Applied Spatial Analysis and Policy (2018) 11:645–646
https://doi.org/10.1007/s12061-018-9283-5

Editorial: Spatial Interaction Modelling

Martin Clarke [1]

Received: 12 October 2018 / Accepted: 24 October 2018 /
Published online: 21 November 2018

Spatial interaction modelling has seen extensive use in public and private sector planning over the last 50 years or so. Although its history can be traced back to researchers in the late 19th and early 20th centuries, where Spatial Interaction Models (SIMs) were often referred to as 'gravity models', the whole field witnessed a sea change in the theoretical underpinnings of SIMs with the publication of Wilson's seminal paper in Transportation Research in 1967 (Wilson 1967). To celebrate the fiftieth anniversary of this publication, a special session was organized at the European Colloquium on Quantitative and Theoretical Methods in Geography in York, England in September 2017. The papers published in this special theme in *Applied Spatial Analysis and Policy* were originally presented at this session. They display the variety and range of the theoretical and applied breadth of SIMs both historically and looking forward.

Fittingly, the first paper is by Wilson himself, looking at the future of urban modelling and demonstrating the range of applications that have appeared in sectors such as urban planning, defence, history and global trade. The paper demonstrates that his contribution to the field has been immense. With the advent of 'Big Data', the opportunities for more detailed applications are beginning to emerge.

When the issue of model application to real world planning problems started to attract attention, scant regard was paid to a number of issues. Amongst these were zone size and intra-zonal costs. Openshaw (1984) was one of the first to draw attention to some of these issues. He investigated the Modifiable Area Unit (MAU) problem and demonstrated that the definition of origin zones in SIMs could have a material bearing on both the parameterization of the models and also their results. Wilson always used to preface his conference presentations with the comment that the design of his models always assumed they were Openshaw optimal so deflecting any criticism from Stan. The paper by Senior and Williams revisits some of these issues and demonstrates the importance of getting some of these 'first principles' right or at least recognizing their importance.

✉ Martin Clarke
martin.c.clarke@btinternet.com

[1] School of Geography, University of Leeds, Leeds LS2 9JT, UK

The third paper, by Southworth, looks at the application of SIMs to freight flow modelling in the USA. The paper emphasizes the importance and complexity of freight flows to the economy of the USA. He presents a detailed review of their development since the 1960s but also highlights some of their shortcomings and missing data problems. He emphasizes that as the supply chain has become more sophisticated and consumers (whether these are firms or individuals) have become more demanding – just in time delivery, next day delivery – the need to have appropriately refined modelling tools is increasingly important.

Stillwell, Daras and Bell focus on the modelling of internal migration in their paper. They again visit the MAU problem and investigate the effects of scale and zone configuration particularly on the calibration of model parameters in SIMs. They point out that internal migration has become an increasingly important component of population change in many countries and that regional and local planners need to be able to project these changes to understand the future demand for services such as education, housing and health care.

The final paper, by Clarke and Birkin, looks at the evolution of SIMs modelling at the University of Leeds from work in the 1970s and 1980s from using largely 'invented' data to their application in a commercial context with some of the world's largest retail focused organisations in the 1990s and 2000s. They examine the differing enthusiasm for applied modelling in the private and public sectors and offer reasons for this. They also look at how the developments in modelling, geographic information systems (GIS) and wider data availability collectively improved the usability of SIMs.

I hope this collection provides a suitable tribute to the work of Wilson in the field. At the very least it should provide testimony to the diversity of applications in the field and their enduring popularity.

Compliance with Ethical Standards

Conflict of Interest The author declares he has no conflict of interest.

References

Openshaw, S. (1984). *The modifiable areal unit problem, CATMOG 38*. Norwich: Geo Books.
Wilson, A. G. (1967). A statistical theory of spatial distribution models. *Transportation Research, 1*, 253–269.