Introduction

Transport Planning and Social Network Analysis – An Introduction

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Transport planning began to use the methods of social network analysis about 15 years ago (see for example, Axhausen (2005) based on a presentation given in 2002; also see Chapter 1). Aiming to understand and model peoples’ out-of-home movements and related choices like traffic mode and location choice, the academic field of transport planning was confronted with two major challenges at that point: First, various national travel surveys in Western societies indicated an increasing importance of the leisure travel segment (for examples, see BFS and ARE 2012; Deutsches Institut für Wirtschaftsforschung 2012; DfT 2012; U.S. Department of Transportation 2011). However, most work in transport planning focused on travel related to work purposes, i.e. commuting and peak hour traffic causing many problems for transport system managers (Larsen et al., 2006). Approaching and explaining leisure travel, as an example of non-work related traffic, is in contrast more complex. In comparison to work related behavioural patterns, peoples’ variety in leisure behaviour is usually much higher: For example, leisure travel and activities are less rigid in temporal and spatial patterns and they are more influenced by external factors like social contacts or weather conditions (see Schlich et al., 2004).

The second challenge resulted from the development and availability of disaggregated modelling frameworks to approach (personal) travel. Traditional aggregated models are zone based. In these model frameworks, trips between zones are determined by the attractiveness of a destination zone to perform certain activities and the generalized costs between origin and destination. The value of an activity is the utility a person gains when satisfying a need. Needs are developed in the zone of origin and can be satisfied at one or several destination(s). Need satisfaction naturally accounts for generalized costs like travel time and monetary costs that usually increase with an increasing distance between two zones. The choice to perform a certain activity at a certain place is therefore explained by a person’s characteristics including individual constraints in time, money, and capability, and the generalized costs. Decision makers are assumed as being independent from each other, exclusively driven by their individual needs. Therefore, these traditional aggregated models do not include any information on peoples’ social interactions or their personal social networks. In contrast, disaggregated models are often implemented in an activity based way. This allows
a more detailed modelling of travel including traditional elements like individual characteristics, motivations, constraints and travel costs, and, in addition, a consideration of new influences from an actor’s social environment as well. Considering peoples’ interactions means that a person does not exclusively travel within an infrastructure but also within a social structure (Frei, 2012). Therefore, decision makers are not considered as being independent from but as influencing each other.

These two main driving factors made transport planners focus on peoples’ interaction and their social network. In recent years there have been a remarkable number of data collection efforts in the field, surveying information on the link between travel behaviour and social motivation. Providing an overview on selected exemplary studies is the main purpose of this volume. The overview includes three dimensions: First, the motivation of the overlap between transport planning and the methods of social network analysis is addressed, including a detailed discussion of the research questions. Second, an overview of the applied methods of social network analysis and related empirical results is provided. Third, current challenges and new research questions in this area are outlined.

Focusing on a coherent sequence of research studies in Switzerland helps to trace back the use of social network analysis methods in transport planning. It can be seen how first hypotheses emerge from theoretical considerations and literature research (Chapter 1). These first hypotheses led to a qualitative study including in-depth interviews to gather first insights on the spatial spread of respondents’ social contacts and related mobility strategies to maintain these relationships (Chapter 2). The experience of this first study was the basis of a larger-scale quantitative survey study on peoples’ personal networks (Chapter 3). This study particularly focused on respondents’ network size, the spatial spread of their social contacts and communication strategies to maintain these relations. It thus aims to test hypotheses and results from Chapters 1 and 2 empirically. However, usually personal networks are embedded in a population-wide network structure. This underlying network allows feelings (Christakis and Fowler, 2009), styles and behaviours (Gladwell, 2002), as well as contagious diseases (Mossong et al., 2008; Smieszek et al., 2011) to spread within a given population. It can be assumed that the level of social coherence and related network issues also influence travel behaviour decisions. Accordingly, a second survey study aimed to reproduce the (local) findings on personal networks from Chapter 3 in a nation-wide survey and study the population-wide network structure of the Swiss population (Chapter 4). Chapters 2, 3 and 4 include detailed information on the survey strategy, instrument and data analysis. They thus show in which way the methods of social network analyses can be applied in transport planning.

Three additional chapters introduce current challenges and research questions. Chapter 5 focuses on differences between personal networks from different populations and locations. A comparison between empirical results from various survey studies, including Swiss and non-Swiss data collection efforts, identifies such differences. The analysis particularly focuses on influences among socio-
demographics, personal network characteristics, mobility biographical aspects, social network geographies and spatial patterns between social contacts by considering the local, regional, or national context of each study and the time they were in the field (Chapter 5). Chapter 6 compares issues of personal networks from Toronto, Canada and Concepción, Chile. This second comparison study focuses on effects from travel demand and supply to enable and maintain social relationships by considering the available transport systems. Finally, Chapter 7 highlights the time dynamics of social networks. As people establish new relationships and maintain or loose older ones, their personal network structures change over time. An overview of the time patterns of personal networks is accompanied by a discussion on the importance of this dimension for transport planning issues.

This edited volume on the link between social contacts and travel behaviour patterns fits well into the series Transport and Society. This becomes clear when recalling an earlier volume of this series, *Mobilities: Networks, Geographies* by Larsen, Urry and Axhausen (2006) or the volume edited by Grieco and Urry (2012) *Mobilities: New Perspectives on Transport and Society*. Building on these, the current volume presents exemplary research studies. It is by no means the last word on the use of social network analysis methods in transport planning but provides an intermediate overview on the methods applied and the insights obtained. Chapters can be read consecutively and include cross-references wherever necessary. However, it is also possible to focus on selected chapters as each of them introduces its research question, technical terms.

**References**


