

S.C.R.T.D. LIBRARY

BIBLIOGRAPHY 62

Annotated Bibliography for
Transportation Planning in
Small and Medium-Sized Communities

Z
7164
.U72
A56
1984

TRB

TRANSPORTATION RESEARCH BOARD
NATIONAL RESEARCH COUNCIL

1984 TRANSPORTATION RESEARCH BOARD EXECUTIVE COMMITTEE

OFFICERS

Chairman: *Joseph M. Clapp*, Senior Vice President, Roadway Express, Inc., Akron, Ohio
Vice Chairman: *John A. Clements*, Commissioner, New Hampshire Department of Public Works and Highways, Concord
Executive Director: *Thomas B. Deen*, Transportation Research Board

MEMBERS

Ray A. Barnhart, Administrator, Federal Highway Administration, U.S. Department of Transportation (ex officio)
Lawrence D. Dahms, Executive Director, Metropolitan Transportation Commission, Oakland, California (ex officio, Past Chairman, 1983)
Donald D. Engen, Vice Admiral, U.S. Navy (retired), Administrator, Federal Aviation Administration, U.S. Department of Transportation (ex officio)
Francis B. Francois, Executive Director, American Association of State Highway and Transportation Officials, Washington, D.C. (ex officio)
William J. Harris, Jr., Vice President, Research and Test Department, Association of American Railroads, Washington, D.C. (ex officio)
Darrell V Manning, Director, Idaho Department of Transportation, Boise (ex officio, Past Chairman, 1982)
Ralph Stanley, Administrator, Urban Mass Transportation Administration, U.S. Department of Transportation (ex officio)
Diane Steed, Administrator, National Highway Traffic Safety Administration, U.S. Department of Transportation (ex officio)

Duane Berentson, Secretary, Washington State Department of Transportation, Olympia
John R. Borchert, Regents Professor, Department of Geography, University of Minnesota, Minneapolis
Ernest E. Dean, Executive Director, Dallas-Fort Worth Airport, Texas
Mortimer L. Downey, Deputy Executive Director for Capital Programs, Metropolitan Transportation Authority, New York
Alan G. Dustin, Vice President and General Manager, New Jersey Transit Rail Operation, Newark
Mark G. Goode, Engineer-Director, Texas State Department of Highways and Public Transportation, Austin
Lester A. Hoel, Hamilton Professor and Chairman, Department of Civil Engineering, University of Virginia, Charlottesville
Lowell B. Jackson, Secretary, Wisconsin Department of Transportation, Madison
Alan F. Kiepper, General Manager, Metropolitan Transit Authority, Houston, Texas
Harold C. King, Commissioner, Virginia Department of Highways and Transportation, Richmond
Fujio Matsuda, Executive Director, Research Corporation of the University of Hawaii, Honolulu
James K. Mitchell, Professor and Chairman, Department of Civil Engineering, University of California, Berkeley
Daniel T. Murphy, County Executive, Oakland County, Pontiac, Michigan
Roland A. Ouellette, Director of Transportation Affairs, General Motors Corporation, Washington, D.C.
Milton Pikarsky, Professor of Civil Engineering, City College of New York, New York
Walter W. Simpson, Vice President-Engineering, Norfolk Southern Corporation, Norfolk, Virginia
John E. Steiner, Vice President for Corporate Product Development, The Boeing Company, Bellevue, Washington (retired)
Leo J. Trombatore, Director, California Department of Transportation, Sacramento
Richard A. Ward, Director-Chief Engineer, Oklahoma Department of Transportation, Oklahoma City

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 purpose is to stimulate research concerning the nature and performance of transportation systems, to disseminate the information produced by the research, and to encourage the application of appropriate research findings. The Board's program is carried out by more than 270 committees, task forces, and panels composed of more than 3,300 administrators, engineers, social scientists, attorneys, educators, and others concerned with transportation; they serve without compensation. The program is supported by state transportation and highway departments, the modal administrations of the U.S. Department of Transportation, the Association of American Railroads, the National Highway Traffic Safety Administration, and other organizations and individuals interested in the development of transportation.

The National Research Council was established by the National Academy of Sciences in 1916 to associate the broad community of science and technology with the

Academy's purposes of furthering knowledge and of advising the federal government. The Council operates in accordance with general policies determined by the Academy under the authority of its Congressional charter, which establishes the Academy as a private, nonprofit, self-governing membership corporation. The Council is the principal operating agency of both the National Academy of Sciences and the National Academy of Engineering in the conduct of their services to the government, the public, and the scientific and engineering communities. It is administered jointly by both Academies and the Institute of Medicine.

The National Academy of Sciences was established in 1863 by Act of Congress as a private, nonprofit, self-governing membership corporation for the furtherance of science and technology, required to advise the federal government upon request within its fields of competence. Under its corporate charter, the Academy established the National Research Council in 1916, the National Academy of Engineering in 1964, and the Institute of Medicine in 1970.

BIBLIOGRAPHY 62

Annotated Bibliography for
Transportation Planning in
Small and Medium-Sized Communities

TRANSPORTATION RESEARCH BOARD
NATIONAL RESEARCH COUNCIL

National Academy of Sciences
Washington, D.C. 1984

Bibliography 62
Price \$8.20

06931

modes	Z
1 highway transportation	7164
2 public transit	.U72
subject areas	A56
12 planning	1984
13 forecasting	

Transportation Research Board publications may be ordered directly from TRB. They may also be obtained on a regular basis through organizational or individual supporting affiliation with TRB; affiliates or library subscribers are eligible for substantial discounts. For further information, write to the Transportation Research Board, National Academy of Sciences, 2101 Constitution Avenue, N.W., Washington, D.C. 20418.

Library of Congress Cataloging in Publication Data

National Research Council. Transportation Research Board.
Annotated bibliography for transportation planning in small and medium-sized communities.

