

Edward Weiner

Urban Transportation Planning in the United States

History, Policy, and Practice

Fourth Edition

 Springer

Urban Transportation Planning in the United States

Edward Weiner

Urban Transportation Planning in the United States

History, Policy, and Practice

Fourth Edition



Springer

Edward Weiner
Silver Spring
MD, USA

ISBN 978-1-4614-5406-9 ISBN 978-1-4614-5407-6 (eBook)
DOI 10.1007/978-1-4614-5407-6
Springer New York Heidelberg Dordrecht London

Library of Congress Control Number: 2012951332

© Springer Science+Business Media New York 2013

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed. Exempted from this legal reservation are brief excerpts in connection with reviews or scholarly analysis or material supplied specifically for the purpose of being entered and executed on a computer system, for exclusive use by the purchaser of the work. Duplication of this publication or parts thereof is permitted only under the provisions of the Copyright Law of the Publisher's location, in its current version, and permission for use must always be obtained from Springer. Permissions for use may be obtained through RightsLink at the Copyright Clearance Center. Violations are liable to prosecution under the respective Copyright Law.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

While the advice and information in this book are believed to be true and accurate at the date of publication, neither the authors nor the editors nor the publisher can accept any legal responsibility for any errors or omissions that may be made. The publisher makes no warranty, express or implied, with respect to the material contained herein.

Printed on acid-free paper

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

Preface

Urban transportation planning is carried out primarily by state and local agencies. Over the years, much experience has been gained in the planning and evaluation of urban transportation systems. This knowledge can be useful to planners and decision makers in the development and implementation of transportation system changes. In this context, it is important to understand the transportation and planning options which have been tried, and how they developed into the approaches we have today. This book describes the evolution of urban transportation planning over the last 80 years.

This is the fourth edition of the book which was first published in 1987. The third edition discussed urban transportation planning to mid-2006. This edition updates the evolution of urban transportation planning and policy to mid-2012. It also contains some additions and revisions to the earlier edition. This book is an updated version of “Evolution of Urban Transportation Planning” which was first published in 1979 as Chap. 15 in *Public Transportation: Planning, Operations and Management*, edited by George E. Gray and Lester L. Hoel. It was revised and published in 1992 as Chap. 3 in *Public Transportation*, Second Edition, edited by George E. Gray and Lester L. Hoel.

The book focuses on the key events in the evolution of urban transportation planning including developments in technical procedures, philosophy, processes, and institutions. But, planners must also be aware of changes in legislation, policy, regulations, and technology. These events have been included to provide a more complete picture of the forces that have affected and often continue to affect urban transportation planning.

Summarizing so much history in a single book requires difficult choices. The efforts of many individuals and groups made important contributions to the development of urban transportation planning. Clearly, not all of these contributions could be included or cited. This book concentrates on the key events of national significance and thereby tries to capture the overall evolution of urban transportation planning. Focusing on key events also serves as a convenient point to discuss developments in a particular area.

The book is generally arranged chronologically. Each period is titled with the major theme pervading that period as viewed by the author. Not all key events fit precisely under a particular theme, but many do. The discussion of the background for some events or the follow-on activities for others may cover more than one time period and is placed where it seemed most relevant.

The book takes a multimodal perspective and attempts to provide a balanced view among a number of subject areas including:

- Significant Federal legislation
- Major, relevant Federal regulations and policies
- Highway concerns
- Transit concerns
- Environmental issues
- Energy issues
- Safety issues
- Climate change concerns
- Financing
- Relevant conferences
- Technological developments
- Transportation service alternatives
- Manuals and methodological developments
- National transportation studies
- National data resources
- Local events with national significance.

Over the years, the author has discussed these events with many persons in the profession. Often they had participated in or had firsthand knowledge of the events. The author appreciates their assistance, even though they are too numerous to mention specifically.

In preparing this book, the author was directly aided by several individuals who provided information on specific events. Their assistance is appreciated: Jack Bennett, Barry Berlin, Susan Binder, Norman Cooper, Frederick W. Ducca, Sheldon H. Edner, Christopher R. Fleet, Charles A. Hedges, Kevin Heanue, Donald Igo, Anthony R. Kane, Thomas Koslowski, Ira Laster, William M. Lyons, James J. McDonnell, Florence Mills, Camille C. Mittelholtz, Norman Paulhus, Elizabeth A. Parker, John Peak, Sam Rea, Carl Rappaport, Elizabeth Riklin, James A. Scott, Mary Lynn Tischer, Martin Wachs, Jimmy Yu, and Samuel Zimmerman.

The author appreciates the review comments provided by Donald Emerson, David S. Gendell, James Getzewich, Charles H. Graves, Thomas J. Hillegass, Howard S. Lapin, Herbert S. Levinson, Alfonso B. Linhares, Gary E. Maring, Alan Pisarski, Ali F. Sevin, Gordon Shunk, Peter R. Stopher, Carl N. Swerdloff, Paul L. Verchinski, and George Wickstrom.

Any errors of fact or interpretation are the responsibility of the author.

Edward Weiner
June 2012

Contents

| | | |
|----------|---|----|
| 1 | Introduction | 1 |
| 2 | Early Highway Planning | 7 |
| | Federal Highway Act of 1921 | 7 |
| | Early Parkways | 9 |
| | Radburn, New Jersey | 10 |
| | Federal-Aid Highway Act of 1934..... | 12 |
| | Electric Railway Presidents’ Conference Committee | 12 |
| | Manual on Uniform Traffic Control Devices..... | 13 |
| | AASHO Policy on Geometric Design of Rural Highways..... | 14 |
| | Toll Road Study | 15 |
| | Highway Capacity Manual | 15 |
| | Interregional Highway Report | 16 |
| 3 | Roots of Urban Transportation Planning | 19 |
| | Federal-Aid Highway Act of 1944..... | 19 |
| | Manual of Procedures for Home Interview Traffic Studies | 20 |
| | Levittown, New York | 22 |
| | Early Transit Planning..... | 24 |
| | Dawn of Analytical Methods | 25 |
| | AASHO Manual on User Benefit Analysis..... | 26 |
| | Breakthroughs in Analytical Techniques | 27 |
| | National Committee on Urban Transportation..... | 28 |
| | Housing Act of 1954: “701” Comprehensive Planning Program | 28 |
| | Pioneering Urban Transportation Studies | 29 |
| 4 | Launching the Interstate Highway Program | 31 |
| | Federal-Aid Highway Act of 1956..... | 32 |
| | Sagamore Conference on Highways and Urban Development..... | 34 |
| | Housing Act of 1961 | 35 |
| | Future Highways and Urban Growth..... | 35 |
| | An Analysis of Urban Travel Demands | 37 |

