Connection Between Social Networks, the Built Environment, and Travel Behavior in the ICT Era

Giancarlos Troncoso Parady

Assistant Professor

Department of Urban Engineering. The University of Tokyo

Abstract

Against the background of urban sprawl and suburbanization, worsening traffic conditions and declining city centers, recent years have seen a paradigm shift in the conceptualization of what constitutes good urban development. Be it New Urbanism or Smart Growth in the United States, or Compact Cities in the EU and Japan, there seems to be a push from practitioners, academics and some governments towards more transit-connected, compact, and mixed-use cities. As a result, a considerable amount of research has been conducted to establish a causal relation between the built environment and travel behavior. That is, the idea that the built environment exerts a strong enough influence on individuals and households to effectively change their travel patterns. On the other hand, in the face of low-cost transport and information and communication technologies (ICT), and increasing disposable income and time budgets as a result of increasing productivity and efficiency, changes in long-term and short term mobility patterns have been observed. In particular, travel for non-work purposes, such as social activities and leisure increasingly account for larger shares of travel, and levels of car ownership are decreasing among the younger cohorts. This trends have been observed in Japan and other developed countries.

These issues raise a number of important questions such as how will travel patterns change in the face of these technological developments? What will be the effect of these changes on the future form of cities? Will lower travel and communication costs result in higher levels of suburbanization countering the push towards more compact cities? Furthermore, do traditional transportation analysis and forecasting tools suffice to answer these questions?

Traditional transportation analysis and forecasting methods were largely designed to model home-based work trips, and rely on assumptions regarding household and social structures that are now outdated. As a result, these models perform poorly when modelling the highly complex and diverse travel patterns observed in modern society, in particular, social activities which by their discretionary nature are less bounded by spatio-temporal constraints, and exhibit much more variability. While traditional behavior models assume individuals to behave independent of others (at most interacting with other household members), recent research has pointed to the role of social network interactions in explaining the observed variability in discretionary travel.

In this presentation I will first discuss the issue of causality in the relation between the built environment and travel and provide some empirical evidence in a Japanese context on the existence of modal substitution mechanisms between car and non-motorized modes travel given increases in the urbanization level of one's residential location. Then I will broaden the discussion to incorporate the social networks component into travel behavior analysis, and elaborate on the effects of social network characteristics on communication patterns and leisure travel behavior, in particular (i) general characteristics of social networks in a Japanese context, (ii) the relation between inter-personal contact frequency, and spatial location and (iii) the relation between (i) and (ii) with leisure activity propensity. I will conclude my presentation outlining potential avenues of research incorporating social networks into travel behavior studies, and discussing its potential implications from an urban planning perspective, specifically in relation to the questions raised above.