

## **Research Notes**

Program Steering Committee (PSC): Modal

October 2014

Title: Field Operational Tests of Vehicle-Assist and Automation (VAA) system using full-size Public Transit Buses

Task Number: 2508

Start Date: June 1, 2012

Completion Date: May 31, 2014

Product Category: Other - The product of the project includes 1. A proven VAA system (after a successful six-month revenue service test) leading to a commercially viable (industrial) product; 2. VAA system requirement and interface design documents; 3. A final report documenting the technical feasibility, application benefits and lessons learned in implementing the projects.

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### **TITLE:**

Vehicle-Assist and Automation Pilot Field Tests Using Public Transit Buses

### **SUBHEAD:**

Vehicle Assist and Automation (VAA) is the implementation of innovative strategies incorporating Intelligent Transportation Systems in bus guidance. Vehicle assist technologies are defined as technologies that help the driver maintain lateral and longitudinal control of the bus while driving. This pilot program will demonstrate and field test the VAA applications using the vehicle assist technologies for bus steering guidance and precision docking.

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### **WHAT IS THE NEED?**

The magnetic guidance technology developed in the past years has been successful and has displayed its maturity through various demonstrations throughout the world. VAA technologies have shown significant promise to provide benefits to transit agencies in terms of more efficient operations, cost savings (such as reduced right-of-way cost and travel times, smoother rider, reduce bus maintenance and repairs, and rail-like services) and safety. However, the United States Department of Transportation (US DOT) Federal Transit Administration (FTA) felt that in most cases, full technical feasibility and the benefits have not been quantified. Therefore, they decided that it is necessary to initiate a pilot program to demonstrate the benefits of VAA applications for full-size public transit buses in revenue service.

## **WHAT ARE WE DOING?**

Caltrans is partnering with Lane Transit District (LTD) in Eugene, Oregon, University of California Partners for Advanced Technology (PATH) Program, and several private sector companies to accomplish this pilot project. Tests will be conducted on the LTD Franklin EmX Bus Rapid Transit (BRT) route in Eugene, Oregon. The four mile BRT route is largely a dedicated right-of-way with eight intermediate stations and two terminal stations. One LTD articulated New Flyer bus will be equipped with the VAA system for testing bus lane guidance and precision docking at BRT stations. The revenue service tests (carrying passengers) in Eugene, Oregon using the LTD test bus, started in June 2013 and continued for four months. Bus drivers from LTD regular bid will be trained to drive the VAA test bus for daily operation. Two more months of revenue testing remains to be done. A two month no-passenger test in the California Bay Area using AC Transit bus was scheduled to start on October 2013.

## **WHAT IS OUR GOAL?**

The main objectives are to demonstrate the technical merits and feasibility, and to assess benefits and costs. Positive results from this pilot program may lead to a more widespread deployment of transit VAA systems throughout the United States.

## **WHAT IS THE BENEFIT?**

Many transit agencies would like to implement VAA technologies on their buses according to US DOT. Completion of this project would expedite the deployment of this technology within the US, so that agencies would not have to look overseas to purchase the system. Lane-assist bus guidance allows for operation on narrow lanes, resulting in reduced right-of-way costs and increased travel safety. VAA technologies can also demonstrate measurable travel-time savings (reduced vehicle run times) which may result in increased ridership.

Lane-assist bus guidance allows for operation on narrow lanes, resulting in reduced right-of-way costs and increased travel safety. Precision docking technology can facilitate movements within bus maintenance facilities, reducing vehicle damage and assisting with faster fuel fill-ups and vehicle washing pass-through. Savings in costs associated with tire scuffing and wear, platform damage and possible customer injuries make precision docking attractive for safety and economic reasons.

## WHAT IS THE PROGRESS TO DATE? (2-3 paragraphs)

This task was amended to end on January 31, 2015. This is to accomplish the remaining testing for the LTD revenue service data collection and AC Transit portion of the research. PATH Researchers went up to Eugene, OR to evaluate the VAA system and determined that it was still operational and is ready for the remaining data collection. LTD said that they are eager to return to using the VAA system in their revenue service and can have new drivers trained soon.

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## IMAGES



AC Transit bus going through the San Mateo Bridge toll plaza on Highway 92.



LTD dedicated busway in Eugene, Oregon.

VAA system on LTD bus.

VAA system on AC Transit bus.