ADDRESSING FIDELITY BETWEEN MESO- AND MICRO-SIMULATIONS TO EVALUATE TRAFFIC FLOWS IN MULTIRESOLUTION MODELING

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Abstract:
Currently, traffic management strategies such as adaptive control and ramp metering systems go through simulation-based testing of the strategies, before field-testing of hardware/software systems, and implementation and evaluation of the system. Simulation testing have been quite successful for isolated intersections and single intersections, and small networks with 1-3 intersections – where the effect of re-routing due to incidents, major events that result in changes in traffic patterns, have none or only minor impacts on the simulations. For larger networks, when there is both lane based dynamics for intersection control and ramps, and link based dynamics for re-routing, integrated models have lack of fidelity between lane dynamics (microscopic simulations) and link dynamics (macroscopic simulation). Part of the lack of fidelity among the meso- and micro-models is due to scope; DTA-type models usually approximate links and path loads for planning purposes while scope of micro-simulation models is on traffic management through small networks. This project will attempt to develop a meso-type model that will approximate the spatial-temporal traffic patterns of a VISSIM model, a well-known micro-simulation model. In other words, instead of fitting a large DTA model based on fitting flows on a few measured links, we would develop a model, here on referred to Model X, which approximates all the flows of a VISSIM model albeit faster than VISSIM.