



Travel Time Reliability Modelling with Burr Distribution

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Abstract

Travel time reliability is the key factor for the travelers to make decision in choosing the public transport, such as bus. However, current methodology may not be sufficient to explain the travel time and its reliability. This paper aims to specify a new approach in the study of travel time modelling for bus route with Burr (which is also known as Burr XII) distribution. Two real day-to-day travel time bus routes data over 6 months in the Klang Valley area, Malaysia has been investigated for illustration purpose. The travel time data often demonstrates strong positive skewed, which could be explained explicitly using the Burr distribution. Mathematical expression and the statistical properties of the distribution will also be presented. The parameter estimation is done by Maximum Likelihood Estimation (MLE). Comparison has been done with some continuous distribution counterparts such as gamma, Weibull, log-normal and log-logistics. The results show that Burr distribution outperformed and appeared as a viable distribution to characterize the bus travel time. Some dynamic insight of the bus route reliability will also be examined by buffer time index and skew-width methods.

Keywords: Travel time; reliability; bus route; positive skewed; Burr distribution.