

Developing a Mode Choice Model using Stated Preference Data for Sri Lanka

Amila Silva¹ and Dimantha De Silva²

Abstract

Developing travel behaviour models are important for forecasting travel demand and, consequently, for planning transportation systems. In Sri Lanka, few studies have been done on analyzing mode choice behaviour of individuals. As a result, in most of the studies, transport planners have been struggling to analyze behaviour of people when a new transport mode is introduced or an existing mode is improved. In this study, travel data collected based on a stated preference survey is used to develop a mode choice model. 6834 observations were available for the estimation. Stated preference survey can be used to not only analyze the existing travel modes but also to analyze the new travel modes introduced to a system. The choice of individuals for private modes including, car, three-wheeler, motor bike and public transport including, bus, conventional rail and Light Rail Transit (LRT) modes were analyzed using their attributes. Train mode was further classified on accessibility as bus to train (Bus-Train) and walk to train (Walk-Train). The LRT mode was further classified as walk to LRT, bus to LRT (Bus-LRT), Park and Ride and LRT (PR- LRT). Only the mode attributes and network attributes were used to estimate the user sensitivity. The multinomial nested logit model structure was used where the coefficients of the attributes were estimated using ALOGIT software. The parameters were estimated using number of nesting structures until it reaches a good model fit. It was found that the travel time, distance and cost are significant parameters for all the modes and number of transfers and waiting time are significant parameters in the LRT and Train utility functions. Value of time (VOT) for users of each mode was calculated using coefficients of travel time and cost, an indirect way of estimating the VOT. It was estimated the value of time of users for Car, Motorbike, Three-wheeler, Bus, Train and LRT are Rs.718, Rs.340, Rs.392, Rs.396, Rs.258, and Rs.423 per hour respectively. The estimated mode choice model can be used in the aggregate transport demand models since it does not have personal attributes of the people who select the mode. It is identified that importance of inclusion of personal attributes also in a mode choice model. The future studies could include personal attributes and tour attributes which can be used in the activity-based model development. However, the estimated mode choice constants can be calibrated in transport demand modelling to analyse the existing and future travel patterns.

Keywords: *mode choice, value of time, LRT*

Authors Details;

1. Senior Lecturer, Department of Civil Engineering, Faculty of Engineering, University of Sri Jayewardenepura, sasilva@hbaspecto.com
2. Senior Lecturer, Department of Civil Engineering, Faculty of Engineering, University of Moratuwa. dimanthads@uom.lk