# Performance-Based Measures in Transit Fund Allocation

**DETAILS**

74 pages | | PAPERBACK
ISBN 978-0-309-42692-3 | DOI 10.17226/23336

**AUTHORS**

# TCRP
## SYNTHESIS 56

TRANSIT
COOPERATIVE
RESEARCH
PROGRAM

Sponsored by
the Federal
Transit Administration

# Performance-Based Measures in Transit Fund Allocation

*A Synthesis of Transit Practice*

TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

# TCRP

## SYNTHESIS 56

TRANSIT COOPERATIVE RESEARCH PROGRAM

Sponsored by the Federal Transit Administration

# Performance-Based Measures in Transit Fund Allocation

*A Synthesis of Transit Practice*

TRANSPORTATION RESEARCH BOARD
*OF THE NATIONAL ACADEMIES*

TRANSIT COOPERATIVE RESEARCH PROGRAM

TCRP SYNTHESIS 56

# Performance-Based Measures in Transit Fund Allocation

## *A Synthesis of Transit Practice*

**CONSULTANTS**

ROBERT G. STANLEY
and
PATRICIA G. HENDREN, Ph.D.

Cambridge Systematics, Inc.
Chevy Chase, Maryland



**SUBJECT AREAS**

Public Transit

Research Sponsored by the Federal Transit Administration in Cooperation with the Transit Development Corporation

**TRANSPORTATION RESEARCH BOARD**

WASHINGTON, D.C.
2004
www.TRB.org

## TRANSIT COOPERATIVE RESEARCH PROGRAM

The nation's growth and the need to meet mobility, environmental, and energy objectives place demands on public transit systems. Current systems, some of which are old and in need of upgrading, must expand service area, increase service frequency, and improve efficiency to serve these demands. Research is necessary to solve operating problems, to adapt appropriate new technologies from other industries, and to introduce innovations into the transit industry. The Transit Cooperative Research Program (TCRP) serves as one of the principal means by which the transit industry can develop innovative near-term solutions to meet demands placed on it.

The need for TCRP was originally identified in *TRB Special Report 213—Research for Public Transit: New Directions*, published in 1987 and based on a study sponsored by the Federal Transit Administration (FTA). A report by the American Public Transportation Association (APTA), *Transportation 2000*, also recognized the need for local, problem-solving research. TCRP, modeled after the longstanding and successful National Cooperative Highway Research Program, undertakes research and other technical activities in response to the needs of transit service providers. The scope of TCRP includes a variety of transit research fields including planning service configuration, equipment, facilities, operations, human resources, maintenance, policy, and administrative practices.

TCRP was established under FTA sponsorship in July 1992. Proposed by the U.S. Department of Transportation, TCRP was authorized as part of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA). On May 13, 1992, a memorandum agreement outlining TCRP operating procedures was executed by the three cooperating organizations: FTA, the National Academy of Sciences, acting through the Transportation Research Board (TRB), and the Transit Development Corporation, Inc. (TDC), a nonprofit educational and research organization established by APTA. TDC is responsible for forming the independent governing board, designated as the TCRP Oversight and Project Selection (TOPS) Committee.

Research problem statements for TCRP are solicited periodically but may be submitted to TRB by anyone at anytime. It is the responsibility of the TOPS Committee to formulate the research program by identifying the highest priority projects. As part of the evaluation, the TOPS Committee defines funding levels and expected products.

Once selected, each project is assigned to an expert panel, appointed by TRB. The panels prepare project statements (requests for proposals), select contractors, and provide technical guidance and counsel throughout the life of the project. The process for developing research problem statements and selecting research agencies has been used by TRB in managing cooperative research programs since 1962. As in other TRB activities, TCRP project panels serve voluntarily without compensation.

Because research cannot have the desired impact if products fail to reach the intended audience, special emphasis is placed on disseminating TCRP results to the intended end-users of the research: transit agencies, service providers, and suppliers. TRB provides a series of research reports, syntheses of transit practice, and other supporting material developed by TCRP research. APTA will arrange for workshops, training aids, field visits, and other activities to ensure that results are implemented by urban and rural transit industry practitioners.

The TCRP provides a forum where transit agencies can cooperatively address common operational problems. TCRP results support and complement other ongoing transit research and training programs.

**TCRP SYNTHESIS 56**

Project J-7, Topic SG-10
ISSN 1073-4880
ISBN 0-309-07018-X
Library of Congress Control No. 2004114406



**Price $16.00**

### NOTICE

The project that is the subject of this report was a part of the Transit Cooperative Research Program conducted by the Transportation Research Board with the approval of the Governing Board of the National Research Council. Such approval reflects the Governing Board's judgment that the project concerned is appropriate with respect to both the purposes and resources of the National Research Council.

The members of the technical advisory panel selected to monitor this project and to review this report were chosen for recognized scholarly competence and with due consideration for the balance of disciplines appropriate to the project. The opinions and conclusions expressed or implied are those of the research agency that performed the research, and while they have been accepted as appropriate by the technical panel, they are not necessarily those of the Transportation Research Board, the Transit Development Corporation, the National Research Council, or the Federal Transit Administration of the U.S. Department of Transportation.

Each report is reviewed and accepted for publication by the technical panel according to procedures established and monitored by the Transportation Research Board Executive Committee and the Governing Board of the National Research Council.

### Special Notice

The Transportation Research Board of the National Academies, the Transit Development Corporation, the National Research Council, and the Federal Transit Administration (sponsor of the Transit Cooperative Research Program) do not endorse products or manufacturers. Trade or manufacturers' names appear herein solely because they are considered essential to the clarity and completeness of the project report.

*Published reports of the*

**TRANSIT COOPERATIVE RESEARCH PROGRAM**

*are available from:*

Transportation Research Board
Business Office
500 Fifth Street, NW
Washington, D.C. 20001

*and can be ordered through the Internet at:*

http://www.national-academies.org/trb/bookstore

Printed in the United States of America

# THE NATIONAL ACADEMIES

*Advisers to the Nation on Science, Engineering, and Medicine*

The **National Academy of Sciences** is a private, nonprofit, self-perpetuating society of distinguished scholars engaged in scientific and engineering research, dedicated to the furtherance of science and technology and to their use for the general welfare. On the authority of the charter granted to it by the Congress in 1863, the Academy has a mandate that requires it to advise the federal government on scientific and technical matters. Dr. Bruce M. Alberts is president of the National Academy of Sciences.

The **National Academy of Engineering** was established in 1964, under the charter of the National Academy of Sciences, as a parallel organization of outstanding engineers. It is autonomous in its administration and in the selection of its members, sharing with the National Academy of Sciences the responsibility for advising the federal government. The National Academy of Engineering also sponsors engineering programs aimed at meeting national needs, encourages education and research, and recognizes the superior achievements of engineers. Dr. William A. Wulf is president of the National Academy of Engineering.

The **Institute of Medicine** was established in 1970 by the National Academy of Sciences to secure the services of eminent members of appropriate professions in the examination of policy matters pertaining to the health of the public. The Institute acts under the responsibility given to the National Academy of Sciences by its congressional charter to be an adviser to the federal government and, on its own initiative, to identify issues of medical care, research, and education. Dr. Harvey V. Fineberg is president of the Institute of Medicine.

The **National Research Council** was organized 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 advising the federal government. Functioning in accordance with general policies determined by the Academy, the Council has become the principal operating agency of both the National Academy of Sciences and the National Academy of Engineering in providing services to the government, the public, and the scientific and engineering communities. The Council is administered jointly by both Academies and the Institute of Medicine. Dr. Bruce M. Alberts and Dr. William A. Wulf are chair and vice chair, respectively, of the National Research Council.

The **Transportation Research Board** is a division of the National Research Council, which serves the National Academy of Sciences and the National Academy of Engineering. The Board's mission is to promote innovation and progress in transportation through research. In an objective and interdisciplinary setting, the Board facilitates the sharing of information on transportation practice and policy by researchers and practitioners; stimulates research and offers research management services that promote technical excellence; provides expert advice on transportation policy and programs; and disseminates research results broadly and encourages their implementation. The Board's varied activities annually engage more than 5,000 engineers, scientists, and other transportation researchers and practitioners from the public and private sectors and academia, all of whom contribute their expertise in the public interest. The program is supported by state transportation departments, federal agencies including the component administrations of the U.S. Department of Transportation, and other organizations and individuals interested in the development of transportation. **www.TRB.org**

**www.national-academies.org**

## FOREWORD

*By Staff*
*Transportation*
*Research Board*

Transit administrators, engineers, and researchers often face problems for which information already exists, either in documented form or as undocumented experience and practice. This information may be fragmented, scattered, and unevaluated. As a consequence, full knowledge of what has been learned about a problem may not be brought to bear on its solution. Costly research findings may go unused, valuable experience may be overlooked, and due consideration may not be given to recommended practices for solving or alleviating the problem.

There is information on nearly every subject of concern to the transit industry. Much of it derives from research or from the work of practitioners faced with problems in their day-to-day work. To provide a systematic means for assembling and evaluating such useful information and to make it available to the entire transit community, the Transit Cooperative Research Program Oversight and Project Selection (TOPS) Committee authorized the Transportation Research Board to undertake a continuing study. This study, TCRP Project J-7, "Synthesis of Information Related to Transit Problems," searches out and synthesizes useful knowledge from all available sources and prepares concise, documented reports on specific topics. Reports from this endeavor constitute a TCRP report series, *Synthesis of Transit Practice*.

The synthesis series reports on current knowledge and practice, in a compact format, without the detailed directions usually found in handbooks or design manuals. Each report in the series provides a compendium of the best knowledge available on those measures found to be the most successful in resolving specific problems.

## PREFACE

This synthesis will be of interest to transit practitioners and transportation professionals, including technical and research staff, as well as those working with them, with regard to the use of performance measures for the allocation of financial assistance to local transit agencies. The synthesis explores current perspectives, practices, and experiences. It focuses primarily on the extent to which traditional measures of transit performance—internal measures of economic efficiency, service effectiveness, and productivity—are used in allocating funds to transit. The report summarizes the experiences of a variety of transit agencies. In addition, it sought to capture key perspectives of transit and transportation professionals on the relationship between system performance and funding decisions and to identify barriers to more extensive use of performance measures in the allocation of funds for public transportation.

This report from the Transportation Research Board includes a literature review, supplemented by survey responses from 22 transit agencies and 9 metropolitan planning agencies, as well as interviews with 4 states to explore in greater detail current approaches to the use of performance measures in funding allocation, use of factors in the allocation of transit funds, barriers or issues involved in doing so, and changes that have been made in recent years in the use of transit performance measures and other factors in fund allocation.

A panel of experts in the subject area guided the work of organizing and evaluating the collected data and reviewed the final synthesis report. A consultant was engaged to collect and synthesize the information and to write the report. Both the consultant and the members of the oversight panel are acknowledged on the title page. This synthesis is an immediately useful document that records the practices that were acceptable within the limitations of the knowledge available at the time of its preparation. As progress in research and practice continues, new knowledge will be added to that now at hand.

