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Title

Moving towards Agent Based Model (AgBM) as the Next Step in Evolution of Integrated ABM-DTA Models

Paragraph

Theoretically consistent ABM-DTA integration schema has to avoid aggregation biases such as using average LOS skims instead of the individual trajectories. This led to a concept of “deep” integration at the individual level contrary to a “loose coupling” schema with aggregate LOS. The presentation summarizes first experience of “deep” integration based on ABM-DTA projects for Chicago, Atlanta, and Columbus. Many complexities of the ABM-DTA integration stem from the fact that historically ABM and DTA have been evolving largely independently. ABM predicts activity generation, tour formation, activity/trip scheduling, and other travel choices mimicking the individual decision-making process of planning for the next day. ABM as such does not model a real-time implementation of the planned activities. DTA historically incorporated both planning (route choice) and real-time implementation (simulation of individual vehicle movements). In the recent projects, several gaps were filled to bring ABM and DTA closer to each other. However, in addition to filling the obvious gaps, a fundamental change in the model system structure is envisioned where the ABM and DTA entities could be replaced with planning and real-time implementation entities of AgBM. Rather than separate activities and trips, the system would completely integrate activity-travel decisions but distinguish day-to-day planning from real-time implementation. The planning module would generate and schedule activities and trips based on the best approximation of travel times. The real-time implementation module would track individuals in time and space during the simulated day with the corresponding time-space constraints and real-time adjustments to the planned schedule.