Intersection Queue Management Plan Based on Video Detection System
Primary Author: Li Zhang, Mississippi State University
Secondary Author(s): Zhitong Huang; Yi Wen, Mississippi State University

Traffic congestion is a worldwide problem which results in significant direct or indirect economic costs. It becomes more serious along with increases of population and economy, since travel demand increases and available lands for construction of new roads decrease. The intersection congestion is a major component of traffic congestions. Thus, effective strategies to mitigate intersection congestion (i.e. intersection control delay) are always a concern to transportation practitioners and researchers. This research is ongoing study. The research team proposed an intersection queue management plan based on video detection system (VDS). Usually, there are significantly different queue lengths of major and minor streets or in and out bounds of an intersection, especially during rush hours and special events, such as football game. The proposed queue management plans aim to this phenomenon and try to reduce control delay of such intersections. Two strategies, using Maximum Green 2 and adjusting passage time of a phase, were utilized. One static plan and three dynamic plans were presented. To evaluate effectiveness of proposed plans, hardware-in-the-loop simulation was conducted. CORSIM was chosen as the simulator and NEMA EPAC300 actuated controller was used. The proposed two strategies were implemented manually. Based on the results, the control delay of best scenario reduces 13.33% of control delay of the entire intersection compared to the base case (actuated control without proposed plans). The proposed queue management plans are effective. Except one scenario, all other scenarios have better results than the base case.