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Valuing in-vehicle comfort and crowding reduction in Swedish public transport

The knowledge of travelers' willingness to pay (WTP) for comfort, e.g., an available seat, and crowding reduction in public transport is important for efficient planning of the public transport network. Most of the research is based on UK evidence (see e.g. Wardman and Whelan, 2011) and evidence of the Swedish situation is rare.

Swedish evidence relies mostly on a study by Transek (2006), where stated preference-data was used to estimate habitual public transport travelers' values of delays, crowding and seat availability on board buses, metro and commuter trains in Stockholm. Subjects were asked to choose between different options with varying travel costs and crowding levels. The results showed that the WTP for seating varied between SEK[1] 7 per hour (on board metro with little crowding) and SEK 16 per hour (on board commuter trains with a high degree of crowding). The WTP for seating was higher the more crowding there was on the vehicles, and the WTP seemed to be higher on commuter trains than on the metro. Given that the travelers were given a seat during the trip, it was no sacrifice to travel with crowding on board the vehicle. In an earlier Swedish study, Olsson et al. (2001) investigated commuting trips, also in Stockholm. As a measure of crowding they used a guaranteed seat. The results of the study showed that travelers would on average be willing to pay SEK 84 more per month to get a seat on buses, and SEK 89 more per month to get a seat on the metro and on commuter trains. By assuming 40 trips per month and 25 minutes per one-way trip, WTP for a seat is some SEK 5 per travel hour.

The purpose of the present study is to estimate travelers' willingness to pay for comfort, i.e., to get a seat, and crowding reduction on board local public transport in Sweden, including the modes metro, tram, commuter trains, and local bus. The results of our study are to be used in Swedish cost benefit analysis and it is important to have updated WTP values for such analysis.

Because previous studies regarding crowding in the Swedish public transport mainly concentrated on Stockholm, the present study will be conducted in the three largest Swedish urban areas. We will also expand the study with infrequent travelers as this travel group not has been included in the previous Swedish studies.

Two different types of data collections were carried out in Göteborg, Malmö, and Stockholm. In Göteborg and Stockholm travelers were recruited at bus stops (both cities), station platforms for metro (Stockholm), tram stops (Göteborg), station platforms for commuter trains (both cities), and by an existing national web panel of people which we had access to through an established market research company. In Malmö the travelers were recruited only

[1] SEK 10 ≈ EUR 1.

by the national web panel. The recruited persons received information about the study and a link to an online survey including eight stated preference-questions where the travelers were asked to choose between two journeys. The two journeys differed according to travel time within the main travel mode, the one-way cost of the entire trip, sitting or standing in the main travel mode, and level of crowding (four different levels). Depending on the participants' actual travel time with the main travel mode, the attribute levels for travel time in the stated preference situations were 5, 9, or 14 minutes for actual trips that were 15 minutes and shorter, and 18, 25, or 34 minutes for actual trips that were longer than 15 minutes. The price per one-way trip was 20, 36, or 44 SEK. The seating attribute had two levels: sitting the whole trip with the main travel mode, or standing the whole trip with the main travel mode. In total, 2038 individuals filled in the questionnaire. Of these, 2003 questionnaires were appropriate for further analyses. The outcome of the stated preference-choices were analyzed by a mixed logit model (e.g. Hensher & Greene, 2003) within a random utility framework.

The estimated results suggest a WTP for seating of SEK 30 to 37 per hour depending on the crowding level. A reduction to no standing passengers from 4 and 8 standing passengers per square meter is valued SEK 12-13 and 27-32 respectively, depending on seating or standing condition. A reduction to no standing passengers from 1 standing passenger per square meter is not worth anything when the traveler is seating but SEK 8 when the traveler is standing. If we instead interpret our estimated results as value of travel time saving-multipliers, the worst travel condition in our study, i.e. standing in a crowding of 8 standing passengers per square meter, the multiplier is about 2.1 compared to the reference travel condition (seating and no standing passengers). The value of travel time savings in the reference travel condition was SEK 54 per hour.

All in all, our results seem plausible as they lies in the middle of comparable estimated results from earlier studies that have valuated comfort and crowding reductions, both in Sweden and in other countries. Finally, sensitivity analysis also show that the results seem to be both robust and in line with existing knowledge of value of travel time savings.

References

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