

THE FUTURE OF URBAN FORM

The Impact of New Technology

Edited by
John Brotchie, Peter Newton, Peter Hall &
Peter Nijkamp

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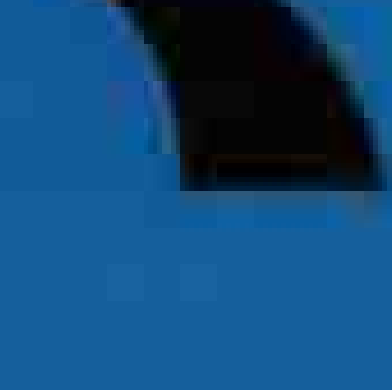
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Volume 5

THE FUTURE OF URBAN FORM

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THE IMPACT OF NEW TECHNOLOGY

**EDITED BY JOHN BROTCHE,
PETER NEWTON, PETER HALL &
PETER NIJKAMP**



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PREFACE

This book of exploratory essays is produced as an outcome of a workshop held in Waterloo, Canada, in July 1983 as part of an international study on technological change and urban form convened by the International Council for Building Research Studies and Documentation (CIB) as Working Commission 72 (CIBW72).

The meeting and associated background studies were concerned with those technological, economic and social changes occurring nationally and internationally which impact on cities and the communities which comprise them. These technological changes included automation in the secondary sector, the combination of the microprocessor and telecommunications in the tertiary and quaternary sectors, the effects of energy price rises and threats of shortage, and substitution effects in the energy and vehicle technology areas. Social and economic consequences included unemployment, increasing income differentials, changes in employment patterns, urban activities and lifestyles, and their interactions. Of foremost concern, however, was the manner in which socio-technical changes had a capability for altering the direction of urban development via changing space needs and locational requirements of industry and transport (supply induced) as well as of individuals and families (demand induced).

Almost without exception the chapters in this volume are future-oriented (with due recognition to the contribution that the past and present make to shaping the future) and are concerned with exploring, often speculatively, the transition of technologically advanced Western societies to an information-based post-industrial state and the impact that such a transition is likely to have on national settlement systems.

As such, the study has important implications for industry and community including building, transport, communications and other service sectors; all industries making investment, location and planning decisions, and all those concerned with the future of our cities and the communities they accommodate and support.

The Plan of the Book

Chapter 1 takes an overview. It notes that the microelectronic-information technology revolution is producing changes in our patterns of living and working at least as profound as did the industrial revolution but

within a shorter timeframe. The industrial revolution extended human musculature. The information revolution is extending the mind and nervous system. It is knowledge-based rather than energy-based, and knowledge is a cumulative resource, contributing to the increasing rate of change. Increasing diversity of opportunities and increasing informality of organisation of activities in space and time are among further consequences expected to occur. A model of urban change is outlined which recognises the interplay of supply (technology and profit-based) and demand (human needs-based) factors; the locational consequences of technological change are represented as two-dimensional trajectories in an activity and interaction space.

Part One provides an international and regional perspective. In Chapter 2, resulting changes in industrial and living patterns are viewed at the world and European levels. The new information based industries are reported to be bypassing the industrial cities in favour of high-amenity areas in the sunbelt and pre-industrial towns, raising the issue of whether these 'rustbowl' cities are restorable or disposable (along with the future of their inhabitants). Chapter 3 views the North American industrial scene. It classifies industry as 'routine' and 'non-routine'. Routine industries are seen to be seeking locations with low-factor costs and to be subject to automation, deskilling and job loss. Non-routine activities are considered to be seeking locations with high amenity and, in the case of 'high tech', further requirements include access to high-quality communications, international transport and knowledge centres. Other features are the growth of the quaternary and quinary sectors, and the number of new small firms setting up. It notes a reversal of the rule 'people follow jobs', substituting 'jobs follow people' in post-industrial society.

