ASCE—MANUALS AND REPORTS ON ENGINEERING PRACTICE—NO. 49

Urban Planning Guide

Revised Edition

AMERICAN SOCIETY of CIVIL ENGINEERS

ASCE Manuals and Reports on Engineering Practice No. 49

Urban Planning Guide

Revised Edition

Prepared by the
Task Committee to Prepare a Planning Guide
of the
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of the
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ABSTRACT

More than any other profession, civil engineers are concerned with infrastructure, the fabric of urban life. Planning for maintenance and expansion of the nation's infrastructure is the subject of this book. The focus of this manual is the practical use of planning tools to solve real life problems. It provides the reader with a broad overview of the planning process and what factors or issues are of particular concern. The first three chapters deal with planning and the planning process in general, describing the process that any planning study must follow from data collection to implementation. The rest of the book covers urban planning in specific areas including land use, housing, urban transportation, intercity highways, airports, railroads, ports, community services facilities, water resources, parks, wastewater management, solid wastes management, energy, environment, and capital improvement programs.

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MANUALS AND REPORTS ON ENGINEERING PRACTICE

(As developed by the ASCE Technical Procedures Committee, July 1930, and revised March 1935, February 1962, April 1982)

A manual or report in this series consists of an orderly presentation of facts on a particular subject, supplemented by an analysis of limitations and applications of these facts. It contains information useful to the average engineer in his everyday work, rather than the findings that may be useful only occasionally or rarely. It is not in any sense a "standard," however; nor is it so elementary or so conclusive as to provide a "rule of thumb" for nonengineers.

Furthermore, material in this series, in distinction from a paper (which expresses only one person's observations or opinions), is the work of a committee or group selected to assemble and express information on a specific topic. As often as practicable the committee is under the general direction of one or more of the Technical Divisions and Councils, and the product evolved has been subjected to review by the Executive Committee of that Division or Council. As a step in the process of this review, proposed manuscripts are often brought before the members of the Technical Divisions and Councils for comment, which may serve as the basis for improvement. When published, each work shows the names of the committees by which it was compiled and indicates clearly the several processes through which it has passed in review, in order that its merit may be definitely understood.

In February 1962 (and revised in April, 1982) the Board of Direction voted to establish:

> A series entitled 'Manuals and Reports on Engineering Practice,' to include the Manuals published and authorized to date, future Manuals of Professional Practice, and Reports on Engineering Practice. All such Manual or Report material of the Society would have been refereed in a manner approved by the Board Committee on Publications and would be bound, with applicable discussion, in books similar to past Manuals. Numbering would be consecutive and would be a continuation of present Manual numbers. In some cases of reports of joint committees, bypassing of Journal publications may be authorized.

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Dedication

This Manual of Practice is dedicated to Roland J. Frappier (December 13, 1947–December 7, 1984), a committed member of ASCE's Urban Planning and Development Division, who contributed significantly to the preparation of this publication, both as an author and as an ex-officio member of the Peer Committee. As Assistant Chief of the Rhode Island Statewide Planning Program, Roland exemplified dedication to the planning profession and will be missed by all who knew and worked with him.

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Acknowledgments

In an undertaking of this nature and scale, there are such a large number of contributors that they cannot possibly all be named here. The work could never have been completed without unselfish and dedicated efforts by many, from authors to reviewers to typists. However, special recognition is deserved by a number of groups and individuals for their long-term commitment to this important effort.

First, to the authors, who each put a great deal of effort into the development of high quality chapters, which collectively add significantly to the base of ASCE publications. Special thanks are due to the authors for their dedication in faithfully incorporating the revisions suggested by the Peer Committee.

