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# **THEORIES OF URBAN EXTERNALITIES**

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The Author's Note: This book was originally published as *Theories of Urban Externalities* by North-Holland in 1980. The book became out of print and the copyright was returned to me. The electronic version of the book is now offered, for free, to people who are interested in studying urban economics. I would like to thank Mrs. Akiko Nishiyama and Mrs. Miyabi Okamoto for the excellent and laborious job they did creating the electronic version from the original hard copy.



**To my parents**

## PREFACE

In this monograph several aspects of externalities in cities are analyzed using extensions of a standard residential land use model. Topics covered are optimal and market city sizes, local public goods, traffic congestion, externalities between different types of households, and the growth of a system of cities.

The monograph grew out of the Ph.D. dissertation I submitted to Cornell University in 1977, which contained several original contributions to theoretical urban economics. I have made an effort to integrate recent theoretical development, and have added appendices on the envelope property and on optimal control theory to make the exposition self-contained.

Although the monograph is written primarily for researchers in the profession, it is designed to be accessible for graduate students who have finished a first year graduate microeconomics course. Mathematically oriented undergraduate students should be able to understand the materials after careful reading of the appendices on the envelope property and on optimal control theory.

I am grateful to the members of my dissertation committee, Walter Isard, who served as chairman. Henry Y. Wan Jr., and Richard E. Schuler, for their comments, criticisms, and suggestions. I wish to express my deepest gratitude to Robert M. Solow who acted as my adviser while the dissertation was being written and made possible an extremely fruitful year at the Department of Economics, Massachusetts Institute of Technology. My interest in this field was initially stimulated by his earlier works on theoretical urban economics. I also benefited greatly from his comments on an earlier draft.

I started doing research on some of the topics in this monograph when I was still a student at the University of Tokyo. I am grateful to Koichi Hamada, Takashi Negishi, Yasuhiko Oishi, Yukihide Okano, and Isao Orishimo for their guidance and suggestions.

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I owe an enormous intellectual debt to many other people who have worked on urban economics, but I do not list them here. Acknowledgement of prior contributions are gathered in the *Notes* at the end of each chapter.

David Robinson provided editorial assistance. His contribution goes, however, beyond the usual editorial work. He made a great contribution to making the manuscript readable, and, being an aspiring economist himself, spotted many errors in earlier versions.

I would like to thank May McKee and Hilary Wilson for the excellent job they did typing the camera-ready copy of the manuscript. May typed Chapters I and II; Hilary, Chapters III and IV; Virginia Tabak, most of Appendices; and I typed the rest of the book.