

Abstract

With growing value of time in our lives, travelling seems like a futile activity. As the population and number of vehicles keeps on increasing the congestion on the roads will keep on getting worse. The performance of roads in India has been deteriorating for a long time and lot of effort is needed to improve the transportation network. Calculating reliability of a road is a step in the direction to improve quality of transportation, as both performance and variability of travel time affects the commuters. The first objective of this research is to evaluate reliability and its various aspects using concepts of information theory and entropy. Entropy computes disorder in a system. Using information theory this disorder or randomness in travel time is captured and reliability of a road is calculated. Other objective is to compare the two techniques of calculating travel time: one measured directly using time taken to cover a distance and second using the spot speed values. Reliability is calculated using both these travel times. This study evaluates reliability of a national highway connecting Kanpur and Allahabad using GPS data from commercial vehicles. The results suggest that reliability calculated from spot speed values is lower than one calculated from measuring actual travel time. This study found out that although travel time are high for various segments of road considered, their reliability have been high and independent of mean travel time.

Keywords: Reliability, congestion, travel time, information theory, entropy