5 Urban Transportation Planning Comes of Age..... 39

Joint Report on Urban Mass Transportation 39

President Kennedy’s Transportation Message 40

Federal-Aid Highway Act of 1962..... 40

Hershey Conference on Urban Freeways 41

Implementation of the 1962 Federal-Aid Highway Act 42

Conventional Urban Travel Forecasting Process..... 44

Southeastern Wisconsin Regional Planning Commission 45

Highway Planning Program Manual..... 47

Urban Mass Transportation Act of 1964..... 48

Urban Development Simulation Models 48

The Urban Transportation Problem 49

Williamsburg Conference on Highways and Urban Development..... 50

Residential Location and Urban Mobility..... 51

6 Improving Intergovernmental Coordination 53

Housing and Urban Development Act of 1965..... 54

1966 Amendments to the Urban Mass Transportation Act 54

Highway and Motor Vehicle Safety Acts of 1966..... 54

Department of Transportation Act of 1966 56

National Historic Preservation Act of 1966 56

Demonstration Cities and Metropolitan Development Act of 1966 57

Dartmouth Conference on Urban Development Models 57

Freedom of Information Act of 1966 58

Reserved Bus Lanes 59

Reverse Commuting Experiments 60

National Highway Needs Studies 61

Federal-Aid Highway Act of 1968..... 63

“Continuing” Urban Transportation Planning 64

Intergovernmental Cooperation Act of 1968 66

Bureau of the Budget’s Circular No. A-95..... 66

7 Rising Concern for the Environment and Citizen Involvement..... 69

Citizen Participation and the Two-Hearing Process for Highways..... 69

National Environmental Policy Act of 1969..... 70

Environmental Quality Improvement Act of 1970 70

Nationwide Personal Transportation Study 71

Clean Air Act Amendments of 1970 73

Boston Transportation Planning Review 74

Urban Corridor Demonstration Program 75

Census Journey-to-Work Surveys..... 75

Case of Overton Park..... 77

8 Beginnings of Multimodal Urban Transportation Planning..... 79

Urban Mass Transportation Assistance Act of 1970 79

Federal-Aid Highway Act of 1970..... 81

| | |
|--|------------|
| Conference on Urban Commodity Flow | 81 |
| Discrete Choice Models | 82 |
| Mt. Pocono Conference on Urban Transportation Planning | 84 |
| DOT Initiatives Toward Planning Unification | 84 |
| Process Guidelines for Highway Projects | 85 |
| UMTA’s External Operating Manual | 86 |
| Williamsburg Conference on Urban Travel Forecasting | 87 |
| Federal-Aid Highway Act of 1973 | 88 |
| Endangered Species Act of 1973 | 89 |
| AASHTO Policy on Geometric Design of Urban Highways | 89 |
| 1972 and 1974 National Transportation Studies | 90 |
| National Mass Transportation Assistance Act of 1974 | 91 |
| PLANPAC and UTPS Batteries of Computer Programs | 92 |
| 9 Transition to Short-Term Planning | 95 |
| Emergency Energy Legislation | 95 |
| Service and Methods Demonstration Program | 96 |
| Taxicabs | 97 |
| OTA’s Report on Automated Guideway Transit | 99 |
| Model 13(c) Labor Protection Agreement for Operating Assistance..... | 100 |
| Joint Highway/Transit Planning Regulations | 101 |
| Traffic Calming | 103 |
| Policy on Major Urban Mass Transportation Investments | 104 |
| Characteristics of Urban Transportation Systems | 107 |
| Light Rail Transit | 108 |
| Federal-Aid Highway Act of 1976..... | 110 |
| ITE Trip Generation Report | 110 |
| Urban System Study | 111 |
| Road Pricing Demonstration Program | 112 |
| National Transportation Trends and Choices | 112 |
| Transit Uniform System of Accounts and Records..... | 113 |
| Clean Air Act Amendments of 1977 | 114 |
| 10 Emphasizing Urban Economic Revitalization..... | 117 |
| 1978 National Urban Policy Report..... | 117 |
| Surface Transportation Assistance Act of 1978 | 119 |
| Quick Response Urban Travel Forecasting Techniques | 120 |
| National Energy Act of 1978 | 121 |
| Council on Environmental Quality’s Regulations | 122 |
| BART Impact Program | 123 |
| International Conferences on Behavioral Travel Demand..... | 126 |
| National Ridesharing Demonstration Program..... | 128 |
| Urban Initiatives Program..... | 128 |
| Section 504 Regulations on Accessibility for the Handicapped | 129 |
| National Transportation Policy Study Commission..... | 130 |
| Interstate Substitutions..... | 131 |

