MarTREC UTC Project Information Form
USDOT Tier 1 University Transportation Center
Agency ID or Contract Number DTRT13-G-UTC50

Project Title: Evaluating the Performance of Intermodal Connectors

Project Abstract (Brief Description): This project will focus on evaluating the performance of Intermodal Connectors (IC)- critical "last mile" roadways connecting intermodal freight facilities such as maritime ports to the National Highway System (NHS). Often, less than 2 miles in length ICs account for less than 1% of NHS mileage, but are critical for timely and efficient multimodal freight movements. ICs are currently not well monitored or understood and are frequently missing from statewide planning, programming, and forecasting models. ICs are in relatively poor condition compared to the NHS as a whole. This has cascading effects on the reliability of multimodal freight operations- a 1- or 2-hour delay in a drayage movement can result in a 24-hour holdup in a domestic multimodal shipment. Continued economic growth and reliance on intermodal supply chains will further strain intermodal connectors if freight planning efforts do not effectively consider the use and performance of these critical network links. As a remedy, this project will instrument a selection of corridors and alternative routes serving the ports Van Buren, Little Rock, and Pine Bluff in Arkansas to gather comprehensive usage and performance characteristics. This project is timely given a recent assessment by the FHWA and MARAD which identified a number of shortcomings in current data collection methods, data availability and a lack of understanding in how IC performance affects local, regional and national freight movements.

Describe Implementation of Research Outcomes: This report presents a strong starting point to further develop low-cost, single-beam Lidar sensor capabilities to understand commodity flow through ICs and evaluate ICs performance. To the best knowledge of the authors, the proposed sensor is the first non-intrusive prototype providing data to classify trucks by body-type- a much needed data element for freight planning applications, in particular performance evaluation. This classification is key to understand commodity flow through a region, and support estimations of demand for transportation facilities, services, energy consumption, and safety risk and environmental concerns.

Impacts/Benefits of Implementation: Using truck GPS data, this research also examined the possibility of identifying alternate routes using GPS or other data sources. An identification of potential alternative routes, currently not designated as ICs, but followed by trucks serving the ports can help decisions makers properly classify port access routes and help prioritize investments for these routes. The analysis showed that GPS data is viable for identifying alternate routes, given proper network representation of the local roads in the vicinity of the port areas. For example, in the Van Buren Port area, local roads were not included in the network file and thus could not be evaluated as potential alternate routes. The analysis for Pine Bluff and Little Rock port areas showed that while some trucks use alternate routes, the average daily and annual volumes along these routes do not meet the thresholds for designating an IC.

Web Links: martrec.uark.edu
Budget (Funding) Amounts & Source(s) (US DOT +Match(s) =Total Costs): $78,365+$39,589=$117,954
Project Start and End Dates: 08/22/16-09/13/18. Project complete
Principal Investigator(s) and Contact Information: Sarah Hernandez
Principal Investigator Institution (University): University of Arkansas