We examined the potential to improve the movement of freight using Truck Platooning Lane strategies on limited access highways in the State of Florida. In the First part of this research, we investigated the potential benefits from dedicating one lane from existing lanes for autonomous trucks only. In this regard, a general framework tool was developed to evaluate and compare different measurements (e.g., travel time, level of service and emissions) to better assist decision makers to determine the most effective freight transportation strategy. Additionally, the travel time, level of service and emissions on Florida Strategic Intermodal System (SIS) were systematically analyzed using a VISSIM and MOVES simulation to determine if it can be improved. For the scenarios simulated in this investigation, the input included different patterns with a variety of peak hour volumes, truck percentages, speeds, and number of lanes. Additionally, the various total values of the resultant travel time, emissions and level of service for each SIS corridor were determined and calculated using a General Linear Model and then tabulated to reveal input patterns. The results showed that a truck platooning lane can significantly reduce the travel time and emissions of trucks.

In the second part, we proposed using a The Analytic Hierarchy Process (AHP) method to evaluate the potential benefits of building a new lane for autonomous trucks. The AHP method was developed to include all possible measurements that can assist decision makers to select the best autonomous truck policy. The results of the AHP model showed that the safety criterion was significantly the most influential perspective per experts’ opinions. The results showed that experts were more concerned about safety and environmental considerations than the initial cost associated with building a new lane.

Major: Civil Engineering

Educational Career:
Bachelor's of Civil Engineering , BS, 2003, University of Benghazi
Master's of Civil Engineering , MS, 2013, University of Central Florida

Committee in Charge:
Amr A. Oloufa, Chair, Civil and Environmental Engineering
Omer Tatari, Civil and Environmental Engineering Department
Nizam Uddin, Department of Statistics
Essam Radwan, Civil and Environmental Engineering Department

Approved for distribution by Amr A. Oloufa, Committee Chair, on March 28, 2018.

The public is welcome to attend.