| | |
|--|------------|
| Aspen Conference on Future Urban Transportation | 132 |
| Land Use Impacts of Beltways | 133 |
| Highway Performance Monitoring System | 134 |
| 11 Decentralization of Decision-Making | 137 |
| President Reagan’s Memorandum on Regulations | 137 |
| Conferences on Goods Transportation in Urban Areas..... | 138 |
| Airlie House Conference on Urban Transportation | |
| Planning in the 1980s..... | 139 |
| Federal-Aid Highway Act of 1981..... | 139 |
| E.O. 12372, Intergovernmental Review of Federal Programs..... | 140 |
| Woods Hole Conference on Future Directions of Urban Public | |
| Transportation | 141 |
| Easton Conference on Travel Analysis Methods for the 1980s | 142 |
| Surface Transportation Assistance Act of 1982 | 143 |
| Advent of Microcomputers | 145 |
| New Urban Transportation Planning Regulations | 146 |
| 12 Promoting Private Sector Participation..... | 149 |
| Paratransit Policy | 149 |
| Transportation Management Associations | 150 |
| Revised Major Transit Capital Investment Policy | 151 |
| Transportation Demand Management..... | 153 |
| Private Participation in the Transit Program..... | 154 |
| National Transit Performance Reports..... | 155 |
| Charter Bus Regulations | 156 |
| Surface Transportation and Uniform Relocation | |
| Assistance Act of 1987..... | 157 |
| National Conferences on Transportation Planning Applications | 160 |
| Smuggler’s Notch Conference on Highway Finance..... | 161 |
| Revised FHWA/UMTA Environmental Regulation..... | 162 |
| Los Angeles’ Regulation XV | 163 |
| 13 The Need for Strategic Planning..... | 165 |
| National Council on Public Works Improvement | 166 |
| Transportation 2020 | 166 |
| Williamsburg Conference on Transportation | |
| and Economic Development | 168 |
| National Transportation Strategic Planning Study..... | 169 |
| Intelligent Vehicle Highway Systems | 170 |
| Lawsuit Against the Metropolitan Transportation | |
| Commission’s Travel Models | 171 |
| Geographic Information Systems | 173 |
| National Maglev Initiative | 174 |
| Clean Air Act Amendments of 1990 | 176 |
| Strategic Planning and Management | 180 |
| Americans with Disabilities Act of 1990..... | 181 |

Intermodal Surface Transportation Efficiency Act of 1991 182

Manual of Regional Transportation Modeling Practice
for Air Quality Analysis 192

14 The Growth of Sustainable Development 195

Charlotte Conference on Moving Urban America 196

Travel Model Improvement Program 196

Livable Communities Initiative 197

Energy Policy Act of 1992..... 198

Transportation Implication of Telecommuting 198

Metropolitan and Statewide Planning Regulations..... 199

Transportation: Air Quality Conformity Regulations 201

Making the Land Use, Transportation, Air Quality
Connection (LUTRAQ) 201

Transportation Management Systems..... 203

E.O. 12893 Principles for Federal Infrastructure Investment..... 204

E.O. 12898 on Environmental Justice..... 205

National Bicycling and Walking Study..... 206

Curbing Gridlock: Peak-Period Fees to Relieve Traffic Congestion 208

Conference on Institutional Aspects of Metropolitan
Transportation Planning 210

Implications of Expanding Metropolitan Highway Capacity 210

State Route 91 Express Lanes in Southern California 211

National Highway System Designation Act of 1995 212

Major Investment Studies 214

Travel Survey Manual..... 215

15 Expanding Participatory Democracy 217

Deployment of Intelligent Transportation Systems 218

Activity-Based Travel Forecasting Conference 219

Public Involvement 221

National Transportation System..... 222

State Infrastructure Banks..... 223

Travel Model Validation Manual 224

Envision Utah..... 226

Context Sensitive Design..... 228

Transportation Equity Act for the Twenty-First Century 229

New Jersey’s Transit Village Initiative 235

Welfare to Work: Job Access and Reverse Commute Program 237

Georgia Regional Transportation Authority..... 237

Congestion Management Systems 239

Value Pricing Pilot Program..... 240

Conferences on Refocusing Transportation Planning
for the Twenty-First Century..... 241

National Transportation Policy Architecture
for the Twenty-First Century..... 242

| | | |
|-----------|--|-----|
| 16 | Moving Towards Performance-Based Planning | 245 |
| | Asset Management..... | 246 |
| | Conference on Performance Measures in Planning and Operations..... | 247 |
| | The Alameda Corridor | 248 |
| | Freight Analysis Framework..... | 250 |
| | Central Texas Regional Mobility Authority..... | 251 |
| | Bus Rapid Transit..... | 252 |
| | Transportation Security..... | 254 |
| | Transit Capacity and Quality of Service Manual..... | 255 |
| | Clean Air Rules of 2004..... | 257 |
| | Scenario Planning | 258 |
| | Public–Private Partnerships | 259 |
| | Norman Y. Mineta Research and Special Programs Improvement Act | 261 |
| | Transportation-Air Quality Conformity..... | 262 |
| | Energy Policy Act of 2005..... | 263 |
| | Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users | 264 |
| | Forum on Road Pricing and Travel Demand Modeling..... | 272 |
| | Interstate 50..... | 273 |
| | Commuting in America III..... | 275 |
| | National Strategy to Reduce Congestion on America’s Transportation Network | 277 |
| 17 | Concern for Climate Change | 279 |
| | California’s Global Warming Solutions Act | 279 |
| | Metropolitan Travel Forecasting: Current Practice and Future Direction | 281 |
| | Conference on the Metropolitan Planning Organization, Present and Future..... | 282 |
| | Chicago Region Environmental and Transportation Program..... | 284 |
| | Car Sharing | 288 |
| | National Surface Transportation Policy and Revenue Study Commission | 289 |
| | California’s Sustainable Communities Planning Act..... | 290 |
| | Potential Impacts of Climate Change on US Transportation..... | 292 |
| | Rail Passenger Investment and Improvement Act of 2008..... | 294 |
| | American Recovery and Reinvestment Act of 2009..... | 296 |
| | Effects of Compact Development on Motorized Travel..... | 297 |
| | Partnership for Sustainable Communities..... | 298 |
| | Executive Order 13514 Federal Leadership in Environmental, Energy, and Economic Performance | 299 |

| | |
|--|------------|
| 18 Era of Constrained Resources | 301 |
| National Surface Transportation Infrastructure | |
| Financing Commission | 302 |
| Advanced Practices in Travel Forecasting | 303 |
| MOVES Motor Vehicle Emissions Model..... | 305 |
| TIGER Discretionary Grant Program | 306 |
| Military Base Traffic | 308 |
| Increased Corporate Average Fuel Economy Standards | 310 |
| Revised Federal Transit Administration New Starts | |
| Evaluation Process | 310 |
| Florida’s Transportation Planning Process..... | 312 |
| Super-Commuting in Mega Regions..... | 314 |
| Travel Demand Forecasting: Parameters and Techniques | 315 |
| Connected Vehicles | 316 |
| Moving Ahead for Progress in the 21st Century Act | 317 |
| 19 Concluding Remarks | 323 |
| References | 329 |
| Index..... | 353 |