(Bibliography/Transportation Research Board, National Research Council; 62)

1. Urban transportation policy—Bibliography. 2. Transportation—Planning—Bibliography. I. National Research Council (U.S.). Transportation Research Board. II. Series: Bibliography (National Research Council (U.S.). Transportation Research Board); 62.
Z7164.U72A56 1984 [HE305] 016.3884'068 85-4920
ISBN 0-309-03767-0 (pbk.) ISSN 0148-849X

Sponsorship of Bibliography 62

DIVISION A COUNCIL

Lester A. Hoel, University of Virginia, chairman

Committee on Transportation Planning Needs and Requirements of Small and Medium-Sized Communities

*C. Michael Walton, University of Texas at Austin, chairman
John Balshaw, Daniel F. Beagan, Katheryn Briscoe, Larry A. Bruno,
Michael T. Cousino, David J. Forkenbrock, A Duane Genzlinger,
Marvin Golenberg, Wayne T. Gruen, Joseph W. Guyton, Harvey
Haack, John Hensrud, Antoine G. Hobeika, Pam Hunt, R. Keith
Jones, Marion R. Poole, George E. Schoener, Kenneth W. Shiatte,
Oliver Snowden, Vergil G. Stover, Montie G. Wade, Bruce B. Wilson,
Eugene M. Wilson*

James A. Scott, Transportation Research Board staff

PREFACE

A wealth of literature has been produced over the past several years that addresses transportation planning in small urban areas. In order to document this work in a single publication, the Transportation Research Board Committee on Transportation Planning Needs and Requirements of Small and Medium-Sized Communities has prepared this annotated bibliography. The bibliography presents relevant manuals and reports in the following subject areas:

- Overall Planning Considerations
- Traffic Planning and Operations
- Transit Planning and Operations
- System Planning

The entries represent an attempt to include available references that address a wide spectrum of issues, problems, and approaches of interest to transportation professionals in cities of fewer than 200,000 population.

The intent of this bibliography is to foster a momentum for future revisions and updates through the Annotated Bibliography series of the Transportation Research Board. Readers are encouraged to direct inquiries to the TRB Committee on Transportation Planning Needs and Requirements of Small and Medium-Sized Communities.

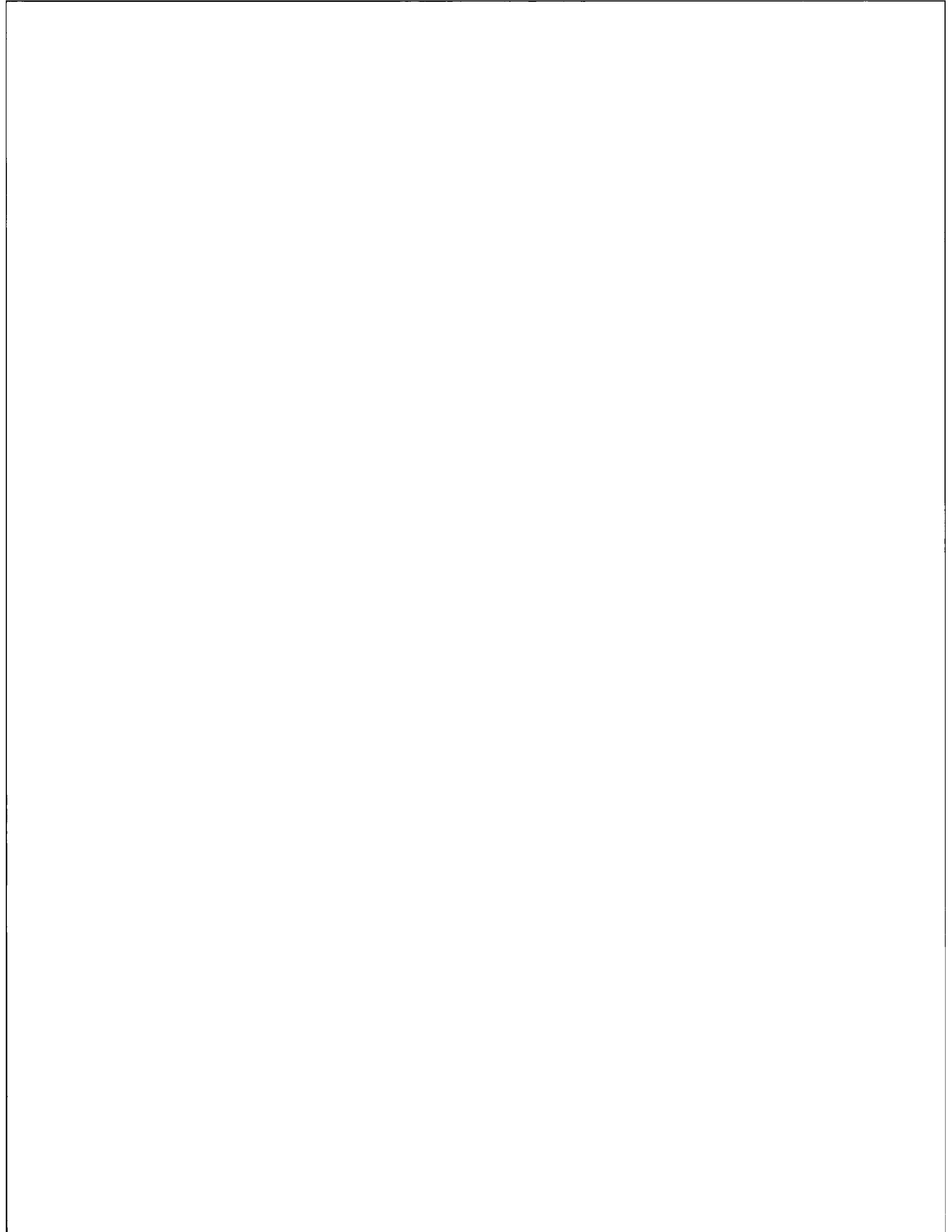
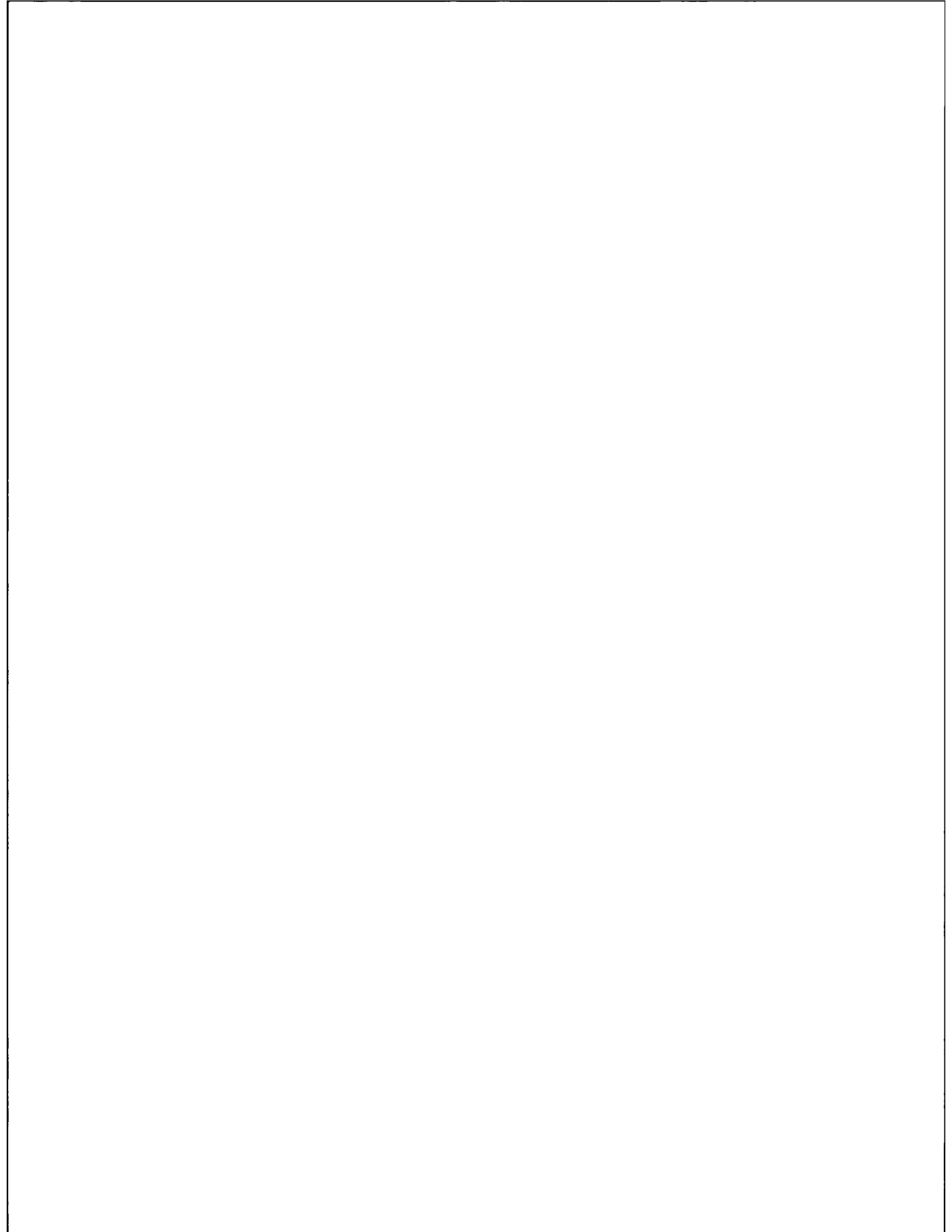


