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The study was conducted in cooperation with the Urban Mass Transportation Administration.

16. Abstract

This report was prepared in catalog format for use in selecting special equipment and vehicles for transporting the elderly and the handicapped. Basic specifications, special considerations, and cost are discussed for 34 manufacturers.

In addition, summaries of operational experience including a TTI survey of 120 providers of specialized elderly and handicapped transportation are provided

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SURVEY OF VEHICLES AND EQUIPMENT

FOR

ELDERLY AND HANDICAPPED TRANSPORTATION

by

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Assistant Research Engineer

William Kelley
Research Associate

and

Jose' A. Soegaard
Research Assistant

Edited by

A. V. Fitzgerald
Assistant Research Specialist

Technical Report 1056-1

Study Number 2-10-78-1056

Transportation of the Elderly and Handicapped

Sponsored by the

State Department of Highways and Public
Transportation in cooperation with the
Urban Mass Transportation Administration

Texas Transportation Institute
Texas A&M University
College Station, Texas 77840

September 1978

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DISCLAIMER

Neither the Texas Transportation Institute, nor its sponsor endorse any product or manufacturer listed in this report. Trade and manufacturers' names appear only because they are essential to the objective of this survey (to provide potential purchasers with some data on equipment available). Potential buyers are encouraged to survey additional manufacturers which may have inadvertently been omitted from this list and to review in detail the equipment they wish to purchase.

Data presented reflects information available as of September 1978.

EXECUTIVE SUMMARY

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EXECUTIVE SUMMARY

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IMPLEMENTATION STATEMENT

The information presented in this report will enable local transit operators, as well as the State Department of Highways and Public Transportation, to evaluate specific vehicles and equipment available for transportation of the elderly and the handicapped. The information should aid in the development of specifications in terms of what equipment is available, what features are particularly troublesome and what features have special impact on users.

The data will also result in reduced effort and elimination of duplicate effort on the part of agencies procuring vehicles, since they will not have to spend significant time determining what equipment is available. The information resulting from the survey of operators should also help avoid some of the problems with new vehicles, since the experience of others will be available to purchasers of new equipment.

TABLE OF CONTENTS

I. INTRODUCTION

The information presented in this report is intended to be used as a preliminary guide in selecting vehicles and equipment for specialized transportation service of the elderly and the handicapped. An initial list of over 70 manufacturers of specialized equipment was assembled from previous reports, transit association registers, and transit operators. The companies were requested to provide current literature on product design and specifications. Additional information, as needed, was requested by telephone. In many cases it was determined that the manufacturers were either no longer in the transportation industry or had discontinued marketing of specialized products applicable to elderly and handicapped transportation. The authors also acknowledge the possibility that some new manufacturers were excluded because their companies were not yet listed in the literature or identified by the operators surveyed.

The main body of the report identifies 34 manufacturers of small buses, van conversions, and equipment that may be used in transporting the elderly and the handicapped. Manufacturers of conventional transit buses (more than 40 passengers) were not included in the report, except in the user survey of vehicles.

II. SMALL BUSES

Classification schemes for small buses vary widely. Categories include a range from light duty vans seating 8-12 passengers to heavy-duty transit vehicles seating 35-40 passengers.

For purposes of this report, small buses are divided into two categories; 1) small buses designed specifically for transit use; 2) and small buses built on truck chassis. Vans are treated separately.

Market demand for small buses in the medium and heavy duty categories is unclear. While many technical reports continue to indicate a significant demand, numerous manufacturers have recently discontinued their small bus programs. On the other hand, at least two domestic firms have initiated new small bus programs specifically designed for transit use.

Transit Type

A small transit bus is defined as being engineered and designed specifically for transit use. It is characterized by:

- heavy-duty, unitized construction of body and chassis
- diesel engine
- seating capacity of 20-35 passengers
- design life of 10 years (400,000 miles)

The small transit bus is intended to represent a higher capital cost vehicle that is more desirable and requires less maintenance.

Classification Small Transit Bus

Manufacturer Chance Manufacturing
Box 12328
Wichita, Kansas 67277

Phone Home Office - 316-942-7411
Sales Office - 214-742-3802

Contact Rod Johnson

Title Vice President, Sales
1103 Ross Ave.
Dallas, Texas 75202

General Description

Model RT - 50 Body Chance Chassis Chance

Engine Caterpillar Diesel-175 Transmission Detroit Allison Auto 4 spd. Brakes Dual self-adjusting air

Length 25'2" Width 96" Height 122" Wheel Base 168"

Interior/Equipment

No. Passenger Seats 25 Seating Option 3-modified for wheelchairs

Aisle Width 20" Max. Headroom 75" Door Width 48

Floor Height 33" normal 29" kneeling 1st Step Height 12"-kneeling Step Dimensions 9" riser

Grab Rails inclined at door-vertical at aisle Seat Handholds yes-unpadded

Interior Lighting 4 ft. fluorescent Windows at each seat, 7/32" single density glazed

Wheelchair Lift/Ramp optional-34" width Restraint System American seating foldup seat/restraint

Climate Control air-45,000 BTU's-1600 CFM airflow
heater-90,000 BTU's & 850 CFM

Cost Base $78,000
with Vapor lift $86,000

Delivery Time 180 days

Comments

220 amp battery, air ride, 50 gallon fuel tank, noise level less than 82 dba, 28.6' turning radius, Rockwell - Axle (9,000# front/15,000# rear) MPG estimate: 8-11.

The City of Austin received the first 5 RT-50 with lifts.

Classification Small Transit Bus

Manufacturer Transportation Manufacturing Co. Phone 505-347-2011

P.O. Box 5670 Contact Mr. Vernon Tull

Roswell, New Mexico 88201 Title Sales Manager
(Greyhound Subsidary)

General Description

Model City Cruiser-TMC-T-30 Body TMC Chassis integrated body

Engine Detroit diesel Transmission auto 4 spd. Detroit Allison Brakes Rockwell-Std. Camaste full air

Length 31'4" Width 96" Height 96" Wheel Base 180"

Interior/Equipment

No. Passenger Seats 31 Seating Option various options

Aisle Width 20.5" Max. Headroom 78" Door Width 36"-rear, 37.5" front

Floor Height 33" 1st Step Height Average 13" Step Dimensions step rise 10"

Grab Rails inclined at door stanchion along the aisle Seat Handholds American Seating-unpadded

Interior Lighting fluorescent illuminator Windows at each seat-double glazed, tinted

Wheelchair Lift/Ramp TDT Restraint System American Seating

Climate Control Carrier-7 ton ratings at 95° ambient heating 80,000 BTU's-800 CFM air flow

Cost $59,997 without lift

Delivery Time 6 months

Comments

MPG estimate: 7.7, 90 gallon tank. 1st delivery scheduled for January of 1979. noise level 82 decibels in rear of bus. Bus was originally designed, manufactured, a marketed as Orion Bus of Canada and as such was tested for 5 weeks by SEMTA (South Eastern Metro Transit Authority) in Detroit, Mich. TMC division of Greyhound has now taken over production and marketing in United States.