List of Abbreviations

| | |
|--------|--|
| 3C | Continuing, comprehensive, and cooperative |
| 3R | Resurfacing, restoration, and rehabilitation |
| 4R | Resurfacing, restoration, rehabilitation, and reconstruction |
| AASHO | American Association of State Highway Officials |
| AASHTO | American Association of State Highway and Transportation Officials |
| AGT | Automated guideway transit |
| ANPRM | Advanced notice of proposed rulemaking |
| APTA | American Public Transit Association |
| ATA | American Transit Association |
| BART | Bay area rapid transit |
| BMS | Bridge management system |
| BOB | Bureau of the Budget |
| BPR | Bureau of Public Roads |
| BRAC | Base Closure and Realignment Commission |
| BRT | Bus rapid transit |
| BTS | Bureau of Transportation Statistics |
| CAFE | Corporate average fuel economy |
| CAMPO | Capital Area Metropolitan Planning Organization |
| CATI | Computer-assisted telephone interviewing |
| CATS | Chicago Area Transportation Study |
| CBD | Central business district |
| CEQ | Council on Environmental Quality |
| CFS | Commodity flow survey |
| CMS | Congestion management system |
| COG | Council of Governments |
| CTRMA | Central Texas Regional Mobility Authority |
| CUTD | Characteristics of urban transportation demand |
| CUTS | Characteristics of urban transportation systems |

| | |
|---------|--|
| DEIS | Draft environmental impact statement |
| DMATS | Detroit Metropolitan Area Traffic Study |
| DOD | Department of Defense |
| DOE | Department of Energy |
| DOT | Department of Transportation |
| DPM | Downtown people mover |
| EIS | Environmental impact statement |
| EO | Executive order |
| EPA | Environmental Protection Agency |
| ERGS | Electronic route guidance system |
| FAF | Freight analysis framework |
| FARE | Uniform financial accounting and reporting elements |
| FAUS | Federal aid urban system |
| FHWA | Federal Highway Administration |
| FOIA | Freedom of Information Act |
| FONSI | Finding of no significant impact |
| FTA | Federal Transit Administration |
| FY | Fiscal year |
| GARVEEs | Grant anticipation revenue vehicles |
| GIS | Geographic information systems |
| GRT | Group rapid transit |
| GRTA | Georgia Regional Transportation Authority |
| HCM | Highway capacity manual |
| HEW | Department of health, education, and welfare |
| HHFA | Housing and Home Finance Agency |
| HHS | Department of Health and Human Services |
| HOV | High occupancy vehicle |
| HP&R | Highway planning and research |
| HPMS | Highway performance monitoring system |
| HRB | Highway Research Board |
| HUD | Department of Housing and Urban Development |
| I/M | Inspection/Maintenance Program |
| ICE | Interstate cost estimate |
| IM | Instructional memorandum |
| IMS | Intermodal transportation facilities and systems management system |
| IPG | Intermodal Planning Group |
| IRT | Institute for rapid transit |
| ISTEA | Intermodal Surface Transportation Efficiency Act of 1991 |
| ITE | Institute of Transportation Engineers |
| ITLUP | Integrated transportation and land-use package |
| ITS | Intelligent transportation systems |
| IVHS | Intelligent vehicle-highway systems |

| | |
|------------|---|
| JARC | Job Access and Reverse Commute Program |
| LCI | Livable communities initiative |
| LPO | Lead Planning Organization |
| LRT | Light rail transit |
| LRV | Light rail vehicle |
| LUTRAQ | Making the land use, transportation, air quality connection |
| MIS | Major investment study |
| MOVES | Motor vehicle emissions model |
| MPO | Metropolitan Planning Organization |
| MSA | Metropolitan statistical area |
| NARC | National Association of Regional Councils |
| NCHRP | National Cooperative Highway Research Program |
| NCTRP | National Cooperative Transit Research Program |
| NEPA | National Environmental Policy Act of 1969 |
| NHS | National highway system |
| NHTSA | National Highway Traffic Safety Administration |
| NMI | National Maglev initiative |
| NPRM | Notice of proposed rulemaking |
| NPTS | Nationwide Personal Transportation Study |
| NRC | National Research Council |
| NTS | National transportation system |
| OMB | Office of Management and Budget |
| OTA | Office of Technology Assessment |
| PATS | Pittsburgh Area Transportation Study |
| PCC | Electric Railway Presidents' Conference Committee |
| PLANPAC | Planning package (of computer programs) |
| PMS | Pavement management system |
| PPM | Policy and procedure memorandum |
| PRT | Personal rapid transit |
| PTMS | Public transportation management system |
| QRS | Quick response system |
| RITA | Research and Innovative Technology Administration |
| RMA | Regional Mobility Authority |
| SAFETEA-LU | Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users |
| SEWRPC | Southeastern Wisconsin Regional Planning Commission |
| SHRP | Strategic Highway Research Program |
| SIB | State Infrastructure Bank |
| SIP | State implementation plan |
| SLRV | Standard light rail vehicle |
| SLT | Shuttle loop transit |

| | |
|----------|--|
| SMD | Service and methods demonstration |
| SMS | Safety management system |
| SMSA | Standard metropolitan statistical area |
| SOV | Single occupancy vehicle |
| STIP | Statewide Transportation Improvement Program |
| STP | Surface Transportation Program |
| SUV | Sport utility vehicle |
| TAG | Transportation Alternatives Group |
| TAZ | Transportation analysis zone |
| TCM | Transportation control measure |
| TCP | Transportation control plan |
| TCQSM | Transit capacity and quality of service manual |
| TCRP | Transit Cooperative Research Program |
| TCSP | Transportation and Community and System Preservation Pilot Program |
| TDM | Transportation demand management |
| TEA-21 | The Transportation Equity Act For the Twenty-First Century |
| TIFIA | Transportation Infrastructure Finance and Innovation Act |
| TIGER | Transportation investment generating economic recovery |
| TIGER | Topologically integrated geographic encoding and reference |
| TIP | Transportation Improvement Program |
| TMA | Transportation Management Association |
| TMA | Transportation management area |
| TMIP | Travel Model Improvement Program |
| TOD | Transit-oriented design |
| TOPICS | Traffic Operations Program to Improve Capacity and Safety |
| TRANSIMS | Transportation simulation and analysis system |
| TRB | Transportation Research Board |
| TRO | Trip Reduction Ordinance |
| TSM | Transportation system management |
| TTC | Texas Transportation Commission |
| UMTA | Urban Mass Transportation Administration |
| UPWP | Unified Planning Work Program |
| UTCS | Urban traffic control systems |
| UTPP | Urban transportation planning package |
| UTPS | Urban transportation planning system |
| V2D | Vehicle to driver communication |
| V2V | Vehicle to vehicle communication |
| VMT | Vehicle miles of travel |