TABLE OF CONTENTS

	Page
Overall Planning Considerations	1
Traffic Planning and Operations	3
Transit Planning and Operations	10
System Planning	16



OVERALL PLANNING CONSIDERATIONS

Hillegass, Tom, et al., A Proposal for a Simplified Urban Transportation Modeling Process, Washington, D.C., U.S. Department of Transportation, Federal Highway Administration, 1973.

Develops a simplified travel estimation technique using dwelling unit level models. Suggests using graphical techniques to apply simple trip generation, trip distribution, and modal split models in the transportation planning process. This modeling technique requires a minimal amount of input data.

Institute of Transportation Engineers Technical Council Committee 6Y-2(GE), "Small City Transportation Studies," Traffic Engineering, Vol. 47, No. 4, April 1977.

Presents guidelines for specific street and highway studies for urban areas with populations between 5,000 and 50,000. Provides a list of references pertaining to the studies.

Iowa Department of Transportation and Johnson County Council of Governments, "Small Urbanized Area Transportation Planning Case Study," Iowa City, Iowa, 1983.

Describes the approach and procedures used to develop a transportation plan and improvement program in Iowa City as part of an FHWA-sponsored case study program.

Marks, Harold, Protection of Highway Utility, National Cooperative Highway Research Program Report 121, Washington, D.C., National Research Council, Highway Research Board, 1971.

Provides guidelines for land-use and highway development. Presents highway design techniques to prevent premature obsolescence and operating inefficiencies of transportation systems.

National Research Council, Transportation Research Board, Transportation Planning for Small and Medium-Sized Communities, Special Report 187, Washington, D.C., 1980.

Contains speeches and resource papers presented at a workshop held in Sarasota, Florida, December 3-6, 1978, as well as summaries of group discussions and workshops on transportation planning for small-and medium-sized communities. The workshop sessions focused on the following subject areas: transit operations planning; traffic operations and planning; surveillance and socioeconomic forecasting; system planning; and plan implementation.

OVERALL PLANNING CONSIDERATIONS

National Research Council, Transportation Research Board, Synthesis of Practice: Planning for Small and Medium-Sized Communities, Transportation Research Circular 283, Washington, D.C., August 1984.

This synthesis report presents case studies on issues and experiences in the following four topic areas: (1) assessing growth effects; (2) data collection and management information systems; (3) public transportation services; and (4) programming, financing, and communications with decision makers. These case studies are designed to provide practitioners in small and medium-sized urban areas with examples of effective planning approaches.

U.S. Department of Transportation, Federal Highway Administration, Financing Urban Transportation Improvements, Washington, D.C., April 1983.

A summary of the cost-effectiveness literature, an overview of how cost-effectiveness has been used with five different project types, and a comparative review of cost-effectiveness practice are included in this report.

U.S. Department of Transportation, Federal Highway Administration, "A Guide for the Decisionmaker," from a series titled Transportation Planning for Your Community, Washington, D.C., 1980.

The guide describes the importance of urban transportation and the benefits of transportation planning. It includes a review of how transportation planning works and the role of city, county, and town officials in transportation planning.

U.S. Department of Transportation, Federal Highway Administration, "The Manager's Guide for Developing a Planning Program," from a series titled Transportation Planning for Your Community, Washington, D.C., 1980.

Describes the principles of transportation planning and is directed to those engineers, planners, and administrators who are charged with the responsibility of organizing and administering the transportation planning program.

TRAFFIC PLANNING AND OPERATIONS

American Association of State Highway and Transportation Officials, A Policy on Geometric Design of Highways and Streets, Washington, D.C., 1984.

This text is intended to form a comprehensive reference manual for assistance in administrative, planning, and educational efforts pertaining to design formulation. The scope of this text is wider than that of previously published AASHTO guides. Although superseded by this publication for all geometric criteria, A Policy on Design of Urban Highways and Arterial Streets, 1973, contains materials on issues of urban planning and design that have not been replaced in this publication.

American Association of State Highway and Transportation Officials, A Policy on Design of Urban Highways and Arterial Streets, Washington, D.C., 1973.

This text serves as a supplement to the previously cited reference by AASHTO, primarily on issues related to urban planning and design.

American Public Works Association, Traffic Engineering Services for Small Political Jurisdictions, Washington, D.C., U.S. Department of Transportation, Federal Highway Administration, 1977.

Discusses parameters influencing traffic engineering services in cities and counties with populations from 2,500 to 40,000. Suggests alternative methods for providing traffic engineering services as they pertain to Highway Safety Program Standard 13 - Traffic Engineering. Summarizes a major survey on the status of traffic engineering services throughout the United States.

