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Modelling the impacts of real-time crowding information in public transport

Passenger overcrowding is an important and recurrent phenomenon, especially in urban public transport systems. Meanwhile, recent advancements in intelligent transport systems allow for designing new measures that can help potentially counteract the negative effects of passenger overcrowding. An especially interesting and feasible solution pertains to providing passengers with Real-Time Crowding Information (RTCI) on current passenger loads of public transport services. The aim of this research is to contribute towards bridging the main gaps regarding the analysis of RTCI effects in public transport networks: missing empirical underpinning of RTCI influence upon travel behaviour, methods for analysing the RTCI consequences for passengers' travel choices and ensuing service performance. Empirical surveys reveal the potential of willingness to wait with RTCI to become a significant travel behaviour phenomenon. Modelling outputs highlight the chain of events triggered by RTCI in passengers' travel choices. Finally, simulation analyses reveal that RTCI-induced decisions can significantly reduce the experience of overcrowding effects and play a crucially instrumental role, especially in case of public transport service disruptions (bus bunching), albeit with certain inaccuracy risks. This project aims to contribute with a research framework for understanding the ramifications of RTCI provision in urban public transport networks, both from passengers' and operators' perspective. As such, it may effectively support the formulation of strategies and operations for enhancing the real-time public transport capacity utilisation, journey experience and system performance. It can also help with the designing future RTCI systems as effective travel demand management tools in modern-day urban public transport networks.