Chapter 1

Introduction

On October 23, 1962 President John F. Kennedy into law the Federal-Aid Highway Act of 1962 50 years have now passed since that act created the federal mandate for urban transportation planning in the USA. The act was the capstone of two decades of experimentation and development of urban transportation procedures and institutions. It was passed at a time in which urban areas were beginning to plan the Dwight D. Eisenhower National System of Interstate and Defense Highway routes through and around their areas. The 1962 Act, combined with the incentive of 90% federal funding for Interstate highway projects, caused urban transportation planning to spread quickly throughout the USA. It also had a significant influence on urban transportation planning in other parts of the world.

In some ways, the urban transportation planning process and planning techniques have changed little over the 50 years. Yet in other ways urban transportation planning has evolved over these years in response to changing issues, conditions and values, and a greater understanding of urban transportation phenomena. Current urban transportation planning practice is considerably more sophisticated, complex, and costly than its highway planning predecessor, and involves a wider range of participants in the process.

Modifications in the planning process took many years to evolve. As new concerns and issues arose, changes in planning techniques and processes were introduced. These modifications sought to make the planning process more responsive and sensitive to those areas of concern. Urban areas that had the resources and technical ability were the first to develop and adopt new concepts and techniques. These new ideas were diffused by various means throughout the nation, usually with the assistance of the federal government and professional organizations. The rate at which the new concepts were accepted varied from area to area. Consequently, the quality and depth of planning is highly variable at any point in time.

Early highway planning concentrated on developing a network of all weather highways connecting the various portions of the nation. As this work was being accomplished, the problems of serving increasing traffic grew. With the planning for urban areas came additional problems of dispersed land use development patterns,

dislocation of homes and businesses, environmental degradation, citizen participation, energy consumption, transportation for the disadvantaged, and infrastructure deterioration. More recently there have been the concerns about traffic congestion, intermodal connectivity, performance measures, sustainable development, environmental justice, climate change, and national security. The need for adequate financial resources has always been a concern.

Urban transportation planning in the USA has always been conducted by state and local agencies in many cases with the assistance of consulting firms and universities. This approach is entirely appropriate since highway and transit facilities and services are owned and operated largely by the states and local agencies, and more recently private entities. The role of the federal government has been to set national policy, provide financial aid, supply technical assistance and training, and conduct research. Over the years, the federal government has attached requirements to its financial assistance. From a planning perspective, the most important has been the requirement that transportation projects in urbanized areas of 50,000 or more in population be based on an urban transportation planning process. This requirement was first incorporated into the Federal-Aid Highway Act of 1962.

Other requirements have been incorporated into federal legislation and regulations over the years. Many of these are chronicled in this report. At times these requirements have been very exacting in their detail. At other times, greater flexibility was allowed in responding to the requirements. Currently, the emphasis is on increasing state and local flexibility in planning implementation, and in making the planning process more inclusive for all groups and individuals.

Over the years, a number of federal agencies have affected urban transportation planning (Table 1.1). The US Bureau of Public Roads (BPR) was part of the US Department of Commerce when the 1962 Highway Act was passed. It became part of the US Department of Transportation (DOT) upon its creation in 1966 and its name was changed to the US Federal Highway Administration (FHWA). The federal urban mass transportation program began in 1961 under the US Housing and Home Finance Agency, which became the US Department of Housing and Urban Development in 1965. The federal urban transit program was transferred to DOT in 1968 as the US Urban Mass Transportation Administration (UMTA). The name was changed to the US Federal Transit Administration (FTA) by the Federal Transit Act Amendments of 1991. The US Federal Railroad Administration (FRA) was created at the same time as DOT. The National Traffic and Motor Vehicle Safety Act of 1966 established the National Traffic Safety Agency, and the Highway Safety Act of 1966 established the National Highway Safety Agency both in the US Department of Commerce. The two safety agencies were combined by Executive Order 11357 in 1967 into the National Highway Safety Bureau in the newly created DOT. In 1970 it became the National Highway Traffic Safety Administration (NHTSA).

Other federal agencies became involved in urban transportation planning as new issues arose. The US Department of Labor (DOL) became involved in 1964 to administer the labor protections provisions of the Urban Mass Transportation Act. The Advisory Council on Historic Preservation was established in 1966 to administer national historic preservation programs. The Bureau of the Budget (BOB), later

Table 1.1 Dates selected federal agencies were established

| | |
|------|---|
| 1849 | Department of Interior |
| 1913 | Department of Commerce |
| 1913 | Department of Labor |
| 1916 | Bureau of Public Roads |
| 1921 | Bureau of the Budget |
| 1947 | Housing and Home Finance Agency |
| 1953 | Department of Health, Education and Welfare |
| 1965 | Department of Housing and Urban Development |
| 1966 | Department of Transportation |
| 1966 | Federal Highway Administration |
| 1966 | Federal Railroad Administration |
| 1966 | Advisory Council on Historic Preservation |
| 1967 | National Highway Safety Bureau |
| 1968 | Urban Mass Transportation Administration |
| 1969 | Council on Environmental Quality |
| 1970 | National Highway Traffic Safety Administration |
| 1970 | Office of Management and Budget |
| 1970 | Environmental Protection Agency |
| 1977 | Department of Energy |
| 1979 | Department of Health and Human Services |
| 1991 | Federal Transit Administration |
| 1992 | Bureau of Transportation Statistics |
| 2000 | Federal Motor Carrier Safety Administration |
| 2001 | Transportation Security Administration |
| 2002 | Department of Homeland Security |
| 2005 | Research and Innovative Technology Administration |

to become the Office of Management and Budget (OMB), issued guidance in 1969 to improve coordination among programs funded by the federal government. In later years, OMB issued guidance on many issues that affected urban transportation. To address environmental concerns that were increasing in the latter part of the 1960s, the Council on Environmental Quality (CEQ) was created in 1969 and the US Environmental Protection Agency (EPA) in 1970. The US Department of Health, Education and Welfare (HEW), now the US Department of Health and Human Services (HHS), became involved in urban transportation as a result of the Rehabilitation Act of 1973 as part of its function to eliminate discrimination against handicapped persons in federal programs. With the passage of the Endangered Species Act of 1973, the Department of Interior and the Department of Commerce became involved in some aspects of urban transportation planning. In 1977, the US Department of Energy (DOE) was created to bring together federal energy functions.