Baerwald, J.E., ed., et al., Transportation and Traffic Engineering Handbook, ITE, Englewood Cliffs, New Jersey, Prentice-Hall, 1976.

Provides a discussion of the basic fundamentals of traffic engineering, and serves as a reference for practicing traffic, highway, and transportation engineers and planners dealing with specific traffic matters.

Baker, Robert F., et al., Handbook of Highway Engineering, New York, Van Nostrand Reinhold Co., 1975.

Presents transportation principles, techniques, and data for all major areas of highway planning, construction, maintenance, and administration. Discusses highway policies and administration, economics, safety, route location, geometric design, traffic control, right-of-way acquisition, drainage subgrades, foundations, landscape development, quality control, cost estimating, maintenance, and snow and ice control.

TRAFFIC PLANNING AND OPERATIONS

Box, Paul C., "Traffic Safety Studies in Smaller Communities," Public Works, Vol. 102, No. 12, December 1971.

Describes methods to obtain and manipulate accident data for small communities to identify hazardous locations and develop corrective measures.

Box, Paul C., and Joseph C. Oppenlander, Manual of Traffic Engineering Studies, Arlington, Virginia, Institute of Transportation Engineers, 1976.

Presents methodologies and techniques to develop traffic engineering studies after a transportation problem has been identified.

Bureau of Public Roads, Increasing the Traffic Carrying Capability of Urban Arterial Streets: The Wisconsin Avenue Study, Washington, D.C., U.S. Department of Commerce, 1962.

Estimates maximum traffic capacity increase on an existing urban arterial which can be obtained by fully utilizing traffic control techniques without expanding the existing right-of-way. Discusses in detail the control techniques employed and their effectiveness in increasing capacity.

Guyton, Joseph W., and W.S. Pollard, Jr., "Corridor Analysis of Travel Desires as Utilized in Major Street Planning," Highway Research Board Bulletin 347, Washington, D.C., National Research Council, Highway Research Board, 1962.

Presents a procedure to analyze street and highway requirements. Provides a technique to test alternate plans for major thoroughfare networks of urban areas and estimates the new facilities required for adequate service. Employs travel desire charts for the procedure.

Institute of Transportation Engineers, Guidelines for Urban Major Street Design, Washington, D.C., 1979.

The objective of this book is to develop general geometric design standards for use on urban area major traffic routes. Freeways, expressways, rural highways of all types, and local urban streets were not included because they are covered under other publications.

TRAFFIC PLANNING AND OPERATIONS

Institute of Transportation Engineers, Trip Generation, Third Edition, Washington, D.C., 1983.

This report serves as an excellent reference on trip generation rates for all land uses and building types. The rates have been developed for the average weekday, Saturday, and Sunday, for the peak hours of the generator and of the adjacent street traffic. Variations in generation rates for the same building or land-use type exist and have been identified in the report.

National Research Council, Highway Research Board, Getting the Most from City Streets, Washington, D.C., 1967.

Discusses control of traffic congestion and accidents in urban communities. Gives examples of successful traffic congestion and accident control in various sizes of urban communities. Uses information presented at the Conference on Improved Street Utilization through Traffic Engineering, held in Washington, D.C., May 1967.

National Research Council, Highway Research Board, Improved Street Utilization through Traffic Engineering, Special Report 93, Washington, D.C., 1967.

These proceedings of a conference held May 22-24, 1967, contain 25 technical papers that develop the basic methodologies and traffic engineering techniques for a successful traffic improvement program. Discusses improvement priorities, conventional flow improvements, exclusive bus lanes, signal modernization, accident reduction, land-use controls, and transportation planning.

National Research Council, Transportation Research Board, Better Use of Existing Transportation Facilities, Special Report 153, Washington, D.C., 1975.

Presents conference proceedings on increasing transportation capacity without new major construction. Discusses many methods and techniques including management approach, facility improvement and maintenance, and safety programs.

TRAFFIC PLANNING AND OPERATIONS

National Research Council, Transportation Research Board, Highway Capacity Manual, Special Report 87, Washington, D.C., 1965.

This manual is a guide to determine the capacity, service volume, or level of service provided by a highway with certain design features. This manual may also be used to find the design necessary to accommodate the traffic demand at a given level of service. This is the most commonly used manual for highway capacity analysis.

National Research Council, Transportation Research Board, Interim Materials on Highway Capacity, Transportation Research Circular 212, Washington, D.C., January 1980.

This report supplements the Highway Capacity Manual and covers capacity procedures for critical movement analysis, unsignalized intersections, transit, and pedestrians.

National Research Council, Transportation Research Board, Simplified Procedures for Evaluating Low-Cost TSM Projects - User's Manual, Report 263, Washington, D.C., October 1983.

The manual presents guidelines and recommendations on approaches and procedures for (1) identifying and assessing problems, (2) identifying and screening potential solutions to these problems, (3) determining the information needed to make design and operation decisions, (4) selecting and applying techniques to produce this information, and (5) formulating priority improvement programs.

Pignataro, Louis J., Traffic Engineering, Englewood Cliffs, New Jersey, Prentice-Hall, 1973.

Presents all aspects of traffic planning and includes transportation planning, traffic safety, highway economy, and traffic theory. Uses practical applications extensively.

R.H. Pratt Associates, Inc., Low Cost Urban Transportation Alternatives: A Study of Ways to Increase the Effectiveness of Existing Transportation Facilities, 3 Volumes, Washington, D.C., U.S. Department of Transportation, 1971.

Presents techniques for improving utilization of the existing investment in transportation capital facilities. Discusses reduction of peak period demand and increased carrying capacity cost techniques, technologies, and management strategies. Examines both traffic and transit case studies. Printed in three volumes: Volume I - Results of a Survey and Analysis of Twenty-One Low Cost Techniques, Volume II - Results of Case Studies and Analysis of Busway Applications in the United States, Volume III - Executive Summary.

TRAFFIC PLANNING AND OPERATIONS

Rankin, Woodrow W., Engineering for Traffic in a Small City, Washington, D.C., Highway Users Federation for Safety and Mobility, 1970.

Develops transportation planning guidelines and procedures for small cities. Uses potential urban growth data in developing the guidelines.

U.S. Department of Transportation, Principles and Procedures for Subarea Planning, Washington, D.C., May 1983.

Provides guidance in designing the planning analysis and selecting the techniques for conducting specific types of subarea planning studies. The guide addresses the many variations of subarea planning problems including: 1) short - and long-range studies; 2) use of TSM operational and low-cost as well as major capital improvement actions; and 3) planning at the corridor level, for activity centers such as CBD's and for localized sites and facilities.

