A Quantitative Review on Travel-Time Reliability Measures

C. J. Vidanapathirana[1] and J. M. S. J. Bandara[2]

Abstract

The time spent on a trip which is termed the 'travel time' is a key parameter in effective journey planning. Having an understating about the travel time for a specific journey is crucial when deciding upon the departure time and route choice. With the advancement of technology, services and products have been introduced which provide travel time data and estimations to fulfil the journey planning needs. These are popularly being used by most of the travellers worldwide since the traffic conditions have become fairly unpredictable in the past few decades.

A common concern the travellers have today is the accuracy of the estimated travel times. Since the estimations are based on historical data and real-time data, an accuracy of 100% can't be achieved. Further, travel time depends on parameters which create uncertainty such as traffic composition, junction delays, pavement conditions, roadside accidents, special events (e.g.: a protest march) and weather. Some of these parameters can neither be quantified nor be predicted.

Studying the reliability of travel time became a major focus area in the field of transportation engineering with these recent developments. Various studies have been conducted in the interest of developing travel time reliability measures. Most commonly used travel time reliability measures are 95th percentile travel time, buffer index, planning time index and travel time budget. It is important to mention that such measures need to be simple and easily understood by people who aren't thorough with technical knowledge. If not, the public will not be able to incorporate travel time reliability for journey planning purposes.

This study is a review on the usability of travel time reliability measures. What is expressed by each measure, how they can be interpreted and how helpful they are for the users are discussed through this analysis. A large data set of travel times was used to develop reliability measures for a selected set of road links. Verification of the results was done afterwards. Mainly this can be described as a quantitative review with a qualitative analysis on the final outcomes.

Keywords: Reliability measures, Travel time

Author Details

1. Graduate Research Assistant, Department of Civil Engineering, University of Moratuwa, Sri Lanka. ra-chathura@uom.lk
2. Senior Professor, Department of Civil Engineering, University of Moratuwa, Sri Lanka. bandara@uom.lk