FTA RESEARCH
FEDERAL TRANSIT ADMINISTRATION

REPORT SUMMARY

U.S. Department of Transportation
Federal Transit Administration

Cedar Avenue Driver Assist System Evaluation Report

Background

The Minnesota Valley Transit Authority (MVTA) received $4.2 million from the Federal Transit Administration (FTA) to develop a lane guidance system for bus-only shoulder operations along Cedar Avenue (Trunk Highway 77). Referred to as the Driver Assist System (DAS), it is a GPS-based technology suite that provides lane position feedback to the driver via a head-up display, virtual mirror, vibrating seat, and actuated steering. MVTA's primary goal in developing the DAS was to enhance driver confidence in operating buses in shoulders, particularly during bad weather. Secondary goals included reduced travel times, increased reliability, safety, and customer satisfaction.

Objectives

The objective of the evaluation was to measure six broad areas of performance: bus driver satisfaction, customer satisfaction, efficiency/productivity, technical performance, maintenance, and safety. Bus driver and customer satisfaction data were gathered through surveys and focus groups. Quantitative data on bus performance were gathered from the DAS on-board computer system, maintenance records, and accident reports. The evaluation used a "with and without" approach in that performance data were collected from the same drivers with the DAS activated and de-activated.

Findings and Conclusions

When the DAS was activated, bus drivers stayed in the shoulders 10 percent longer and drove 3 miles per hour faster, on average. Lateral (side-to-side) movement was reduced by 5.5 inches. A total of 32 percent of bus drivers said their level of confidence in driving in the shoulder was greater when using the DAS, while 60 percent said it was the same. The majority believed the DAS made driving in the shoulder safer and less stressful. In terms of actual safety, there were zero accidents in the shoulder. Nevertheless, many drivers raised concerns about one of the components—the head-up display—being a distraction. For customer satisfaction, more than 80 percent of surveyed passengers rated the ride quality in the shoulder as very good or good. For maintenance, a review of the maintenance logs showed that the buses were operative 91.9 percent of the time.

Benefits

The Cedar Avenue DAS is the first lane-keeping application of vehicle assist and automation technology (VAA) in bus revenue service by a U.S. transit system. This report is the first comprehensive evaluation of VAA technology being used in U.S. bus revenue service. It confirms that VAA technologies such as the DAS can improve bus operations and reduce driver stress. This evaluation also provides a means of supporting future federal policy development in the areas of innovative technology and improved mobility.

Project Information

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