Active Traffic Management Strategies:
Implications for Freeway Operations and Traffic Safety

Abstract
With the help of Intelligent Transportation Systems (ITS), Active Traffic Management (ATM) strategies respond to prevailing road, traffic, and weather conditions in real time, in order to increase safety and operational reliability. This paper investigated the implications of three ATM strategies on freeway operations and traffic safety: Variable speed limits (VSL), peak-period shoulder use, and VSL with shoulder use. Each scenario is compared with a base model. Missouri-Pacific (MoPac) Expressway in Austin was used as a testbed for this study. Variable speed limits (VSL) and peak-period shoulder use were implemented in VISSIM microscopic model, which provided traffic operations measures to compare the ATM strategies. Safety factors and analysis were obtained using the Surrogate Safety Assessment Model (SSAM), which uses the vehicle trajectory files produced by microscopic simulation models to perform safety analysis. VSL was found to harmonize traffic flow, but these benefits were partially offset by shoulder use. Shoulder use improved traffic operations in the middle of the testbed section, but created adverse traffic operations and safety condition toward the end of the testbed segment. Overall, the two ATM strategies were found to harmonize traffic and improve safety conditions for the network.

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