Abstract. In this presentation I describe the recently developed large-scale spatio-temporal simulator of activities and travel for Southern California. The simulator includes population synthesis that recreates the entire resident population of this region, provides locations for residences, workplaces, and schools for each person, estimates car ownership and type as well as main driver for each vehicle, and provides other key personal and household characteristics. Then, a synthetic schedule generator recreates for each resident person in the simulated region a schedule of activities and travel that reflects intra-household activity coordination for a day. These synthetic activity and travel daily schedules are then converted to multiple Origin Destination (OD) matrices at different times in a day. These are in turn combined with other Origin-Destination matrices (representing truck travel, travel from and to ports and airports, and travel generated outside the region) and assigned to the network in multiple periods in a day. The assignment output is then used in the software EMFAC to produce estimates of fuel consumed and pollutants emitted (including CO2) by different classes of vehicles. The overall model system also includes provision for finer spatial and temporal resolutions that are pilot tested using TRANSIMS (a fine time-space resolution routing algorithm). Numerical examples from each major modeling group are also provided together with an outline of next steps in research and practice.

Kostas Goulias is Professor of Geography at the University of California, Santa Barbara, Co-Director of UCSB’s GeoTrans Laboratory, and Associate Director of the UC Transportation Center. His Ph.D. is in Civil Engineering from the University of California, Davis. Research interests include microsimulation in activity-based analysis and forecasting, travel behavior, survey design, applied statistics and econometrics, transportation and air quality, travel demand management, congestion management systems, traffic analysis and site impacts, telecommunications and travel behavior/demand, optimal resource allocation, and road transport informatics/intelligent transportation systems. Goulias has provided transportation engineering and planning consulting services to state/federal agencies and to international organizations and firms in the United States, Europe, and Asia, developing new data-collection and modeling techniques, simulation frameworks, and expert reviews of technologies and engineering practice and policies.