TREC Datasets and Databases

Transportation Research and Education Center (TREC)

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Data from: Statistical Inference for Multimodal Travel Time Reliability

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Abstract: Travel time reliability is a key metric of interest to practitioners and researchers because it affects travel choice and the economic competitiveness of urban areas. This research focuses on three travel time reliability metrics – buffer index, modified buffer index, and the relative width of travel time distributions. The key novel contributions of this research include using the multivariate delta method to prove that the sampling distributions of the three travel time reliability metrics are asymptotically normal. The asymptotic standard error for the three reliability metrics is derived. The asymptotic normality and the standard error result are used to arrive at a formula for the confidence interval. The derivations are non-parametric since they do not impose any shape requirement on travel time distributions. A case study based on a highway corridor in Portland, OR, is utilized to estimate confidence intervals for the three travel time reliability metrics for several travel time distributions with different shapes and levels of skewness. The performance of the proposed method is compared against several bootstrapping-based confidence intervals with favorable performance. Finally, upper-tailed, lower-tailed, and two-tailed one-sample hypothesis testing procedures are developed, and numerical tests show a positive performance and high statistical power for sample sizes that can be readily obtained.

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Data Description: These data support a final report published on NITC's website "Statistical Inference for Multimodal Travel Time Reliability (2022)".

List of files: The csv file contains two columns: The first column contains the date and time at which data was collected. The second column contains the travel time in seconds.