

STC Research Project Description

Project Title: Safety Evaluation of Traffic Signal Installation

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Project Start Date: 04/01/03

End Date: 03/31/04

Other Milestones, Dates:

Project Objective:

The objective of this research is to perform a safety evaluation of traffic signal installation based on before-and-after analysis of crash data, and crash prediction models that can estimate the expected number of crashes at an intersection before and after the installation of traffic signals, which will allow the estimation and analysis of change in the number of crashes.

Project Abstract:

This project will perform a safety evaluation of the installation of traffic signals. This evaluation will be based on a before-and-after analysis and/or crash prediction models that can estimate the expected number of crashes at an intersection before and after the installation of traffic signals. Crash data from the Florida Department of Transportation will be used. For the modeling process, Poisson and Negative Binomial regression models will be considered.

Task Description:

The main purpose of the project is to perform a safety evaluation of traffic signal installation through a before-and-after analysis of crash data at intersections and/or the estimation of the change of average number of crashes at intersections based on statistical models. These crash prediction models will estimate the crash frequency distribution, which usually follow a Poisson or negative binomial distribution due to the small number of crashes at the intersections. Traffic crash data, traffic volume data, traffic control data and geometric data for intersections will be needed in order to develop the crash prediction models. The crash prediction models will include the variables that better described the relationship between crashes and parameters such volumes and geometric conditions. Also, a statistical test will be used to test the significance of the results. The categories for crashes to be considered in the research will include all crashes, different types of crashes and crash severities. The crash data considered will be from Florida and will be obtain from the FDOT crash database. The crash data and volume data will include two to three years of data for the before and after installation of traffic signals periods.

Total Budget: \$ 20,431.00 (\$10,000.00 Federal Funds and \$10,431.00 matching funds)

Student Involvement (Thesis, Assistantships, Paid Employment):

The transportation program of the Department of Civil and Environmental Engineering at the University of South Florida has more than 25 graduate students including both Ph.D. and M.S students. Many of these students are working in the area of transportation safety. The proposed research study could be developed into a master thesis topic. A graduate student will be hired to work on this research project. Additionally several undergraduate research assistants may be assigned to this project to be involved in field data collection and reduction depending on the need.

Relationship to Other Projects:

Technology Transfer Activities:

The results of this research will be nationally distributed to safety professionals, practitioners, engineers, State Departments of Transportation, local governments, planners, and other agencies and organizations concerned with improving highway safety. Papers and presentations will be prepared for submission to TRB Annual Meeting, National Safety Council Congress, and ITE annual meetings. Also, research results will be made available through the National Technical Information Service (NTIS). For further dissemination of the knowledge, papers will be prepared and submitted to relevant journals and publications such as *Transportation Research Record*, *Accident Analysis and Prevention*, *Journal of Safety Research*, *ITE Journal*, etc. To provide local, national, and international dissemination of the research results, an executive summary of the findings will be posted on the Internet as part of the Center's World Wide Web page and to transportation related bulletin board systems and newsgroups.

Potential Benefits of Project:

This project will provide information related to the effects of traffic signal installation at intersections based on two types of analysis. This information will be very helpful when evaluating the installation or non-installation of traffic signals based on traffic warrants.

TRB Keywords:

Signalization, safety, before-and-after study, accident prediction models, traffic signal, crashes at intersections