SPEED-BASED SAFETY ANALYSIS FOR WORK ZONES

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ABSTRACT

Speed is one of the characteristics of traffic flow that affect accident rates and severity near work zones. Approximately 25% fatal crashes in work zones involved high speed. In speed-related work zone traffic safety study, 85th percentile speed is usually considered as the measures of effectiveness in evaluating speed management strategies. In order to determine the significance of the improvements of the measure of effectiveness, statistical methodology is applied. However, in spite of the wide use of the 85th percentile speed, statistical test for comparing percentile speeds from different groups of speed population is not as common as t-test and ANOVA for the mean speed. In this thesis, a standard normal Z statistical test for quantiles is derived based on Crammer's asymptotic distribution of sample quantiles. In addition, two research projects that motivated this methodology are presented as case studies of speed-based safety analysis for work zones, as well as excellent illustrations of this new methodology. One is the evaluation of the effectiveness of work zone speed limits. The other one is analysis of the sequential warning lights in night time work zone.