

Evaluation of the First Automated Speed Enforcement Program on a US Freeway: The Scottsdale Arizona Experience

Abstract:

Speeding is recognized as one of the most important factors causing traffic crashes. In 2004, 36 percent of all motorcyclists involved in fatal crashes were speeding, approximately twice the rate for drivers of passenger cars or light trucks (National Highway Traffic Safety, 2005). Intelligent Transportation Systems (ITS) now exist to reduce speeding related crashes by enforcing speed limits with camera-based technologies. These enforcement technologies are generically called "speed cameras" and have been effective on municipal streets and arterials in Arizona (Roberts and brown-Esplain, 2005).

The City of Scottsdale began a speed enforcement program (SEP) in December of 1996. Between 1996 and 1998, four wet film mobile speed units and six wet film red light cameras were deployed for a total of nine intersections on enforcement rotation, depending on the needs of the City. The cameras on city streets <http://www.ci.scottsdale.az.us/photoradar/history.asp> have helped Scottsdale improve safety (Washington and Shin, 2005). Scottsdale expanded these efforts in August of 2004 with a dual direction fixed speed enforcement system on 7700 Frank Lloyd Wright Blvd. This system covers three lanes of traffic Eastbound and three lanes of traffic Westbound on Frank Lloyd Wright Blvd. The city's recent experience on Frank Lloyd Wright Boulevard is that speed violations significantly decreased in the one year period after installation of cameras.

Accurately estimating the impacts of the traffic safety countermeasures such as the speed enforcement cameras is challenging for several reasons. First, many safety related factors such as traffic volume, the crash reporting threshold (legal requirement to report a crash), the probability of reporting, and the driving population are uncontrolled during the periods of observation. Second, 'spillover' effects can make the selection of comparison sites difficult. Third, the sites selected for the treatment may not be selected randomly, and as a result may suffer from the regression to the mean effect. Fourth, a speed enforcement program may influence specific types of crashes-called target crashes-which often may be difficult to define and identify. Finally, crash severity needs to be considered to fully understand the safety impact of the treatment.

This presentation reports on the analysis of the 101 SEP. Presented are the estimates of the impact of the SEP on speeding behavior, estimates of the changes in mean speeds, estimates of the impact of the SEP on traffic safety, and estimates of the impact on economic costs and/or benefits. Also discussed are the less quantitative aspects, such as the political nature of the project, travel time savings estimates, and the costs to motorists of the program. Future research is discussed in conclusion.