U.S. Department of Transportation, A Short Range TSM Subarea Planning Case Study, Washington, D.C., May 1983.

This report documents an example of short-range TSM highway circulation system and highway deficiency improvement planning for an activity center located in a downtown area of Lewiston, Maine.

U.S. Department of Transportation, TSM: An Assessment of Impacts, Washington, D.C., November 1978.

This report provides an assessment of the impact of areawide applications of various classes of TSM actions.

U.S. Department of Transportation, Federal Highway Administration, Access Management for Streets and Highways, Washington, D.C., June 1982.

This report provides design details and traffic operation methods for reducing the frequency and severity of traffic accidents at driveways. Evaluation techniques along with warrants are provided to aid in the selection of the appropriate control measure. Guidance for establishing a comprehensive access management program is also included.

U.S. Department of Transportation, Federal Highway Administration, Design of Urban Streets, Washington, D.C., January 1980.

This document serves as a guide for a training course on urban street design. Design factors, including specific material on current practice, are reviewed in detail. Roadway cross sections, alignment, and locations are covered in addition to details on the design and operations of intersections.

TRAFFIC PLANNING AND OPERATIONS

U.S. Department of Transportation, Federal Highway Administration, Guide for Estimating Urban Vehicle Classification and Occupancy, Washington, D.C., September 1981.

The report provides methods for estimating the proportion of vehicles by types, average passenger vehicle occupancy, and person miles of travel at the regional and focused levels.

U.S. Department of Transportation, Federal Highway Administration, Guide to Urban Traffic Volume Counting, Washington, D.C., 1981.

This report identifies the role of traffic volumes in the urban transportation planning process and provides methods for estimating regional VMT and focused volume measures.

U.S. Department of Transportation, Federal Highway Administration, Handbook of Computer Models for Traffic Operations Analysis, Washington, D.C., December 1982.

This handbook is designed to inform the practicing traffic engineer of the computer models that are available for developing and evaluating practical, day-to-day, transportation management problems.

U.S. Department of Transportation, Federal Highway Administration, Manual on Uniform Traffic Devices, Washington, D.C., 1978.

This manual discusses regulation of the use of traffic control devices to provide for uniform application of standards to different classes of roads and streets. Traffic control devices are all signs, signals, markings, and devices placed on, over, or adjacent to a street or highway by authority of a public body or official having jurisdiction to regulate, warn, or guide traffic.

U.S. Department of Transportation, Federal Highway Administration, "Traffic Planning," from a series titled, Transportation Planning for Your Community, Washington, D.C., 1980.

A reference of basic traffic engineering techniques and their potential for improving traffic flow and traffic safety of urban arterial streets and highways. The manual identifies the traffic engineering measures appropriate for consideration in development of transportation improvement plans and programs.

TRAFFIC PLANNING AND OPERATIONS

U.S. Department of Transportation, Federal Highway Administration, Traffic Reviews for Operational Efficiency, Washington, D.C., 1973.

Describes methods and techniques for periodic review of existing highway facilities to identify problems which create or contribute to inefficient traffic operations. Suggests procedures to correct the problems.

U.S. Department of Transportation, Urban Mass Transportation Administration, Simplified Aids for Transportation Analysis: Estimating Parking Accumulation, Washington, D.C., January 1979.

This report provides a method for estimating the accumulation of parked vehicles within a study area over the course of a typical weekday. Parking accumulation and use of parking facilities may be estimated for all parkers, long-term parkers, and/or short-term parkers, based on an estimate of daily automobile trip destinations, an inventory of available parking supply, and a set of parking accumulation factors.

TRANSIT PLANNING AND OPERATIONS

Casey, R., Small City Transit: Chapel Hill, North Carolina - Public Transit Serving a University and Town, Washington, D.C., U.S. Department of Transportation, Urban Mass Transportation Administration, 1976.

Discusses the implementation and operation characteristics of a small town public transit system. Describes the different stages of development of the Chapel Hill, North Carolina, transit system. Stresses the community response to the specific needs for transit service within the local context.

Casey, R., and G. Paul, Small City Transit: El Cajon, California, City-Wide Shared-Ride Taxi Service, Washington, D.C., U.S. Department of Transportation, Urban Mass Transportation Administration, 1976.

Describes a shared-ride taxi service for the small city of El Cajon, California. Discusses the implementation process and operational characteristics of the transit service.

City of Rome, New York, VIP Transportation - Extending Urban Mass Transportation in a Typical Small City, Rome, New York, U.S. Department of Transportation, Urban Mass Transportation Administration, 1969.

Describes the planning and operation of the VIP mini-bus system in Rome, New York. Discusses the comprehensive public relations program required to encourage ridership. Presents the ridership and revenue growth data along with subsidies required to keep the VIP system operational.

Cornell University, Mass Transit Development for Small Urban Areas: A Case Study - Tompkins County, New York, Washington, D.C., U.S. Department of Transportation, Office of System Development and Technology, 1976.

Develops mass transit models applicable to specific small urban problems. Model operates on small data bases, does not require area aggregations, and responds to small urban policies and investments. Analyzes Tompkins County, New York, mass transportation system. Discusses how study findings can be applied.

TRANSIT PLANNING AND OPERATIONS

Corradino, Joseph C., et al., "Successive Overlays - A Small Transit Surveying Process," Traffic Engineering, Vol. 44, No. 15, December 1974.

Describes a practical, accurate, and economical method to define areas with transit potential. The method indicates the transit market's existence and prospective usage, but does not define the market size. Defines high transit potential areas with visual analysis.

Davis, F.W., Jr., et al., Increased Transportation Efficiency Through Ridesharing: The Brokerage Approach, Washington, D.C., U.S. Department of Transportation, 1977.

Defines brokerage concept, describes benefits, assesses market potential, describes methods to determine needs, outlines cost comparison methodology, identifies institutional barriers to program implementation, and develops strategies for increasing ridesharing.

Gilbert, G., et al., Taxicab Users' Characteristics in Small- and Medium-Size Cities, Washington, D.C., U.S. Department of Transportation, Urban Mass Transportation Administration, 1976.

Determines taxicab user characteristics in small- and medium-size cities from interviews conducted with 6,176 taxicab users in eight cities. Examines variation in usage with user characteristics, time of month, and transit. Discusses the difference between large and small city operations.

Hart, K., How to Set Up a Local Public Transportation Service in Your Community, Washington, D.C., U.S. Department of Transportation, Urban Mass Transportation Administration, 1975.