The Bureau of Transportation Statistics (BTS) was created by the Intermodal Surface Transportation Efficiency Act of 1991 for data collection, analysis, and reporting and to ensure the most cost-effective use of transportation monitoring resources. It was merged into the Research and Innovative Technology Administration (RITA) in 2005 by the Norman Y. Mineta Research and Special Programs

Improvement Act. The Federal Motor Carrier Safety Administration (FMCSA) was established as a separate administration within the US DOT in 2000 by the Motor Carrier Safety Improvement Act of 1999 to reduce crashes, injuries, and fatalities involving large trucks and buses. The US Transportation Security Administration (TSA) was created in the US DOT in 2001 by Transportation Security Act to protect the nation's transportation systems by ensuring the freedom of movement for people and commerce. It was merged into the Department of Homeland Security (DHS) when it was created by Homeland Security Act of 2002.

The involvement of these and other agencies at the federal, state and local level created an increasing challenge to agencies conducting urban transportation planning to meet all the requirements that resulted. Local planners devoted substantial resources to meeting requirements of higher level governments, which often detracted from their ability to address local needs and objectives. These requirements, however, were also used by local agencies as the justification to carry out activities that they desired but for which they could not obtain support at the local level.

This report reviews the historical development of the urban transportation planning process in the USA from its beginnings in early highway and transit planning to its current focus on intermodal connectivity, sustainable development, and broad participation in the planning process.

Chapter 2 discusses the early beginnings of highway planning.

Chapters 3 covers the formative years of urban transportation planning during which many of the basic concepts were developed.

Chapter 4 describes the beginning of the National System of Interstate and Defense Highways.

Chapter 5 focuses on the 1962 Federal-Aid Highway Act and the sweeping changes it brought in urban transportation planning in the USA. It also describes early federal involvement in urban public transportation.

Chapter 6 discusses efforts at intergovernmental coordination, the beginning of the federal highway and vehicle safety programs, a deeper federal role in urban public transportation and the evolution to "continuing" transportation planning.

Chapter 7 describes the environmental revolution of the late 1960s and the increased involvement of citizens in the urban transportation planning process.

Chapter 8 addresses the events that led to integrated planning for urban public transportation and highways. These included major increases in federal transit programs as well as increased flexibility in the use of highway funds.

Chapter 9 focuses on the Arab oil embargo of 1973 which accelerated the transition from long-term system planning to short-term, smaller scale planning. It also discusses the concern for cost-effectiveness in transportation decisions and the emphasis on transportation system management techniques.

Chapter 10 highlights the concern for the revitalization of older urban centers and the growing need for energy conservation. It describes the expanding federal requirements on environmental quality and transportation for special groups.

Chapter 11 describes the efforts to reverse federal intrusion into local decisions and to scale back federal requirements.

Chapter 12 discusses the expanded interest in involving the private sector in the provision of transportation services and the decline in public resources to address transportation planning.

Chapter 13 focuses on strategic planning to the year 2000 and into the next century, and the renewed interest in new technological options. It also discusses the growing concern for traffic congestion and air pollution and the efforts at transportation demand management.

Chapter 14 describe the increasing concern for the effects of transportation on living quality and the environment grew, and on broader approaches of the transportation planning process to address the relationship of transportation to sustainable development.

Chapter 15 focuses on expansion of a participatory transportation decision-making process to include a wide range of participants in the process including individuals and citizen groups.

Chapter 16 highlights the beginning of a new century which ushered in a drive to preserve and effectively operate the transportation system, assure that expenditures achieved solid results, and find adequate resources to meet growing needs.

Chapter 17 describes the rising concern for climate change and measures to address it.

Chapter 18 discusses the nation's economic slowdown, rising national deficit and difficulty in obtaining financial resources for transportation projects.

Chapter 19 provides summary and concluding remarks.

Chapter 2

Early Highway Planning

Early highway planning grew out the need for information on the rising tide of automobile and truck usage during the first quarter of the twentieth century. From 1904, when the first automobiles ventured out of the cities, traffic grew at a steady and rapid rate. After the initial period of highway construction which connected many of the nation's cities, emphasis shifted to improving the highway system to carry these increased traffic loads. New concepts were pioneered to increase highway capacity including control of access, elimination of at grade intersections, new traffic control devices, and improved roadway design. Transit properties were privately held were the purview of cities.

Early highway planning was devoted to the collection and analysis of factual information and, on applying that information to the growing highway problems in the period prior to World War II. It was during this period that scientific and engineering principles were first used to measure highway traffic and capacity and to apply that knowledge to the planning and design of highways.

Federal Highway Act of 1921

In the early years of highway construction, the automobile had been regarded as a pleasure vehicle rather than an important means of transportation. Consequently, highways consisted of comparatively short sections that were built from the cities into the countryside. There were significant gaps in many important intercity routes. During this period, urban roads were considered to be adequate, particularly in comparison to rural roads which were generally not paved.

As the automobile was improved and ownership became more widespread, the idea of a highway network gained in strength. The concept of a national system of highways was recognized in the Federal Highway Act of 1921. The Act required that the State highway departments designate a system of principal interstate and inter county roads, limited to 7% of the total mileage of rural roads then existing.