# CONTENTS

1 SUMMARY

5 CHAPTER ONE INTRODUCTION
Synthesis Focus, 6
Orientation to Performance Measurement, 6
Synthesis Organization, 6

8 CHAPTER TWO PROJECT APPROACH
Definition and Application of Performance Measures, 8
Literature Review, 8
Surveys, 9
Case Studies, 10

11 CHAPTER THREE PRACTICES, PERSPECTIVES, AND FUTURE DIRECTIONS IN USE OF PERFORMANCE MEASURES TO ALLOCATE TRANSIT FUNDS
Transit Goals and Performance Monitoring, 11
Performance Measures and Allocation of Transit Funds, 14
Benefits and Drawbacks of Using Performance Measures and Other Factors in Fund Allocation Decisions, 18
Equity in Allocation of Transit Funds, 21
Future Perspectives on Use of Performance Measures in Allocating Transit Funds, 22

26 CHAPTER FOUR CASE STUDIES
Introduction, 26
Indiana, 26
North Carolina, 28
Ohio, 31
Pennsylvania, 34

40 CHAPTER FIVE CONCLUSIONS

42 REFERENCES

43 ANNOTATED BIBLIOGRAPHY

47 APPENDIX A SURVEY INSTRUMENTS

73 APPENDIX B SURVEY RESPONDENTS

74 APPENDIX C CASE STUDY INTERVIEWEES

# PERFORMANCE-BASED MEASURES IN TRANSIT FUND ALLOCATION

## SUMMARY

This synthesis explores current perspectives, practices, and experiences in the use of performance measures for the allocation of financial assistance to local transit systems. A similar examination was undertaken and reported in *TCRP Synthesis of Transit Practice 6: The Role of Performance-Based Measures in Allocating Funding for Transit Operations*, published in 1994. The current project has been designed and carried out to update and expand on the earlier findings.

A key issue in the examination of performance measures in funding allocation is the definition of transit performance and the specification of transit performance measures. As suggested in the 1994 synthesis, performance measurement can be viewed as "the assessment of an organization's output as a product of the management of its internal resources (dollars, people, vehicles, facilities) and the environment in which it operates" (*TCRP Synthesis of Transit Practice 6*, p. 1). This definition generally implies ratios of outputs to resource inputs that measure economic efficiency, operating effectiveness, or agency productivity.

Despite the clarity of this definition, there remain a number of parallel operational definitions and perspectives on what constitutes "performance" in the design and delivery of public transportation services. Progress toward goal achievement provides one alternative perspective. Although efficient and effective operation is a goal for virtually all transit systems, other goals are also specified, and they are often defined in simple, single dimensions; for example, ridership, market share, service coverage, budget adherence, and extent of local or user financial contribution. However, because they do not reference the resource commitment associated with whatever level of output is achieved, they may not be considered true measures of internal performance in terms of the foregoing definition. They are, nonetheless, widely used to gauge system or agency success in both public and political arenas.

Judgments about performance are also clouded because many typical agency and community goals for transit are contradictory. For example, expanding coverage may increase ridership but necessitate increased expenditures, whereas budget adherence may require reductions in service coverage and frequency, reducing ridership, and so forth. Performance is to a large degree a function of locally established goals and objectives and the desired balance between them, whether stated or implied.

Further obscuring the picture are the impacts of policy and regulation on the ability of a transit agency to "perform." The restrictions on federally supported transit systems serving charter and school-related markets limit revenue raising, thereby constraining resources, budgets, and service levels, and restricting access to important segments of the travel market. Requirements to serve elderly and disabled populations by using comparable services parallel to fixed-route services, a long-standing federal policy, dramatically raise costs and

the subsidy per trip in such markets. When looked at systemwide, these effects may diminish apparent agency performance measured in traditional ways.

As a result, the definition of performance in the design and delivery of public transportation services, as a practical matter, must be sensitive to goals and expectations that extend beyond internal resource management and internal efficiencies in service delivery. The definition must account for the effects of a wide array of local, state, and federal policy goals.

For these reasons, the current study has not only inquired about the use of traditional performance measures in funding allocation (ratio measures of efficiency, effectiveness, and productivity), but also about the use of other factors, typically performance-related external factors and service area characteristics (single data elements that may measure aspects of goal achievement and related community impacts).

Distinct questionnaires were directed to three different audiences, all 50 state departments of transportation (DOTs), 18 metropolitan planning agencies (MPOs), and 21 transit agencies, to reveal the extent to which performance measures and other factors are being used today to allocate transit funds or guide transit investment and expenditures.

Two hypotheses were informally established and tested in the synthesis process. The first was a test of the overall findings of the previously mentioned 1994 synthesis project—that only limited use is made of traditional internal transit performance measures to allocate funds to transit agencies. The second was a counter-balancing hypothesis that performance-based management using traditional internal measures of efficiency, effectiveness, and productivity is extensive throughout the transit industry although these same measures are not directly linked to allocating funds.

In addition to the three-part surveying effort, interviews were conducted with four states (Indiana, North Carolina, Ohio, and Pennsylvania) that are or have been leaders in the use of traditional performance measures for fund allocation. The purpose was to explore in detail current approaches to the use of performance measures in funding allocation, the use of other factors in the allocation of transit funds, the barriers or issues involved in doing so, and the changes that have been made in recent years in the use of transit performance measures and other factors in fund allocation.

Based on the limited sample of survey responses, case studies, and a review of recent literature, a number of general findings and conclusions can be drawn.

- Transit system performance continues to be of considerable importance when viewed across the full spectrum of processes, activities, and organizations involved in the design, funding, operation, and oversight of transit services.
- The allocation of funds for transit takes place at several levels and a differing mix of performance measures and other allocation factors is in evidence at each level.
- Management and oversight of transit performance and the allocation of funds to transit systems are being pursued increasingly as independent activities.
- Transit system performance measurement is broadening to include progress against goals and objectives that extend beyond efficiency in the use of available resources.
- There has been no apparent increase in the use of traditional internal measures of performance in fund allocation at either the state or regional level since the 1994 synthesis survey and report.
- There are a wide array of perspectives and approaches to achieving “equity” in fund allocation.

- There appears to be a high level of stability and limited impetus for change in fund allocation processes and the measures and factors currently in place.
- The use of traditional performance measures in fund allocation can conflict with the desire for stable and reliable funding needed to sustain basic levels of service.
- Data quality and consistency, varied goals, and outside forces and influences were among the points that survey respondents mentioned.
- There appears to be a lack of clarity outside the transit industry in differentiating traditional internal measures of performance (ratio measures of inputs and outputs measuring efficiency, effectiveness, and organizational productivity) from other factors measuring agency or community goal achievement.

CHAPTER ONE

# INTRODUCTION

The performance of public systems and services has received increased attention in recent years as concerns have arisen over both the quality and cost of all types of public services. These concerns are heightened in an environment characterized by rising costs, continued resource limitations, and resistance to increased taxes.

In the public transportation arena, interest in system performance is driven by two key factors. The first is the sizeable investment being made in transit as policymakers respond to expanding travel demand, burgeoning congestion, and associated impacts of transportation investments on communities and their economic vitality. The second is that transit investment is a shared responsibility among the federal, state, and local governments as well as transit users. As a result, the performance of our public transportation systems and how performance is measured remain a concern to a wide range of policymakers, stakeholders, and citizens.

Transit investment is significant as evidenced by the billions of dollars that are invested each year in supporting the expanding availability and use of public transportation. APTA estimates that nearly $11.5 billion was invested in transit capital facilities and equipment in 2001, and an additional $25 billion was spent in support of transit operations (see www.apta.com/research/stats/ and Figure 1 for details).

Furthermore, transit investment is a broadly shared responsibility. Approximately 57% of total annual transit investment is from government sources, with roughly equal support from the federal, state, and local levels. The balance consists of funds directly generated by transit agencies locally, including fares and a variety of dedicated agency sources. The federal government supports approximately 50% of all transit capital investment; state and local sources support more than 95% of transit operating expenditures (see www.apta.com/research/stats/).

It is anticipated that public transportation needs and investment levels will increase. As these needs and investment levels rise, it is certain that concern about the performance of public transportation systems and agencies will continue.

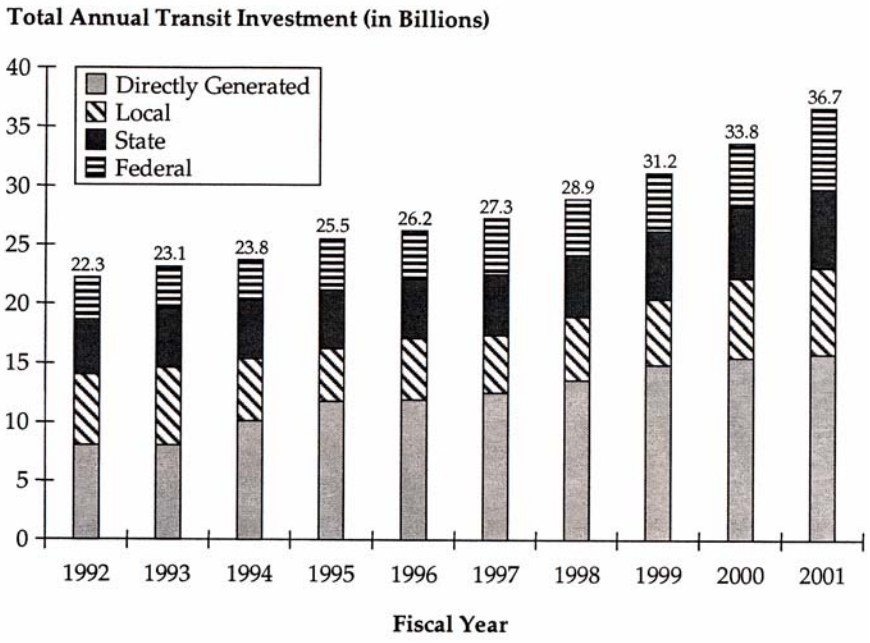


FIGURE 1 Transit funding, all sources, 1992–2001, total capital and operating. [*Source*: American Public Transportation Association, *Public Transportation Fact Book* (*1*).]

## SYNTHESIS FOCUS

This synthesis focuses primarily on the extent to which traditional measures of transit performance—internal measures of economic efficiency, service effectiveness, and productivity—are used in allocating funds to transit [see Table 1, which originally appeared in *TCRP Synthesis of Transit Practice 6* (*2*)]. It also examines how the use of performance measures for fund allocation has changed in recent years and the reasons for the changes.