Truck Chassis Type

The technology of school bus and recreational vehicle manufacturers is being widely adapted to the needs of elderly and handicapped transportation service. The manufacturers add their specialized bodies to standard truck chassis.

Such vehicles are characterized by:

- gross vehicle weight in range of 9-11,000 lbs.
- added strength and durability afforded by truck chassis
- passenger capacities range from 16-24.
- option of gasoline or diesel engine.
- low capital cost relative to passenger capacity

Classification Small Bus - Truck Chassis

Manufacturer Mercedes Benz of North America Phone 201-573-0600

One Mercedes Drive Contact Mr. R. L. Towner

P.O. Box 350 Title Manager
Montuale, NJ 07645

Texas-Van Winkle Motor Company
4023 Oaklawn Ave.
Dallas, 75219 - Phone-214-526-870

General Description

Model 0309 D Body Mercedes Chassis Mercedes

Engine 4 cyl. diesel (230 cu. in.) Transmission Auto 4 spd. Allison Brakes air assisted hydrauli

Length 236" Width 83.4" Height 108.8" Wheel Base 137.8"

Interior/Equipment

No. Passenger Seats 16 Seating Option customer's - option

Aisle Width 19" Max. Headroom 74.8" Door Width NA

Floor Height NA 1st Step Height 9" Step Dimensions NA

Grab Rails vertical at aisle and entrance Seat Handholds no

Interior Lighting 6 ceiling lights Windows at every seat

Wheelchair Lift/Ramp options Restraint System option

Climate Control heater - hvy. duty AC option

Cost $28,000 - Base Price

Delivery Time United States Distribution discontinued.

Comments

Michigan study (1) found Mercedes bus to be well-built and economical to operate. Only significant complaint was noise level. TTI survey respondents gave 309 D above average rating with only moderate complaints on parts accessibility.

Classification Small Bus - Truck Chassis

Manufacturer Argosy Manufacturing
60 Vista Drive
Versailles, Ohio 45380

Phone 513-526-3131
Contact Joel Diehl
Title National Sales Manager
Bus Division

General Description

Model CB/20'/24'/28' Body Argosy-RU-Diesel MT643 Chassis Diesel Chevrolet/ modified Dodge
Engine Detroit Diesel 453 or Chevrolet 454 Transmission Auto Model 1400/ 475 Brakes power-hydraboost
Length 240" - 125" WB / 288" - 158" WB / 328" - 178" WB Width 96" (all) Height 109" Wheel Base 125"/158"/178"

Interior/Equipment

No. Passenger Seats 17 Pass. - 125" WB / 2 whl. & 22 Pass.-158" WB / 3 " " 26 " -178" WB Seating Option Various (perimeter seating available)
Aisle Width 11" W/39" seats / 21" W/34"seats / 24"-28" Max. Headroom 79" Door Width 26"
Floor Height 28"-30" 1st Step Height 9½" Step Dimensions 8" riser x 9 3/4" depth x 29½" width
Grab Rails inclined at entrance, vertical Seat Handholds yes-unpadded
Interior Lighting Full length passenger compartment Windows at each seat
Wheelchair Lift/Ramp optional-TDT system Restraint System Collins
Climate Control 40,000 BTU heater-std. AC & heater-optional

Cost $43,000-CB24 & 73,000 CB24 Diesel / $45,000 - CB-28

Delivery Time 120 days

Comments

"A good bus when it runs" was reported by the Michigan Study (1). Operators experienced continous engine and transmission problems. CB-20 available in large quantities only.

Classification Small Bus-Truck Chassis

Manufacturer Carpenter Body Works
Mitchell, Indiana 47446

Phone 812-849-3131
Contact Rod Gardner
Title Sales Manager

General Description

Model Cadet Body Carpenter Chassis GMC/Chevrolet

Engine Chevrolet Transmission standard Brakes front disc/rear drum

Length 224"/252"/280" Width 84" Height 108" Wheel Base 133"

Interior/Equipment

No. Passenger Seats 18-32 Seating Option 6 options

Aisle Width 13" Max. Headroom 78" Door Width 75"

Floor Height 26"-27" 1st Step Height 12" Step Dimensions riser - 7"

Grab Rails Full length at door Seat Handholds yes-option

Interior Lighting 6 dome lights Windows at each seat

Wheelchair Lift/Ramp optional-Collins W23A-single, W36A-double Restraint System optional

Climate Control heavy-duty heater/air condition

Cost approx. $14,000 fully equipped with lift/air/assc.

Delivery Time 6 months

Comments

Michigan study (1) rated bus as good buy for money with low service cost. Chief difficiencies were high first step and minor problems with electrical system.

Classification Small Bus-Truck Chassis

Manufacturer Cortez Enterprises, Inc. Phone 216-678-4932

777 Stow Street Contact James Whalen

Kent, Ohio 44240 Title Material Control Manager

General Description

Model Transporter Body Cortez Chassis Unitized

Engine Oldsmobile-403 CI Transmission Oldsmobile 3spd Auto Brakes hydraulic-power boosted

Length 22'4" Width 95" Height 96" Wheel Base 132"

Interior/Equipment

No. Passenger Seats 15 passengers Seating Option optional

Aisle Width optional Max. Headroom 6'3" Door Width 40"

Floor Height 18" 1st Step Height 14" Step Dimensions 7" riser

Grab Rails option Seat Handholds option

Interior Lighting optional Windows 4 lg. windows in passenger section

Wheelchair Lift/Ramp optional Restraint System optional

Climate Control 36,000 BTU A.C.-optional
40,000 BTU heater

Cost $18,000 base to nearly $40,000

Delivery Time 8 weeks

Comments

Classification Small Bus - Truck Chassis

Manufacturer Grumman Allied
600 Old Country Rd.
Garden City, New York 11530

Phone 614-369-7671
Contact Richard Ripp
Title

General Description

Model 23-Grumman Lift Body Grumman Chassis Chevrolet/Dodge

Engine Chevrolet & Dodge Transmission Optional Brakes Front disc/Rear drum

Length 243" Width 96" Height 112" Wheel Base 137"

Interior/Equipment

No. Passenger Seats 17 Seating Option custom

Aisle Width 19" Max. Headroom 6'6" Door Width 23"

Floor Height 33" 1st Step Height 17" Step Dimensions 8" risers

Grab Rails vertical at entrance Seat Handholds yes, on back of seats

Interior Lighting 4 ceiling lights Windows at every seat

Wheelchair Lift/Ramp optional electro-hydraulic Restraint System optional

Climate Control heater - AC option Scott

Cost Base - $23,000, with lift $28,000

Delivery Time No longer available

Comments

Note: Michigan Study (1) indicated that while passengers liked design of Grumman Bus, operators were plagued with continuous breakdowns. TTI survey respondents also indicated dissatisfaction with service requirements.