Second, to the Peer Committee, who reviewed the Planning Guide and without which this project would never have been completed. For a whole year, the Committee read, reread and "re-reread" a massive amount of material. Throughout, the Peer Committee maintained high standards, commenting on each chapter in detail. Their comments were consistently thoughtful, insightful, detailed and specific, making it easy for authors to respond. The members of the Peer Committee are as follows:

Ruth Fitzgerald—Chairman
Wayne C. Allinson—UPD ExCom Representative
William H. Claire
George D. Barnes
Daniel W. Varin
Roland J. Frappier

We were indeed fortunate for the purposes of continuity that Bill Claire was able to serve on the Peer Committee for this effort, as he served as editor of the original *ASCE Planning Guide.*

Third, to the members of the Task Committee to Prepare a Planning Guide, listed below, who worked so hard to formulate the *Planning Guide* approach and to bring it to fruition. Many from this Task Committee also served as authors of various chapters.

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*First Chairman
**Second Chairman

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Final thanks belong to my employer and to the employers of all other major participants who supported our efforts for the duration of this project.

A. Ruth Fitzgerald
CE Maguire, Inc.
New Britain, Connecticut
January, 1986

Preface

In 1969, the *Urban Planning Guide* was published by ASCE as Manual of Practice No. 49. This timely publication attempted to set forth the planning precepts of the time and was a popular and widely read document. After more than a decade of use, ASCE's Urban Planning and Development Division decided to either update the 1969 *Urban Planning Guide* or replace it with a new Planning Guide expanded to cover more of the current complexities of the planning field. The decision was made at that time to pursue the latter route, and a Task Committee was appointed to formulate and carry out the process.

The current *Planning Guide* contains a total of eighteen chapters. The first three chapters deal with planning and the planning process in a generic way, describing the process that any planning study must follow, from data collection to development of implementation measures. The last fifteen chapters are devoted to various specific technical subareas of planning, such as urban transportation planning, solid waste planning, and the environmental assessment process.

Although the *Planning Guide* contains eighteen different chapters, fifteen of them covering technical "subareas" of planning which may be of interest to planners and civil engineers, it makes no claim to full comprehensiveness.

The strong focus of this *Planning Guide* is the practical use of planning tools to solve real life problems. It is intended to be a handbook for practitioners rather than an investigation of planning theory. As such, the information provided in each chapter is not intended to add a new dimension to the field or to provide a step-by-step "cookbook" for carrying out planning studies, but rather to provide the reader with a broad understanding or overview of how the planning process applies to that field and what factors or issues are of particular concern. It is hoped that this *Planning Guide* will not only be useful to practitioners, but that it will serve as a text for use in engineering and planning curricula.

More than any other profession, civil engineers are concerned with infrastructure, the fabric of urban life. Planning for the maintenance and expansion of the nation's infrastructure is the subject of this guide.

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CHAPTER 1

PLANNING CONTEXTS[a]

1.1 ENGINEERS IN THE PLANNING PROCESS

Although this book occasionally refers to "planning" and "engineering" as though they were unrelated professions or disciplines, it does so only to differentiate between two parts of a large process. Planning and engineering are very closely bound to each other, as, indeed, planning is bound to many other disciplines. Planning is essentially the first phase of the development process and, as such, is also the first step in the engineering process.

Traditionally, engineering has been subdivided into five phases: planning, design (preliminary and final), construction, operation and maintenance, and monitoring or evaluation. In some respects, planning has become identified as a separate function, and design, construction, operation, and maintenance are commonly referred to as the engineering elements. It must be emphasized that this is by no means a clear distinction. However, the division of labor that has characterized technology since the Industrial Revolution, combined with the reality of an increasingly complex society, have resulted in the separation of planning, which is the broad view, from design and construction, which are more specifically directed. This division may also be characterized by the statement that design and construction efforts are directed toward meeting a need while planning efforts, in addition to meeting needs, are also concerned with identifying the need and determining the implications of meeting that need in a variety of different ways.

Occasionally, the planning phase of a project results in a recommendation that no further engineering is necessary. Rather, benefits can be most appropriately achieved by a management or operational course of action. For example, the decision to expand bus service rather than construct a rail line, or the decision to implement an aggressive ridesharing program rather than widen a congested highway corridor, are

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