Chapter 1
Introduction

The patterns and rhythms of urban life have fascinated observers ever since urban life began (Mumford 1961; Pahl 1970; Lilley 2002). Industrialization profoundly changed the scale of urban life from the early 19th century onwards, inspiring works by Honoré de Balzac, Friedrich Engels, Charles Booth (1889)[1] and Auguste Comte, for example. The rapid growth of cities exacerbated urban problems, making it necessary to provide and manage urban infrastructure more professionally. Transport planning and traffic engineering were two allied disciplines which emerged out of these processes relatively late, in the 1930s and 1940s, but both had been concerns of municipal engineering and urban design from the start in the 1860s (see, for example, Baumeister 1876). Their purpose has always been to provide urban actors with a reasonably priced transport system for the pursuit of spatially distributed activities (see Chapter 11 for empirical evidence).

Early success in the 1950s by social-physics researchers using large-scale, computer-based models narrowed the focus of transport planning to the peak hours of the average working day (see Weiner 2008; Hutchinson 1974; Martin, Memmott, and Bone 1961; Leibbrand 1957). While this focus was understandable against the concerns of the day, it became increasingly restrictive as time progressed. Then research in the tradition of the activity-based approach to understanding travel behaviour (see Chapter 4 for an introduction) emerged as the most important tool for widening the scope of analysis for transport planning. Not the isolated trip (see Chapter 3 for definitions), but the whole activity programme with its rhythms and interdependencies became the object of analysis (see Jones et al. 1983 and the proceedings of the relevant conference series, especially: www.iatbr.org). Better knowledge of the structures and motives of longitudinal travel behaviour has enabled transport policy and planning practice to design better measures to influence travellers according to current transport policy priorities (Long 1997; Miller 1999). Since demand management, information and counselling play more important roles in transport policy today, the traveller as an individual decision maker and his or her travel habits have been receiving more attention.

The work reported here belongs to the tradition of activity-based analysis and advances it in one crucial aspect: For the first time it employs multiday geocoded[2]

1 See also booth.lse.ac.uk.

2 Geo-coded data add an exact geographical reference (coordinate) to the item observed or reported, which allows it to be mapped, to be linked with other spatially referenced data and analysed.

observations to address questions which had been raised earlier by our discipline, but never pursued for lack of data:

- What are the multiday rhythms of activity participation?
- How variable is behaviour from day to day?
- What is the size and shape of human activity space in the urban area?
- How is innovation in spatial choice mixed with well-known routines?

This is not to say that such data have never been collected or that such analyses have never been undertaken before, but either the data was much more limited in scale and scope, or the questions were different. The only early geocoded long-duration survey (the five-week Uppsala survey of 1971; see Chapter 6) was never analysed in its spatial dimension, but employed to identify the typical day or answer the reverse question of inter- and intrapersonal variability. Analyses of various two-week surveys also focused on the latter question (see, e.g., Webber 1978; Yun and O'Kelly 1997; Miller and O'Kelly 2005).

The structure of this book

This book has four main parts. Part I presents the foundations, including a discussion of theoretical perspectives on time, space and travel, an introduction to data-collection methods and terminology and a presentation of the longitudinal data sets used in our analysis. Part II focuses on the temporal aspects of day-to-day travel behaviour, which includes the concept of activity scheduling, basic results on human mobility and an analysis of the temporal rhythms of human space-time behaviour. Part III provides a framework for the analysis of spatial aspects of day-to-day mobility and presents results on the variability of human activity space. Part IV concludes with an interpretation of our findings.

PART I – Foundations

In Chapter 2 we introduce the subject of this book by sketching the interaction between social networks, activity spaces and traffic growth. These linkages influence the adoption of intelligent transport systems, particularly with respect to their management and control technologies. We then develop qualitative models of personal activity space and commercial markets. These suggest that any decoupling between economic and traffic growth will be difficult. They also suggest that any change in trends is difficult to achieve because existing travel patterns reflect the social-capital structures of society, and society is reluctant to change without good reason or external pressure.

Chapter 3 provides a consistent definition of the units of measurement for human movement. The scope of transport and activity surveys is described, and the strengths and weaknesses of the possible implementations of such surveys

(stage, trip, journey and activity-based) are highlighted, as are similarities with comparable issues in time-budget surveys.

Chapter 4 provides the theoretical and empirical background for the analyses in this book, with a focus on the introduction of the *activity-based-analysis* (ABA) tradition within mobility research, the relevant terminology of the space-time travel relationship as well as concepts and findings of earlier work on the subject.

Different levels of reporting in travel and activity diaries (stage, trip, journey and daily activity chain) result in various non-reporting strategies by the respondents that interact across the sequence of contacts between the survey researcher and the respondent. Chapter 5 summarizes what is known about these non-response processes and suggests expected values for the most crucial of them: reports of staying at home.

The analyses in this book are based on a range of individual panel-data sets derived by different data-collection methods and survey areas, which provides a great range of behavioural patterns and regional peculiarities. Chapter 6 gives a synopsis of the data bases used to reveal the structures of daily mobility. It provides a detailed description of the different data sources and clarifies differences between the observation approaches, especially between travel-diary surveys and in-vehicle GPS tracking.

Part II – The temporal aspects of day-to-day travel behaviour

The authors of this book take the view that people plan and schedule their day. Chapter 7 suggests a framework for understanding this process and summarizes current knowledge about how travellers commit to trips and activities over the preceding days.

Chapter 8 frames the other results by providing an overview of current patterns of travel behaviour in its key dimensions (share of out-of-home travellers, number of journeys and trips, distances travelled and the durations involved in conjunction with the modes chosen) while addressing the temporal (day-of-week and time-of-day) and spatial (urban, suburban and rural) dimensions.

Chapter 9 is about variability and periodicity of personal day-to-day travel. We develop a conceptual framework to investigate the day-to-day variability in activity demand and a suitable modelling approach to capture the variables driving it.

Part III – Human spatial behaviour and the analysis of activity spaces

In Chapters 10 and 11 we describe the development of approaches to visualizing and measuring human activity space and we outline a (comparative) analysis. We then provide a synopsis of the results gained by the two main analytical approaches (enumerating trips and locations over time and continuously representing and measuring space usage).

Part IV – Conclusions

Chapter 12 concludes with a summary of the results and a methodological and policy-relevant review of the major findings. The analysis of the longitudinal travel data will show a distinct ambiguity between strong habits and the aspiration for variety seeking, especially in spatial behaviour.