Abstract

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An Investigation on the Performances of Mode Shift Models in Transit Ridership Forecasting.

This paper aims at investigating the over-prediction of public transit ridership by traditional mode choice models estimated using revealed preference data. Five different types of models are estimated and analysed, namely a traditional Revealed Preference (RP) data-based mode choice model, a hybrid mode choice model with a latent variable, a Stated Preference (SP) data-based mode switching model, a joint RP/SP mode switching model, and a hybrid mode switching model with a latent variable. A comparison of the RP data-based mode choice model with the mode choice models including a latent variable showed that the inclusion of behavioural factors (especially habit formation) significantly improved the models. The SP data-based mode switching models elucidated the reasons why traditional models tend to over-predict transit ridership by revealing the role played by different transit level-of-service attributes and their relative importance to mode switching decisions. The results showed that traditional attributes (e.g. travel cost and time) are of lower importance to mode switching behaviour than behavioural factors (e.g. habit formation towards car driving) and other transit service design attributes (e.g. crowding level, number of transfers, and schedule delays). The findings of this study provide general guidelines for developing a variety of transit ridership forecasting models depending on the availability of data and the experience of the planner.