

Social Networks and Travel Behaviour

Summary

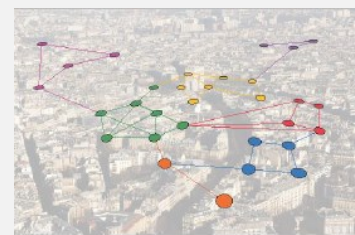
The past decade has gone through rapid ICT developments, which had wide societal impacts. ICT enhanced the shift from social groups defined by location to individually-based social networks. High-speed telecoms allow for ad-hoc personalised networks that affect travel behaviour. Unfortunately, research has lagged behind ICT advances, as our understanding of current travel behaviour is limited and existing urban mobility solutions cater to population behaviour that no longer exists. The transport demand models used today are based on inadequate understanding of the new social structure. A new transport paradigm is needed for the ultra-urbanized smart city. This Action aims to develop a new collaboration framework for the various EU research groups that develops a new transport paradigm based upon ICT social networks and their subsequent travel behaviour in the urban environment. The goals are to explore ways in which social activities become mobilized in space, identify how social ties affect the integration of local public transport into urban patterns, and develop a rigorous conceptual framework for new ideas and methodologies. This work is achieved by creating a joint discussions platform that includes seminars, thematic working groups, discussion sessions, workshops and publishing scientific results. Social networks are one of the main motivators for the use of transport systems. A social network is a social structure, based upon group members and the relations among them. Social network studies are concerned with the structure of socio-cultural systems, such as the amount of contacts and level of communication among different members of a certain social group. The appearance of virtual social networks and changes in patterns of work (home/hub-based, shorter working week days) have resulted in integration of leisure activities with other daily routines. The past decade has witnessed rapid communication developments, which have major social impacts. The use of the new Information and Communication Technologies accelerated the shift from social groups that were defined through a specific location (e.g., residential neighbourhood or work place) to individually-based social networks. This shift, coined by in research the "Networked Individualism," is a stage in which mobile, high-speed telecommunications allows for personalized networks and "person-to-person" social ties. These new social networks are associated with several changes, compared to the past 50 years, such as; wider spatial distribution of social networks members than in the past, typical social networks are less coherent, i.e. fewer people share multiple affiliations today than in the past, memberships overlap less in spatial terms, i.e., vis-à-vis their residential locations and activity spaces, people have a larger set of active contacts today than

in the past, and the contacts are spread across more social networks than in the past. At the same time, rapid transport network systems enable long-distance mobility and multilocality to develop. These mobility practices depend on residential biographies, social and familial anchorages and appear to concern more and more people. The link between (residential and daily) mobility practices and social ties then necessitates to be more precisely studied.

All of the above have an impact upon travel and mobility within the urban realm. However, current transportation models are not equipped to deal with this new social structure. They are based upon what professionals' term as "little-boxes," in which "members used to deal principally with fellow members of the few groups to which they belonged: at home, in the neighbourhood, at work, or in voluntary organizations. They worked in a discrete work group within a single organization; they lived in a household in a neighbourhood; they were members of one or two kinship groups; and they participated mainly in structured voluntary organizations: churches, bowling leagues, the ACM, and the like."

Current transportation models, developed in the 1950s, are still at the core of the transportation strategic planning process. These models do not capture the transition from a situation in which a person's social networks had once been strongly overlapping and spatially coherent to the current situation in which membership overlap is small and members are spatially dispersed.

Existing models forecast the future demand for travel in a specific area/city/region and therefore play a major role in the defining the specification of the Intelligent Transport Systems (ITS) tools that follow. The demand model commonly used in a conventional transportation plan is composed of four analytic sub-models including: trip generation, trip distribution, modal split and traffic assignment. They are developed in a linear order, where one model's output is the subsequent model's input. The result of the planning process is the development of transportation infrastructure and related ICT and ITS services. Even though significant advances in modelling travel demand have been made over the years (mainly by methods of disaggregate choice modelling and later by incorporating insights gained from activity-based travel theory into urban travel forecasting models), the basic theories and concepts did not change very much. Future trips are still predicted from past behaviour patterns. Transport models, and in particular operational models, also focus on the generalized costs of travel to explain travel choices. The generalized cost of a trip is composed of travel time and perceived



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monetary expenditure, as well as risk and comfort. In such models the benefits arising from the activity participation are captured poorly through the activity's purpose.

Research on social networks and travel behaviour began only around 2003 and has produced eight empirical research studies with several papers for each group. As pioneers in this field, a number of basic questions had to be addressed, such as: which social network parameters are important for travel behaviour study? Which phenomena should be studied? And what methods are suitable?

The common denominator in all previous research is that travel behaviour, though influenced by social networks, is studied on an individual basis, such as by using the "Egocentric Analysis" approach. Most studies have used traditional transport activity-based modelling and variables, in particular travel distances, frequencies and mode of travel. They focus on leisure trips and usually resulted in drawing "confidence ellipse" showing distances and activity space of an "average person," as well as statistical technical correlations among travel variables (such as social travel distance, mode of travel, number of trips) and social network characteristics (such as strong/weak ties between members), controlling for personal and household characteristics.

Former studies lack the spatial characteristics of the trips and the spatial configuration of the mobility network that influences the mobility flow and the location of various economic activities.

They tend not to focus either upon the characteristics of the actual location of the activities or the path/route taken. The urban environment characteristics are missing. Thus, the public transport system fails to accommodate properly the needs of modern lives, and there is a need for a paradigmatic change in the travel planning demand modelling. In order to fill this gap a conceptual framework for integrating analysis of ICT social networks with travel behaviour, mobility and urban analysis is proposed in this action, leading development of a new transport paradigm and foster public transport services in urban areas.

Objectives and Benefits

Aim

This COST Action aims to initiate a new collaboration framework for the various

European research groups in urban transport and urban networks including sociology, transport research, urban planning, architecture, geography and Information Technology (IT) science to develop a new transport paradigm based on ICT social networks and their subsequent travel behaviour. Through this collaboration the COST Action partners are expected to focus their research on exploring the relationships among ICT social networks, social travel behaviour, and spatial configuration. In particular, the goals are to explore the ways in which social activities become mobilised in space, to identify the ways in which social ties affect the integration of local public transport into urban patterns, to establish a linkage between social networks, travel behaviour and urban structure and to broaden the theoretical and practical framework of the field, taking into account both urban structure, and jointly performed social activities.

Objectives

- Develop a conceptual framework for analysis of ICT social networks that will comply (or be compatible) with travel behaviour and mobility analysis.
- Foster new concepts for public transport services.
- Identify guidelines for collecting spatial information for urban network analysis from social networks and the community of passengers.
- Develop a combined conceptual framework that will integrate methods from three disciplines including social networks analysis, travel behaviour analysis, and spatial configuration and urban research. These will be complemented by striving towards a pan-European consensus for the required structures of data security and privacy aspects in new transport models.
- Exchange local experiences in different urban settings and to assess the implications of ICT social networks activities on public transport, the transport system and urban form.
- Contribute to training young researchers in an innovative interdisciplinary new research area that has implications for urban and transport planning.