

## The Potential of On-Demand Shuttle Services to Reduce Private Car Use

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**Abstract :** Findings of an ongoing discrete choice study of future transport mode choice will be presented. Many urban centers face the triple challenge of having to cope with ever increasing traffic congestion, environmental pollution, and greenhouse gas emission brought about by private car use. In principle, private car use may be diminished by extending public transport systems like bus lines, trams, tubes, and trains. However, there are limits to increasing the (perceived) spatial and temporal flexibility and reducing peak-time crowding of classical public transport systems. An emerging new type of system, publicly or privately operated on-demand shuttle bus services, seem suitable to ameliorate the situation. A fleet of on-demand shuttle busses operates without fixed stops and schedules. It may be deployed efficiently in that each bus picks up passengers whose itineraries may be combined into an optimized route. Crowding may be minimized by limiting the number of seats and the inter-seat distance for each bus. The study is conducted as a discrete choice experiment. The choice between private car, public transport, and shuttle service is registered as a function of several push and pull factors (financial costs, travel time, walking distances, mobility tax/congestion charge, and waiting time/parking space search time). After the completion of the discrete choice items, the study participant is asked to rate the three modes of transport with regard to the pull factors of comfort, safety, privacy, and opportunity to engage in activities like reading or surfing the internet. These ratings are entered as additional predictors into the discrete choice experiment regression model. The study is conducted in the region of Stuttgart in southern Germany. N=1000 participants are being recruited. Participants are between 18 and 69 years of age, hold a driver's license, and live in the city or the surrounding region of Stuttgart. In the discrete choice experiment, participants are asked to assume they lived within the Stuttgart region, but outside of the city, and were planning the journey from their apartment to their place of work, training, or education during the peak traffic time in the morning. Then, for each item of the discrete choice experiment, they are asked to choose between the transport modes of private car, public transport, and on-demand shuttle in the light of particular values of the push and pull factors studied. The study will provide valuable information on the potential of switching from private car use to the use of on-demand shuttles, but also on the less desirable potential of switching from public transport to on-demand shuttle services. Furthermore, information will be provided on the modulation of these switching potentials by pull and push factors.

**Keywords :** determinants of travel mode choice, on-demand shuttle services, private car use, public transport

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