

Updated Vehicle Operating Cost Models Function of Roadway Characteristics for an Array of Vehicle Classes and Technologies

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About the Speaker

Considerable changes in vehicle technology over the past several decades resulted in an emerging need for improved fuel and non-fuel vehicle operating costs (VOCs) estimations for use in benefit-cost analyses. In a recently completed FHWA study, thirty representative vehicle dynamics computer simulation models from subcompact cars to fully loaded class 8 tractor-trailer trucks were built and verified. The fleet included gasoline, diesel, E85, and LNG fueled vehicles as well as HE vehicles. Each vehicle model was simulated over developed driving cycles and respective highway grades (upslope and downslope) and curvatures to predict fuel economy for different scenarios of full access control (FAC) and partial or no access control (PNAC) facilities. A total of 652 unique driving cycles (i.e., speed-time profiles) that represent real-world conditions were generated in this study for different scenarios of FAC and PNAC facilities.

Four non-fuel VOCs (tire wear, oil consumption, mileage-related vehicle depreciation, and repair and maintenance) models were also developed for different vehicle types, traffic conditions, and highway design. The effects of pavement roughness on vehicle fuel and non-fuel VOCs were also studied and established. A web application was developed to facilitate the use of the newly developed fuel and non-fuel VOCs models.

About the Talk

Dr. Elie Hajj is a Professor in the Civil and Environmental Engineering Department and an Associate Director of the Western Regional Superpave Center at University of Nevada, Reno. He has over 16 years of experience in academia and industry with an emphasis on sustainability of pavement systems and dynamic response of pavement structures. Dr. Hajj authored over 100 publications in journals, national and international conferences, and technical reports. He made more than 100 presentations in professional meetings, conferences, and workshops. He served as a principal investigator on multiple projects for FHWA, FAA, State DOTs, local governments, etc.

Dr. Hajj is a member of the ASCE, Association of Asphalt Paving Technologists, and the International Society for Asphalt Pavements. He is a founding member and an elected officer for the international Academy of Pavement Science & Engineering (APSE). Dr. Hajj is also an associate editor for the International Journal of Pavement Engineering-IJPE.

This seminar has been converted to a webinar and is now webcast live to a worldwide audience using Zoom.

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