Classification Small Bus - Truck Chassis

Manufacturer Micro Bus CORP - Phone 213-923-3221

12420 Bloomfield Ave. Contact A. B. Miller

Santa Fe Springs, CA 90670 Title President

General Description

Model Fortibus Commuter-XB Body Microbus Chassis Ford/GMC/Dodge/Chevrolet

Engine Gas or Diesel Transmission Optional Brakes std.-front disc/rear drum
Ford 233" & 253" Ford 90" Ford- 107" Ford

Length Chev. - 249" Width Chev. 80" Height Chev - 105" Wheel Base Chev - 146"

Interior/Equipment

No. Passenger Seats 12-20 Seating Option forward or perimeter

Aisle Width Min-15" Max. Headroom 74-76" Door Width 36-54"

Floor Height 27" 1st Step Height 10-11" Step Dimensions 10 3/4" riser

Grab Rails inclined at entrance-vertical at aisle & optional at ceiling Seat Handholds optional

Interior Lighting 4 domelights Windows at each seat

Wheelchair Lift/Ramp electric hydraulic lift with dual hydraulic cylinders Restraint System optional

Climate Control optional- 18-36,000 BTU A.C.

Cost $19-23,000 Base,-Add $2750 for lift and $2,600 for air conditioning

Delivery Time 3-5 months

Comments

Micro Bus manufactures electro-hydraulic lift with auxilary backup 44"door width for lift - 60" height.

Company also provides van conversions.

Classification Small Bus - Truck Chassis (Recreational Vehicle)

Manufacturer Revcon Inc. Phone 714-968-3346

10870 Kalama River Rd. Contact

Fountain Valley, CA 92708 Title

General Description

Model T-27 and T-30 Body Revcon Chassis Revcon

Engine Oldsmobile-403CI Transmission 3 spd. Hydramatic Brakes vacuum assisted and dual cylinder

Length 27' - T 27 / 30' - T 30 Width 95" Height 101" Wheel Base 185" - T-27 / 202" - T-30

Interior/Equipment

No. Passenger Seats * Seating Option *

Aisle Width * Max. Headroom 77" Door Width N. A.

Floor Height 22" 1st Step Height 12" Step Dimensions riser-10"

Grab Rails * Seat Handholds *

Interior Lighting * Windows *

Wheelchair Lift/Ramp * Restraint System N. A.

Climate Control heater A-C - 16,000 BTU

Cost T-27 - $21,800 / T-30 - $23,800

Delivery Time 90 days

Comments

* - Requires customer design for interior

Classification Small Bus - Truck Chassis

Manufacturer Superior - Sheller Globe Corp Phone 214-371-7715 or 7716

1200 E. Kirby St. Contact Lee F. Naugle

Lima, Ohio Title Superior Coach Sales of Texas
309 E. Overton Road
Dallas, Texas 75216

General Description

Model Pacemaker - 3 models Body Superior Chassis Chevrolet/GMC/Dodge heavy duty-front

Engine Gas or Diesel Transmission * Brakes disc/rear drum

18'8"-125" WB 9'5"-125" WB

Length 21'-133" WB Width 84" Height 9'6"-133" WB Wheel Base 125",133",157"

Interior/Equipment

No. Passenger Seats 2 wheelchairs + 15 seated-125"WB
4 whl. + 11 seated-133"WB Seating Option various wheelchair options

Aisle Width 13" Max. Headroom 78" Door Width 27½"

Floor Height _____ 1st Step Height 14" Step Dimensions 8" riser

Grab Rails inclined bar at entrance vertical stanchions along aisle Seat Handholds _____ option

Interior Lighting 6 ceiling lights Collins Windows at every seat

Wheelchair Lift/Ramp single or double width platform Restraint System wheel lock - seat belt

Climate Control heater-AC optional Scot-40,000 BTU

Cost $22,000-125"wheel base add approx. $3,200 for air conditioning
$24,000-133" wheel base add approx. $2,400 for lift
$26,000-157" wheel base

Delivery Time 6 months

*125" wheel base-std. automatic
133" & 157" wheel base-heavy duty 3 spd. automatic

Comments

Michigan study (1) gave bus good ratings with exception of 1st step height and lift door dimensions. 94 inch wide Pioneer model with 4 cyl. Detroit diesel is available for $33,000. Texas operator: Amarillo

Classification Small Bus - Truck Chassis

Manufacturer Thomas Built Buses
P.O. Box 2450
High Point,
North Carolina 27261

Phone factory 919-886-4871
Contact Jack Connel-Sales Manager
Title Longhorn Bus Sales
P.O. Box 20362
Houston, Texas 77205
Phone-713-741-1423

General Description

Model lift buses Body Thomas Chassis Chevrolet/GMC heavy duty

Engine 350 Chevrolet Transmission Chevy MX-1 auto Brakes J-55 brakes-heavy duty vacuum

Length 21'-133"WB 18'9"-125" WB Width 84" Height 91" Wheel Base 125",133",157"

Interior/Equipment

No. Passenger Seats 125"-WB-18-20 133"-WB-20-24 159"-WB-20-26 Seating Option several options

Aisle Width N.A. Max. Headroom 73" Door Width 30"

Floor Height 31" max 1st Step Height 11" Step Dimensions 10" riser

Grab Rails at entrance-along aisle Seat Handholds no-grab rails can be adjusted

Interior Lighting 6 dome lights Windows at every seat

Wheelchair Lift/Ramp REB lift Restraint System optional

Climate Control heater-AC option Therm-air

Cost Base-$16,000 with air $20,200

Delivery Time 90-210 days depending on chassis available

Comments

Customers include several several hospitals and school districts in Texas

Classification Small Bus - Truck Chassis

Manufacturer Transcoach Division Phone

Sportscoach Corp. Contact

9601 Cenoga Ave. Title
Chatsworth, Calf. 91311

General Description

Model Transcoach Body Transcoach Chassis Ford

Engine Ford V-8 390 cu. in. Transmission optional Brakes power-option

Length 22'4" Width 7'7' Height 9'3" Wheel Base 135"

Interior/Equipment

No. Passenger Seats 14 passengers or 4 wheel-chairs and 6 passengers Seating Option optional-vinyl covered & sponge rubber

Aisle Width 29" Max. Headroom 79" Door Width 40"

Floor Height Ist Step Height 9½" Step Dimensions 10" riser

Grab Rails on lift, at entrance, along aisle Seat Handholds None

Interior Lighting 8 ceiling lights Windows at every seat

Wheelchair Lift/Ramp option Restraint System

Climate Control heater-AC option

Cost N.A.

Delivery Time No longer being manufactured

Comments

Michigan study (1) stated that during brief evaluation; many problems were encountered. TTI data confirms problems with maintainence and serviceability. Emergency exits are windows, making it difficult to evacuate handicapped.