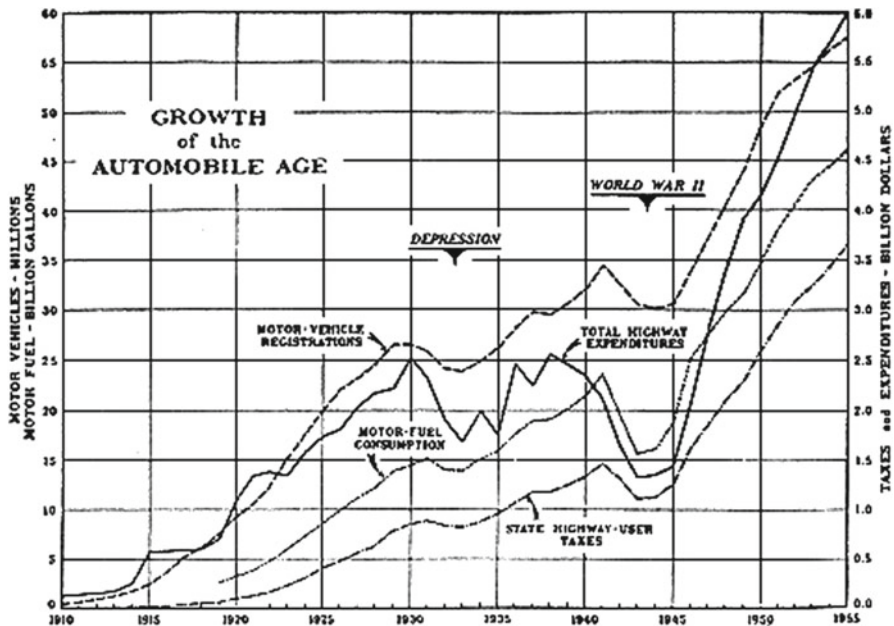


Fig. 2.1 Motor vehicle registrations, fuel consumption, user taxes, and highway expenditures, 1910–1955. Source: US Dept. of Commerce, 1954a, b

The use of Federal-aid funds was restricted to this system. The Federal government would pay 50% of the construction cost while the states would pay the other 50%. This concentration of attention on a carefully selected system of roads had a large influence on the rapid development of an integrated, nationwide network of improved highways.

The concept of a continuous national system of highways was reinforced in the Federal-Aid Highway Act of 1925 with the requirement for a US numbered highway system composed of important through routes extending entirely across the nation. Instead of using names and colored bands on telephone poles, this new system would use uniform numbers for inter-state highways and a standardized shield that would be universally recognizable. This was not a formal highway system but simply a basis for route marking as a guide for motorists. The US number highway system was adopted in 1926.

With the adoption of a Federal-aid system, in the Federal-Aid Act of 1921, and the marking of through routes, the focus of highway construction was on “closing the gaps.” By the early 1930s, the objective of constructing a system of two-lane roads connecting the centers of population had largely been completed. It was then possible to travel around the country on a smooth, all-weather highway system (US Federal Works Agency, 1949).

With the completion of this “pioneering period” of highway construction, attention shifted to the more complex issues resulting from the rapid growth in traffic and increasing vehicle weights. Figure 2.1 shows the growth in vehicle registrations,

motor fuel consumption, highway expenditures and tax receipts during the period (US Dept. of Commerce, 1954a). Early highways were inadequate in width, grade and alignment to serve major traffic loads, and highway pavements had not been designed to carry the numbers and weights of the newer trucks.

It became clear that these growing problems necessitated the collection and analysis of information on highways and their use on a more comprehensive scale than had ever before been attempted (Holmes and Lynch, 1957). A systematic approach to the planning of highways was needed to respond to these problems.

Early Parkways

The growing numbers of automobiles and the expansion of cities into nearby suburbs in the early part of the century created the need for specialized roadways. In New York, the city's growth was rapidly extending northward into Westchester County. Property along the Bronx River was coming into the market, and the subdivision of this land into smaller plots and the development upon it was polluting the river. The Bronx River Commission was established in 1907 to acquire the necessary lands, and build the Bronx River Parkway as a joint undertaking between New York City and Westchester County.

The Bronx River Parkway Reservation was the first public parkway designed explicitly for automobile use. The project began as an environmental restoration and park development initiative that aimed to transform the heavily polluted Bronx River into an attractive linear park. With the addition of a parkway drive the project became a pioneering example of modern motorway development. It combined beauty, safety, and efficiency by reducing the number of dangerous intersections, limiting access from surrounding streets and businesses, and surrounding motorists in a broad swath of landscaped greenery. The Bronx River Parkway Reservation, which parallels the parkway, was the first parkland in Westchester Count (Bronx River Parkway—Historic Overview).

The parkway drive accommodated four lanes of traffic on a 40"-wide pavement and included several important design features that would soon become hallmarks of parkway design. These included the avoidance of excessive grades and dangerous curves; the replacement of at-grade intersections with grade-separated crossings; and the division of traffic into two one-way drives separated by a landscaped median divider. Bridges were built for permanence with architectural treatment in harmony with their natural surroundings. Many of these features were duplicated by designers of other projects and became the hallmarks of parkways (Bronx River Parkway—Historic Overview).

The continued expansion of automobile ownership and the technological advances in automobiles soon required additional parkways. During the 1920s and 1930s a number of new parkways were built including the Hutchinson, Saw Mill, Grand Central and the Taconic, north of the New York City, the Henry Hudson Parkway in New York and the Palisades and the Palisades Parkway in New Jersey.

On Long Island, there were the Meadowbrook, Northern and Southern State, and Wantagh State Parkway. By 1934, there were some 134 miles of parkways in Queens, Nassau and Westchester Counties under the direction of Robert Moses (Walmsley, 2003). Also in the 1930s, the modern parkway movement expanded out of New York with construction of several Federal parkways including Skyline Drive in Virginia, Blue Ridge Parkway in North Carolina and Tennessee, and the Merritt Parkway in Connecticut (Loukaitou-Sideris and Gottlieb, 2003).

Radburn, New Jersey

The industrialization of the USA after World War I led to migration from the rural areas and a striking growth of the cities during the 1920's. This population shift led to a severe housing shortage. The automobile, which was becoming a mainstay in American life, added a new problem to urban living. Changes in urban design were necessary to provide more housing and to protect people from automobile traffic. To address these needs, Radburn, the "Town for the Motor Age," was created in 1929 in Fairlawn, New Jersey outside of New York City.

