ABSTRACT: Beginning in the 1960s, U.S. federal law required ongoing and systematic planning as a condition of federal transportation funding. An ad-hoc system for forecasting future travel, which has come to be referred to as the “four-step model,” quickly became established as the ubiquitous analytic tool for transportation planning. The four-step model has long been criticized for a variety of shortcomings and inconsistencies. In the past ten years, an alternative activities-based approach has been adopted by a handful of planning agencies across the country. However, the cost and complexity of the activities-based approach has thus far prevented its widespread adoption.

Vince Bernardin, Jr., working with Professors Frank Koppelman and David Boyce, has developed a new system of forecasting future travel which addresses many of the critiques of the traditional four-step model with significantly less complexity and costs than the activity-based framework. The core of the new method is a two-stage model of the choice of stop locations and stop sequences. These models address the most glaring inconsistency of the traditional model by ensuring that all travel is consistent with closed tours, or continuous space-time trajectories which return to the residence location where they began. The ability of this model to ensure consistency with tours without enumerating the tours themselves is the key source of its simplicity and cost savings compared to activity-based techniques.

The Knoxville Regional Planning Organization has already contracted with Bernardin, Lochmueller & Associates to develop the first forecasting model based on this research. The seminar will present an overview of the entire travel forecasting system being developed for the Knoxville region as well as a more detailed presentation of the core stop location and sequence choice models and their ability to reflect realistic trip-chaining effects in tours.

Bio: Vince Bernardin, Jr., Ph.D. is a recent graduate of Northwestern University’s transportation engineering group, a recipient of an Eisenhower Fellowship from the National Highway Institute, and a young member of the Transportation Planning Applications Committee of the Transportation Research Board of the National Academies as well as a Dissertation Year Fellow of Northwestern University’s Transportation Center. He is has just returned to full time employment as a senior transportation modeler with Bernardin, Lochmueller & Associates, Inc.

He is presenting his doctoral research on advanced trip-based travel forecasting models incorporating realistic touring behavior. In addition to this work, his previous research has included integrated travel demand and air quality modeling, the estimation of vehicle operating costs associated with speed variability for benefit-cost analysis and the development of asset management strategies for local government agencies. Prior to returning to graduate studies, he worked for three years as a transportation systems analyst with Bernardin, Lochmueller & Associates in the areas of statewide and urban travel demand modeling, air quality and economic impact analyses.