq 200$

\* Refers to Notes on Table 1

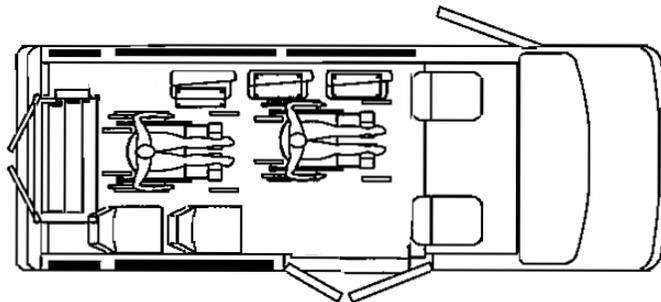
## Standard Vehicle Floor Plans



A. \*12 passengers without lift.



B. \*Six (6) passengers, one (1) double foldaway, one (1) wheelchair space with rear passive lift.



C. \*Two (2) passengers, three (3) double foldaways, two (2) wheelchair spaces with rear passive lift.

\* Passenger seat counts do not include OEM driver and side passenger seats.

Version Date: 10/27/2011