

Modeling the effects of drivers' adaptive behavior on system safety

Linda Ng Boyle

Departments of Industrial & Systems Engineering and Civil & Environmental

Engineering (joint)

University of Washington

Abstract: Many technological innovations are designed to increase driver safety by simplifying tasks and user demands in safety-critical situations. Some safety systems are designed to help drivers make appropriate decisions while others will initiate the decision if the driver is not capable during safety critical moments. An effect that is not anticipated by system designers is that the drivers' behavior may change, adapting in unforeseen ways that may either enhance or compromise the potential benefits of the system. A system that is designed with the intended purpose of increasing or maintaining safety will fail if adaptation negates the intended outcome. Behavioral adaptation can have an effect on overall system performance and developing approaches to understand and model this effect can provide great benefits for the design of future transportation systems. One specific technology that is influenced by adaptive behavior is adaptive cruise control (ACC). It is one of many in-vehicle systems that is transforming the driving task and is provided as a case study to showcase factors that should be considered when modeling the effects of adaptive behavior.

Bio: *Linda Ng Boyle* is professor and chair of the Industrial & Systems Engineering Department at the University of Washington. She has a joint appointment in Civil & Environmental Engineering. Her BS degree is from the University of Buffalo and her MS and PhD are from the University of Washington. She is an associate editor for the journal Accident Analysis and Prevention, the chair of the TRB committee on Statistical Methods, and a recipient of the NSF Career Award. She is also one of the organizers for the International Conference on Driving Assessment.