## Abstract

It is a common observation that toll plazas on highways act as bottlenecks as the vehicles need to stop or at least slow down to pay the toll. In order to improve the design of toll plazas one needs to understand and analyse the queuing process at these facilities. One of the key inputs for such an analysis will be how drivers choose toll-lane. In this paper an attempt has been made to model the choice process adopted by the drivers in selecting the toll-lanes. A random-parameter (mixed) multinomial logit model has been proposed to model the toll-lane choice behaviour of the drivers at a toll plaza. The model has been calibrated on revealed preference data for toll-lane choice collected in India. The numerical simulation technique used for estimating the mixed logit model is Halton sequence based Quasi-Monte Carlo method and the optimisation algorithm used to search for the parameter estimates which maximise log-likelihood is trust region method. Also a detailed analysis of the issues faced while calibrating mixed logit model has been presented.

Keywords: toll-lane choice, mixed logit, Halton draw, trust region method