

**Decision
Support
Systems
in Urban
Planning**

**Edited by
Harry
Timmermans**

Published by E & FN Spon, an imprint of Thomson Professional, 2-6 Boundary Row, London SE1 8HN, UK

Thomson Science & Professional, 2-6 Boundary Row, London SE1 8HN, UK

Thomson Science & Professional, Pappelallee 3, 69469 Weinheim, Germany

Thomson Science & Professional, 115 Fifth Avenue, New York, NY 10003, USA

Thomson Science & Professional, ITP-Japan, Kyowa Building, 3F, 2-2-1 Hirakawacho, Chiyoda-ku, Tokyo 102, Japan

Thomson Science & Professional, 102 Dodds Street, South Melbourne, Victoria 3205, Australia

Thomson Science & Professional, R. Seshadri, 32 Second Main Road, CIT East, Madras 600 035, India

First edition 1997

© 1997 E & FN Spon

Typeset in 10/12pt Palatino by Saxon Graphics Ltd, Derby

Printed in Great Britain by TJ International Ltd, Padstow

ISBN 0 419 21050 4

Apart from any fair dealing for the purposes of research or private study, or criticism or review, as permitted under the UK Copyright Designs and Patents Act, 1988, this publication may not be reproduced, stored, or transmitted, in any form or by any means, without the prior permission in writing of the publishers, or in the case of reprographic reproduction only in accordance with the terms of the licences issued by the Copyright Licensing Agency in the UK, or in accordance with the terms of licences issued by the appropriate Reproduction Rights Organization outside the UK. Enquiries concerning reproduction outside the terms stated here should be sent to the publishers at the London address printed on this page.

The publisher makes no representation, express or implied, with regard to the accuracy of the information contained in this book and cannot accept any legal responsibility or liability for any errors or omissions that may be made.

A catalogue record for this book is available from the British Library

 Printed on permanent acid-free text paper, manufactured in accordance with ANSI/NISO Z39.48-1992 and ANSI/NISO Z39.48-1984 (Permanence of Paper).

Contents

List of contributors	vii	
Introduction	x	
<i>Harry J.P. Timmermans</i>		
Part One	Theory	1
1	The design of spatial decision support systems in urban and regional planning	3
	<i>Bola Ayeni</i>	
2	How to define problems: a systemic approach	23
	<i>Dirk Vriens and Paul Hendriks</i>	
3	Planning as argumentation and power-acting: theory and methods	34
	<i>Wolf Reuter</i>	
4	Establishing the design professions' perspective on GIS	53
	<i>Noel Campbell and Thomas O'Reilly</i>	
5	Geographical information systems and decision support for environmental management	75
	<i>Robert Peckham</i>	
6	Reversing decision support systems to reveal differences in human strategizing behaviour	87
	<i>Ray Wyatt</i>	
Part Two	Methodology	107
7	Urban convergence: morphology and attraction	109
	<i>Romulo Krafta</i>	
8	Integrating constrained cellular automata models, GIS and decision support tools for urban planning and policy-making	125
	<i>Guy Engelen, Roger White and Inge Uljee</i>	
9	Constructing and consulting fuzzy decision tables	156
	<i>Frank Witlox, Theo Arentze and Harry Timmermans</i>	

10	An optimization method for facility location using a genetic algorithm <i>Yoshitsugu Aoki and Naoto Muraoka</i>	175
Part Three	Application	193
11	Towards hybrid technologies for urban design: balancing reliability, power and speed in decision support <i>Joan Antoni Solans and Josep Maria Fargas</i>	195
12	GIS and decision support systems for local authorities in Malaysia <i>Ahris Yaakup, Foziah Johar and Nor Azina Dahlan</i>	212
13	Using the 'ALLOT' model in land use decision-making <i>Elise Bright</i>	229
14	Neighbourhood management, performance measuring and decision-making <i>Jos Smeets</i>	251
15	Design tools in an integrated CAD-GIS environment: space syntax as an example <i>Jan Teklenburg, Harry Timmermans and Aloys Borgers</i>	261
16	Three-dimensional CAAD modelling: technical constraints and local planning attributes as parameters for conceptual design support and evaluation <i>Ashraf Ismail and Kevin McCartney</i>	277
17	Computer-mediated cooperative spatial planning <i>Thomas Gordon, Nikos Karacapilidis, Hans Voss and Andreas Zauke</i>	299
18	Parking simulation using a geographical information system <i>Peter van der Waerden and Harry Timmermans</i>	310
	Index	323