Outlines procedures to set up public transportation services in small urban and rural areas. Discusses how to estimate costs, obtain funding, market the service, subsidize a taxi operator, set up a nonprofit corporation to operate the service, and develop forms for required transit recordkeeping. Provides simple, straightforward guidelines for local officials and private groups to use in establishing public transit services.

TRANSIT PLANNING AND OPERATIONS

Hartgen, David T., and Carol A. Keck, Forecasting Dial-a-Rider Ridership in Small Urban Areas, Preliminary Research Report No. 60, Albany, New York, New York State Department of Transportation, 1974.

Develops a transit usage forecasting methodology for a particular transit service. Assumes that the rate of usage is limited for particular population groupings independent of their geographic locations.

Heathington, K.W., et al., "Public Transportation for Small Urban Areas," Highway Research Record 119, Washington, D.C., National Research Council, Highway Research Board, 1972.

Describes study to establish public transportation priorities for urban areas with populations less than 100,000. Evaluates 14 alternative public transportation systems to determine the priorities in the transit planning process.

Hillegass, T., Transit Travel Analysis for Smaller Urbanized Areas, Washington, D.C., U.S. Department of Transportation, Federal Highway Administration, 1973.

Develops a technique quantifying transit travel demand in urban areas with populations less than 250,000. Recognizes the transportation disadvantaged and uses current actual trip and latent (home interview) surveys to estimate transit travel demand. Calculates trip interchanges manually.

Keck, Carol A., and Peter S. Liou, Forecasting Demand for Peripheral Park-and-Ride Transit Service, Preliminary Research Report No. 56, Albany, New York, New York Department of Transportation, 1974.

Presents a method to estimate demand for peripheral park-and-ride transit services. Uses a license plate survey to determine peripheral park-and-ride usage. Concludes that travel time, cost, distance between park-and-ride and destination, and geographical location affect patronage.

Kendall, D., et al., Small City Transit Characteristics: An Overview, Washington, D.C., U.S. Department of Transportation, Urban Mass Transportation Administration, 1976.

Evaluates 13 small community transit systems. Describes the range of service options and results, community settings, service objectives, financing mechanisms, and political environments. Discusses goals that motivate the initiation of transit systems and service characteristics which can be achieved.

TRANSIT PLANNING AND OPERATIONS

Kidder, Alice E., "Transportation Policy and the Delivery of Social Services in a Small City," Transportation Research Record 516, Washington, D.C., National Research Council, Transportation Research Board, 1974.

Presents problems social service agencies face in transporting nonambulatory clients in small cities. Suggests interim solutions, such as improved coordination among agencies regarding driver and vehicle availability information and increased use of public transportation.

Kirby, Ronald F., et al., Para-Transit: Neglected Options for Urban Mobility, Washington, D.C., U.S. Department of Transportation, Urban Mass Transportation Administration and Federal Highway Administration, 1974.

Discusses the characteristics, regulations, demand, and financial aspects of paratransit. Reviews experience to date of paratransit. Presents case studies. Assesses the potential of paratransit services in the urban transportation system.

Kurban, G.J., Characteristics of Transit Supply in Small- and Medium-Sized Cities, University Park, Pennsylvania, Pennsylvania State University, Transportation Institute, 1974.

Presents methodology to improve bus service in small or medium communities using available financial resources. Describes techniques to assess present systems and develop economically viable solutions for bus operators and passengers, using relative level of service analyses.

Miller, N. Craig, and John C. Goodknight, "Policies and Procedures for Planning Mass Transportation Systems in Small Urban Areas," Highway Research Record 449, Washington, D.C., National Research Council, Highway Research Board, 1973.

Describes the irrelevance and inappropriateness of large metropolitan transit planning techniques being used for small urban areas. Discusses policies and procedures more pertinent to small-area transit planning. Represents the transit planning process as a series of key decisions and identifies major issues associated with each decision, major inputs required, and the role of each organization or participant in the planning process.

TRANSIT PLANNING AND OPERATIONS

National Research Council, Transportation Research Board, Paratransit, Special Report 164, Washington, D.C., 1976.

These proceedings present papers and results from a paratransit conference held in November 1975. Examines six major issues: the role of paratransit in an integrated urban transportation system, the effect of governmental capital and operating assistance on paratransit development, institutional changes needed to foster development, paratransit in small urban areas, paratransit operational management, and paratransit service to the needs of special groups.

Neuzil, Dennis, "Preliminary Transit Patronage Estimation For Small Urban Areas via Transit Service Factor," Traffic Engineering, Vol. 45, No. 8, August 1975.

Develops "transit service factor" technique to provide information for transit feasibility studies where operational data are unavailable. Defines service factor as the annual revenue miles of bus service per capita.

Saltzman, Arthur, et al., "Transportation Planning for the Transportation-Disadvantaged in a Small Town," Highway Research Record 473, Washington, D.C., National Research Council, Highway Research Board, 1973.

Presents an innovative transit program to minimize cost of providing service to the transportation-disadvantaged in Lumberton, North Carolina, a low-wage area of less than 25,000 population. Gives a thorough economic and demand analysis. Proposes a transit consortium with nearby communities to make joint application for Urban Mass Transportation Administration funding.

Schimpeler-Corradino, Associates, Paducah Transit Study, Louisville, Kentucky, U.S. Department of Transportation, Urban Mass Transportation Administration, 1974.

Defines the short-range transit needs for Paducah, Kentucky. Discusses community involvement, transit objectives, pre-existing conditions, data collection, transit ridership surveys, short-range improvement program, implementation, and continuing transit planning.

U.S. Department of Transportation, Demand Responsive Transportation, Washington, D.C., 1974.

Presents overview of demand responsive transportation for managerial, planning, and operating personnel. Includes supplementary data as source of further information.

TRANSIT PLANNING AND OPERATIONS

U.S. Department of Transportation, Federal Highway Administration, "Transit Planning," from a series titled, Transportation Planning for Your Community, Washington, D.C., 1980.

Includes techniques for estimating transit patronage, service options, and operating requirements. Also included are procedures for evaluating the need for specialized services for the elderly and handicapped.

U.S. Department of Transportation, Transportation Systems Center, "Transit Options For Small Communities," a 16mm color sound film, U.S. Urban Mass Transportation Administration, Washington, D.C., 1976.

Documents innovative public transit concepts in four small cities. Includes a fixed-route system in Westport, Connecticut; route deviation in Merrill, Wisconsin; dial-a-ride service in Merced, California; and a subsidized shared-taxi in El Cajon, California. Represents a spectrum of alternatives available to small communities.

U.S. Department of Transportation, Urban Mass Transportation Administration, Analyzing Transit Options for Small Urban Communities, 3 Volumes: Volume I - Transit Service Objectives and Options; Volume II - Analysis Methods; Volume III - Summary of Management and Operations Experience, Washington, D.C., January 1978.