TABLE 1
COMMON INTERNAL PERFORMANCE MEASURES

| Performance Measure | Performance Indicator |
|---|---|
| Cost Efficiency | Cost per mile<br>Cost per hour<br>Cost per vehicle<br>Ridership per expense |
| Cost-Effectiveness | Cost per passenger trip<br>Revenue per passenger trip<br>Ridership per expense |
| Service Utilization/ Effectiveness | Passenger trips per mile<br>Passenger trips per hour<br>Passenger trips per capita |
| Vehicle Utilization/ Efficiency | Miles per vehicle |
| Quality of Service | Average speed<br>Vehicle miles between road calls<br>Vehicle miles between accidents |
| Labor Productivity | Passenger trips per employee<br>Vehicle miles per employee |
| Coverage | Vehicle miles per capita<br>Vehicle miles per service |

*Source: TCRP Synthesis of Transit Practice 6* (*2*).

In addition, the project has sought to capture key perspectives of transit and transportation professionals on the relationship between system performance and funding decisions and to identify barriers to more extensive use of performance measures in the allocation of funds for public transportation.

The research team has also sought to broaden the investigation somewhat. Because transit system performance has multiple dimensions, the project examines not only how traditional internal performance measures are used in funding allocation, but also notes the range of other factors that are currently being used to allocate funds, including performance-related external factors and service area characteristics. These factors include (1) simple descriptors of transit services such as service levels and ridership; (2) those external to the agency that fall outside the direct control of transit managers and policymakers, such as population, population and development densities, and locally derived transit revenues; and (3) measures of broader community goal achievement, such as transit's contribution to personal safety, vehicle emission reductions, fuel savings, or support for economic growth.

Finally, although the link between performance and the allocation of state funds to transit operating agencies is the focus of the study, the research team also has sought to examine the use of performance measures at two other key steps in the funding and investment decision-making process: (1) priority setting among projects competing for funding in the annual metropolitan planning organization (MPO) regional programming process and (2) internal budget and operational decisions by transit operating agencies.

## ORIENTATION TO PERFORMANCE MEASUREMENT

Performance in the design and delivery of public transportation can be gauged on many levels, and it has many dimensions. On the one hand, one expects public transportation organizations to use available resources in ways that are efficient, effective, and productive—the "traditional" internal economic dimensions of performance. These dimensions are measured most often through the use of ratios that relate a unit of output (or outcome) to a unit of input, such as passengers per hour of service or cost per passenger. Such measures have long been the focus of transit professionals in the day-to-day management of transit operations. The data to derive these measures have been reported at the system level to the federal government since the beginning of the federal transit assistance program in the mid-1960s. Those data are collected currently through annual data submissions to the FTA's National Transit Database (NTD).

In addition to the traditional internal economic measures of performance, however, the goals established for local and regional transit services are frequently expressed in simpler, one-dimensional ways, including ridership, market share, service coverage, budget adherence, extent of local or user financial contribution, etc. In addition, one has come to expect—and attempt to measure—the effect of (or benefit from) alternative transportation investments, including transit, on a variety of broader community goals, such as safety and security, economic vitality, environmental quality, and social equity. Each of these goals represents an important dimension of transit performance, and the inquiries made as part of this synthesis have sought to gather information across the full range of relevant goals and measures of performance.

## SYNTHESIS ORGANIZATION

This synthesis is organized into five chapters, including this Introduction.

- Chapter two—provides added detail on how the current study was conducted.
- Chapter three—highlights survey responses from state departments of transportation (DOTs), MPOs, and transit agencies to a series of questions about the use of performance measures and related factors in allocating transit funds and making related transit funding decisions. Responses from each type of organization are presented under key topic headings to highlight where perspectives and practices among the different organizations are consistent and where they diverge.
- Chapter four—describes in somewhat more detail the experiences, perspectives, and practices of four states—Indiana, North Carolina, Ohio, and Pennsylvania—in the use of performance measures to allocate state transit funds to operating agencies.
- Chapter five—presents the conclusions of the research team and identifies potential research activities associated with the use of performance measures in allocating transit funds.

This report also features an annotated bibliography, and in the appendixes the survey instruments (Appendix A) and lists of the survey respondents (Appendix B) and case study interviewees (Appendix C).

CHAPTER TWO

# PROJECT APPROACH

## DEFINITION AND APPLICATION OF PERFORMANCE MEASURES

As suggested in the Introduction, transit performance is measured in a variety of ways, including

- Indicators in ratio form that measure traditional internal transit performance, that is, the relationship between outputs achieved and levels of resource consumed;
- Other single-dimensional factors that gauge agency goal achievement; and
- Factors and measures that gauge the contribution of transit in the pursuit of broader community goals.

In addition, each of these types of measures is being used to influence varying types of funding decisions, including

- Allocation of state transit funding to transit operating agencies;
- Assignment of project priorities for funding during development of regional transportation improvement programs (TIPs), a process managed by designated MPOs in urbanized areas across the country; and
- Adoption of and adjustments made to transit operating agency budgets.

Figure 2 provides a framework that illustrates the broader context in which performance measures and other factors may be applied to allocate or influence how transit funds are used. Although survey responses provide information and insights in each of the cells of Figure 2, the focus of the study and the case studies in chapter four is on the use of traditional internal performance measures and other factors in the allocation of transit funds by state DOTs, highlighted in the shaded cell of Figure 2.

## LITERATURE REVIEW

A literature review was conducted at the outset of the study to gather information on issues related to the use of performance measures in transit fund allocation. The literature review concentrated on material produced since 1998 and involved searches of the National Technical Information Service and Transportation Research Information System databases. Selected state DOTs, transit agencies, university transportation research centers, and consultants were also asked to identify work on transit funding allocation systems and performance measures that have been completed but not formally published.

The literature review revealed only a few recent sources that are of limited scope and relevance, suggesting that

| Application in Transit Fund Allocation | Traditional Internal Measures of Transit Performance | Type of Performance Measure: Measures of Transit Agency Goal Achievement | Measures of Transit Agency Success in Pursuing Community Goals |
|---|---|---|---|
| State Allocation of Funds to Transit Operating Agencies | ***Project Emphasis*** | | |
| Funding Priorities in Regional Programming of Transportation Investments | | | |
| Budget Priorities and Fund Allocation Within Operating Agency Budgeting | | | |

FIGURE 2 Conceptual framework for examining the application of performance measures in transit fund allocation.

lately there has been little interest in the topic. Annotations from a selected group of the most relevant sources have been compiled and included in this synthesis.

The principal inferences made from the literature review are as follows:

- There is limited information on how state DOTs use performance measures to allocate funds to transit systems, and what is available has not been compiled in any systematic way. It is clear, however, that state distribution of transit funding is influenced significantly by federal program structure, eligibility requirements, related formulas, and evolving federal policy and program initiatives.
- An interest exists in developing transit-specific performance measures to help track progress toward the goals listed in state DOTs' long-range transportation plans. However, only 12 of the responding states have fully developed such transit-specific measures of goal achievement.
- Only four states reported that they use traditional performance measures for the allocation of transit funds—Indiana, Iowa, North Carolina, and Ohio. The primary use of traditional performance measures in the transit industry is to monitor system performance at an operational level. Transit agencies have developed extensive lists of performance measures that go beyond the data requirements of the NTD.
- Not many transit agencies use performance measures as a factor in prioritizing transit projects. Substantial resistance exists to relying solely on traditional quantitative measures of performance to evaluate transit investments.
- Few comprehensive or in-depth analyses are being conducted on transit funding allocation schemes and their effectiveness. It is unclear whether the reason is a lack of interest or because of the inherent political nature of investment decisions in public transportation.

Although not obvious from the literature reviewed, the lack of current attention to and analysis of allocation schemes is likely a result of three circumstances evident from survey and interviews (discussed in chapters three and four): (1) the widespread and long-standing use of factors other than traditional performance measures in transit fund allocation, (2) the political difficulty that arises in efforts to reformulate allocation factors under conditions of constrained funding, and (3) the widespread use of performance measures by operating and funding agencies for routine monitoring that is not connected to the allocation of funds. These circumstances reflect the long-standing practice in the transit industry, required by law, to submit standardized operating and financial statistics to the federal government as a condition of federal funding. Over time, states also have imposed the same general reporting requirements on their in-state grantees so that the data on performance are being reported and monitored, but as a separate stream of activity from funding allocation.

## SURVEYS

The most significant and interesting information presented in the subsequent chapters has been gathered from a series of surveys and more extensive interviews and case studies. Surveys were distributed to all 50 state DOTs inquiring asked about their use of performance measures (or other factors) to allocate funds for transit capital investment or operating support. Responses were received from 22 states. With regard to population characteristics and transit intensity, DOT responses were weighted toward states with smaller urban areas and less intense transit service.

- Ten responding states (Indiana, Iowa, New Hampshire, New Mexico, North Dakota, Oklahoma, South Dakota, Vermont, West Virginia, and Wyoming) have predominantly smaller urbanized areas, small urban and rural communities, and less-intensive transit services.
- Five responding states have major urbanized population centers and high levels of transit intensity (California, Maryland, Ohio, Pennsylvania, and Virginia).
- Seven responding states (Colorado, Illinois, Michigan, Missouri, North Carolina, Rhode Island, and Wisconsin) have a single, dominant urbanized area with varying levels of less intense service to smaller urban and rural populations.
- Geographically, nine DOT responses were from Eastern states, eight were from Midwestern states, and five were from Western states.

Eighteen MPOs were asked about their use of transit performance measures to prioritize investments in programming funds available at the metropolitan level through the 5-year TIP process, with survey responses received from nine. An additional MPO did not complete the survey but provided some background material that has been included in the survey response discussion where appropriate. With regard to community size and transit intensity, MPO responses are weighted toward major urbanized areas.

- Two-thirds of the responses were from agencies serving urbanized areas with populations of more than 1 million (Philadelphia, Pennsylvania; San Francisco, California; San Diego, California; Minneapolis/St. Paul, Minnesota; Denver, Colorado; and Orlando, Florida).
- The remainder is from agencies serving urbanized areas with populations between 200,000 and 1 million.
- Geographically, respondents were weighted slightly to the East and Midwest.

Twenty-one transit agencies were asked about their use of performance measures to allocate funds among existing and proposed services as a matter of annual budget development, with survey responses received from eight. With regard to community size and transit intensity, transit agency responses are weighted toward urbanized areas

- Five systems were from major urbanized areas with populations of more than 1 million (San Francisco, California; Tampa, Florida; Denver, Colorado; San Jose, California; and Milwaukee, Wisconsin).
- Three systems were from urbanized areas with populations between 200,000 and 1 million (Hartford, Connecticut; Dayton, Ohio; and Boise, Idaho).
- Geographically, one-half of the transit agency responses were from communities in the West, with two each from the Midwest and East.

Appendix C identifies survey respondents in each group, and the results of the survey activities are reported in chapter three.

## CASE STUDIES

A limited set of interviews were conducted and case study descriptions were prepared. Transit program managers and staff from Indiana, North Carolina, Ohio, and Pennsylvania were interviewed to delve into the issues of performance measures and fund allocation beyond what could be learned through the analysis of survey returns alone. Table 2 summarizes the rationale of those states for the selection. Each is or has been a leader in using traditional performance measures to allocate some portion of state transit funding. The results of interviews are presented in chapter four.

