ABSTRACT

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The testing and implementation of traffic signal performance measures at a local government agency revolves around three main performance measures: signal detector anomaly identification, signal split failures reports and red light running identification. Signal detector anomaly identification used the Kolmogorov-Smirnov test to compare current and past detector operation and was shown to be effective in identification of anomalies. Three different types of split failure reports were utilized to determine operational issues on signal systems. Long-term longitudinal, corridor scale, and single intersection split failure reports were implemented on active signal systems and found to be effective in determining and correcting problems. A statistical analysis using the logit model found there was a correlation between split failures on an intersection phase and vehicle crashes. A red light running index algorithm and report was described, including strategies to use the report to improve safety through signal system changes. Case studies of these performance measures being used effectively on signal systems in Elkhart County and the City of Mishawaka, both in Indiana, are presented as a guide to practitioners. Implementation strategies for local government agencies are described, including: the pros and cons of local funding and federal-aid funding, identification of funding sources and sample funding applications. A set of contract bid specifications that a local agency can use to acquire the performance measures described herein are also included.