

CEE691 Seminar Series in Spring 2017

The Department of Civil and Environmental Engineering
University of Hawaii at Manoa

ITS Sensor Data-based Active Traffic Management for Freeway Congestion Mitigation and Safety Improvement

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Abstract From 1980 to 2014, annual vehicle miles traveled increased by 96%, while roadway lane miles increased by only about 4% nationally. The enlarging gap between travel demand and infrastructure supply has increased the level of congestion nationwide. Freeway traffic congestion costs billions of dollars every year due to lost time, wasted fuel, excess air pollution, and lost productivity. In Albuquerque, the annual average delay per traveler is 26 hours, and traffic congestion costs more than \$286 million in 2009. Constructing new roads has been a traditional solution to solving traffic congestion problems. Due to the high construction cost, long project cycle, increased environmental awareness and tighter environmental regulations, however, the increase of roadway capacity has lagged far behind the increase of travel demand over the past decades. Managing the existing infrastructure more efficiently with advanced traffic control and operational technologies has been widely accepted as a cost effective solution. Active Traffic Management (ATM) presents a promising and applicable solution to freeway congestion mitigation. ATM strategies aim at increasing freeway throughputs, enhancing safety, reducing traffic delays, and improving travel time reliability through the integral use of advanced control technologies. In this presentation, the innovative ATM concepts and various control strategies such as speed harmonization, dynamic signing, ramp metering, and network-wide vehicle re-routing will be introduced. A simulation-based case study will be presented to demonstrate ATM strategy implementation and verify its effectiveness. Potential research opportunities will be explored and discussed.



Tuesday, January 24th
2:30 p.m. – 3:20 p.m.

Crawford Hall
Room 105