

**SAFETY EFFECTS OF TRAFFIC SIGNAL INSTALLATION  
ON CRASHES AT INTERSECTIONS**

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## **ABSTRACT**

Traffic signals have long been considered a way to improve traffic safety and traffic operations at intersections. However, the impacts of intersection signalization on crashes are complicated and have not been fully investigated. This research performed a study of a ten-year crash data for 447 newly signalized intersections in Florida to evaluate the impacts of traffic signal installation on crashes at intersections. Statistical crash predictive models were developed to estimate average number of crashes in terms of all crashes and specific types of crashes including angle, left-turn, rear-end and other crashes at intersections before and after the installation of traffic signals. After an analysis of all available variables, seven predictor variables were considered for the models, which included Average Daily Traffic (ADT), surrounding land use, location type, number of lanes, posted speed, median, and shoulder type. Regression parameters were estimated by using maximum likelihood method. The goodness-of-fit of developed models were evaluated based on Pearson's R-square and likelihood ratio index. Based on modeling results, intersections with higher ADT, with more than four lanes on major road, in urban areas, and in business areas will have more crashes than intersections with lower ADT, with four or less lanes, in rural areas, and in other areas. Intersections with posted speeds higher than 45 mph or paved shoulders will have lower crashes than intersections with posted speeds lower or equal to 45 mph or other types of shoulder. In reference to the impacts of signalization on crashes at intersections based on the average number of crashes estimated from models for the before and after periods, all crashes, rear-end crashes and all other crashes will increase. Angle crashes and left-turn crashes will generally decrease.

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