

ITS SEMINAR

CONVERGENCE OF TRAFFIC ASSIGNMENT AND INTEGRATED TRAVEL FORECASTING MODELS

Co-sponsored by the
Department of Planning, Policy and Design and the
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12:30 p.m. - 2:00 p.m.

Room 408, Multipurpose Academic & Administration Building

Daily traffic assignments on a large-scale road network are described for 'build' and 'no-build' scenarios to evaluate the addition of two proposed ramps between I-295 and SR-42 in the New Jersey part of the Delaware Valley Region. The road network consists of 39,800 links connecting 1,510 zones. The user-equilibrium traffic assignment problem was solved with a new algorithm called *origin-based assignment* (OBA) that can achieve highly converged solutions with reasonable computing effort. The stability of link flow differences between the two scenarios in the vicinity of the proposed ramps are examined over a broad range of assignment convergence levels. Then, link flow differences over this range of convergence levels are compared to link flow differences between two very highly converged solutions. The findings reveal that a relative gap of 0.01% (0.0001) is required to ensure that the traffic assignments are sufficiently converged to achieve link flow stability. These convergence levels are then interpreted in terms of the number of Frank-Wolfe iterations and computational effort required to achieve comparable relative gaps.

David Boyce is professor emeritus of civil and environmental engineering at Northwestern University. He has also served on the faculties of the University of Pennsylvania, the University of Illinois at Urbana-Champaign and the University of Illinois at Chicago. His research focuses on key methodological issues related to metropolitan transportation and land use planning. His early monograph, Metropolitan Plan Making, was a critical examination of the land use and travel forecasting models of the 1960s. Since then, he has worked on the formulation and solution of more advanced modeling techniques including in-vehicle dynamic route guidance systems, dynamic travel choice modes and the performance of route-guidance on urban road networks. Dr. Boyce holds a B.S. in civil engineering from Northwestern University; and a M.C.P. and Ph.D. in regional science from the University of Pennsylvania.