These three volumes provide an analytical framework and supporting analytical techniques to assist planners and decisionmakers in the analysis of transit operations for communities with less than 200,000 residents. Specification of local transit service objectives is discussed, along with formulation of service, estimations of patronage, cost, and revenue implications of transit service operation. Also presented are numerous data and statistics that characterize the financial and operating performance of existing conventional transit and paratransit service in small areas.

U.S. Department of Transportation, Urban Mass Transportation Administration, The Runaround: User Side Subsidies for Mass Transportation in Danville Illinois, UMTA-IL-06-0034-80-1, Washington, D.C., 1980.

Discusses the application of the user side subsidy concept to fixed route and demand responsive general public services.

SYSTEM PLANNING

Bates, John W., Development and Testing of Synthetic Generation and Distribution Models for Urban Transportation Studies, Atlanta, Georgia, Georgia Highway Department, 1971.

Develops procedure for estimating internal trip movements without interview surveys, using a generalized trip generation model based on analysis of trip data in eight cities. Proposes a method for estimating gravity model travel time factors based on maximum trip length over the traffic assignment network. Evaluates procedure in four cities and presents results.

Coomer, B. Douglas, and Joseph C. Corradino, "Trip Generation and Distribution in a Small Urban Area - An Efficiency Analysis," Traffic Engineering, Vol. 43, No. 9, June 1973.

Describes procedures that synthetically duplicate trip ends and simulate volumes of travel between areas to project future travel patterns and transportation requirements. Replaces the origin-destination (O-D) survey with a mathematical travel simulation of internal trip activity using relationships developed in previous transportation planning studies. Applies method to Elizabethtown, Kentucky, area.

Hajj, Hatim M., "Synthesis of Vehicle Trip Patterns in Small Urban Areas," Highway Research Record 369, Washington, D.C., National Research Council, Highway Research Board, 1971.

Develops a simplified technique for calculating trip generation and distribution in small urban area of Madisonville, Kentucky. The technique eliminates the need for an internal origin-destination (O-D) survey. Discusses input requirements, including external O-D survey, present daily traffic volumes on major streets, and limited socio-economic data.

Harmelink, M.D., et al., "Trip Production and Attraction Characteristics in Small Cities," Highway Research Record 205, Washington, D.C., National Research Council, Highway Research Board, 1967.

Examines trip production and attraction in two small Canadian cities. Describes interrelationships among factors and the relative degree of error expected with different sample sizes. Results are applicable to both conventional origin-destination (O-D) surveys and mathematical traffic models.

SYSTEM PLANNING

Heightchew, Robert E., Jr., "Procedures for Small Staff: Adapting Large-Scale Land Use for Forecasting Techniques for Use in Small Urban Area Transportation Studies," Traffic Engineering, Vol. 44, No. 6, March 1974.

Develops a simple, flexible method to apply concepts of large urban area transportation planning studies to small urban areas. Compares travel pattern data with population and employment data to develop trip making models. Forecasts future socio-economic conditions for each traffic zone to estimate future trip generation characteristics. Expresses land use in terms of acres, population, and employment to determine future conditions.

Institute of Traffic Engineers, Use of Census Data in Transportation Planning, Arlington, Virginia, 1974.

Presents methods for using census data in transportation planning. Describes transportation and land-use information in the census data, methods to obtain data, and results of planning studies that use census data.

INTERPLAN Corporation, Transportation System Management: State of the Art, Washington, D.C., U.S. Department of Transportation, Urban Mass Transportation Administration, 1977.

Summarizes current information on actions relating to Transportation System Management (TSM). Includes actions to influence transportation demand and manage the supply of service or performance characteristics. Presents 31 specific TSM actions in the following areas: vehicular flow, high-occupancy vehicles, peak period travel demand, parking, and mass transit. Discusses each action and includes examples of successful experience, advantages and disadvantages, guideline conditions concerning implementation, range of costs, and interrelationships.

Jefferies, W., and E. Carter, "Simplified Techniques for Developing Transportation Plans - Trip Generation in Small Urban Areas," Highway Research Record 240, Washington, D.C., National Research Council, Highway Research Board, 1968.

Examines the use of simplified transportation planning techniques for small urban areas. Analyzes data from six small urban areas to determine feasibility of the simplified techniques, using the gravity model. Presents the gravity model application to small urban communities.

SYSTEM PLANNING

Jones, A. D., and W. L. Grecco, "Simplified Procedures for Major Thoroughfare Planning in Small Urban Areas," Highway Research Record 472, Washington, D.C., National Research Council, Highway Research Board, 1973.

Analyzes various growth factor models for developing future estimates of internal traffic in small urban areas. Develops a low-cost methodology to forecast traffic volumes with the accuracy necessary for major thoroughfare planning in small urban areas. The methodology is developed with Lafayette, Indiana, transportation data and demonstrated in Columbus, Indiana.

Khasnabis, Snehamy, and Marion R. Poole, "Synthesizing Travel Patterns for a Small Urban Area," Traffic Engineering, Vol. 45, No. 8, August 1975.

Describes a methodology to synthesize traffic patterns for small urban areas without origin-destination (O-D) surveys. Develops travel forecast models using trip production data and travel relationships validated in prior studies of small urban areas. Methodology uses calibration techniques with systematic parameter variations to obtain agreement with assigned network volumes and with actual measured data.

Kristofferson, Svein, and Eugene H. Wilson, "Trip Generation Synthesis for Small and Medium Sized Cities," Transportation Research Record 638, Washington, D.C., National Research Council, Transportation Research Board, 1977.

Presents a generalized synthesis approach for transportation facilities in small- and medium-sized urban areas. Based on the findings that trip purpose distributions are independent of city size, develops trip generation equations using both dwelling units and motor vehicles with a step-down procedure. Compares the equations with other generalized equations.

Lund, John W., "A Simplified Trip-Distribution Model for the Estimation of Urban Travel," Highway Research Record 297, Washington, D.C., National Research Council, Highway Research Board, 1969.

Develops a low-cost method to estimate urban travel. Based upon a modified version of the gravity model, generates and distributes trips in one operation. Requires very little data relative to other methods.

SYSTEM PLANNING

McLaughlin, Mary, ed., Issues in Transportation Planning for Small- and Medium-Sized Communities, Transportation Research Record 730, Washington, D.C., National Research Council, Transportation Research Board, 1979.

Includes reports on demand forecasting, system planning, and transit planning.

Melinyshyn, Walter, et al., "Transportation Planning Improvement Priorities: Development of a Methodology," Highway Research Record 458, Washington, D.C., National Research Council, Highway Research Board, 1973.

