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Concurrent Flow Lanes: Phase I

Problem

As has been demonstrated in various regions within the United States, the use of express toll lanes or similarly functioning high occupancy toll (HOT) lanes can lead to more effective use of existing roadway capacity, improved traffic flow along general purpose lanes and additional revenue to support much needed transportation improvements. This study sought to review existing and prior modeling activities related to concurrent flow lane operations, with particular concern for nonbarrier-separated managed lane facilities.

Objectives

The primary objective of this first phase of a multi-phase effort was to develop a comprehensive understanding of the current state-of-the-art in modeling and analysis of nonbarrier separated HOT lane and other concurrent flow lane operations.

Description

Information was gathered through interviews conducted with project managers of existing and proposed HOT lane facilities, modelers and other domain experts and review of related reports and literature.

Results

This effort culminated in a comprehensive understanding of the state-of-the-practice and state-of-the-art in modeling of nonbarrier separated HOT lane and other concurrent flow lane operations. Specific details related to the models employed, and analytical tools used, around the country to evaluate the impact of proposed HOT lanes on traffic operations and potential revenue were revealed and information pertaining to lane configurations, tolling strategies, high occupancy vehicle (HOV) restrictions, types of separation, how weaving is addressed, and design alternatives for ingress and egress between the HOT and general purpose lanes were documented. Knowledge pertaining to model calibration and validation was gleaned from the interview and literature review processes. Potential data sources for calibrating developed models were also identified. Finally, a proof-of-concept was developed to illustrate how details associated with violation modeling can be handled in the selected modeling framework, the VISSIM simulation platform, which was proposed for use in this and additional subsequent phases of this research effort.

Report Information

Miller-Hooks, E., X. Chen, C-S. Chou, P. Tarnoff (2007). "Concurrent Flow Lanes – Phase I," Maryland State Highway Administration Report MD-07-SP608B4C.