

Evaluation of Minivan Ramp Vehicles Versus Full-Size Lift Vans

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There are several new minivan conversions on the market, which could potentially reduce operating costs and still meet most of the demand for specialized transportation. Transportation Management Services, Inc. has considered the use of these vehicles for its turn-key operations and has recently purchased a used minivan for test purposes. The use of these vehicles in both rural and urban environments is evaluated in this paper. Primary focus is on operational issues such as ability to meet demand, passenger and driver acceptance, operating characteristics (fuel consumption, brake life, etc.), and productivity. The evaluation is conducted from a private operator's perspective and, therefore, is biased toward the financial considerations of low cost, low maintenance, high productivity, and good return for dollars invested. A subjective view is provided by the managers who used the vehicle.

The use of minivans with low-floor ramps is a relatively new technology that the author believes will help improve the efficiency of specialized paratransit services. Operating experience has shown that the number of times there are more than two wheelchairs in a vehicle is minimal. In addition, demand-responsive services most often have only one passenger per trip. For a private for-profit transportation provider, it is important that services be cost-effective to make a profit and still provide the service at competitive rates. With this in mind, Transportation Management Services, Inc., (TMSI) purchased a used minivan with a ramp in February 1990 to test the vehicle and evaluate it for applications companywide. TMSI not only wanted to study its cost-effectiveness, but also wanted to evaluate driver, management, and user reaction. The purpose of this paper is to present preliminary findings, suggest some places where the vehicle might work, and propose some changes in the specifications derived from TMSI's limited experience. The vehicle purchased was used and of older technology. Many of the managers' suggestions already have been incorporated into the design of newer vehicles.

BACKGROUND OF RAMP VERSUS LIFT DEVICES

Historically the transportation of individuals confined to a wheelchair has been accomplished by transferring the person from the ground to a vehicle by the use of a mechanical, electrical, or hydraulic lift. Many companies entered the market to sell these lift devices. Most transit agencies have argued that the lift technology was inadequate and, capital costs aside,

maintaining the lifts for everyday use was difficult. The technology has improved and most paratransit operators are able to maintain lifts in service most of the time.

The actual van designs have included side lifts, rear lifts, raised roofs, double wheelchair to multiple wheelchair tie-downs, and various securement devices, some good and some bad. Van technology has emerged to the point where vehicle design is no longer a major issue. Vans with a capacity of 15 passengers, converted for wheelchair transportation, are here to stay and have many applications in the business. The large vans are good for group trips with standing-order schedules but are less applicable to demand-responsive single trips.

NATIONAL EXPERIENCE

The use of ramp-equipped minivans in the United States has been limited. The most extensive use of these vehicles has been by Cook-DuPage Transportation in Chicago, Illinois. This agency boasts of 7 million miles of operation without any boarding or unloading accidents. In addition, the company was so enamored with the concept that they are now building and selling their own vehicle.

Ohio recently purchased three vans for test purposes. The test results, although not conclusive at this point, do offer some general observations:

1. The less "gingerbread" (frills and extras) on the van the better the performance;
2. Low floors are good;
3. Managers like the vehicles;
4. There is a concern that the vehicles may not be heavy duty and may have a short life expectancy; and
5. There is concern by the Ohio Department of Transportation (ODOT) about the cost per seated passenger.

TMSI purchased a used ramp van with the intent of evaluating its operational characteristics. The vehicle has been in service for 8 months and has been operated in a rural environment in South Carolina and also in an urban environment in Richmond, Virginia. From these operations, TMSI managers have developed a list of pros and cons regarding the vehicles. These will be discussed in the next section.

MANAGERS' PERSPECTIVE ON MINIVAN PROS AND CONS

The true test of these vehicles is how they are used in day-to-day operations. As a private for-profit company, TMSI is

interested not only in operational costs, but also in management, driver, and rider acceptance.

When the vehicle was delivered to South Carolina, there were a number of minor problems that immediately gained the disfavor of management and drivers. The first time the vehicle was used, the driver was unable to put the wheelchair on the ramp because the chair was too wide. This set the tone for drivers and management. The following comments were received during the 3 months the vehicle was in South Carolina:

1. Vehicle got good fuel mileage;
2. Passengers liked the level at which they were riding;
3. Drivers did not like the "lip" between the ramp and the floor (this has been corrected on new designs);
4. Management was reluctant to schedule the vehicle without specific knowledge of the user's wheelchair because of the initial experience; and
5. Drivers preferred lifts more than ramps because of the requirement to push wheelchairs up the ramp.

TMSI experience in Richmond was better because some of the initial problems had been corrected. In addition, the Richmond manager assigned the vehicle to a supervisor who was given direct responsibility for the van. This supervisor took an interest in the vehicle and provided observations as follows. On the positive side

1. The vehicle provides better maneuverability in tight urban areas and better accessibility when compared with lift vans;
2. The vehicle is more cost-effective than large-lift 15-passenger vans (fuel economy is almost 2½ times better);
3. The two wheelchair positions more closely match demand;
4. The users find it comfortable;
5. The vehicle appears to be safe;
6. The rear bench seat makes the vehicle versatile; and
7. The small size allows control of difficult clients.

On the other hand

1. The vehicle is a little underpowered;
2. The front end is light, which might be a problem in snow and ice;
3. The interior space is too tight;
4. Different size wheelchairs cause problems;
5. A swing door would be better than the slide door;
6. The ramp should be wider; and
7. The roof top should be higher.

Overall, TMSI managers thought that the operational effectiveness coupled with some design modification would make the vehicle very attractive.

THE FUTURE

In the author's opinion the ramp-equipped minivan has a definite place in the future of specialized paratransit. Con-

siderations include maneuverability, operating costs, safety, and demand. Some of the specific situations where it should be considered include

1. In urban areas where maneuverability is an issue,
2. For special-purpose long distance trips such as medical treatments in hospitals or clinics,
3. For demand-responsive services with low demand and productivity, and
4. For use by supervisors for sweeps.

There are some suggestions that would help the minivan industry improve the vehicle and therefore increase acceptability by paratransit operators. These include

1. Making the roof raised and reinforced,
2. Making the floor flush with the ramp,
3. Providing quick-release seats in the center,
4. Offering a swing door rather than a sliding door,
5. Powering vehicles by a six-cylinder engine,
6. The stretch van should be strictly considered, and
7. Improving coordination with wheelchair manufacturers.

ODOT is in the process of preparing specifications that will allow recipients of funds provided under Section 16(b)2 of UMTA to purchase low-floor minivans. These specifications should set the tone for future vehicle purchases.

SUMMARY

It is incumbent on the transportation community to find new ways to improve productivity and stabilize cost. The Americans with Disabilities Act places new demands on funding agencies and the industry must be ready to respond. Vehicle manufacturers have developed a new technology and operators must experiment and comment on how to improve it. The experiments in Ohio will go a long way toward this end. Operators such as TMSI will also work with manufacturers to improve the product. The final area of coordination that must be undertaken is among transportation operators, vehicle manufacturers, and wheelchair manufacturers. The final answer is not minivans with ramps alone, but the use of these vehicles where appropriate, as a part of the paratransit solution.

EPILOGUE

During the presentation of this paper at the conference in Sarasota, Florida, a number of people expressed their support of the minivan concept. Some operators have converted their own vans and have had great success. This was particularly true in one operation in Minnesota. In addition, Metro Dade County in Miami, Florida, is running a demonstration with 15 of these vehicles. The results of the demonstration should be available in 1991. There were many people at the conference and most believed that the low-floor minivan has a place in the provision of specialized services.