Classification Small Bus-Truck Chassis

Manufacturer Urban Transportation Dev. Corp. Phone N.A.
20 Eglinton Ave. West Contact
Toronto, Ontario Canada Title

General Description

Model Toronto Go-Bus Body Toronto Go-Bus Chassis Dodge 500
Engine Chrysler - 440 Transmission auto Brakes dual master cylinder
Length 24'2" Width 8' Height 9'4" Wheel Base 167"

Interior/Equipment

No. Passenger Seats 17 Seating Option contoured-60"
Aisle Width 24" Max. Headroom 6'3" Door Width 27"
Floor Height Ist Step Height 16" Step Dimensions 9" risers, 11" trea
Grab Rails horizontal-door-vertical aisle Seat Handholds none
Interior Lighting lighting at every seat Windows not at every seat-removable
Wheelchair Lift/Ramp option Restraint System none
Climate Control heater - AC option

Cost $21,000
Delivery Time No longer being manufactured.

Comments

Classification Small Bus - Truck Chassis

Manufacturer Winnebago Industries Phone 515-582-3535

Forest City, Iowa 50436 Contact Gary D. Gernetzke

Title Commercial Vehicle Sales Coordinator

General Description

Model D-23MI, D-23 D-28MIC, D-28 Body Winnebago Chassis Dodge

Engine Dodge 360 D-23MI,D-23 Dodge 440 Dr 28MIC Transmission 3 spd. auto Brakes disc front/drum rear hydraulic power assist

Length 22'11"-D-23 28'2"-D-28 Width 7'9" Height 10'2'-D-23 10'6'-D-28 Wheel Base 137"-D-23 178"-D-28

Interior/Equipment *

No. Passenger Seats _____ Seating Option _____

Aisle Width _____ Max. Headroom _____ Door Width _____

Floor Height _____ 1st Step Height _____ Step Dimensions _____

Grab Rails _____ Seat Handholds _____

Interior Lighting _____ Windows _____

Wheelchair Lift/Ramp _____ Restraint System _____

Climate Control _____

Cost $14,000-$14,800 D-23 $16,200-$17,700 D-28 BASE ONLY

Delivery Time _____

Comments

* Winnebago Interior Shell must be converted to customer specifications for transportation of E & H., Michigan study indicated passengers liked vehicle but operators complained of time consuming servicing because parts not attainable. TTI survey respondents liked the basic design but felt Winnebago used too many non-standard parts.

Classification Small Bus - Truck Chassis

Manufacturer Wayne Corp.
P.O. Box 1447
Richmond, Indiana 47374

Phone Sales-512-385-5300
Contact Conwell Smith, President
Title Smith Sales Company
P.O. Box 1551
Austin, Texas 78767

General Description

Model Transette, Busette Body Wayne Chassis GMC/Chevy

Engine 350-V8 Transmission 3 spd. auto Brakes front disc/rear drum

Length 210" Width 91.68" Height 107" Wheel Base 125"

Interior/Equipment

No. Passenger Seats 11-19 combined pass. & wheelchairs Seating Option numerous options

Aisle Width 15" Max. Headroom 63" Door Width 25.5"

Floor Height 29" 1st Step Height Transette-11 3/4" Busette-14" Step Dimensions 7½" riser

Grab Rails optional-one side only Seat Handholds optional with 36" seat

Interior Lighting 1 ceiling light Windows at every seat

Wheelchair Lift/Ramp Collins electro-hydraulic Restraint System manual wall lock

Climate Control heater-AC option dual unit

Cost Transette Vista-$17,000
Busette-$11,000
Transette Custom-$15,300

Delivery Time 90-120 days

Comments

Texas operators: Houston Independent School District, Austin Independent School District, Fort Worth Independent School District.

III. VANS

Vans constitute the most widely used vehicle type in transporting the elderly and handicapped. Seventy (70) percent of organizations surveyed by TTI were utilizing vans. Of all van models, Dodge was most frequently selected because of the maxivan's extended chassis.

Conversion of a van to a more bus-like appearance and application is effected by raising the roof (normally 12-24 inches); this permits most passengers to move within the vehicle while standing. Other modifications include installation of wheelchair lifts or ramps and securing devices. Seating capacities vary with specified mix of wheelchair and seat positions.

Classification Van Conversion

Manufacturer Braun Corporation
1014 S. Monticello
Winamac, Indiana 46996

Phone 219-946-3647
Contact Keven Crawford
Title Sales

General Description

Model Braun Conversion Body 12" raised roof Chassis Ford, Dodge, Chevy, GMC

Engine _____ Transmission _____ Brakes disc front or heavy-duty hydraulic

Length _____ Width _____ Height _____ Wheel Base _____

Interior/Equipment

No. Passenger Seats option Seating Option custom option

Aisle Width _____ Max. Headroom 72" Door Width --

Floor Height NA 1st Step Height 12½" Step Dimensions NA

Grab Rails option Seat Handholds No

Interior Lighting 2 dome lights Windows _____

Wheelchair Lift/Ramp Braun-Lift Restraint System wheel or over the center tiedown

Climate Control factory air - rear air

Cost $750.00 for 12" raised roof
$850.00 for 24" raised roof
Delivery Time 6-12 weeks

Comments

Customer may supply van or Braun will provide.

Classification Van Conversion

Manufacturer Continental Mobility Systems Phone 303-988-4433

4345 S. Santa Fe Drive Contact Howard Burkett

Englewood, Col 80110 Title Sales Manager

General Description

Model Royce mobile Body Royce conversion Chassis Dodge or Ford

Engine Dodge-318 CI Transmission 3 spd.-auto Brakes Power Front Discs.

Length 194"-220" Width 80" Height 81" Wheel Base 127"
Maxi van is 18" longer

Interior/Equipment

No. Passenger Seats 9-12 Seating Option optional

Aisle Width NA Max. Headroom 73" Door Width 50"

Floor Height 29" 1st Step Height 6-9" Step Dimensions NA

Grab Rails NO Seat Handholds NO

Interior Lighting standard Windows

Wheelchair Lift/Ramp drawbridge lift-intergate with side door Restraint System T Bar lock down-options with shoulder belt

Climate Control factory ARA option

Cost $9,200 with lift and air

Delivery Time 30 days

Comments

Classification Van Conversion and Accessories

Manufacturer Drive-Master Corp. Phone 201-785-2204

16 Andrews Drive Contact

West Patterson, New Jersey 07424 Title

General Description

Model Drive-Master Transportation Body 14" & 24" raised roof Chassis Chevrolet, Dodge, Ford

Engine Ford Option Transmission option Brakes option

Length Standard Width standard Height standard + 12-22" Wheel Base standard

Interior/Equipment

No. Passenger Seats option Seating Option option

Aisle Width NA Max. Headroom NA Door Width NA

Floor Height NA 1st Step Height NA Step Dimensions NA

Grab Rails NA Seat Handholds NA

Interior Lighting standard Windows factory/ARA option

Wheelchair Lift/Ramp Ricon or Target swing way-electric Restraint System under center wheelchair lock shoulder harness/seat belt

Climate Control factory/ARA option

Cost $15,000

Delivery Time 120-180 days

Comments

Drive-master provides numerous accesories for the handicapped driver.

Majority of Drive-Master's production is oriented toward individual user.