Part Two views future impacts on industry, providing a contrast between the UK and USA. For Britain (Chapter 4), the prospect of cities without manufacturing industry is raised, and a transition from supply-determined development to consumer-led development patterns is perceived. For the US (Chapter 5), the factors influencing the future of manufacturing are discussed; and a scenario of continued increase in capital substitution, automation and growth in high-technology industries is examined, with continued dispersal of industry and workforce. A less likely, politically imposed, 'low tech', labour-intensive alternative is also considered. Chapter 6 gives an overview which focuses on the quaternary sector (and on California in particular), which is enmeshed in the information-technology development wave.

Part Three examines the role of innovation in development. Chapter 7

explores the dynamics of the process of industrial and urban change including long-wave or cyclic effects. The place of innovation in this process and its implications for the urban system are considered and modelled. Chapter 8 views spatial patterns of biotechnology industries, which are at the front of the wave of the next technological revolution, and the different locational behaviours exhibited in their development and production stages.

Part Four treats communication and transport and their interactions. Chapter 9 evaluates the role of information technology (particularly telecommunications) in the urban system, including the changes in activity patterns that this is generating and the needs that it is meeting. The importance of trust as a factor in the development and operation of urban systems and the (initially inhibiting) role of information technology in this regard are discussed. Chapter 10 reviews the impacts of previous transport improvements on urban development and looks at transport innovations currently in the development pipeline (largely information-related), speculating upon their impacts on the urban system and its future form. Chapter 11 examines transport-communication interactions and the implications for growth in each. Chapter 12 discusses the impacts of energy price changes, scarcity concerns and associated transport and energy technologies on the urban system, arguing for better integration of work and residential activities through planning and policy initiatives.

Part Five considers information systems and their impacts. Chapter 13 discusses trends in both 'high tech' and 'low tech' ('high touch') service industries. Chapter 14 considers 'teleshopping' systems and their impacts on shopping-centre development. Chapter 15 proposes the concept of key factors in the urban system for use in urban planning, and information systems based on these factors to provide an early warning system for monitoring and analysing urban impacts of technological change. Chapter 16 discusses the reaction developing in many urban communities to perceived threats from high-technology and information systems, with the consequence that personal information for use in planning may not be collected in future.

Part Six discusses institutional influences: first from the viewpoint of the state as a facilitator of technological change and the role of planning authorities as regulators (Chapter 17); and secondly, the role of the state as a safety net (Chapter 18). The increasing roles of the informal sector and self-help networks and the responsibilities of industry itself in periods of societal transition are also noted.

Part Seven focuses on approaches to modelling urban systems under

selected change processes. Chapter 19 considers metropolitan implications of technological change using a transport-land use interaction model, with rearrangement of activities being projected under various scenarios. Chapter 20 studies energy impacts and policies for a metropolitan region and a non-metropolitan region using transport-land use interaction models. Chapter 21 discusses the resulting dynamics of urban change and new techniques for its modelling. Chapter 22 takes an overview of the urban change process and its relationship to the process of modelling that change, indicating the need to seek for a 'deep structure' of urban systems.

Part Eight considers the future urban system — firstly, to the extent that it is determined by decisions already made, and therefore predictable, and secondly, to the extent that it may be influenced by decisions yet to be made, and is therefore choosable. In Chapter 23, a study of current and emerging socio-technical trends and impacts, and their interactions, is reported. In Chapter 24 the criteria for a desirable urban system are discussed in the context of a better spatial balance between work and residence, with implementation via the co-ordination of various public sector investment decisions and planning controls.

Part Nine takes an overview of the future urban system and its implications for planning. Chapter 25 examines the various forces which operate to increase concentration of activities, and those working to increase their dispersal, and the various urban forms resulting. Dispersal at the national and regional levels and decentralisation at the metropolitan level are expected due to the influence of the information revolution; but redistribution of activity and concentration around urban sub-centres within the metropolis are also projected. Chapter 26 looks at planning strategies for the future and the reasons for both optimism and pessimism in this regard. The pessimism comes from projection of present trends in the short term. Cautious optimism relates to the potential for human intervention as a response to these projections, in selection of and working towards a more desirable future in the longer term.