TABLE 2
STATES CHOSEN FOR CASE STUDIES

| Case Study State | Rationale for Selection |
|---|---|
| Indiana | • Featured in 1994 *TCRP Synthesis of Transit Practice 6* (*2*)<br>• Update provides some continuity on the topic over time<br>• Formally reexamined fund allocation methods and rationales since the 1994 case study description |
| North Carolina | • Has used a performance-based funding allocation method for some time<br>• Has initiated its own independent study of current state funding allocation practices in anticipation of presumed changes in its long-standing methodology |
| Ohio | • Is undergoing a second reexamination of funding allocation methods and rationales since the 1994 synthesis findings were reported |
| Pennsylvania | • Featured in 1994 *TCRP Synthesis of Transit Practice 6* (*2*)<br>• Update provides some continuity on the topic over time<br>• Long-standing experience in formula-driven fund allocation |

CHAPTER THREE

# PRACTICES, PERSPECTIVES, AND FUTURE DIRECTIONS IN USE OF PERFORMANCE MEASURES TO ALLOCATE TRANSIT FUNDS

Survey responses were received from 22 of the 50 state DOTs, 8 of the 21 transit agencies surveyed, and 9 of the 18 MPOs contacted. The survey instruments are presented in Appendix A and respondents in each category are listed in Appendix B. Each of the surveys addressed the same general set of topics, with some variation based on the respective roles of state DOTs, MPOs, and transit agencies in the funding cycle. Major topics included the following:

- Agency goals relative to transit operations and performance, and measures used to monitor performance, irrespective of fund allocation procedures;
- Performance measures used in the allocation of both capital and operating funds by the state DOTs, measures used by the MPOs in the regional programming process, and measures used as part of the internal transit agency budgeting;
- Benefits and drawbacks of using performance measures and other factors in funding allocation decisions;
- Approaches and measures to assess equity in the allocation of transit funds; and
- Plans related to future use of performance measures in the allocation of transit funds, including barriers and issues related to their expanded use.

Survey results from all three target audiences are summarized here in these broad categories to facilitate comparisons between key institutions and at stages of the process when critical funding decisions are being made.

## TRANSIT GOALS AND PERFORMANCE MONITORING

The basis for measuring transit performance lies in the set of stated or implied goals established for programs, regions, agencies, or systems. Reporting progress toward goal achievement is common across agencies responsible for transit planning, funding, and operations. To gauge how this reporting responsibility is being carried out, state DOTs, MPOs, and transit agencies were each asked about the existence of formal goals for transit, indicators or factors used to report progress toward those goals, and measures used to monitor system performance. In addition, each was asked to evaluate the effectiveness of performance monitoring on improving transit performance. State DOTs and MPOs were first asked whether they have recently studied the use of performance measures in fund allocation.

Six of the 22 state DOTs (Iowa, Maryland, Michigan, Ohio, Oklahoma, and Virginia) and 3 of the 8 MPOs (Metropolitan Council, Minneapolis/St. Paul, Minnesota; Metropolitan Transportation Commission, San Francisco Bay Area, California; and San Diego Metropolitan Transit Development Board, San Diego, California) confirmed that they have in the last 5 years reviewed the use of performance measures in fund allocation.

### Goals for Transit

*State DOTs*

Twelve of the state DOTs responding identified formal goals for public transportation, including states with a significant transit presence or intensity as well as those with a limited transit presence or intensity. The range of goals and related measures varies considerably, from those focused on internal performance to those reflecting broader community or societal goals and included the following:

- Increase ridership—annual ridership with and without a target, and ridership by market segment;
- Service quality—safety, affordability, improvement, customer satisfaction, and fleet age;
- Viable service/effective management—farebox recovery, efficiency, effectiveness, improvement, and grant management;
- Availability and coverage—new services, counties served, population served, and vehicles available; and
- Societal outcomes—access for dependent populations, safety, basic mobility, congestion mitigation, support for economic development, job access, and clean air.

*Transit Agencies*

Seven of the eight responding transit agencies had established agency goals with specific performance measures linked to each goal. The reported goals and related indicators cover all aspects of service performance and included the following:

- Cost efficiency—audits, cost ratios, subsidy per passenger, and bugeted versus actual revenue miles;

- Use—total passengers, passengers per revenue mile, passengers per revenue hour, ridership per capita, and needs evaluation;
- Reliability—percentage of on-time performance, road calls per monthly mileage, scheduled pullout rate, percentage of delay because of mechanical failure, and percentage of scheduled trips missed;
- Safety—miles between accidents, miles between preventable accidents, accidents and miles of service, response time to emergency calls, security-related incidents, and light-rail accidents;
- Customer satisfaction—surveys of passenger opinion, customer complaints per passenger, customer response time, complaints per boarding, schedule availability complaints, and website visits; and
- Employee ownership—employee surveys, turnover, percentage of absenteeism, and percentage of available positions filled with existing internal applications.

Indicative of general practice throughout the transit industry, several of the transit agencies also set specific targets for each measure. For example, the Greater Dayton Regional Transit Authority lists reliability as one of its seven goals. The three performance measures linked to the reliability goal have the following targets: 96% of service on time, average of 1,000 mi between road calls for electric trolley fleet, and average of 2,500 mi between road calls for diesel bus fleet.

*MPOs*

The MPOs were asked if their long-range transportation plans had explicit goals established for public transportation and, if so, what measures or factors were used to assess or report progress toward goal achievement. The results varied among the nine MPOs from whom responses were received.

- Three of the nine MPOs did not have transit-specific goals or measures listed in their transportation plans.
- Two MPO plans did not have transit-specific goals, but their plans contained transit-specific performance measures.
- Four MPO plans listed transit-specific goals and measures.

Table 3 presents a sample of the range of goals (broad and transit specific) and the transit-oriented measures and factors reported by the MPOs.

### Performance Monitoring

In addition to reporting progress against stated goals, it was assumed that state DOTs, transit agencies, and MPOs often use a more expansive set of measures or factors to monitor system performance. State DOTs indicated that the following measures and factors are monitored:

TABLE 3
SAMPLE OF MPO TRANSPORTATION PLAN GOALS AND MEASURES

| Long-Range Transportation Plan Goals | Transit-Specific Measures and Factors Linked to Goals |
|---|---|
| Broad Goals | |
| Safe and well-maintained system | Average age of transit fleet |
| Reliable commute | On-time transit performance<br>Transit connectivity projects completed |
| Mobility | Amount of lifeline transportation services provided<br>Progress in implementing programs for older adults |
| Clean air | Progress in retrofitting urban buses with new emission control devices |
| Transportation services | Percent of p.m. peak-hour trips that are transit accessible |
| Transit Specific Goals | |
| Transit system access | Land use data |
| Enhance transportation choices while maintaining safety and efficiency | Vehicle revenue miles<br>Peak-hour seat miles<br>Ridership<br>Route cost/ridership profiles |
| Improve area coverage and operation of transit services | Track area coverage and transit operations |
| Increase the number of multimodal transportation centers and park-and-ride facilities | Track new transportation centers and park-and-ride facilities |
| Encourage transit-oriented land use and mode use development | Inventory transit-oriented development sites and track future development |
| Service effectiveness | Subsidy/passenger<br>Passengers/revenue hour<br>Passengers/mile |

- Progress against an agency's own goals, performance measures, and service standards;
- Extent of service—ridership, vehicle miles, vehicle hours, peak vehicle requirement, seat miles, and total trips;
- Internal performance—cost per mile and hour, cost per trip, boardings per hour and mile, trips per capita, service hours per capita, and customer satisfaction;
- Unmet needs documentation;
- Financial information—expenses, revenues, locally derived income, and audit findings;
- Customer satisfaction through the results of periodic surveys;
- Compliance with contracting and procurement requirements; and
- DOT timeliness in program administration.

As mentioned earlier, the majority of the transit agencies that responded to the survey have developed a detailed battery of specific performance measures and factors and monitor performance on a monthly, quarterly, and/or annual basis.

Four of the eight MPOs surveyed formally monitor transit performance and focus on measures and factors typically used by transit agencies: operating cost per passenger, operating cost per hour, passengers per hour, vehicle hours per employee, and ridership. Among responding MPOs, the MTC for the San Francisco Bay Area and the San Diego Association of Governments (SANDAG) are the two most involved in monitoring transit performance. They are also the two organizations that oversee regional planning and programming for the greatest number of transit systems and agencies, 47 and 12, respectively.

#### Effectiveness of Performance Monitoring

The ability to monitor transit system performance, particularly through the use of traditional internal operating measures, is made possible by the long-standing requirement for operating agencies to submit operating and financial data to the NTD. For most small urban and rural systems, states generally collect basic operating data when NTD requirements do not apply. As a result, transit system performance is monitored comprehensively and often simultaneously through a combined effort of federal, state, and regional agencies and local governments as well as by the operating agencies themselves. How effective is current performance monitoring activity when it is not connected to the allocation of funds? Table 4 highlights responses to the statement, "Performance monitoring (not linked to fund allocation) has been effective in improving transit system performance." Responses suggest that there is little disagreement among transit agencies about the value of performance monitoring, whereas responding state DOTs and MPOs are somewhat less certain. Among responding state DOTs, there is somewhat more agreement on the effectiveness of performance monitoring among states with a smaller urban focus and less transit intensity.

#### Common and Divergent Perspectives

Among responding state DOTs, there exists a wide range of goals and related measures that may not be transit specific. Of the measures that do apply to transit, the most prominent mentioned by state DOT survey respondents are those related to service coverage and availability, and effective management of resources. In the latter category, a small number of well-established and widely reported measures are in widespread use by states. There is some doubt, however, about the extent to which traditional monitoring is improving performance, with nearly half the states responding indicating some uncertainty.

In comparison with state DOTs, transit agencies have developed a more extensive list of performance measures and other factors to evaluate progress toward agency goals and to monitor service delivery. Transit agencies also expressed a higher level of support for performance monitoring as an effective means of improving system performance. Nearly two-thirds of responding transit agencies strongly agreed that performance monitoring was effective. The Regional Transportation District (Colorado) stated, "The tracking of performance measures is a process that the District has practiced for the last 7 years. These measures provide a framework in which the District determines how well it provides service to its passengers and the citizens of the District."