Classification Van Conversion

Manufacturer Medical Coaches
Box 129
Onconta, New York 13820

Phone 607-432-1333
Contact Al Collins
Title Vice-President

General Description

Model Medical Coach Van Body Medical Coaches Chassis Ford/Dodge

Engine Option Transmission option Brakes Front disc
Length Low Boy - 9'6" Low boy 5'0" Dodge-127"
Of Roof High Boy - 10'0" Width High boy4'6" Height Wheel Base Ford- 138"

Interior/Equipment

No. Passenger Seats 8-12 Seating Option customer option

Aisle Width NA Max. Headroom 60"-76" Door Width NA

Floor Height NA 1st Step Height NA Step Dimensions NA

Grab Rails option Seat Handholds option

Interior Lighting 2 ceiling lights Windows

Wheelchair Lift/Ramp Collins Restraint System 2 floor mounted tiedowns

Climate Control factory

Cost for conversion only - $5,365.00 - Low Boy
$5,445.00 - High Boy
Delivery Time 90-120 days

Comments

Low Boy model conversion gives a floor to ceiling height of 60" High Boy model conversion gives a floor to ceiling height of 76" Conversion cost includes installati of extended fiberglass root, reinforced flooring, insulated side walls, Collins lift, 2 wheelchair tiedowns, and rear mounted seat. Other options available

Classification Van Conversion

Manufacturer Recreation Industries, Inc. Phone 216-743-3043

716 Union National Bank Bldg. Contact Mr. Schlummz

Youngstown, Ohio 44503 Title

General Description

Model Transporter Body RI-Conversion Chassis Dodge 1-ton Chassis

Engine option Transmission option Brakes option

Length 214" Width 78" Height 8'4" Wheel Base 127"

Interior/Equipment

No. Passenger Seats 12 Seating Option optional

Aisle Width 12" Max. Headroom 6'2" Door Width

Floor Height N.A 1st Step Height 13" Step Dimensions NA

Grab Rails Vertical poles at entrance Seat Handholds no

Interior Lighting 4 ceiling lights Windows at every seat

Wheelchair Lift/Ramp Collins W25A Restraint System American seating Floor mount T Bar

Climate Control Heater AC option/standard front ARA-rear

Cost Van Cost + $7500-$8500 conversion cost

Delivery Time 60 days

Comments

Recreational Industries has developed 26 foot E & H transporter with lift from 6 MC Transmode Chassis.

Classification Van Conversion

Manufacturer Skillcraft Industries
1270 Ogden Rd.
Venice, Fla 33595

Phone 813-488-1501
Contact T. L. Huston
Title President

General Description

Model Skillcraft Body Skillcraft Conversion Chassis B-300 Dodge-Maxi Van

Engine 318 Transmission auto Brakes front-disc/rear drum

Length std. Width std. Height extends height 20" Wheel Base std.

Interior/Equipment

No. Passenger Seats 14 passenger-3 spd Seating Option Perimeter seating-foldup seat

Aisle Width 20" Max. Headroom 70" Door Width NA

Floor Height NA 1st Step Height 11" Step Dimensions Riser- 7½"

Grab Rails handrail at door Seat Handholds option

Interior Lighting standard Windows

Wheelchair Lift/Ramp side or rear mounted elect-hydraulic Restraint System J Bolt at wheel with seat belt

Climate Control factory-evap at rear

Cost $14,500

Delivery Time 90 days

Comments

Electric-hydraulic lift manufactured by skillcraft and marketed by Collins and Associates.

Classification Van Conversion

Manufacturer Speedy Wagon
1700A Scherer Parkway
St. Charles, MO 63301

Phone 314-724-0400
Contact Joan Meng
Title Sales Coordinator

General Description

Model S-200/S-201 Body 12"/24" extended roof Chassis 12"-Dodge, Chevrolet, roof 24"-Dodge only, Ford

Engine std. Transmission standard Brakes standard

Length Standard Width standard Height adds-10-20" to top Wheel Base

Interior/Equipment

No. Passenger Seats Optional Seating Option Optional

Aisle Width NA Max. Headroom S-200-63" S-201-74" Door Width NA

Floor Height NA 1st Step Height NA Step Dimensions NA

Grab Rails option Seat Handholds no

Interior Lighting standard Windows

Wheelchair Lift/Ramp side fold or swing out Restraint System floor mounted tiedowns

Climate Control Factory AC-heater

Cost Base price $7500-12"top-11,000 24"top-$10,700

Delivery Time approximately 90 days

Comments

Manufacturing is oriented toward handicapped owner/operator. Lift system is electric with manual hand crank backup system. Other options may be specified Manufacturer also provides numerous accessories for wheelchair driver.

Classification Van Conversion

Manufacturer Superior-Sheller Globe
1200 E. Kirby Street
Lima Ohio 45802

Phone 214-371-7715
Contact Lee Naugle
Title Superior Coach Sales of Texas

General Description

Model Superior Van Body Superior Conversion Chassis Chevy, Ford, Dodge, GMC
Engine optional Transmission std-Heavy duty option Brakes std-heavy-duty option
Length 201" Width 77.5" Height 88.5" Wheel Base 125"

Interior/Equipment

No. Passenger Seats 12 Seating Option numerous options
Aisle Width 8" Max. Headroom 63.5" Door Width 39"
Floor Height _____ 1st Step Height 14½" Step Dimensions NA
Grab Rails at entrance Seat Handholds none
Interior Lighting 3 ceiling lights Windows none
Wheelchair Lift/Ramp Collins Restraint System Collins option
Climate Control Heater-AC option

Cost $10,400
Delivery Time 120 days

Comments

IV. LIFTS AND RESTRAINT SYSTEMS

Wheelchair lifts and restraint systems are the most commonly used aids in transporting the handicapped client. Transit bus lifts are generally integrated into the body of the steps, whereas lifts for vans and small buses are separate components fitting into the side of the vehicle.

Equipment Category Wheelchair Restraint System-Small Buses-Transit

Manufacturer American Seating Company
Transportation Seating Division
Grand Rapids, MI 49504

Phone 616-456-0600

Contact Guy Soda-Home office 616-456-0408

Title Sales Rep. for Texas
Al Trager-Atlanta, GA
404-523-1916

Model # 6426-Bench
6464-2 separate cushions

Cost $490.00 - $544.00
12 weeks shipment

Description

In the down position, the seat may be used by any passenger. In up position, the lock is set to restrain a standard wheelchair. The 36" conventional two passenger seat may be installed at front or rear of bus. Restraint system activates upon contact with wheel and depression of release lever releases chair. System also features energy-absorbing grab rail across top of seat. Seats can be mounted on floor.

Safety Features

Options

Fiberglass or upholstered seats. Optional Type II seat belt (and/or shoulder harness) for wheelchair occupant. Some operators have expressed dissatisfaction with quality of shoulder harness.

Comments

Equipment Category Wheelchair Lift - Vans and Small Buses

Manufacturer Braum Corporation
1014 South Monticello
Wonamac, Indiana 46996

Phone 219-946-3647
Contact Keven Crawford
Title Sales Dept.

