Investigating the Value of Travel Time of Sydney Residents by Developing Time-use Models

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Willingness to pay (WTP) for improving different travel attributes, specifically travel time, is a crucial concept in transport infrastructure investment analysis. It has major implications in cost-benefit analysis and provides transport planners with insights on how to price transport services. This research will focus on investigating this fundamental concept for Sydney residents from various perspectives using different methodologies.

The utility maximization framework serves as the basis for the employed models. We began with a simple discrete choice modelling approach called the Multinomial Logit (MNL) model to investigate the value of time, as well as how incorporating a complementary SP data set in our MNL development on the RP dataset can help us reach statistically significant estimates for WTP. Next, we investigated the distribution of WTP using Mixed Multinomial Logit (MMNL) models, while incorporating the correlation among parameters. Following that, the Logit Mixed Logit model, introduced by Train, 2016, is employed to study the non-parametric distribution of WTP. This method reveals the underlying WTP distribution without imposing any restrictions. The findings can be incorporated into transport policy analysis. For instance, the multi-modality of WTP distribution.

The Value of Travel Time Saving (VTTS) comprises two components: the (dis)utility of travel time itself and the utility of activities that would have otherwise been undertaken. Therefore, VTTS is defined based on the value of working time, leisure time, and time-use patterns. As our next step, we will investigate individuals' time-use patterns by developing Multiple Discrete Continuous Extreme Value models (MDCEV) using time-use data. Then, we will implement Jara-Diaz et al.'s expanded microeconomic consumer theory model to estimate the different components of the value of time using time-use data, providing a holistic overview of VTTS for Sydney residents.