Finally, the variety of MPO survey responses reflects the different roles MPOs perform in the allocation of transit funds and monitoring of transit services. Of the eight MPOs that completed the surveys, 50% do not participate in transit allocation because the state DOT largely controls

TABLE 4
EFFECTIVENESS OF PERFORMANCE MONITORING (not linked to fund allocation)

| Organization | No. of Survey Responses | Strongly Agree on Effectiveness | Somewhat Agree | Uncertain | Somewhat Disagree | Strongly Disagree |
|---|---|---|---|---|---|---|
| State DOTs | 17 | 1 | 8 | 7 | 1 | 0 |
| Transit Agencies | 8 | 5 | 3 | 0 | 0 | 0 |
| MPOs | 6 | 1 | 3 | 2 | 0 | 0 |

TABLE 5
FACTORS IN STATE DOT CAPITAL FUND ALLOCATION

| State | Other Factors Used in Capital Fund Allocation |
|---|---|
| California | 20% farebox recovery required in urban areas of more than 500,000<br>10% farebox recovery required in nonurban areas of less than 500,000<br>(Traditional "service performance" data are reported on capital grant applications for information) |
| Maryland | Ridership<br>Service levels<br>Emission reduction |
| Michigan | Vehicle age |
| Missouri (75-point scale) | Replacement needs (mileage) (25 points)<br>Services provided (20 points)<br>Vehicle mileage (15 points)<br>Hours of service (10 points)<br>Trips weighted by trip purpose (5 points) |
| Pennsylvania | Annual vehicle miles (16.6%)<br>Annual vehicle hours (16.6%)<br>Annual total passengers (16.6%)<br>Historical state funding (25%)<br>Historical federal funding (25%) |
| South Dakota | Degree of coordination |
| Virginia | Non-federal share of cost<br>Age and condition of asset |
| Wyoming | Percentage of elderly in community population<br>Unique features (e.g., resort community) |

fund allocation decisions, only one transit agency exists in the jurisdiction so allocation is not an issue, or the transit operators manage fund allocation. For many of the same reasons, only two of the eight MPOs actively monitor transit performance in their regions. Nevertheless, the respondents expressed some support for the effectiveness of performance monitoring, although they may not be actively involved in the process.

## PERFORMANCE MEASURES AND ALLOCATION OF TRANSIT FUNDS

The major focus of the current project is the use of traditional internal performance measures and other factors in the allocation of transit funds through the states, the development of annual budgets in operating agencies, and the programming of transit funds through the MPO process. Respondents were asked to note the extent to which performance measures as well as other factors—both performance-related external factors and service area characteristics—are used in allocating both capital and operating funds. They were also asked about the effectiveness of various measures and what changes, if any, have been made recently in allocation procedures.

### Capital Fund Allocation Factors

None of the 22 responding states reported using traditional internal performance measures in the allocation of either state or federal capital funds for transit. Eight states reported using either performance-related external factors or service area characteristics for capital fund allocation, as indicated in Table 5.

In assessing the effectiveness of various types of performance measures and other factors in allocating capital funds, 12 responding state DOTs singled out asset age and condition, followed by service levels as the most effective factors.

Transit agencies were asked if performance measures and other factors were used by their state or their MPO to allocate capital funding to their agencies. Of the eight transit agency respondents, only three reported that performance measures and/or other factors were used for capital fund distribution (see Table 6).

In regard to the effectiveness of the performance measures and factors used by state DOTs and MPOs to allocate capital transit funds, one transit system ranked service area characteristics as somewhat effective, but it did not support the other measures; another system rated only asset age and condition and service area characteristics as somewhat effective; and a third system ranked asset age and condition as somewhat effective.

Transit agencies also were asked if they used performance measures or other factors to allocate funds across their own services. Seven of the eight responding transit agencies indicated that they used measures and factors for capital projects or budget allocation activities covering system

TABLE 6
CAPITAL ALLOCATION MEASURES USED FOR TRANSIT AGENCIES BY STATES OR MPOs

| Agency | Mode | Measures and Factors Used in Capital Fund Allocation |
|---|---|---|
| Greater Dayton Regional Transit Authority (Ohio) | Bus, demand response, trolley | Measures of system performance (e.g., passengers/vehicle mile)<br>Asset age/condition (e.g., vehicle age)<br>Service levels (e.g., vehicle miles)<br>**Area characteristics (e.g., population)** |
| Hillsborough Area Regional Transit Authority (Florida) | Rail, bus, demand response | Measures of system performance (e.g., passengers/vehicle mile)<br>**Asset age/condition (e.g., vehicle age)**<br>Service levels (e.g., vehicle miles)<br>**Area characteristics (e.g., population)** |
| San Mateo County Transit District (California) | Rail, bus, ADA | **Asset age/condition (e.g., vehicle age)** |

Notes: Items in bold highlight measures or factors transit agency reported as effective for capital fund allocation. ADA = Americans with Disabilities Act.

TABLE 7
PERFORMANCE MEASURES AND OTHER FACTORS USED BY TRANSIT AGENCIES TO ALLOCATE CAPITAL FUNDS

| Measure/Factor | Description |
|---|---|
| Maintenance | Average age of equipment and service life<br>Mileage between lost service maintenance road calls |
| Service | Utilization of bus stops<br>Number of bus routes converging on a transfer point<br>Congestion relief/ridership<br>Customer/operational benefits<br>Average customer call wait time<br>Average monthly website visits<br>Ridership |
| Security | Security-related incidents at park-and-rides with surveillance cameras<br>Vandalism on buses detected by surveillance cameras |
| Financial | Potential to reduce operating costs through capital investment<br>Return on investment<br>Program efficiency/project readiness<br>Timely completion of capital projects |
| Equity | Environmental equity<br>Socioeconomic equity<br>Geographic equity<br>Prioritized by need |
| Other | Regulatory requirements<br>Land use impact<br>Transit-oriented development |

expansion; for improvements to existing system operations; and for maintenance, rehabilitation, and replacement work. The seven transit agencies specified a wide range of measures and factors used for capital fund allocation (Table 7).

Four of the eight MPO respondents reported using performance measures and/or other factors to allocate capital funds through the TIP process in their region. Specific indicators and factors reported are listed by MPO in Table 8. These four MPOs highlighted asset age and condition, followed by service levels as the most effective factors.

#### Operating Fund Allocations

Four of the 22 state DOTs responding—Indiana, Iowa, North Carolina, and Ohio—use a combination of performance measures and other factors for allocating transit operating funds. Ten additional states reported using other factors for operating fund allocation, as indicated in Table 9.

In assessing the effectiveness of various types of performance measures and other factors in allocating operating funds, eight responding state DOTs viewed characteristics of the service area being served as the most important, followed closely by traditional measures of system performance, service levels, and asset age and condition.

Only one transit agency, the Hillsborough Area Regional Transit Authority in Florida, responded that its state or MPO used performance measures or other factors to allocate transit operating funds (Table 10). The agency stated that the wide range of measures and factors used by Florida was an effective means of allocating operating funds, except for asset age and condition factors. The Milwaukee

County Transit System reported that measures of system performance, service levels, and area characteristics would be an effective means to allocate operating funds, although these measures are not used in Wisconsin.

TABLE 8
FACTORS IN MPO CAPITAL FUND ALLOCATION

| MPO | Measures and Factors Used in Capital Fund Allocation |
|---|---|
| MTC (California) | Age of asset<br>How critical to system?<br>Is safety an issue? |
| SANDAG and Metropolitan Transit Development Board (California) | Safety<br>Replacement value<br>Operating cost–benefit<br>Travel time savings<br>Customer benefit |
| Metropolitan Orlando (Florida) | Basic service<br>Service development<br>Capital—bus replacement<br>Customer amenities<br>Non-basic service<br>Systems development |
| Metropolitan Council (Minnesota) | Net operating cost per passenger<br>Ridership<br>Trips/platform |

TABLE 9
FACTORS IN OPERATING FUND ALLOCATION

| State | Measures and Factors Used in Operating Fund Allocation |
|---|---|
| California | 20% farebox recovery in areas of more than 500,000<br>10% farebox recovery in areas of less than 500,000 |
| Colorado | Rural (factors not identified) |
| Illinois | 50% farebox recovery (Chicago metropolitan area)<br>Operating budget balance |
| Indiana | **Cost per passenger**<br>Operating expense<br>Locally derived income |
| Iowa | **Ridership per operating expense (25% all areas)**<br>**Revenue miles per operating expense (25% all areas)**<br>Locally derived income (50% all areas) |
| Michigan | Population (50% in areas of more than 100,000)<br>Population (60% in areas of less than 100,000) |
| New Hampshire | Vehicle miles<br>Passenger trips |
| North Carolina | **Passengers per hour**<br>**Cost per passenger trip**<br>Locally derived revenue<br>Equal minimum share |
| North Dakota | Population |
| Ohio | Urban 50 to 200,000<br>• **Performance (50% cost per hour, passengers per mile, farebox recovery)**<br>• System data (50% ridership, miles, farebox revenue)<br>Rural<br>System data (50% passengers, 25% revenue miles, 25% local share) |
| Pennsylvania | Small/medium bus<br>• Historical state funding level (50%)<br>• Vehicle miles (25%)<br>• Operating revenue (25%)<br>Rural<br>• Historical state funding level (50%)<br>• Vehicle miles (25%)<br>• Vehicle hours (25%) |
| South Dakota | Vehicle miles<br>Passenger trips<br>Locally derived income |
| Virginia | Total operating expense (all areas) |
| Wyoming | Rural (factors not identified) |

Note: Items in bold indicate traditional ratio measures of performance.

TABLE 10
STATE AND MPO OPERATIONS ALLOCATION MEASURES FOR TRANSIT AGENCIES

| Agency | Mode | Performance Measures/Other Factors Used |
|---|---|---|
| Hillsborough Area Regional Transit Authority (Florida) | Bus, rail, demand response, trolley | **Measures of system performance (e.g., passengers/vehicle mile)**<br>Asset age/condition (e.g., vehicle age)<br>**Service levels (e.g., vehicle miles)**<br>**Area characteristics (e.g., population)** |

Note: Items in bold highlight measures or factors the transit agency reported as effective for capital fund allocation.

TABLE 11
SAMPLE OF PERFORMANCE MEASURES AND OTHER FACTORS TRANSIT AGENCIES USE TO ALLOCATE OPERATING FUNDS

| Measure/Factor | Description |
|---|---|
| Service Utilization | Passenger trips (or boardings) per mile<br>Passengers per hour<br>Overall ridership increase<br>Average peak load factor for express routes |
| Cost Efficiency | Payroll/platform ratio trends<br>Revenue trends<br>Cost per passenger<br>Passenger miles per vendor per mile for contracted paratransit services |
| Other | Average customer call wait time |

Next, transit agencies were asked if they used measures and factors to allocate their own operating budgets across services. Five of the eight surveyed transit agencies indicated that these factors were indeed part of their allocation procedures. A sample of the measures and factors is presented in Table 11.

The role that performance measures and other factors play in the allocation of operating funds varied dramatically for the MPO respondents. Similar to the situation for capital funds, four MPOs indicated they did not use measures and factors for operating fund allocation because the state DOT controls allocation of all funds, only one transit agency exists in their regions, or the transit agencies decide operating fund allocations. One MPO responded that the majority of operating funds are allocated according to a population formula derived by the state DOT. Another MPO stated that a portion of federal Congestion Mitigation and Air Quality Improvement Program funds that are distributed competitively can be allocated to transit operations, but that the majority of regular transit operating funds are not allocated in this manner. In summary, the role of traditional performance measures and other factors is minimal for the allocation of transit operating funds by MPOs.