Model # fully automatic side mount

Cost $2497.00

Description

Designed for vans, motorhomes and larger vehicles. Electro-hydraulic system with maximum lift capacity of 750 lbs. Self-contained unit requiring no modification May be operated remotely or by occupant. Platform dimension is 30" x 46". Lift stores in approximately 2 ft. of floor space.

Safety Features

Guard prevents wheelchairs from slipping off platform. Fastening devices installed optionally.

Options

Semi-automatic and automatic for rear mount or side mount.

Comments

Braum manufacturers numerous products for handicapped operators of vehicles.

Equipment Category Wheelchair lift-vans and small buses

Manufacturer Collins Industries
Box 58
Hutchinson, Kansas 67501

Phone 316-663-4441
Contact
Title Texas Representative
Larry Hemphill
817-383-3518

Model # SAF-T-lift Cost $1600-2200.00 + installation

Description (Standard Model)

Hydraulic power up + down; lift cycle-12 seconds up-10 seconds down; cylinder; 1½ -in. diameter/Piston Rod: 3/4 -in.diameter; Power Unit-Electro-hydraulic, self-contained, 12 volt motor, pump, valve, and reservoir; Platform-2½" x 30" x 44"; (average) Lift Height-33" min; 39" max

Capacity - 700 lbs; mounted weight - 360 lbs.

Safety Features

Equipped with swing up safety stop plate

Door activated power cutoff switch prevents accidental movement of lift from transport position when doors are closed. Manual operation in case of electrical failure.

Options

Collins offers nine (9) models of lifts. Various features add additional safety devices at many points of operation as well as auxillary power sources.

Comments

Platform folds on the inside of van flush with side doors-14" deep. Collins also manufactures foldup ramps, and other equipment used in transporting the handicapped. Collins is considered to be one of the principal suppliers to school bus manufacturers.

Equipment Category Wheelchair lift and Accessories-Vans

Manufacturer Handicapps, Inc.
4335 So. Santa Fe Drive
Englewood, Col. 80110

Phone 303-781-2062
Contact Mr. Haynes
Title Texas Distributer:
Best Rentals
5118 Westheimer
Houston, Texas 77056
713-621-6400

Model # Superlift II

Cost $1,243 plus shipping
$100 Installation suggested

Description

Electrically powered by ½ or 3/4 HP motor powered from van battery. May be installed on any side door.

Platform 29" x 42" - sets high to door

400 lb. test capacity.

Cycle time - approx. 20 seconds.

Safety Features

Safety stop optional

Options

Comments

Handicapps, Inc. Also manufactures numerous vehicle control accessories for handicapped drivers.

Equipment Category Wheelchair lift-Vans

Manufacturer Mac's Lift Gate, Inc. Phone 213-634-5962

2727 South Street Contact Jerry MacDonald

Long Beach, Calf. 90805 Title Sales Manager

Model # 1 WBU57 Cost Side Lift-$785.00 including shipping charge
1 WSU32 Back lift-$850

Description

Model	Capacity	Weight	Max Height	Lowering	Power	Platform	Closing	Mount
WSUB2	800 lbs.	175 lbs	29"	Gravity	Elec.	30"x47"	Power	side
1WBV57	800 lbs.	250 lbs.	33"	Gravity	Elec.	55"x31"	Power	rear

Both Units have remote control

Safety Features

Foot safety plate to turn off power

Wheelchair stop on end of platform

Emergency gate release

Options

Extension for 1WBV57 of 30" x 18" to produce 55" x 31" platform area.

Comments

Fits Chevrolet, Ford, and Dodge vans

Equipment Category Wheelchair lift-Van

Manufacturer Maxon Industries
1960 East Slauson Ave.
Huntington Park, CA 90255

Phone 213-725-0200
Contact Wendell Smith
Title Product Manager

Model # WL-5A Cost Unavailable

Description

Swing type platform lift designed for use with vans. It is powered by electric-hydraulic system that works off 12-volt battery. Requires little or no modification to vehicle. Capacity is 500 lbs. Height Range is 0-31 inches. Hand held control cycle time is 25 seconds.

Safety Features

A horizontal grab rail is installed on platform.
The wheelchair is rolled on a sturdy platform and secured with the chair's handbrake.

Options

AC-DC current option

Comments

Lift takes up space of one bench seat.
May be mounted on rear or side. Company specializes in cargo lifts as opposed to wheelchair lifts.

Equipment Category Wheelchair lift-Van & Small Buses

Manufacturer Para Industries Ltd. Phone 403-276-3133

11 Street NE Contact Doug Arnesson

Calgary, Alberta, Canada Title Sales - Dallas
214-526-8391

Model # Mark II Cost $1898.00 - Base plus freight and installation

Description

Operates on roller chains over dual hydraulic cylinders

Handrails move with lift. 12-volt power pack

Height - 46½"

Width - 36"

Length - 41" Max Capacity - 1,000 lbs.

Depth of Unit - 12" Total Weight - 315 lbs.

Safety Features

Handrails are standard item

Emergency switch activities override in a event of failure to complete cycle.

Senitivity edge ensures safety stop.

Safety gate/roll stop prevents wheelchair from rolling off platform.

Options

May be purchased with automatic door opener, extended platforms, manual hydraulic pump back up system.

Comments

Equipment Category Wheelchair Lift - Vans and Small Buses

Manufacturer REB Manufacturing Inc. Phone 419-396-6969

P.O. Box 276 Contact Raymond Smalley

Carey, Ohio 43316 Title President

Model # 10500 Cost $1265.00

Description

Electro-hydraulic lift with dual cylinders. Cycle time = 43 sec; Unfolded = 6 sec. lower-17 sec., raise-20 secs. Installation can be made without modification to vehicle. Interior storage depth of lift is less than 8½" (excluding power pack). Platform 30" x 44" with 5" ramp. Lift height 26" maximum. Maximum capacity is 1000 lbs. Mounted weight is 190 lbs.

Safety Features

Has anti-rollbar on platform

Flip stop on platform

Handrail optional.

Manual operation in case of electrical failure.

Options

Grab rail, semi-automatic operation, manual operation, cutoff switch, and special paint per specification. 9 models reflecting different platform demensions and operating criteria. 3 auxillary systems.

Comments

1-2 weeks shipment. REB is used by many bus manufacturers.

Equipment Category Wheelchair Lift and Accessories-Vans

Manufacturer Total Mobility Systems & Design Inc. Phone 503-686-9706

4060 Stewart Rd. Contact Chris Casady

Eugene, Oregon 97402 Title President

Model # Safety Van Lift* Cost $1495.00-$2195.00 F.O.B.-Eugene, Oregon

Description

Electro-hydraulic system designed for 750-pound capacity. With a platform size of one square yard and rotating platform, operation lift extends 38" from side of van. The lift platform, when folded, extends into the van 12" (6" are stepwell) One day installation requires no modification.

