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The **Transportation Research Board** is a unit of the National Research Council, which serves the National Academy of Sciences and the National Academy of Engineering. The Board's mission is to promote innovation and progress in transportation by stimulating and conducting research, facilitating the dissemination of information, and encouraging the implementation of research results. The Board's varied activities annually engage more than 2,000 engineers, scientists, and other transportation researchers and practitioners from the public and private sectors and academies, all of whom contribute their expertise in the public interest. The program is supported by the state transportation departments, federal agencies including the component administrations of the U.S. Department of Transportation, and other organizations and individuals interested in the development of transportation.

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PREFACE

The Transportation Research Board's (TRB's) *Highway Capacity Manual* (HCM) provides a collection of state-of-the-art techniques for estimating the capacity and determining the level of service for transportation facilities, including intersections and roadways as well as facilities for transit, bicycles, and pedestrians. For more than 50 years, the HCM has fulfilled this goal, earning a unique place in the esteem of the transportation community.

Developed and revised under the direction of the TRB Committee on Highway Capacity and Quality of Service, this newest edition, HCM 2000, presents the best available techniques for determining capacity and level of service for transportation facilities at the start of the new millennium. However, this comprehensive manual does not establish a legal standard for highway design or construction.

HISTORICAL PERSPECTIVE

Originally published in 1950, the HCM was the first document to quantify the concept of capacity for transportation facilities. The 1965 edition in turn was the first to define the concept of level of service, which has become the foundation for determining the adequacy of transportation facilities from the perspectives of planning, design, and operations. The 1985 edition, along with its 1994 and 1997 updates, is TRB's most widely used document. Translated into several languages, it has become the standard reference on capacity and level-of-service procedures, relied on by transportation analysts around the world.

DEVELOPMENT OF HCM 2000

To produce HCM 2000, TRB's Committee on Highway Capacity and Quality of Service developed a comprehensive program of research. The research was implemented through the funding efforts of the National Cooperative Highway Research Program (NCHRP) and the Transit Cooperative Research Program. In addition, the Federal Highway Administration supported TRB with a variety of research endeavors. These combined efforts produced the basic research reviewed by the committee and incorporated into HCM 2000.

All of the research results contributing to HCM 2000 underwent an iterative and interactive review. When a funded research project was completed, the group that guided its development—for example, an NCHRP panel—reviewed the findings first. If accepted by the group, the research was then presented for consideration by one of the 12 working subcommittees of the Highway Capacity and Quality of Service Committee. The subcommittee, including several committee members as well as other active professionals, then provided its recommendations to the full committee. The final approval for each chapter of HCM 2000 rested with the Highway Capacity and Quality of Service Committee, composed of 30 members representing the research community, government agencies, and private industry.

CONTENTS OF HCM 2000

The *Highway Capacity Manual* 2000 represents a significant revision and expansion of the material provided in previous editions. The manual has grown from 14 to 31 chapters. These chapters are divided into five parts:

- I. Overview,
- II. Concepts,
- III. Methodologies,
- IV. Corridor and Areawide Analyses, and
- V. Simulation and Other Models.

Parts I and III contain information that corresponds to the contents of previous editions. Part II provides concepts and estimated default values for use in planning-level

analytical work. Part IV presents computational techniques and general analysis guidelines for corridor and areawide analyses. Part V offers background and information on alternative models that may be appropriate for systemwide or more complex analyses.

A companion version of the manual is available in CD-ROM, including tutorials and video clips to enhance the communication of the concepts. In addition, there are links between the text and the glossary to facilitate understanding of the manual by less-experienced users.

SPECIAL ACKNOWLEDGMENTS

HCM 2000 incorporates significant advances in the state of knowledge in determining capacity and quality-of-service values for all modes of surface transportation.

Hundreds of professionals have volunteered their time and energy to the work of the Committee on Highway Capacity and Quality of Service. Twice every year, the committee meets to perform a major review of relevant research and to identify new research needs in response to changes in roadway design standards, driver behavior, and vehicle operating characteristics.

Members of the committee and its subcommittees are listed on pages ii–vii. Special recognition is extended to those who have chaired the committee: O.K. Normann, Carl C. Saal, Robert C. Blumenthal, James H. Kell, Carlton C. Robinson, and Adolf D. May. In acknowledgment of their sustained contributions to the committee and to the development of HCM 2000, Robinson and May have been designated members emeritus of the committee.

Complementing the volunteer efforts vital to the work of the committee, TRB staff has provided outstanding support. Special thanks are given to Richard Cunard, Engineer of Traffic and Operations, and to B. Ray Derr, NCHRP Senior Program Officer, for their contributions.

The Committee on Highway Capacity and Quality of Service invites comments and suggestions on HCM 2000 while continuing its mission of enhancing and improving the design, operation, and planning of transportation facilities.

John D. Zegeer

Chairman, TRB Committee on Highway Capacity and Quality of Service

CONTRIBUTORS AND ACKNOWLEDGMENTS

HCM 2000 is the result of the coordinated efforts of many individuals, groups, research organizations, and government agencies. The TRB Committee on Highway Capacity and Quality of Service is responsible for the content of the *Highway Capacity Manual*; preparation of the volume was accomplished through the efforts of the following groups and individuals:

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