SOLUTION MANUAL

TO

LOCATION THEORY AND DECISION ANALYSIS

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LOCATION, TRANSPORT AND LAND-USE:
MODELING SPATIAL-TEMPORAL INFORMATION

by

Yupo Chan
FORWARD

Yupo Chan Esq. composed the complete work on *Facility Location and Land Use/Multicriteria Analysis of Spatial Temporal Information*. In a land far away from his parents, he pursued an industrious academic career. As a naturalized citizen of the United States, he married the former Susan Johnson—both when they were in their middle age. As a legacy to his parents, this volume is dedicated expressly with a Chinese-language forward to his father Mr. Chan Wui of Hong Kong and his mother Madam Yeung Yun-Yin, for bringing him to this world and their careful upbringing.

The earth is made up of seventy percent ocean. There is only a limited amount of land resources upon which we intricately depend. This scarce resource is often further diminished by ocean erosion and by infringing mountainous-topography. Misuse of land further upsets ecological balance. Little scientific guidance is available for the judicious use of this small amount of developable land. In his book, Mr. Chan shed some light on this important area of investigation.

Mr. Chan was raised in Hong Kong. He obtained his doctorate at the Massachusetts Institute of Technology. Among his teaching appointments were the State University of New York at Stony Brook and Washington State University. He is currently Professor in the Graduate School of Engineering at the Air Force Institute of Technology. For five years, he also served as deputy head of the Department of Operational Sciences. Among his professional experience was a response to an invitation to attend the "National Reconstruction Seminar" at Taiwan, Republic of China. He contributed as a member of the Transportation Discussion Group. Being a good friend of my son-in-law Hsu Chin Shung and being of Chinese ancestry, I was asked to honor the Chinese family tradition by composing this forward. In spite of my limited familiarity with this subject area, I am more than glad to oblige in this meaningful project—even at my advanced age of seventy eight.

Wang Hung Wen
Taipei, Taiwan

---(Original Chinese forward appended at the back of the Manual)---
I. Introduction

As pointed out in the book, the set of homework and case studies is developed for both classroom and professional use. Rather than a regurgitation of mechanical calculations, it is designed to extend many of the concepts covered in the book. The exercises and homework are broken down into these topics: Remote sensing and geographic information systems, Facility location, Location-routing, Activity derivation/competition/allocation, Land-use models, and Spatial-temporal information. Even though they are categorized by these major topics, the exercises play an important role in integrating the many diverse principles advanced in the text. In some quarters, they are given the name "mind expanding" exercises, so named for their synergistic effects and open-ended answers.

Another objective of these exercises is to challenge the readers in creatively using the data-sets and computer software that come with this book. For easy references, key instructions to the software are printed out in hard copies and included here in this Solution Manual. The complete User's manuals are included as README files compiled with the computer programs and data-sets. Being the information age, additional data-sets can be downloaded from a number of worldwide-web internet-sites. We have included a sample of these in this Manual. These additional data can help the readers to construct and analyze other real-world case-studies of interest to them.

To assist both the instructors and the professionals, answers to selected exercises are available in this "problem solutions" booklet, or the Solution Manual in short. Here 'typical' answers to the exercises are given. In the current version, only answers to every other exercise is given. Our plan is to include answers to the remaining half of the problems in a future edition of the Manual. It is inevitable in any first editions that mistakes abound. I beg the forgiveness of our readers if these mistakes prove inconvenient to them. If you can alert me of these errors, I promise to fix them in a future edition. Simply address your suggestions to the addresses in the Preface of the book or under the "User's Manual for Computer Software" section of this Manual.

In compiling these solutions, I am again indebted to my students and colleagues. Their contributions are explicitly recognized in the references made throughout this Manual. Obviously, I alone am responsible for any oversights.

Yupo Chan
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1The entire set of Exercises and Problems, as well as the Computer Software, are included in the volume entitled "Spatial-Temporal Information for Location, Transport and Land-use."