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Title of the work: ETAPAS: Towards an activity-based modeling of transport demand in Santiago applying empirical schedules of transport behaviour

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The development of proper methodologies for modeling urban transport processes in Megacities is of paramount importance once they are utilized as planning instruments that support decision-making. To this purpose models have to deal with complex urban environments on different spatial and/or temporal scales. In Santiago the integration of a model into the planning and decision-making context goes back to the development of the 4-Step-Model ESTRAUS since the 1980s. Today the regularly updated model is primarily applied to support strategic decision-making concerning fare policies and projects of road and public transport infrastructure. At the same time ESTRAUS lacks of certain characteristics that approaches based on the concept of activity-based demand-generation (ABDG) address by understanding travel demand as derived from interdependent activities and trips throughout a day.

Accordingly, the ABDG methodology currently under implementation in Santiago aims at introducing a more detailed analysis of processes and elements on different levels concerning users, space, time, activities and travel modes. The paper will address methodological characteristics and presents selected results already achieved. With regard to the methodology choice processes for activities and later on for related destinations and travel modes are taken hierarchically. This means for example that an activity-plan (refers to a given number and order of activities; source to that is the Chilean Travel Survey "Encuesta Origen-Destino 2001 – EOD") is assigned to an individual whereas the activities are differentiated by those of primary and secondary importance. The decision for destinations and modes of each activity is taken simultaneously in reference to the transport system supply quality (times, costs). It goes along with an adjustment process to adjust modeled expected time expenditure to observed time-use of travelers to make sure that the complete activity-trajectory (refers to an activity-plan complemented by destinations and modes) is practicable. In this regard, the paper concentrates on the formulation and solution of the computation of conditional probabilities for any activity-trajectory by the combination of Origen-Destination (OD) matrices the ESTRAUS-model provides.

Mayor inputs to the model are daily activity-plans, generated by an investigation and analysis of the EOD data set. The EOD for Santiago provides information about approximately 150,000 trips as well as sociodemographic and economic characteristics of nearly 60,000 people living in 15,000 households. Using this information a set of about 46,000 activity-plans could be generated. Consequently, results with regard to similarities and differences of travel behaviour characteristics of the Santiago sample are presented and discussed (e.g. variability in starting and duration times of activities, activity generation rates by user groups, mode choices by activity type). Besides the explanations of the analysis of activity-plans, the paper will describe the integration and further application of the plans within the development of the ABDG framework.

Summing up, the paper emphasizes the potentials of the new modeling framework for the analysis of measures with influence on the city's transport demand and provides an outlook on the upcoming challenges and developments.