

Abstract

This thesis investigates the dynamics of the relationship between personal communications and travel, using agent-based computer simulation modelling. It focuses on the interaction between social, communication and transport networks. The novelty of the thesis lies in using this new modelling technique to identify the important factors underlying this relationship, to get a better understanding of why communication and travel have grown together, and to address the question ‘Why are communication and travel complements, not substitutes?’

A new way of modelling social networks is presented, based on social circles, which reflects the characteristics of social networks better than the standard network models. This social network model is then used as the basis for three case studies, drawing on qualitative and quantitative secondary data. The first case study looks at the development of mail from 1840 to the start of the First World War; the second at fixed-line phones from 1951 to 2001; and the third at mobile communications and the internet from 1998 to 2007, with forecasts to 2021.

The key conclusion is that communication networks evolve out of social networks as does travel for social purposes. When a new communications technology is introduced, affordability is always an initial constraint on take-up, but in the nineteenth century literacy was also important, as is ‘digital literacy’ in the late twentieth and early twenty-first centuries. Literacy enables people to keep in touch with those who are geographically remote and this communication is likely to engender travel. Because the internet facilitates meeting new people, this effect is strengthened in contrast to earlier communication modes which have in general only facilitated contact between people who are already known to one another.