

INTELLIGENT TRANSPORTATION SYSTEMS

Arizona Department of Transportation Research Center



Intelligent transportation systems, known as ITS, integrate advanced communication technologies into transportation infrastructure and vehicles. ITS extends from the most familiar applications, such as freeway ramp metering and electronic message signs, to IntelliDrive, a futuristic technology with the potential to use wireless communication to make surface transportation safer, more efficient, and more environmentally compatible.

Research conducted within the **ITS emphasis area** encompasses these topics and others that include adaptive control systems, freeway management, mitigation of traffic bottlenecks, networked wireless vehicle-to-infrastructure and vehicle-to-vehicle data communication, algorithmic platforms for conducting mass evacuations, and enhanced methods for vehicle counting.

Representative Projects

SPR 634: A Platform for Evaluating Emergency Evacuation Strategies. The development of a computational platform that accepts decision algorithms and simulation modules that represent behavioral and physical system dynamics, as well as adaptive strategies for managing mass evacuations. *Publication pending. SPR 679, a second phase of this study, is ongoing.*

SPR 604: Real-time Adaptive Ramp Metering/Phase 2: Implementation and Enhancement. An evaluation of the performance capabilities of a freeway ramp metering system prior to potential implementation. *Ongoing.*

SPR 681: Work Zone Instant Driver Warnings – Speed or Penalty. An investigation into the possible effects on work-zone safety of a portable, radar-equipped dynamic-message sign capable of displaying a driver's speed and the monetary fee for the violation of the speed limit. *Ongoing.*

SPR 682: Analysis of Freeway Bottlenecks: Capacity Reduction and Temporal Variations. A study that aims to enhance understanding of bottlenecks in the Phoenix metropolitan area by studying how they are formed, the extent to which they reduce capacity, and the variation of this capacity reduction as a function of time; the study will culminate with recommendations for preventing and reducing the effects of bottlenecks. *Ongoing.*

Project Manager

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Frank joined the Research Center in 2008, after having also served the ADOT Traffic Group, where he helped develop standard drawings and specifications, evaluate new products, and author scientific papers. He is a career systems analyst and electrical engineer, having worked on industrial controls, telemetry and cellular systems, rail transit lines, and electrical distribution.