Safety Features

Structural support of platform provides built-in grab rail and ramp serves as safety stop during cycle.

Options

* Automatic or semi-automatic models. Semi-automatic can be converted to automatic. Other accessories for the handicapped driver are also manufactured.

Comments

Wheelchair lift designed for van use.

Equipment Category Wheelchair lift-Transit Vehicle

Manufacturer Transportation Design & Technology Phone 714-566-8940

9345 Cabot Drive Contact L. W. Smith

San Diego, Calf. 92126 Title President

Model # TDT steplift Cost average price $5,000.00

Description

Integral part of standard door opening, steel frame. Operation is electro-hydraulic with 1000 lb. capacity or a power-steering pump with 3,000 lb. capacity. Cycle time is 30-45 seconds. Platform dimensions are 35" x 36" with 16" 8-degree ramp. In the stowed mode, the lift shall assume the normal entrance step configuration.

Safety Features

Hand pump enables driver or attendant to operate lift mechanically. Lift platform has sensitivity edge, when it touches any obstruction (person, ground, etc); it automatically stops. Platform has safety roll, stop feature. Platform and lift are covered with non-skid material. Bus cannot operate until lift is in stowed position.

Options

Platform dimensions may be at customer's specification.

Comments

Lift has undergone testing by AM General at the request of the Southern California Rapid Transit District.

* Designed for small or large transit bus.

Equipment Category Wheelchair Lift-Transit Vehicle

Manufacturer Vapor Corporation
6420 West Howard Street
Chicago, ILL 60648

Phone 312-631-9200
Contact C. Krisco
Title Sales Engineer

Model # Travel Lift Cost $7,990

Description

Designed for application to front door of standard transit bus. Intergrated with steps. Lifting capacity is 600 lbs. Cycle time is 30.45 seconds. Platform dimensions are 48" length + 8" ramp (56" total length) and 34" width.

Safety Features

Sensitivity edge action of lift at ground or curb level.
Ramp becomes end gate during cycle of lift
Bus cannot operate until lift is in stowed position.

Options

Application other than described above is possible.

Comments

Vapor is under going extensive testing with CALTRANS. in Calif. Delivery 60-120 days.

V. VEHICLE SURVEY

In order to obtain operating data on vehicles actually in service for elderly and handicapped transportation, a survey of 120 agencies was conducted. The survey represented response from 34 transit agencies and 24 social service agencies. These agencies produced a total of 67 usable responses, as some agencies had more than one type of vehicle. A total of 1418 vehicles were represented in the survey.

Of the 120 agencies, 58 completed the survey, 15 did not have service, and 9 questionaires were returned as undeliverable. The survey responses were tabulated in 4 classifications as follows: 1) Vans with lifts; 2) Vans without lifts; 3) Small buses; and 4) Large transit coaches. The following summarizes the results of the survey.

Vans With Lifts

Fourteen transit agencies and 8 social service agencies operated a total of 74 vans with lifts. Table 1 is a summary of the equipment operated.

The results of the survey are summarized in Table 2. Perhaps the most striking result is the low level of dissatisfaction. The most noticeable problem is with steps. Air conditioning is another area that warrants special attention.

Vans Without Lift

Two transit agencies and 13 social service agencies operated a total of 67 vans without lifts. Table 3 is a summary of the equipment operated.

The results of the survey are summarized in Table 4. The results, as would be expected, are similar to vans with lifts. Steps are the most significant problem. Overall, the ratings would still have to be characterized as good.

TABLE 1: SUMMARY OF VANS WITH LIFTS

Manufacturer	Year	Cost Range*	# of Vehicles
Dodge	74-78	5-16,000	47
Chevrolet	72-78	5-16,000	12
Plymouth	77	7,200-9,250	3
Ford	73-78	5-9,000	9
GMC	77	15,000	2
Unknown	74	8-9,000	1
TOTAL			74

*Two organizations leased vehicles

TABLE 2: RESPONSES TO SURVEY OF VANS WITH LIFTS

Feature/Performance	Very Satisfactory	Satisfactory	Not Satisfactory	Not Applicable
Seating Comfort	42%	45%	13%	
Tiedown Method	23%	61%	6%	10%
Width of Aisles	20%	42%	6%	32%
Head Room	35%	52%	13%	
Storage Space	13%	42%	19%	26%
Air Conditioning	13%	52%	23%	12%
Heating	29%	65%	3%	3%
Ramp/Lift System	26%	58%	13%	3%
Doors	16%	65%	19%	
Steps	10%	42%	38%	10%
Smoothness of Ride	23%	55%	22%	
Doorway Assist Rails	10%	48%	13%	29%
Noise Levels	16%	74%	10%	

Driver/Service Oriented Features	Very Satisfactory	Satisfactory	Not Satisfactory	Not Applicable
Starting & Stopping	35%	58%	7%	
Maneuverability	35%	65%		
Driver Visibility	26%	68%	6%	
Serviceability	6%	75%	19%	

TABLE 3: SUMMARY OF VANS WITHOUT LIFTS

Manufacturer	Year	Cost Range	# of Vehicles
Dodge	74-77	5,400-8,800	29
Chevrolet	71-75	4,500-6,600	13
Ford	74	6,800	4
GMC	73-77	5,000-7,000	3
Plymouth	75-77	4,000-6,300	12
Unknown	69-73		6
TOTAL			67

TABLE 4: RESPONSES TO SURVEY OF VANS WITHOUT LIFTS

Feature/Performance	Very Satisfactory	Satisfactory	Not Satisfactory	Not Applicable
Seating Comfort	5%	95%		
Tiedown Method		24%	5%	71%
Width of Aisles	9%	62%	10%	19%
Head Room	14%	71%	10%	5%
Storage Space	5%	43%	4%	48%
Air Conditioning		67%	14%	19%
Heating	5%	90%	5%	
Ramp/Lift System		9%	5%	86%
Doors	5%	71%	24%	
Steps		43%	48%	9%
Smoothness of Ride	5%	76%	19%	
Doorway Assist Rails		38%	14%	48%
Noise Levels		76%	14%	10%

Driver/Service Oriented Features	Very Satisfactory	Satisfactory	Not Satisfactory	Not Applicable
Starting & Stopping	24%	76%		
Maneuverability	19%	76%		5%
Driver Visibility	14%	76%	5%	5%
Serviceability		95%	5%	

Small Buses

The third category of buses includes vehicles in the 20 to 30 foot size range. Seventeen transit agencies and 4 social service agencies operated a total of 258 small buses. Table 5 is a summary of the equipment operated.

TABLE 5: SUMMARY OF SMALL BUSES

Manufacturer	Year	Cost Range	# of Vehicles
FMC	74-76	48-62,000	15
Ford	75	18-19,000	26
Argosy	77	20-27,000	30
Mercedes Benz	75-77	25-30,000	9
Transcoach	75	20-30,000	79
Winnebago	76	24,000	3
Wayne	77	10-11,000	5
Grumman	74-77	18-27,000	31
Carpenter	77-78	22-30,000	50
Twin Coach	75	45,000	2
Unknown	74-75	28-40,000	4
Chrysler	75	35,000	4
TOTAL			258

The results of the survey are summarized in Table 6. The most significant finding is the high level of dissatisfaction (44%) with the serviceability of the vehicle. A related area, air conditioning, also appears to be a problem.

