Springer Tracts on Transportation and Traffic

Volume 5

Series editor

Roger P. Roess, New York University Polytechnic School of Engineering,
New York, USA
e-mail: rpr246@nyu.edu

For further volumes:
http://www.springer.com/series/11059

About this Series

The book series "Springer Tracts on Transportation and Traffic" (STTT) publishes current and historical insights and new developments in the fields of Transportation and Traffic research. The intent is to cover all the technical contents, applications, and multidisciplinary aspects of Transportation and Traffic, as well as the methodologies behind them. The objective of the book series is to publish monographs, handbooks, selected contributions from specialized conferences and workshops, and textbooks, rapidly and informally but with a high quality. The STTT book series is intended to cover both the state-of-the-art and recent developments, hence leading to deeper insight and understanding in Transportation and Traffic Engineering. The series provides valuable references for researchers, engineering practitioners, graduate students and communicates new findings to a large interdisciplinary audience.

Roger P. Roess · Elena S. Prassas

The Highway Capacity Manual: A Conceptual and Research History

Volume 1: Uninterrupted Flow

Springer

Roger P. Roess
Emeritus Professor
NYU Polytechnic School of Engineering
New York, NY
USA

Elena S. Prassas
Associate Professor of Transportation Engineering
NYU Polytechnic School of Engineering
New York, NY
USA

ISSN 2194-8119 ISSN 2194-8127 (electronic)
ISBN 978-3-319-05785-9 ISBN 978-3-319-05786-6 (eBook)
DOI 10.1007/978-3-319-05786-6
Springer Cham Heidelberg New York Dordrecht London

Library of Congress Control Number: 2014934174

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

Dedication

This book is dedicated to the members of the Highway Capacity and Quality of Service Committee of the Transportation Research Board and its subcommittees. From the first Committee, led by the legendary O.K. Normann, to the current group, led by Lily Elefteriadou, the past and present members comprise a family of professionals passionate about the study and development of concepts, criteria, and methodologies for the planning, design, analysis and operation of traffic facilities. Through their efforts and dedication, the profession has had the benefit of 5 editions of the *Highway Capacity Manual*, each representing the state-of-the-art at the time of their publication. It has been a privilege to work among this tireless group for many years. We look forward to many more years of working in their company, and sharing in their passionate pursuit of engineering excellence.

.

Preface

For over sixty years, the *Highway Capacity Manual* has served as a key standard used in planning, design, analysis and operation of the nation's vast highway systems. It has been used internationally as well, and has spurred a number of nations to develop their own versions of the document and its methodologies. It covers every type of highway one can think of, from freeways and rural highways to signalized intersections, urban arterials, and streets. In the U.S. no highway can be designed without using it; no analysis of traffic impacts can be conducted without using it; no comprehensive highway plan can be developed without using it.

The manual is now in its 5th full edition, but a number of interim documents and revisions have taken place as well, and a new update to the latest edition is, at this writing, underway. The responsibility for producing the manual and evaluating its use has fallen to the Highway Capacity and Quality of Service Committee of the Transportation Research Board, an arm of the National Academies of Science and Engineering. The Committee was first formed in 1944, and consisted of eleven members. The Committee was chaired by O.K. Normann, who was already a driving force on the subject of highway capacity and related issues. The Committee has now grown to 32 members, with a full set of subcommittees in place which involve well over an additional 100 people.

The first two manuals, in 1950 and 1965, were written directly by Committee members. Subsequent manuals have been assembled and produced under contracts with the National Cooperative Highway Research Program, and have involved a variety of contracting agencies.

My first interactions with the Committee came in 1970, when I was a Ph.D. student at the then Polytechnic Institute of Brooklyn (now the NYU Polytechnic School of Engineering). With my advisor, William McShane, I was working on a research contract aimed at developing a new methodology for weaving areas on freeways. As a Ph.D. student, I was privileged to meet Powell Walker, one of the original 11 Committee members, and worked on another unrelated project with Nate Cherniak, another of the founding 11. I also got to work with Jack Leisch, who developed the weaving methodology of the 1965 HCM, and who was an early member of the Committee. My work has brought me into contact with some of the great leaders of early research in traffic engineering in general, and highway capacity analysis in particular, including such luminaries as Jim Kell, Carlton Robinson, Dolf May, and others. At one Transportation Research Board meeting,

as a Master's student, I actually met and got to talk to Bruce Greenshields, generally recognized as the father of traffic engineering.
In my first interactions with the Committee, I was the "new kid" on the block, but I was actually working with professionals who literally started and defined the profession. Those early interactions greatly affected me, and set high standards for me and countless others to reach the same level of professionalism and dedication.

These days, I have reached the other end of the spectrum. I am the "old guy" on a Committee dominated by younger, thoroughly dedicated, and energetic professionals. Time, however, provides many opportunities, but denies others. Most of the professionals now on the Committee did not have the opportunity to meet the founders of the Committee and the profession. This book is written for them, and for the future professionals that will follow, indeed, for anyone with an interest in the rich historical background of the *Highway Capacity Manual*.

I came away from this effort with a great sense of awe at the work done by some of the earliest professionals, saddled with a new medium (superhighways), little data collection technology, and no tested approaches to studying and establishing the methodologies needed to properly design, analyze, and operate the nation's growing highway system. They took what they had and created a viable set of procedures that led to a better highway system for the nation. Over time, data collection, reduction, and analysis capabilities and technologies have made the job simpler, while complexities in highway operations made the job harder. Through it all, the Highway Capacity and Quality of Service Committee, with the help of dedicated contractors, have continued to advance the profession and the utility of the manual itself. It's a job that will go on for a long time.

My co-author has been involved with the Committee since the early 1980's, and has been an integral part of developing and preparing materials for the last three editions of the manual.

Together, we hope that we have provided an interesting documentary of why and how the key concepts and models that comprise the *Highway Capacity Manual* were developed, and we hope that current and future researchers in the field will find this to be a valuable tool in their efforts.

Roger P. Roess

Contents

List of Tables

List of Figures