### Common and Divergent Perspectives in the Use of Traditional Performance Measures and Other Factors in Fund Allocation

There was some agreement by state DOT, transit agency, and MPO survey respondents in regard to the effectiveness of measures and indicators for fund allocation.

- All three types of agencies viewed asset age and condition as a generally effective means of allocating capital funds.
- State DOT and MPO respondents also supported service-level measures (e.g., vehicle miles), whereas transit agencies favored area characteristics (e.g., population) when allocating capital funds.
- Traditional measures of performance (e.g., passengers per vehicle mile) and service levels (e.g., vehicle miles) received support from state DOT, transit agency, and MPO respondents for operating fund allocation.
- State DOT and transit agency respondents also supported service area characteristics.
- None of the three types of government agencies believed that asset age was as effective as other factors for operating fund allocation.

### Recent Changes in Allocation Systems, Measures, and Factors

Survey respondents were asked to describe the changes in the performance measures or factors used in transit capital or operating fund allocation over the past 5 years. Only 2 of the 22 state DOT respondents—Maryland and Wyoming—noted any changes. Maryland has placed greater emphasis on quantitative system performance analysis and the coordination efforts among transit providers; Wyoming has improved its ridership data collection and is considering including the data in fund allocation decisions. The clear implication is that the procedures in place, although diverse, apparently satisfy the needs and desires of respon-

sible funding, operating, and planning agencies. The lack of recent changes also suggests that once factors and processes are established they are often difficult to alter or renegotiate.

#### Analyses Under Way

Three states reported on efforts to evaluate their current fund allocation procedures. A study by the Ohio DOT to reevaluate its allocation procedure is planned in the near future. The Iowa DOT is currently evaluating its reliance on efficiency factors for the allocation of state funds. Most likely the study will recommend reducing the weight assigned to efficiency factors (ridership and revenue miles per operating expense) and increase the reliance on ridership and service miles. The reasoning behind the change is to ensure that Iowans receive Americans with Disabilities Act (ADA) and other critically needed services even though their transit system's overall efficiency may be low in comparison with that of regular fixed-route services.

North Carolina also has an analysis of transit funding allocation procedures under way, begun, in part, because relatively equal amounts of state funds were being allocated to systems with very different financial and operating performance profiles.

Only one of the eight transit agency respondents indicated that a change had occurred in the use of performance measures and/or other factors in allocating funds. In an effort to maximize the air quality benefit of Congestion Mitigation and Air Quality Improvement Program projects, the Hillsborough Area Regional Transit Authority (Florida) MPO began prioritizing projects based on predicted emission reductions. This effort had an impact on both capital and operating fund allocation.

The MTC in San Francisco and SANDAG in San Diego both reported a change in the past 5 years in measures and factors used to prioritize and program transit funds. The MTC added a farebox recovery ratio measure for the allocation of transit operating funds. This change occurred because of the desire of the MTC to ensure that discretionary bridge toll money is being directed to transbay transit service that had a high farebox recovery ratio. Farebox recovery was selected as an indicator of the demand for the service, indicating the potential to reduce vehicular traffic along the bridge corridors. Because demand for federal Section 5307 to meet the replacement needs in the region outstrips available funding, the MTC also recently added an asset age factor in allocating Section 5309 rail modernization funds.

SANDAG has made several changes in its evaluation and ranking of existing and new transit services including

- Addition of passengers per revenue hour as a quantitative criterion to appropriately represent lower passenger densities and higher travel speeds occurring in suburban operations;
- Addition of qualitative measures (e.g., transit-supportive lane uses) to the project ranking process; and
- Establishment of a lifeline service plan to set a minimum level of transit services that must be maintained.

The motivation behind the changes at SANDAG was to develop more meaningful measures and targets that better reflected the goals and objectives identified in its short-range transit plan. The evaluation of the preexisting procedures and recommended changes was summarized in "A Comprehensive Process for Evaluating Existing and New Transit Services at the San Diego Metropolitan Transit Development Board" (*3*).

### BENEFITS AND DRAWBACKS OF USING PERFORMANCE MEASURES AND OTHER FACTORS IN FUND ALLOCATION DECISIONS

State DOTs, transit agencies, and MPOs were asked about the advantages and disadvantages of using performance measures and other factors to allocate transit funds. Table 12 presents responses by type of agency. Across all three agency types, there is general support for the potential benefits of performance measures and other factors (e.g., encourages efficiency, creates incentive, and provides objective observations). There is a hesitation, however, about any overreliance on a standard set of strict quantitative measures and factors, owing to the uniqueness of each transit agency and service area. In addition, focusing solely on a few quantitative measures and factors might diminish transit's ability to fulfill societal needs that may have inherently low-cost effectiveness. The following quotes express the difficulties and benefits associated with measures and indicators.

> Every transit system is unique, and the service provided by every transit system reflects values and choices of the decision-making authority. For example, how should the relative inefficiency of operating nighttime and weekend service be used to reward or punish a transit system's allocation of operating assistance? (CT Transit, Connecticut)

> Performance measures and/or other factors contribute to efficiently allocating limited funding on a competitive basis. (Greater Dayton Regional Transit Authority, Ohio)

> Provides incentives to improve performance, but could reward well-funded agencies at the expense of poorly funded ones whose needs may be more pressing. Also, ignores equity issues involved with publicly funded service. (Hillsborough Area Regional Transit Authority, Tampa, Florida)

> Withholding state capital or operating funds from a transit system with poor performance may not be sufficient incentive for

TABLE 12
PROS AND CONS OF USING PERFORMANCE MEASURES AND OTHER FACTORS IN FUND ALLOCATION
(both capital and operating)

| | Pro | Con |
|---|---|---|
| State DOTs | Increases efficiency of allocating limited resources<br>Creates incentive to improve performance, local commitment<br>Is straightforward<br>Fosters communication and problem solving<br>Ensures a minimum/base allocation | Differences between transit agencies not taken into account<br>Creates an additional layer of bureaucracy (data reporting must be supervised)<br>Punishing "poor" performance will make situation worse<br>Does not create adequate incentive<br>Interdependence of agency performance not taken into account<br>Disincentive to provide transit services that are needed but are not as cost-effective (e.g., demand response) |
| Transit Agencies | Increases efficiency of allocating limited resources<br>Provides objectivity<br>Reduces political impact<br>Creates incentive to improve performance | Differences between transit agencies not taken into account<br>Inconsistent data<br>An agency's funding deficiencies not taken into account<br>Qualitative goals of transit not taken into account<br>Ignores equity issues<br>May result in funding that is contrary to agency goals |
| MPOs | Using farebox recovery ratios for allocation could encourage sustainable operations<br>Incentive to achieve goals<br>Objective, nonpartisan set of statistics to help allocation<br>Helps to link investment to regional goals<br>Using asset age/condition directs more dollars to areas with larger fleet needs, which is typically also the transit properties that provide the highest service levels | Does not account for uniqueness of each funding proposal; data collection/analysis can be extensive<br>Farebox recovery does not acknowledge lifeline service needs or affordability of transit<br>Institutional issue: transit agencies do not want to be second guessed by a planning agency<br>Adds to bureaucracy and disputes<br>Difficulty deciding on which measures<br>Maintenance of measures difficult<br>Asset age is not an exact indicator of actual need; further, it does not provide incentives to maintain the fleets locally or reward properties that use preventive maintenance programs to extend the life of their assets |

> performance improvements, especially if the system does not have the organizational, institutional, or political wherewithal to provide the improvements. Withholding state support may further disable the system, leading to service reduction and negative impacts on the users (i.e., things could get worse before they get better). (Michigan DOT)

> Helps to ensure prudent financial decisions regarding transit service. Provides incentives to improve existing service. (California DOT)

> Ultimately, resource allocation is a partisan process—data help shape results but do not dictate results. Also, doing allocation for capital projects in the real world is very hard. Everything is estimated and open to wide interpretation. Getting everything on a level playing field is almost impossible. (an MPO)

Finally, respondents were asked to use a 6-point scale to gauge the extent of various problems or issues commonly associated with the use of traditional internal performance measures in the allocation of transit funds, including the following:

- Data collection effort required,
- Data quality and consistency,
- Variation in goals across systems or for different types of service,
- Lack of connection between typical measures and system goals,
- Lack of consensus on best measures
  - among transportation professionals,
  - among transportation policymakers, and
  - measures are not intuitive to policymakers.
- Funding limitations resulting in an inability to reward performance
  - without unduly disadvantaging others,
  - and still meet all legitimate needs,
  - and amounts involved are too small to serve as an effective incentive.
- Measured elements largely outside of the agency's control.

Table 13 summarizes the responses from state DOTs, transit agencies, and MPOs. The highlighted rows in Table 13 mark the issues or problems associated with the use of traditional performance measures that respondents felt were the most significant. From the standpoint of DOT respondents, the three most significant problems in using traditional performance measures to allocate transit funds in order of importance are as follows:

1. Data quality and consistency;
2. Inability to meet legitimate needs under resources and funding constraints (i.e., lack of flexibility); and
3. Inequity stemming from the zero-sum nature of performance-based allocations under constrained resources (i.e., although all recipients may improve performance, the worst of improving systems might lose