Describes a priority planning methodology which identifies and assesses the impacts of transportation improvements on both the user and community at large. Discusses the evaluation of impacts by using time flows of benefits' percent worth as functions of the implementation year.

Modlin, David G., Jr., "Synthetic Through-trip Patterns," Transportation Engineering Journal of the ASCE, Vol. 100, No. TE2, May 1974.

Develops models to synthesize through-trip travel patterns in small urban areas. Eliminates the need for costly and time-consuming origin-destination (O-D) surveys by using the model. Method is based on common statistical measures of accuracy. Designed for urban areas with populations below 50,000.

National Committee on Urban Transportation, Better Transportation for Your City: A Guide to the Factual Development of Urban Transportation Plans, Brattleboro, Vermont, The Vermont Printing Company, 1958.

Describes techniques to improve transportation planning through systematic data collection and analysis of basic facts. Presents guidelines for development of highway, transit, and terminal improvements. Designed for any community or metropolitan area.

National Committee on Urban Transportation, Procedure Manuals, 17 Volumes, Ann Arbor, Michigan, Cushing-Malloy, Inc., 1958-59.

Describes the collection, reduction, and analysis of transportation data. Develops techniques to determine basic transportation needs; evaluate transportation facilities; and appraise financial, legal, and administrative activities. Should be used in conjunction with Better Transportation for Your City: A Guide to the Factual Development of Urban Transportation Plans.

SYSTEM PLANNING

National Research Council, Transportation Research Board, Quick-Response Urban Travel Estimation Techniques and Transferable Parameters -- User's Guide, National Cooperative Highway Research Program Report 187, Washington, D.C., 1978.

This report describes simplified travel estimation procedures designed to be applied manually and quickly. The procedures are totally noncomputerized and make substantial use of charts, graphs, and monographs in application. All the major elements of the 4-step process have been converted to easily applicable methods which are valid for all city size groups. Also provided are numerous factors and transferable parameters. In all, the procedures represent a very convenient and simple means of analyzing transportation issues.

Pearson, Frederick C., and George E. Schoener, Land Use and Arterial Spacing in Suburban Areas, Washington, D.C., U.S. Department of Transportation, Federal Highway Administration, May 1977.

This report provides planners and engineers with guidelines and a "how to" approach for estimating traffic volumes within corridors and the associated arterial street system requirements. The guidelines also aid in decisions concerning the amount of development an existing arterial street system can support and thus provide an indication of how zoning changes impact the street system. Application of the methodology involves the use of several simple graphs. The guidelines were originally developed by Gruen Associates.

Shortreed, John L. and Richard F. Crowther, "Programming Transport Investment: A Priority Planning Procedure," Transportation Research Record 574, Washington, D.C., National Research Council, Transportation Research Board, 1976.

Develops a priority-programming procedure to deal with rural highway and urban transit investment. Describes linear programming as a valuable extension of cost-benefit analysis, enabling the explicit considerations of trade-offs concerning the timing of improvement investments.

U.S. Department of Transportation, Federal Highway Administration, An Introduction to Urban Travel Demand Forecasting - A Self-Instructional Text, Washington, D.C., 1977.

This text is intended to provide a general introduction to the travel demand forecasting process. The material is based on the traditional travel demand forecasting process: trip generation, trip distribution, mode usage, and network assignment.

SYSTEM PLANNING

U.S. Department of Transportation, Federal Highway Administration, "System Planning," from a series titled, Transportation Planning for Your Community, Washington, D.C., 1980.

Details the steps required for the functional classification of streets and highways, the estimation of future traffic, the estimation of impacts of future traffic, and the estimation of street and highway system requirements. An Appendix includes alternative methods for forecasting traffic.

U.S. Department of Transportation, Federal Highway Administration, Traffic Assignment, Washington, D.C., August 1973.

This report presents in concise terms techniques available for estimating loads on a transportation network. In addition, it discusses operational decisions that will be made in applying any assignment technique, the uses of the procedure, and the evaluation of the products of the assignment process.

U.S. Department of Transportation, Federal Highway Administration, Transportation Planners Guide to Using the 1980 Census, Washington, D.C., January 1984.

This report describes the data available from the 1980 decennial census that is of value to the transportation planner.

U.S. Department of Transportation, Federal Highway Administration, Trip Generation Analysis, Washington, D.C., 1975.

The purpose of this document is to provide a step-by-step approach to trip generation analysis. The approach is straightforward, logical, is more easily monitored and can be updated using survey and secondary source data. The approach is based upon cross-classification for residential trip generation and upon rates for nonresidential generations. Numerous tables and graphs are provided for easy application.

U.S. Department of Transportation, Federal Highway Administration, Urban Trip Distribution Friction Factors, Washington, D.C., 1974.

This report documents the trip distribution friction factors used in transportation studies in several urban areas. The report presents friction factor graphs or composites that could be used for synthesis or borrowed to run a gravity model for a city. These graphs are also useful as an initial set of factors to any city calibrating a gravity model using O-D data. This would reduce the calibration effort and amount of time required for application. The graphs are delineated by five trip purposes for four city size groups.

SYSTEM PLANNING

U.S. Department of Transportation, Office of Transportation Economic Analysis, Evaluating Urban Transportation System Alternatives, Washington, D.C., November 1978.

This report presents a comprehensive and practical methodology for evaluating urban transportation system alternatives, ranging from large-scale changes to low-investment options. Procedures are included for determining the economic efficiency of alternatives (such as might be measured through a benefit-cost ratio, net present value, or rate of return) and for portraying the distribution of impacts.

U.S. Department of Transportation, Urban Mass Transportation Administration, Characteristics of Urban Transportation Demand - A Handbook for Transportation Planners, Washington, D.C., April 1978.

This report is a handbook that may be used by urban transportation planners in estimating the various components of urban transportation demand. It contains characteristics of urban bus, rail, and highway systems, and urban trip-making. It also notes ways of checking the results of the urban planning process for reasonableness and relevance.

U.S. Department of Transportation, Urban Mass Transportation Administration, Characteristics of Urban Transportation Systems - A Handbook for Transportation Planners, Washington, D.C., June 1979.

This handbook is to be used by transportation planners and urban specialists for estimating system parameters for conventional transportation technology. Three modes are evaluated: rail transit, local bus and bus rapid transit, and highway systems. Each mode contains an assessment of the following seven selected supply parameters: speed, capacity, operating cost, energy consumption, pollutant emissions, capital costs, and accident frequency. These parameters are organized as proxy variables in describing the characteristics of each transport mode. Each mode has a corresponding Appendix section where these parameters are evaluated in further detail and for particular geographic areas.