Advanced Low-Floor Vehicle Specification Research

Suresh Iyer, Ph.D., Partha Mishra, David Klinikowski, Boyd Thompson, Myra Strange, Wanda Boggs, and Carl Thornsbad, Ph.D.

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SJSU Research Center
210 N. Fourth St., 4th Fl.
San José, CA 95112

Tel // 408.924.7560
Fax // 408.924.7565

transweb.sjsu.edu

The ALFV - a novel design for a long life, cost effective, flex-route transit bus.

A flex-route transit bus is necessary, based on the potential for diminishing transit funding, as well as on demographic, socio-economic, and transportation factors. This report presents the results of research on market comparison, operational cost efficiencies, and prototype tests conducted on a novel design for an Advanced Low Floor Vehicle (ALFV) capable of flex-route transit operation. This bus design has unique features that render it suitable for rural and urban operation. They include a low floor with no steps and the ability to carry 25 passengers, or 5 wheelchairs, or 6 gurneys, or a combination of the above. The shortest rear overhang in its category renders it capable of operation on rural, unpaved roads. A welded steel structure is projected by the manufacturer to improve the shell life to 20 years or more.

Study Methods

The prototype bus was developed by Ride Solution, Inc., of Putnam County, Florida, for the United States Department of Transportation (USDOT) Federal Transit Administration (FTA) Advanced Low Floor Vehicle Specifications Research project. Tests conducted at the Altoona Bus Research and Testing Center included a 10-year, 350,000-mile STURAA (Altoona) test. Supplemental tests also were conducted at the Center to determine the turning radius of the vehicle, suspension travel, ramp travel index, and ADA conformance. Ride Solution, Inc., conducted research to provide a specifications comparison of currently available mid-sized vehicles with this prototype bus, and operational cost efficiencies for this new design.

Findings

The ALFV completed all sections of the Altoona test. Findings indicated that the ALFV required a high number of scheduled and unscheduled repairs and work hours. The manufacturer attributes this to the bus development as a research project built by non-profit transit agency personnel rather than by commercial manufacturing professionals. This also accounted for its large number of subsystem failures during the Structural Integrity Tests. It performed well after being repaired.

The ALFV's operating costs were similar to the other low floor buses included in the study, when compared using a dollar-per-passenger-seat-per-mile basis. AT GVW, both front and rear axles were well within their rated loads.

Policy Recommendations

Results from prototype tests indicate that the following aspects of the production model should be improved:

- The quality of workmanship and assembly should be improved to deliver a better fit and finish of the bus.
- Better quality control of welding should help to prevent welding cracks during service.
- Additional testing and quality assurance should enhance sub-systems' reliability.
- Additional consideration should be given to ergonomic design and layout for better access to components, which should reduce time when replacing service parts/assemblies.
- Brake system performance should be improved to reduce stopping distance under wet conditions.
- The vehicle should be redesigned to meet all ADA requirements.
- Design modifications should be made to reduce interior and exterior noise.
- The exhaust after-treatment should be modified to comply with current emission regulations.

The prototype Advanced Low-Floor Vehicle

About the Authors

Suresh Iyer, Ph.D. is a Senior Research Associate; Partha Mishra is a Graduate Student; and David Klinikowski is the Director of the Bus Testing Program at the Larson Transportation Institute of the Mechanical and Nuclear Engineering Department at the Pennsylvania State University. Boyd Thomson is the Director of Operations; Myra Strange is the Operations Manager; and Wanda Boggs is Office Manager for Ride Solution, Inc., Florida. Carl Thornblad, Ph.D. is a consultant to Ride Solution Inc.

To Learn More

For more details about the study, download the full report at ***transweb.sjsu.edu/project/1151.html***

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