TABLE 13
PROBLEMS IN USING TRADITIONAL MEASURES OF TRANSIT PERFORMANCE IN FUND ALLOCATION

| Problem | No. of Responses | No. of Responses by Size of Problem | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | No Problem | 1 Small | 2 | 3 | 4 | 5 Large | Average on 6-point scale |
| Data Collection Effort | | | | | | | | |
| DOTs | (20) | 1 | 3 | 5 | 7 | 3 | 1 | 2.6 |
| Transit agencies | (8) | 0 | 1 | 2 | 3 | 2 | 0 | 2.8 |
| MPOs | (5) | 0 | 2 | 0 | 1 | 1 | 1 | 2.8 |
| Data Quality/Consistency | | | | | | | | |
| DOTs | (20) | 0 | 0 | 1 | 5 | 8 | 6 | 3.6 |
| Transit agencies | (8) | 0 | 1 | 1 | 1 | 3 | 2 | 3.5 |
| MPOs | (6) | 0 | 1 | 0 | 1 | 2 | 2 | 3.7 |
| Varied Goals Across Systems | | | | | | | | |
| DOTs | (22) | 1 | 2 | 3 | 6 | 4 | 4 | 2.8 |
| Transit agencies | (8) | 0 | 0 | 0 | 2 | 5 | 1 | 3.9 |
| MPOs | (6) | 0 | 1 | 1 | 1 | 1 | 2 | 3.3 |
| Little Connection to Goals | | | | | | | | |
| DOTs | (19) | 1 | 3 | 6 | 6 | 2 | 1 | 2.4 |
| Transit agencies | (8) | 0 | 3 | 1 | 2 | 1 | 1 | 2.5 |
| MPOs | (6) | 1 | 2 | 0 | 2 | 1 | 0 | 2.0 |
| Lack of Consensus on Measures (among professionals) | | | | | | | | |
| DOTs | (20) | 1 | 5 | 7 | 1 | 3 | 3 | 2.4 |
| Transit agencies | (8) | 0 | 3 | 0 | 3 | 1 | 1 | 2.6 |
| MPOs | (6) | 0 | 1 | 1 | 1 | 1 | 2 | 3.3 |
| (among policymakers) | | | | | | | | |
| DOTs | (20) | 1 | 3 | 5 | 3 | 4 | 4 | 2.9 |
| Transit agencies | (8) | 0 | 1 | 0 | 2 | 2 | 3 | 3.8 |
| MPOs | (6) | 0 | 2 | 0 | 0 | 1 | 3 | 3.5 |
| (measures not intuitive enough) | | | | | | | | |
| DOTs | (20) | 1 | 4 | 4 | 5 | 4 | 2 | 2.7 |
| Transit agencies | (8) | 0 | 1 | 2 | 3 | 1 | 1 | 2.9 |
| MPOs | (6) | 0 | 1 | 0 | 1 | 0 | 4 | 4.0 |
| Funding Limits Make it Hard to Reward (without disadvantaging someone) | | | | | | | | |
| DOTs | (20) | 2 | 0 | 2 | 4 | 7 | 5 | 3.5 |
| Transit agencies | (7) | 0 | 0 | 1 | 2 | 3 | 1 | 3.6 |
| MPOs | (6) | 1 | 0 | 0 | 2 | 2 | 1 | 3.2 |
| (and meet legitimate needs) | | | | | | | | |
| DOTs | (19) | 1 | 0 | 2 | 4 | 7 | 5 | 3.5 |
| Transit agencies | (7) | 0 | 0 | 1 | 1 | 3 | 2 | 3.9 |
| MPOs | (5) | 1 | 0 | 1 | 1 | 2 | 0 | 2.6 |
| (and create a useful incentive) | | | | | | | | |
| DOTs | (20) | 3 | 1 | 1 | 4 | 5 | 6 | 3.3 |
| Transit agencies | (7) | 0 | 0 | 4 | 2 | 1 | 0 | 2.6 |
| MPOs | (6) | 1 | 1 | 0 | 1 | 2 | 1 | 2.8 |
| Measures Outside Agency Control | | | | | | | | |
| DOTs | (19) | 1 | 6 | 3 | 6 | 1 | 2 | 2.6 |
| Transit agencies | (4) | 0 | 0 | 1 | 1 | 2 | 0 | 3.3 |
| MPOs | (4) | 0 | 0 | 0 | 2 | 2 | 0 | 3.5 |

essential resources). Also, under resource constraints, performance-based allocations are not likely to provide a meaningful incentive.

Results suggest that data quality and consistency is a slightly greater problem for states where small urban and rural systems predominate. The only other discernable patterns suggest that states with a preponderance of small urban and rural systems tend to be (1) less concerned with whether performance measures are intuitively understood by policymakers and (2) less concerned about conditions outside the agency's control that may affect performance.

1. From the standpoint of transit operating agency respondents, the four most significant problems in using traditional performance measures to allocate transit funds are very consistent with those identified by the state DOTs.

1. Inability to meet legitimate needs under resources and funding constraints (i.e., lack of flexibility);
2. Goals vary across systems and across types of transit service, which is tied with;
3. Difficulty in reaching a consensus on measures with policymakers; and
4. Inequity stemming from the zero-sum nature of performance-based allocations under constrained resources (i.e., although all recipients may improve performance, the worst of the improving systems might lose essential resources).

From the standpoint of responding MPOs, the four most significant problems in using traditional performance measures and indicators shared some consistency with the DOT and transit operating agency responses.

1. Measures not intuitive enough;
2. Data quality and consistency;
3. Difficulty in reaching a consensus on measures with policymakers; and
4. Measures are outside agency control (tied with number 3).

The three types of responding agencies did not agree that there is a single, most important problem area in the use of performance measures and other factors in funding allocation. However, there were some crossovers in the top three problem areas. Responding state DOTs and transit agencies agreed on the importance of funding limits—that they pose a difficulty in rewarding one recipient agency without disadvantaging others, and that legitimate needs may be hard to meet. State DOTs also believed that the limited funding availability fails to create an effective incentive to improve performance. Transit agencies and MPOs emphasized the lack of consensus among policymakers on what measures are most important. Because MPOs do not use performance measures to the degree that state DOTs and transit agencies do, it is not surprising that responding MPOs identified “measures not intuitive” as the top problem. This may also explain why responding MPOs believed that performance measurement is hampered owing to factors outside the control of the agency being measured. Responding state DOTs and MPOs agreed on the potential problems with data quality and consistency, an area that transit agencies also identified as a key concern.

## EQUITY IN ALLOCATION OF TRANSIT FUNDS

Mobility and access are common needs across all segments of the population. However, the ability to meet those needs is often uneven among neighborhoods, across socioeconomic groups, or across institutions. As a result, concern for the degree of equity in transit investment has become an important feature in the allocation of funds. Equity concerns have been addressed from the beginning of the federal transit program through the requirements of Title VI of the Civil Rights Act of 1964, which requires that no person be denied the benefits of programs or activities receiving federal financial assistance. A self-certification to this effect along with significant supporting documentation is required of every FTA grantee as a condition of receiving federal funds. Unfortunately, equity can be defined in many ways. In recent years, lawsuits have been filed to engage the courts in determining whether transit investment levels are appropriately balanced across racially and economically diverse metropolitan regions and citizens. These legal cases may establish a firm socioeconomic definition of equity in transit investment and service deployment.

Survey respondents were asked to note whether their transit funding allocation procedures specifically incorporated measures of equity. State DOT survey responses portrayed equity as a multidimensional concern, reflecting the direct and varied interests of the local jurisdictions that help fund transit services. Observations included

- One-half of the 22 state DOTs responding noted that specific equity measures were used in the allocation of both transit capital and operating funds.
- Two noted equity as a specific factor only in capital fund allocations.
- Three noted equity as a specific factor in only operating fund allocation.
- Six noted no explicit equity factors in allocating transit funds.

Most transit agencies indicated that equity was a factor in allocating funds to routes or areas served by their agencies. More specifically

- Five of the eight transit agencies responding noted that specific equity measures were used in the allocation of both transit capital and operating funds.
- One noted equity as a specific factor only in operating fund allocation.
- One noted no explicit equity factors in allocating transit funds.

The MPO survey responses on equity were quite varied, owing to different regional characteristics and funding procedures.

- Three of the eight MPOs noted that specific equity measures were used in the allocation of both transit capital and operating funds.
- One noted equity as a specific factor only in capital fund allocation.
- Two provide funding for a single transit agency, making equity among recipient agencies a non-issue.

TABLE 14
FREQUENCY OF EQUITY MEASURES USED FOR TRANSIT FUND ALLOCATION

| Equity Measure | No. of Agencies | | |
|---|---|---|---|
| | State DOT ($n$ = 22) | Transit Agency ($n$ = 8) | MPO ($n$ = 9) |
| Geography | 6 | 1 | 3 |
| Area/agency needs | 8 | 1 | 4 |
| Population | 9 | 2 | 1 |
| System size | 8 | 1 | 2 |
| Service use | 4 | 4 | |
| Socioeconomic characteristics | 5 | 5 | |
| Other | Historical funding trends (2)<br>Percent of total operating expenditures (1)<br>Federal fund matching ability (1)<br>Capital needs submission (1) | Environmental equity (1)<br>Density (1) | Local contribution (1) |

TABLE 15
TRADITIONAL PERFORMANCE MEASURES: A LARGER ROLE IN CAPITAL FUNDING ALLOCATION?

| Organization | No. of Survey Responses | Strongly Agree on Expanding Use | Somewhat Agree | Uncertain | Somewhat Disagree | Strongly Disagree |
|---|---|---|---|---|---|---|
| State DOTs | 18 | 3 | 5 | 3 | 6 | 1 |
| Transit Agencies | 8 | 1 | 2 | 1 | 4 | 0 |
| MPOs | 7 | 0 | 2 | 3 | 1 | 1 |

To clarify how equity was defined in each type of agency, respondents were asked to select from one or more of the following definitions and illustrative measures of equity:

- Geography—such as jurisdictions treated equally or a uniform funding "floor";
- Area and agency needs—such as equivalent proportion of "needs" funded for all recipients;
- Population—such as equal per capita allocations;
- System size—such as equal amounts based on service levels—vehicles, miles, hours, etc.);
- Service use—such as equal amounts based on ridership or utilization; and
- Socioeconomic characteristics—such as compensating investment to areas with more lower-income or transportation-disadvantaged households and populations.

Table 14 lists the frequency with which equity measures are used by state DOT, transit agency, and MPO respondents. State DOTs focus primarily on population and system size measures, whereas transit agencies emphasize service use and socioeconomic characteristics and MPOs geography and area and agency needs measures. It is important to note that the majority of respondents across all agency types use a combination of equity measures.

In regard to common and divergent perspectives on definitions of equity in the allocation of transit funds, there is clearly divergence. Some definitions are based on the principle of equivalent investment per capita and others on equivalent investment across jurisdictions or institutions. Some are based on meeting an equivalent portion of defined needs, whereas still others are based on levels of service provided or use of the service. It is noteworthy, despite the small number of survey responses, that the transit agencies were the only respondents that focus on socioeconomic characteristics of the customer when evaluating equity, a likely outgrowth of 40 years of compliance with the Civil Rights Act of 1964.

DOTs in states with a single dominant urbanized area tend to rely more on population- and geographic-based notions of equity, whereas DOTs serving either multiple major metropolitan areas or predominantly small urban and rural areas show more widespread variation in their definitions of equity.

## FUTURE PERSPECTIVES ON USE OF PERFORMANCE MEASURES IN ALLOCATING TRANSIT FUNDS

Respondents from each of the three types of organizations were asked about expanding the role of performance measures and other factors in transit funding allocation for both capital projects and for operating support. Tables 15 through 18 summarize their responses.

