

**HOV Lane Configurations and Safety Performance of California Freeways
– An Investigation of Differential Distributions and Statistical Analysis**

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ABSTRACT

From a recent study of safety evaluation of HOV-equipped freeways, it was found that limited-access HOV lanes appear to have a safety performance disadvantage when measured by collision distribution or collision rates for the HOV lane alone and for the HOV and left lanes combined. This paper describes the work performed to verify the statistical significance of related findings. Several statistical tests were used: empirical cumulative density function (CDF), Kolmogorov-Smirnov Tests, and comparison of means based on Poisson Distributed Samples. The conclusion that continuous-access HOV lanes perform better than limited-access ones by several safety metrics is confirmed by the three separate approaches. In addition, the historical data for the HOV segments and the general-purpose lanes are extracted and compared, which offers supporting evidence for similar conclusions. The work described in this paper offers a methodology of statistical verification and can provide support to assist policy-making in selecting HOV configurations.