Announcing the Final Examination of Ahmed Tarek Ahmed Farid for the degree of Master of Science

Time & Location: October 19, 2015 at 11:30 AM in Engineering 2 211p
Title: EXAMINING MULTIPLE APPROACHES FOR THE TRANSFERABILITY OF SAFETY PERFORMANCE FUNCTIONS

Safety performance functions (SPFs) are essential in road safety since they are used to predict crash frequencies. They are commonly applied for detecting hot spots in network screening and assessing whether road safety countermeasures are effective. In the Highway Safety Manual (HSM), SPFs are provided for several crash classifications for several types of roadway facilities. The SPFs of the HSM were developed using data from multiple states. In regions where jurisdiction specific SPFs are not available, it is custom to adopt nationwide SPFs for crash prediction then apply a calibration factor. Yet, the research is limited regarding the application of national SPFs for local jurisdictions. In this study, the topic of transferability is explored by the examination of rural multilane highway SPFs from Florida, Ohio, and California. That is for both divided segments and intersections. Traffic and crash data from the three states are collected to develop one-state, two-state and three-state SPFs. The SPFs are negative binomial models taking the form of those of the HSM. Evaluation of the transferability of models is undertaken by calculating a measure known as the transfer index. It is used to explain which SPFs transfer tolerably to other jurisdictions. According to the results, the Florida and California SPFs are more transferable relative to the Ohio SPFs for divided segments. For four-leg signalized intersections neither state’s models are transferable. Also, the transfer index indicates improved transferability when using pooled data from multiple states. A modified version of the Empirical Bayes method that is responsible for segment specific adjustment factors is proposed as an alternative to the HSM calibration method. It is used to adjust crash frequencies predicted by the transferred SPF. The modified method proposed outperforms the HSM calibration method as per the analysis results.

Major: Civil Engineering

Educational Career:
Bachelor's of Civil and Environmental Engineering, BS, 2012, American University in Dubai

Committee in Charge:
Mohamed Abdel-Aty, Chair, Civil and Environmental Engineering
Naveen Eluru, Civil and Environmental Engineering
Jaeyoung Lee, Civil and Environmental Engineering

Approved for distribution by Mohamed Abdel-Aty, Committee Chair, on October 1, 2015.

The public is welcome to attend.