TABLE 6: RESPONSES TO SURVEY OF SMALL BUSES

Feature/Performance	Very Satisfactory	Satisfactory	Not Satisfactory	Not Applicable
Seating Comfort	28%	56%	16%	
Tiedown Method	20%	40%	12%	28%
Width of Aisles	48%	44%	4%	4%
Head Room	52%	44%	4%	
Storage Space	8%	44%	12%	36%
Air Conditioning	12%	36%	36%	16%
Heating	20%	52%	20%	8%
Ramp/Lift System	16%	40%	12%	32%
Doors	16%	68%	16%	
Steps	12%	68%	20%	
Smoothness of Ride	16%	60%	24%	
Doorway Assist Rails	12%	68%	16%	4%
Noise Levels	4%	68%	28%	

Driver/Service Oriented Features	Very Satisfactory	Satisfactory	Not Satisfactory	Not Applicable
Starting & Stopping	24%	56%	20%	
Maneuverability	44%	52%	4%	
Driver Visibility	32%	56%	12%	
Serviceability	4%	52%	44%	

Large Transit Coaches

Although not originally intended to be included in the survey, 7 agencies including one social service agency included responses on their large transit coaches. The data are included here primarily for comparison purposes. Table 7 is a summary of the 1056 vehicles represented in the survey.

TABLE 7: SUMMARY OF LARGE TRANSIT COACHES

Manufacturer	Year	Cost Range	# of Vehicles
Flexible	76-77	65-77,000	269
GMC	63-76	Unknown-65,000	743
AMC	74-77	31,000-66,500	50
Unknown	75-76	39,000	4
TOTAL			1066

Many of the vehicles were equipped with a kneeling feature or were retrofitted with lifts. Some agencies appeared to favor a retrofit approach as the most cost-effective method of developing necessary vehicles for the handicapped.

Table 8 summarizes the responses to the survey. The results indicate a generally high overall level of satisfaction. A high level of satisfaction could be expected from those choosing the retrofit approach.

TABLE 8: RESPONSES TO SURVEY OF LARGE TRANSIT COACHES

Feature/Performance	Very Satisfactory	Satisfactory	Not Satisfactory	Not Applicable
Seating Comfort	40%	60%		
Tiedown Method	10%	40%		50%
Width of Aisles	10%	80%	10%	
Head Room	20%	80%		
Storage Space	20%	30%		50%
Air Conditioning		80%	10%	10%
Heating	10%	80%		10%
Ramp/Lift System		40%	20%	40%
Doors		80%	10%	10%
Steps		70%	20%	10%
Smoothness of Ride		90%	10%	
Doorway Assist Rails		70%	10%	20%
Noise Levels		70%	30%	

Driver/Service Oriented Features	Very Satisfactory	Satisfactory	Not Satisfactory	Not Applicable
Starting & Stopping	10%	90%		
Maneuverability	20%	80%		
Driver Visibility	50%	40%	10%	
Serviceability	30%	50%	20%	

VI. CONCLUSIONS

There is significant evidence of existing problems with entrance/exit ways of van type vehicles. The most repeated dissatisfaction was with the steps. Overall, however, the vehicles were rated as satisfactory. It is noteworthy that 44% of users in the Small Bus classification expressed dissatisfaction with serviceability.

The third serious problem highlighted in the survey was in the area of climate control; most notably air conditioning systems were not adequate in midsize vehicles.

Survey design emphasized brevity and simplicity. Due to the constraints of this approach, several gaps in the information resulted. In addition some problems become apparent only after completion of the survey. The following are a summary of the shortcomings.

- No specific information was requested on manufacturers of lift systems, ramps or retractable step devices.
- There was such a wide disparity in estimates of operating cost as to make even "guesstimates" useless.
- No information was sought as to identify specific maintenance problems (e.g., radiators, brakes, transmissions, etc.).

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TEXAS A&M UNIVERSITY

TEXAS TRANSPORTATION INSTITUTE

COLLEGE STATION TEXAS 77843

TRANSPORT OPERATIONS PROGRAM

Dear Sir or Madam:

The Texas Transportation Institute is investigating transportation for the elderly and the handicapped.

Attached you will find a brief questionnaire regarding vehicle satisfaction levels. TTI would appreciate your response. Please make additional copies of the survey form if you have more than one type of vehicle for the elderly and the handicapped.

For your convenience we have enclosed a stamped, self-addressed envelope. If you so request, TTI will make available a copy of the survey results.

Thank you for taking the time to share this information.

Sincerely,

Thomas Urbanik

Thomas Urbanik, II
Assistant Research Engineer

TU:nc

Enclosure

VEHICLE SURVEY

Organization _____

Address _____

Contact Person _____ Telephone No. _____

Year/Model _____

Type/Size Engine _____

Special Equipment (check)

_____ Lift
_____ Securement Device
_____ Ramps
_____ Retractable Steps

# of Seats _____

# of Wheelchairs _____

Purchase Date _____

# of Vehicles _____

Cost _____

Miles per gallon _____

Average Mileage per Vehicle _____

Approximate Total Operating Cost per Mile (Gas, Oil, Maint.) _____

Please check appropriate box to indicate level of satisfaction.

Feature/Performance	Very Satisfactory	Satisfactory	Unsatisfactory	Not Applicable
Seating Comfort				
Tiedown Method				
Width of Aisles				
Head Room				
Storage Space				
Air Conditioning				
Heating				
Ramp/Lift System				
Doors				
Steps				
Smoothness of Ride				
Assist Rails in Doorway				
Noise Levels				

Driver/Service Oriented Features	Very Satisfactory	Satisfactory	Unsatisfactory	Not Applicable
Starting and Stopping				
Maneuverability				
Visibility (Windows/Mirrors)				
Serviceability				

Additional Comments: _____

_____

_____

Would you like a copy of survey? _____ Yes _____ No

TEXAS A&M UNIVERSITY
TEXAS TRANSPORTATION INSTITUTE
COLLEGE STATION TEXAS 77843

TRANSPORT OPERATIONS PROGRAM

Dear Sir:

Last month, Texas Transportation Institute initiated a survey requesting information regarding vehicles used in transporting the elderly and the handicapped. The survey was mailed to transportation agencies believed to be offering specialized elderly and handicapped service. Your organization should have received a copy, but in the event you did not, another is enclosed.

If your organization does not provide specialized service, just make a note to that effect and return the survey. If your organization is operating converted vans, please specify company doing the conversion.

Thus far, the response level to the survey is 50 percent. Our goal, of course, is 100 percent. Your effort in helping us achieve that goal will be greatly appreciated.

Sincerely,

Thomas Urbanik, II
Assistant Research Engineer

TU:nc