



# TRANSPORTATION SEMINAR SERIES

*Friday, September 14, 2007  
4 - 5 p.m. in 240 Bechtel Engineering Center*

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### **Improving Safety of Large-Truck Operations with Automated Trailer Steering For Fuel Efficiency, Emission Reduction and Productivity**

**Abstract:** Energy and environmental concerns have led to much attention on fuel efficiency and sustainable development. A class of large trucks called “longer combination vehicles” (LCVs) currently operates on designated highways in 20 states of the US. Although they provide high fuel efficiency and productivity, they also pose safety and infrastructure hazards. A major source of such hazards is off-tracking – the phenomenon that the rear wheels of a truck do not follow the track of the front wheels. A major category of LCVs is the Triple, consisting of a tractor and three 28-foot trailers, and some Triples also suffer from continuous sideways sway while cruising on the highway. We propose the concept of automated trailer steering to overcome these problems. Vehicle-dynamics models and steering algorithms have been developed. Computer simulation suggests that off-tracking can be virtually eliminated; it also provides a clue for the reason of the continuous sway of some Triples. Systems issues about expanding current LCV operations will be discussed as well as a new mode of freight transportation enabled by automated trailer steering – Short Trailer Combination Vehicles (STCVs).

**Bio:** Dr. Jacob Tsao received his Ph.D. in Operations Research from The University of California at Berkeley in 1984. He worked for Consilium Inc., AT&T Bell Laboratories and Bell Communication Research as a systems engineer for eight years. He joined PATH Program of the Institute of Transportation Studies of UC Berkeley in 1992 and researched into intelligent transportation systems (ITS). He was a member of the research staff of National Center of Excellence for Aviation Operations Research (NEXTOR) between 1997 and 1999 within the same Institute. He serves on the Vehicle Design Committee of the American Society of Mechanical Engineers (ASME). Since August 1999, he has been with San Jose State University, where he is Professor of Industrial and Systems Engineering and Director of Graduate Program in Industrial and Systems Engineering.

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