Low Cost Speed Management in High Speed Rural Roadways: Optical Speed Bars

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Despite considerable safety measures implemented by traffic and transportation engineers, speeding continues to be a significant safety problem on the highway network, both in the United States and other countries. Even though higher traffic volumes and more travel occur in urban areas, majority of fatal crashes occur in rural areas indicating the significance of the issue. When high-speed roadways pass right through the small towns in rural areas there are considerable drops in speed limits, making proper speed management critically important. However managing speed has always been a challenge particularly in rural communities due to the low budgets available leading to lower levels of enforcement. It is therefore necessary to identify effective, low-cost approaches to control speeds in such areas.

Optical Speed Bar (OSB) treatment is one such approach, where transverse pavement makings are put in place with gradually deceasing spacing giving the drivers the perception of going faster than they actually are traveling. This research attempted to evaluate the effectiveness of OSBs in reducing approach speeds on two-lane, rural divided highways approaching small communities. Each approach had one lane and speed drop was either from 65 mph to 45 mph (4 sites) or from 55 mph to 30 mph (1 site). Speeds data were collected and analyzed both before and after installation of the optical speed bars at the five ssites. Effectiveness of the bars was evaluated using changes in mean and 85th percentile speeds under different categories by considering all vehicles, vehicle classification (two axles vs. more than two axles), days of the week (weekdays vs. weekends), and time of day (daytime vs. nighttime). The t-test for the sample mean and the F-test of variance were used to determine significant differences in speeds among datasets. Significant reductions in mean speeds and speed variance were observed at the end of the OSBs at four of the five sites, and one site showed no statistically significant change in speeds. Speed reductions were higher during daytime and weekdays. Higher speed reductions for two-axle vehicles were observed, with the exception of one test site. Daytime speeds and speeds of two axle vehicles decreased the most at almost all test sites. However speeds analyzed farther downstream of the treatments gave indication that speed reductions were not maintained for a long distance. However, when considering the low cost associated with the treatment, optical speed bars might be a good solution to control approach speeds in small communities.

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