Radburn was designed by Henry Wright and Clarence Stein using Wright's "Six Planks for a Housing Platform":

- Plan simply, but comprehensively. Don't stop at the individual property line. Adjust paving, sidewalks, sewers and the like to the particular needs of the property dealt with—not to a conventional pattern. Arrange buildings and grounds so as to give sunlight, air and a tolerable outlook to even the smallest and cheapest house.
- Provide ample sites in the right places for community use, i.e., playgrounds, school gardens, schools, theaters, churches, public buildings, and stores.
- Put factories and other industrial buildings where they can be used without wasteful transportation of goods or people.
- Cars must be parked and stored, deliveries made, waste collected—plan for such services with a minimum of danger, noise, and confusion.
- Bring private and public land into relationship and plan buildings and groups of buildings with relation to each other. Develop collectively such services as will add to the comfort of the individual, at lower cost than is possible under individual operation.
- Arrange for the occupancy of houses on a fair basis of cost and service, including the cost of what needs to be done in organizing, building, and maintaining the community.

The primary innovation of Radburn was the Road System Hierarchy which separated pedestrian and vehicular traffic. This was accomplished by doing away with the traditional grid-iron street pattern and replacing it with an innovation called the superblock. The superblock was large block of land surrounded by main roads. The houses were grouped around small cul-de-sacs, each of which had an access road

coming from the main roads. The remaining land inside the superblock was park area, the backbone of the neighborhood. The living and sleeping sections of the houses faced toward the garden and park areas, while the service rooms faced the access road.

The idea of purely residential streets was a new idea at that time. The Radburn plan used the cul-de-sac as a rational way to escape the limitations of the checkerboard plan, in which all streets were through streets, with the possibility of collisions between cars and pedestrians every 100 m. The Radburn cul-de-sac lane was designed at a 100–130 m length, with only a 10 m wide right of way, as opposed to the prevailing 16–20 m width. The plan further reduced the paved driving lane to 6 m and allowed for the 2 m utility strip on each side to be landscaped and thus visually part of the garden. Building setbacks were 5 m and provisions were made for street parking.

The walks that surround the cul-de-sacs on the garden side of the houses divided the cu-de-sacs from each other and from the central park area. These paths crossed the park when necessary. Finally, to further maintain the separation of pedestrian and vehicular traffic, a pedestrian underpass and an overpass, linking the superblocks, was provided. The systems was so devised that a pedestrian could start at any given point and proceed on foot to school, stores, or church without crossing a street used by automobiles.

Another innovation of Radburn was that the parks were secured without additional cost to the residents. The savings in expenditures for roads and public utilities at Radburn, as contrasted with the normal subdivision, paid for the parks. The Radburn type of plan used small property lots and less area of street to secure the same amount of frontage. In addition, for direct access to most houses, it used narrower roads of less expensive construction, as well as smaller utility lines. The area in streets and length of utilities was 25% less than in the typical American street. The savings in cost not only paid for 12–14% of the total area that went into internal parks, but also covered the cost of grading and landscaping the play spaces and green links connecting the central block commons. The cost of living in such a community was therefore set at a minimum for the homeowner, and the cost to the builder was small enough to make the venture profitable.

Radburn was unique because it was envisioned as a town for better living, and it was the first example of city planning which recognized the importance of the automobile in modern life without permitting it to dominate the environment. None of the Radburn design features were completely new. Yet, their synthesis and integration into a comprehensive layout was a breakthrough in subdivision form. It was the first time in the USA that a housing development was attempted on such a large scale, proceeding from a definite architectural plan resulting in a complete town. Radburn was also important to builders because of the unique way that the parks and grading were funded.

The Radburn idea, however watered down, became the suburban model of choice. Planners enshrined it in cluster zoning ordinances. Developers, who had never heard of Radburn or its planning principles, grouped buildings around cul-de-sacs and marketed their product from “community centers”. Their projects routinely include

“common open space,” a swimming pool, and sometimes tennis courts, indoor exercise facilities, and children’s play equipment (Garvin, 1998).

Federal-Aid Highway Act of 1934

Beginning with the Federal-Aid Highway Act of 1934, the Congress authorized that 1–1/2% of the amount apportioned to any state annually for construction could be used for surveys, plans, engineering, and economic analyses for future highway construction projects. The act created the cooperative arrangement between the US Bureau of Public Roads (now the US Federal Highway Administration) and the state highway departments, known as the statewide highway planning surveys. By 1940, all states were participating in this program (Holmes and Lynch, 1957).

As an initial activity, these highway planning surveys included a complete inventory and mapping of the highway system and its physical characteristics. Traffic surveys were undertaken to determine the volume of traffic by vehicle type, weight, and dimensions. Financial studies were made to determine the relationship of highway finances to other financial operations within each state, to assess the ability of the states to finance the construction and operation of the highway system, and to indicate how to allocate highway taxes among the users. Many of the same types of activities are still being performed on a continuing basis by highway agencies (Holmes, 1962).

Electric Railway Presidents’ Conference Committee

Electric railway systems were the backbone of urban mass transportation by World War I with over 1,000 street railway companies carrying some 11 billion passengers by 1917 (Mills, 1975). After 1923, ridership on the nation’s electric railways began to decline as the motor bus, with its flexibility to change routes and lower capital costs, quickly began replacing the electric streetcar (N.D. Lea Transportation Research Corporation, 1975). With rising costs and the inability to raise fares to cover costs, the financial condition of street railway companies worsened.

In 1930, the heads of 25 electric railway companies formed the Electric Railway Presidents’ Conference Committee (PCC). The goal of the PCC was to develop a modern streetcar to match the comfort, performance, and modern image of its competitors, and stem the decline of the street railway industry. The effort took 5 years and \$750,000. It was one of the most thorough and efficiently organized ventures in urban mass transit. The product, known as the “PCC car,” far surpassed its predecessors in acceleration, braking, passenger comfort, and noise (Mills, 1975).

The first commercial application of the PCC car was in 1935 in Brooklyn, New York. By 1940 more than 1,100 vehicles had been purchased. By 1952, when production was first halted, about 6,000 PCC cars had been produced. The PCC cars did improve the