

Congestion Pricing Strategy Development for Traffic Congestion Mitigation on Freeways

Abstract:

Dramatically increasing travel demands and insufficient traffic facility supplies have induced severe traffic congestion problems. It is of practical importance to manage the existing transportation facilities more efficiently with advanced traffic control and management technologies in addition to travel demand control. High Occupancy Toll (HOT) lane is one of the most effective traffic management systems for freeway congestion mitigation. In this presentation, HOT lane system operation mechanisms are introduced, and a self-adaptive tolling strategy is presented to optimize HOT lane operations. The toll rates are computed based on toll changing patterns and real-time traffic measurements on HOT and General Purpose (GP) lanes. By dynamically adjusting toll rates, traffic allocations between GP and HOT lanes can be controlled and overall system operation efficiency can be maximized. VISSIM-based simulation experimental tests show the proposed tolling strategy performs reasonably well in optimizing HOT lane system operations under various traffic conditions.



Guohui Zhang Short Bio

Dr. Guohui Zhang is an Assistant Professor in the Department of Civil and Environmental Engineering at the University of Hawaii. Dr. Zhang received his Ph.D. from the University of Washington. Dr. Zhang's research focuses on Intelligent Transportation Systems, large-scale transportation systems modeling and simulation, traffic safety and accident modeling, congestion pricing, traffic detection and sensor data analysis, and sustainable transportation infrastructure design and maintenance. Dr. Zhang has served as a member of Transportation Research Board (TRB) committee on Information Systems and Technology, and a member on NCHRP Project Panel Work Zone Capacity Methods for the Highway Capacity Manual.