



Car sharing demand estimation and urban transport demand modelling using stated preference techniques

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Abstract

The research deals with the use of the stated preference technique (SP) and transport demand modelling to analyse travel mode choice behaviour for commuting urban trips in Palermo, Italy.

The principal aim of the study was the calibration of a demand model to forecast the modal split of the urban transport demand, allowing for the possibility of using innovative transport systems like car sharing and car pooling.

In order to estimate the demand model parameters, a specific survey was carried out inside the urban area of Palermo. The survey focused on the morning rush hour and involved mainly employees, self-employed workers and students (about 500 respondents) whose final destination was located within the historical centre of the city. The questionnaires contained a stated preference experiment regarding the choice among four different transport alternatives: private car, car pooling, car sharing and public transport.

A random utility model was developed by using data resulting from the SP experiment. We found out that, for the specific case of Palermo, the multinomial logit proved to be the best urban transport demand model, even if the choice set contained three car alternatives. We identified as main attributes affecting mode choice behaviour the one-way trip travel time and cost, the parking time, the number of cars available to each household member, the alternative specific attributes for the car option and the car sharing one.

The model was applied to analyse the potential demand for car sharing and car pooling in Palermo, under a future scenario characterized by several policy actions for limiting private transport use. The analysis highlighted that the car club market share could increase up to the 10% level, while car pooling could slightly rise.

Keywords: Car sharing; Car pooling; Stated Preference; Random Utility Models; Sustainable transport systems.

1. Introduction

In the last decades, the growth of mobility (passenger and freight transport demand) has produced a wild development of vehicles (car and trucks) moving inside urban

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