Abstract

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Modal Shift Forecasting Model for Transit Service Planning: Survey Instrument Design.

While being useful to explain current modal split, mode choice models developed by using only Revealed Preference (RP) data often suffer from many problems. Evidence in the literature shows that RP data based mode choice models fail to accurately forecast modal shift in response to new improvements in the transit services. Further, it is often difficult to accommodate attributes of emerging systems, such as passenger information systems, ITS technologies that improve reliability, etc in conventional mode choice models because detailed information of such attributes are often missing in traditional household based RP travel survey data. In addition, traditional logit mode choice models are criticized for their weak characterization of several behavioural aspects, contributing in part to their misleading modal shift estimation. This is a critical issue in transit service design where improving service to facilitate modal shift towards transit is targeted. As opposed to traditional mode choice models based on RP data, mode shift models will be developed using state-of-the-art methodology of combining Revealed Preference (RP) and Stated Preference (SP) information. Our proposed methodological approach incorporates two main stages. The first deals with designing and implementing an innovative socio-psychometric survey about personal attitudes and habit formation of Toronto commuters regarding shifting to different transit technologies of varying characteristics. The second stage focuses on developing an econometric choice model of mode-switching behaviour towards public transit. However, this paper only reports on the first stage. In addition to collecting common socioeconomic, demographic and modal attributes, the survey is intended to collect data on the revealed mode choice behaviour as well as the stated mode switching preferences to public transit considering some important preference attributes such as advance information provision, ITS technologies and rail vs. bus attraction. Moreover, the survey will gather psychological information regarding habit of auto driving, affective appraisal and personal attitudes. Different psychometric tools will be used to capture psychological factors affecting mode choice. Further, the survey sets up a stated choice experiment based on efficient experimental design techniques to maximize the information gained from different hypothetical scenarios. The survey respondents will be asked to identify their propensity to perform their work trip by a non-existing transit service in the future. In an attempt to maintain practical attribute level ranges in the stated choice experiment, best practices in transit service planning will be utilized in terms of service accessibility standards, service frequency and headway standards and service reliability standards. The data collected through such novel survey will develop a better understanding of commuters’ preferences and mode switching behaviour towards public transit in response to changes in transit service design attributes.