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Southeastern Transportation Research,
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2018 Research Project Abstract

Project Title: Macroscopic Fundamental Diagram Approach to Traffic Flow with Autonomous/Connected Vehicles (Project O2)

Principal Investigator: Robert Whalin, Ph.D., PE, Civil & Environmental Engineering, Jackson State University
Email: Robert.w.whalin@jsums.edu

Research Team: Feng Wang, Ph.D., PE, Civil & Environmental Engineering, JSU; Guojing Hu, Mathematics, JSU

ABSTRACT: The introduction of connected and autonomous vehicles (CV/AV) will bring changes to the highway driving environment. Connected and autonomous vehicle technology provides real-time information about the surrounding traffic condition and the traffic management center's decisions. Setting the parameters of VISSIM driver behavior model by calling the VISSIM Component Object Model (COM) in Python/Matlab, the project will build an AV/CV simulation framework to conduct a pilot study of the features, and management and control strategies for traffic flows with AV/CV vehicles. Based on this simulation framework, the macroscopic fundamental diagrams (MFDs) of an AV/CV traffic network will be developed and analyzed, and compared with the MFDs in a traditional traffic circumstance. Using MFD as an evaluation index, mathematical models will be built to optimize network design, measure the network vulnerability, and evaluate the effectiveness of traffic management and control strategies for AV/CV and traditional traffic flows. Also, the perimeter control in an AV/CV network will be investigated.