

Project Information Form

Project Title:	Integrating Car-Following Models and Vehicle Specific Power Emission/Fuel Consumption
University:	Georgia Institute of Technology
Principal Investigator:	Hongyu Lu
PI Contact Information:	
Funding Source(s) and Amounts Provided (by each agency or organization):	U.S. Department of Transportation (USDOT)
Total Project Cost:	
Agency ID or Contract Number:	
Start and End Dates:	
Brief Description of Research Project:	Traffic simulation has been widely used for the evaluation of the traffic environmental impact, where the simulation model outputs are linked with energy/emission models. However, significant differences have been noted between field measurements of traffic operations and speed/acceleration predictions from car-following models which significantly affect energy consumption and emission predictions. Car-following models were originally developed from (and calibrated with) aggregate parameters, while fuel consumption and emissions models require instantaneous vehicle activity as inputs. In this research, widely used car-following models are re-assessed for use in emission/fuel consumption estimation, with their impact on vehicle specific power and instantaneous engine work as comparative indices. Second-by-second vehicle trajectories are used in these comparative analyses. Simulated VSP distributions and instantaneous engine work are compared with field distributions to verify these models. A new car-following model based on machine learning is proposed for more accurate estimation of emission/fuel consumption.
Describe Implementation of Research Outcomes (or why not implemented): Place any photos here	
Impacts/Benefits of Implementation (actual, not anticipated):	



National Center for Sustainable Transportation

Web Links

- Reports
- Project website

<https://ncst.ucdavis.edu/graduate-student-research/>

<http://transportation.ce.gatech.edu/node/102>