

Modelling on the Move 4

Social Theory, Transport and Energy Modelling

University of Westminster, Friday 13th September, 9:30 – 4pm

9:30am registration, coffee

10am Theories, categories and units: collecting and using data on time, mobility and energy demand. Jillian Anable (University of Aberdeen), Ben Anderson (Durham University), Elizabeth Shove (Lancaster University), Jacopo Torriti (University of Reading).

Methods of data collection are unavoidably rooted in some sort of theoretical paradigm, and are inextricably tied to an implicit agenda or broad problem framing. These prior orientations are not always explicit, but they matter for what data is collected and how it is used. They also structure opportunities for asking new questions, and for linking or bridging between existing data sets. In this contribution we provide an historical and comparative review of the changing categories used in organising and collecting data on mobility/travel, energy and time use. This exercise reveals systematic differences of method and approach, for instance in units of measurement, in how issues of time/duration and periodicity are handled, and how these strategies relate to the questions such data is routinely used to address. It also points to more fundamental differences in how traditions of research into mobility, domestic energy and time use have developed. We end with a discussion of the practical implications of these diverse histories for understanding and analysing changing patterns of energy/mobility demand at different scales.

11:15am Models in the Wild: rethinking modelling in the context of climate change. Dan Olnier (Leeds University)

During the next few decades an energy revolution must take place to avoid the worst effects of climate change. This poses an unprecedented challenge to the use of quantitative models and the role they play in steering social choices. Models are a form of map; Scott notes maps are "designed to summarise precisely those aspects of a complex world that are of immediate interest to the map maker and to ignore the rest" and that, through their use, they have the power to transform what they describe (Scott 1998). This power, wielded by the state, has made much of the political right see modelling as intrinsically authoritarian, liable to damage social structures beyond any model's reach. Climate change challenges model builders and users to prove this wrong. In her final article, the late Elinor Ostrom argued that "no one knows for sure what will work, so it is important to build a system that can evolve and adapt rapidly" (Ostrom 2012). This is easy to state, but how in practice can models, and the systems they are embedded in, be made this responsive? At one extreme is the cybernetic ideal typified by Stafford Beer. He quotes Macmillan: "running the economy is like trying to catch a train using last year's timetable." Stafford Beer believed it possible to create a perfectly responsive system, and even attempted to apply this ideal to an entire economy in 1970s Chile before Pinochet's coup. At this extreme, there is no difference between model and governance (and so perhaps no democratic oversight). Or should model-building be a much more modest affair? Milton Friedman argued for models as "engines of analysis", not "realistic utopias"; one part of a set of tools able to support decision-makers' common sense. But can this approach, plugging into existing governance structures, hope to achieve a transition to a post-carbon world?

12:30 Lunch

1:30pm Metaphors, metonyms and alternative narratives of the transport system Paul Timms and David Watling (STEP CHANGE / University of Leeds)

Draft Timetable

Empirical, practical and predictive activities in transport research (such as analyses of past evidence, studies to identify current problems, and formulation of plans for the future) generally make a variety of explicit and implicit assumptions about the mobility of people and goods, the means provided for such mobility and how transport policy is made. These assumptions, when bundled together in a specific study, can be understood as forming an account of the transport system. A model can be understood as a device for constructing such an account. A key insight of the presentation is that all such accounts (and hence models) are underpinned by narratives as to how the transport system evolves, and that in order to get better understanding about transport modeling and its role in society it is necessary to make an analysis of narrative-types. The presentation will describe a classification of four narrative types identifiable in existing transport research based upon two sets of criteria: (assumptions of) contingency versus determinism; and actor-based versus (external) scenario-based narratives (where an actor can be interpreted as any decision-making entity, such as individual trip-maker, individual policy-maker, local authority etc). It will be argued that traditional transport modeling puts undue emphasis on determinism at the expense of contingency. Ideas will be presented as to how semiotic analyses, examining the metaphors and metonyms embedded in transport modeling, can help the development of future-oriented narratives and models that pay more attention to contingency.

2:45pm Using simulation models to explore changes in social practices. Georg Holtz (University of Osnabrück).

This talk is about using simulation models to understand (change of) social practices. It discusses some fundamental issues that arise from this intent and presents an abstract model for doing it. Modelling as a formal method involves the definition of elements and relations among these which are supposed to explain some phenomenon of interest – the latter being in this case the change of social practices. This raises a set of questions: What are social practices, i.e. what is the ontology to be applied for modelling social practices? What are appropriate elements and relations to be included in a model of (change of) social practices? What is an appropriate method to formally represent the elements and relations and to study resulting dynamics?

In the model study presented, social practices are understood as socially shared routine behaviour which emerges from underlying elements and relations. The components approach by Shove and colleagues is used to represent the underlying elements, and five processes which establish relations between the components within or between individuals are identified based on (socio-)psychological research. Agent-based modelling is used to implement the outlined conceptual model in a computer simulation model. Agent-based models comprise self-contained software parts (the 'agents') which interact with each other and their (in silicio) environment. Agent-based modelling allows using the full potential of a computer language to describe agents' characteristics and their interactions. It is thus a flexible method able to include all sorts of elements, be it humans, material artefacts, or components, and to represent all kind of relationships among these. In the abstract model presented, the components are represented as Bitstrings, what allows expressing in an abstract way similarity between components as well as processes of mutual adaptation. The relations are operationalized as processes that switch bits or change components adopted by individuals. In a first step the simulation model has served to confirm the conceptual model. The simulation model is able to let emerge socially shared routine behaviour, i.e., social practices. The model can now be used in future research to study which measures seem promising to change social practices.

4pm Close