IRA A. FULTON SCHOOLS OF engineering
ARIZONA STATE UNIVERSITY

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College Avenue Commons (CAVC) 459

An Integrated Urban Model of Transportation, Land-Use, Energy, and Environment

Abstract: A sustainable transportation system is multifaceted and is influenced by various other urban systems. Undeniably, transportation, urban form, urban logistics, public health, environment, and energy resources are fundamentally linked. Therefore, they must be explicitly captured if the full impacts of the sustainable policies are to be assessed. In this seminar, we will review a comprehensive urban system framework that allows exploring the interactions and interrelationships between connected urban systems. At the core of the integrated urban framework, are two large-scale microsimulation models of ADAPTS and FAME. The ADAPTS model presents the next generation activity-based travel demand modeling paradigm that is developed specifically to address many limitations of practical activity-based models by retaining the link at the individual level between activities and travel. It models the processes by which activity-travel patterns are developed. In that sense, ADAPTS takes the activity-based paradigm one step further by explicitly and dynamically representing the process of activity planning rather than relying on a sequential series of models. This allows the direct impacts of policies in the decisions made during activity planning. The FAME model represents a pioneering effort in freight demand modeling that has a separate component for supply chain configuration and has a wide geographical and industrial coverage. The model incorporates firms' essential characteristics in replicating shipping behaviors, and aims at paving the way for more advanced behavioral freight microsimulation models. The models are currently further extended to include emission and dispersion models, as well as a public health impact model. In addition, the ADAPTS model is being expanded to include in-home activities that can help developing policy-sensitive and individual-level energy consumption and conservation models.

Bio: Dr. Kouros Mohammadian is a Professor of Transportation Systems at the University of Illinois at Chicago. He has received his PhD from the University of Toronto and has over 20 years of experience in transportation systems engineering. He has authored/co-authored over 240 scholarly publications in scientific journals, conference proceedings, book chapters, and reports. Dr. Mohammadian is the editor of the Journal of Transportation Letters. His research has covered various areas of transportation planning including travel behavior analysis, modeling of activity and travel patterns, freight and logistics modeling, travel surveys, computational analysis of transportation systems, and advanced microsimulation models. Dr. Mohammadian is the chairman of the "Traveler Behavior and Values" committee (ADB10) of the Transportation Research Board (TRB). He has also chaired two subcommittees of the Behavioral Processes (ADB10-4), and New Technologies (ABJ40-4) of TRB. He has served on several other TRB committees including Transportation Demand Forecasting, Telecommunications and Travel Behavior, Travel Survey Methods, Statistical Methodology in Transportation Research, and the Taskforce on Moving activity-based approach to practice. He has received the Ryuichi Kitamura award in 2011, Fred Burggraf award in 2008, and Charley Wootan award in 2007, recognizing his contributions to transportation research.