State DOT respondents have varied opinions about the desirability of expanding the use of either traditional performance measures or other factors—performance-related external factors or service area characteristics—in the allocation of transit capital funds (see Tables 15 and 16). The strongest supporters came from less populous states, where transit service intensity is relatively low and where transit serves predominantly smaller urban and rural areas that are

TABLE 16
OTHER FACTORS: A LARGER ROLE IN CAPITAL FUNDING ALLOCATION?

| Organization | No. of Survey Responses | Strongly Agree on Expanding Use | Somewhat Agree | Uncertain | Somewhat Disagree | Strongly Disagree |
|---|---|---|---|---|---|---|
| State DOTs | 18 | 3 | 6 | 3 | 5 | 1 |
| Transit Agencies | 6 | 1 | 2 | 3 | 0 | 0 |
| MPOs | 5 | 1 | 1 | 1 | 2 | 0 |

TABLE 17
TRADITIONAL PERFORMANCE MEASURES: A LARGER ROLE IN OPERATING FUNDING ALLOCATION?

| Organization | No. of Survey Responses | Strongly Agree on Expanding Use | Somewhat Agree | Uncertain | Somewhat Disagree | Strongly Disagree |
|---|---|---|---|---|---|---|
| State DOTs | 21 | 4 | 8 | 5 | 3 | 1 |
| Transit Agencies | 7 | 1 | 2 | 2 | 2 | 0 |
| MPOs | 7 | 0 | 2 | 3 | 1 | 1 |

TABLE 18
OTHER FACTORS: A LARGER ROLE IN OPERATING FUNDING ALLOCATION?

| Organization | No. of Survey Responses | Strongly Agree on Expanding Use | Somewhat Agree | Uncertain | Somewhat Disagree | Strongly Disagree |
|---|---|---|---|---|---|---|
| State DOTs | 19 | 4 | 7 | 5 | 2 | 1 |
| Transit Agencies | 4 | 1 | 1 | 1 | 1 | 0 |
| MPOs | 4 | 0 | 1 | 2 | 1 | 0 |

TABLE 19
RATIONALES CITED BY THOSE WHO *FAVOR* INCREASED USE OF PERFORMANCE MEASURES OR OTHER FACTORS

| State DOTs | Transit Agencies | MPOs |
|---|---|---|
| • Accountability in all modes increasingly requires that performance be measured, especially when resources are constrained<br>• Encourages efficient operation<br>• Promotes more efficiency in the use of resources<br>• Measures help establish a base level of service in comparable markets/regions<br>• Needed if appropriate sets of measures can be derived for different operating environments/ agencies | • Accountability in all modes increasingly requires that performance be measured, especially when resources are constrained<br>• Encourages efficient operation<br>• Ensures best return on investment<br>• Some criteria are necessary<br>• Performance measures are essential to track progress toward program goals<br>• Reduces impact of politics | • Provides rationale for decision making<br>• Ensures funding directed to where the investment needs are most critical |

less likely to be well versed in the use of performance-based allocation procedures. States with high levels of transit intensity and more experience in the use of various measures of transit performance were less interested in expanding such use for the allocation of transit capital funds.

In comparison with views on capital fund allocation, increasing the role of both performance measures and other factors in operating fund allocation was viewed more favorably by state DOT respondents (see Table 17). Twelve of 21 state DOT respondents strongly or somewhat agreed with greater use of traditional performance measures for allocating operating funds, whereas only 4 disagreed.

One-half of the eight transit agency respondents indicated that the role of traditional performance measures in capital fund allocation should not be expanded (see Table 15), but none disagreed with greater use of other factors (see Table 16). The transit agencies that supported expanding the role of measures and factors in fund allocation typically already use these tools in their planning processes. In regard to operating funds, transit agency responses were across the board on expanding the use of either traditional performance measures or other factors. Half of those responding were uncertain about the notion, however.

MPO respondents also had varied opinions about expanding the role of performance measures and other factors for both capital and operating funds. The two MPOs that heavily use measures and factors in their current funding processes—the MTC in San Francisco and SANDAG in San Diego—ranked expanding those roles very low. Lower interest in expanding the role of performance measures in fund allocation could reflect satisfaction with current methods.

The organizations that tended to favor increased use of performance measures or other factors in allocating capital and operating funds cited the rationales as shown in Table 19. Those organizations that tended to disagree with

TABLE 20
RATIONALES CITED BY THOSE WHO *DISAGREE* WITH GREATER USE OF PERFORMANCE MEASURES AND OTHER FACTORS

| State DOTs | Transit Agencies | MPOs |
|---|---|---|
| • Current level of performance measures and other factor utilization sufficient<br>• Traditional measures address only one set of factors affecting investment needs, especially capital<br>• Lack of local resources may translate into lower performance and a disproportionate loss of funding despite local needs for service<br>• Lack of consensus on the measures<br>• Service levels and locally derived income are just as important a rationale for funding as performance measures<br>• Operating conditions are too varied from one system to another<br>• Leads to disproportionate support to larger systems<br>• The continued "social service" objectives/ mission of transit drag down performance measured in traditional terms; other measures are needed | • Current level of performance measures and other factor utilization sufficient<br>• Traditional measures address only one set of factors affecting investment needs<br>• Lack of local resources may translate into lower performance and a disproportionate loss of funding despite local needs for service<br>• Inconsistent data between agencies<br>• Performance evaluation may not adequately take growth factors into consideration<br>• Intergovernmental evaluation subject to gamesmanship<br>• Some projects have no relationship to measures (e.g., roof replacement) | • Current level of performance measures and other factor utilization sufficient<br>• MPO allocates funds to one transit agency<br>• Measures can be estimates and open to wide interpretation |

TABLE 21
SUGGESTED PERFORMANCE MEASURES AND OTHER FACTORS FOR FUTURE ALLOCATION PROCESSES

| | Performance Measures | Other Factors | |
|---|---|---|---|
| State DOTs | | | |
| Capital Funds | Vehicle miles/mechanic<br>Maintenance expense/vehicle mile<br>Ridership/cost<br>Vehicle hours/peak vehicle<br>Passengers/vehicle mile<br>Passengers/vehicle hour | Ridership<br>Environmental benefits<br>Economic benefits<br>Vehicle age/mileage/condition | Service miles<br>Geographic equity<br>Locally derived income |
| Operating Funds | Cost/trip<br>Cost/vehicle hour<br>Cost/vehicle mile<br>Passengers/vehicle hour<br>Operating income/expense | Management effectiveness<br>Audit reports<br>Budgeting effectiveness<br>Service area size (population, geography)<br>Proportion of elderly and disabled residents<br>Ridership | Vehicle miles<br>Locally derived income<br>Quality of service<br>Accessibility<br>Reliability |
| Transit Agencies | | | |
| Capital Funds | Congestion relief/ridership<br>Customer/operational benefit<br>Program efficiency/project readiness | Vehicle age/mileage/condition<br>Facility age/mileage/condition<br>Service area size (population, geography)<br>Service utilization<br>Air quality improvement<br>Operating efficiency | Locally derived income<br>Geographic equity<br>Land use impact<br>Environmental equity<br>Socioeconomic equity |
| Operating Funds | Passengers/vehicle mile<br>Passengers/vehicle hour<br>Subsidy/passenger<br>Cost/paratransit trip | Sociodemographic shifts (population, employment, demographics)<br>Customer surveys | Hours between maintenance calls |
| MPOs | | | |
| Capital Funds | Vehicle efficiency<br>Service effectiveness | | |
| Operating Funds | Labor efficiency | | |

greater use of performance measures and other factors in fund allocation cited the rationales as shown in Table 20.

When evaluating the future of performance measures and other factors, survey respondents were also asked to identify a list of what might be useful in allocating transit funding. Responses included a limited set of both common traditional performance measures and other performance-related external factors or service area characteristics, as summarized in Table 21.

### Common and Divergent Perspectives on Future Use of Performance Measures in Allocating Transit Funds

Survey responses suggest that agencies *most* experienced with the use of performance measures (for either fund allo-

cation or monitoring) are *least* interested in broadening such use and that those with limited experience would like to see greater use of performance measures.

Transit agencies have a far greater understanding of and experience in the use of performance measures than do state DOTs or MPOs, but survey respondents appear to support continued use of detailed performance measures as an activity separate from fund allocation. State DOTs and MPOs appear to struggle with the definitions of and distinctions between traditional performance measures and other factors used in fund allocation. All three types of organizations, however, are more receptive to the use of other factors rather than traditional performance measures for fund allocation.

CHAPTER FOUR

# CASE STUDIES

## INTRODUCTION

Four case studies have been prepared to further examine the use of performance measures in the allocation of transit funds. All case studies focus on the allocation of state funds for transit because it is this set of allocation decisions and processes that must reconcile the greatest variations in transit market characteristics, geographic conditions, demographics, and system characteristics.

The states whose current allocation mechanisms are described—Indiana, North Carolina, Ohio, and Pennsylvania—have varying degrees of transit intensity, well-developed state transit programs with varied levels of funding, and a wide range of grantees and conditions to balance in allocating state funds. Each has also undergone or is in the midst of a review of the state's current approach to transit funding through either formal analyses or informal dialogue among stakeholders, and each has or is currently using traditional performance measures in fund allocation. Each case study generally describes the following elements:

- Scope and nature of transit services in the state,
- Scope and structure of the state's transit funding programs,
- Specific factors used in fund allocation,
- Approaches to equity in fund allocation, and
- Future directions in the use of performance measures and other factors in fund allocation.

## INDIANA

### Background

The Indiana DOT provides financial and technical assistance to 53 public transit systems throughout the state:

- Eight large fixed-route systems,
- Nine small fixed-route systems,
- Four urban demand-response systems,
- Thirty-one rural demand-response systems, and
- One commuter rail system.

Indiana's most recent annual report on public transit states that five new rural transit systems were added in 2002. The growth provided a new mobility option to more than 294,899 citizens and, in the first year of service, provided 150,937 additional transit trips (*4*).

Transit services in Indiana are funded through 0.76% of the state's general sales and use tax. These dedicated funds are divided between the Commuter Rail Service Fund and the Public Mass Transit Fund (PMTF), a funding source solely dedicated to public transportation. Created in 1980, the PMTF covers both operating and capital assistance to transit systems. Figure 3 highlights the current transit program structure administered by the Indiana DOT.

The Indiana DOT has a long history of using traditional transit system performance measures to allocate transit operating funds. The earlier mentioned 1994 TCRP study on the linkage between performance measures and funding decisions (*2*) highlights Indiana DOT funding procedures. The Indiana DOT has also recently undergone a reevaluation of its operating fund allocation procedures.

### Transit Goals and Performance Monitoring

The Indiana DOT does not currently have transit-specific goals; however, its Public Transit Section regularly monitors the operating and financial characteristics of Indiana's 53 transit providers. Every year, the Public Transit Section produces a report recounting each transit system's expenditures, revenue, total ridership, vehicle miles of service, passengers per capita based on the transit system's service area, and the proportion of the total state ridership provided by each transit system. The report also breaks down each transit system's expenditures and revenues by category and relates each system's financial information to the other state systems. In addition, the report lists public transit highlights such as the training, technical assistance, and research conducted by the Indiana DOT. The annual report helps public officials, planners, transit managers, and interested citizens gauge how well the Indiana DOT is furnishing reliable, safe, and efficient public transit services.

### Funding Allocation Approaches and Effectiveness

Transit funding is distributed to service providers based on an allocation formula. Transit systems are first divided into peer groups. One group consists solely of the Northern Indiana Commuter Transportation District (NICTD). The NICTD provides commuter rail service between South Bend and Chicago and receives a set 12.34% of the total state transit funds. The NICTD funds are used for maintenance,

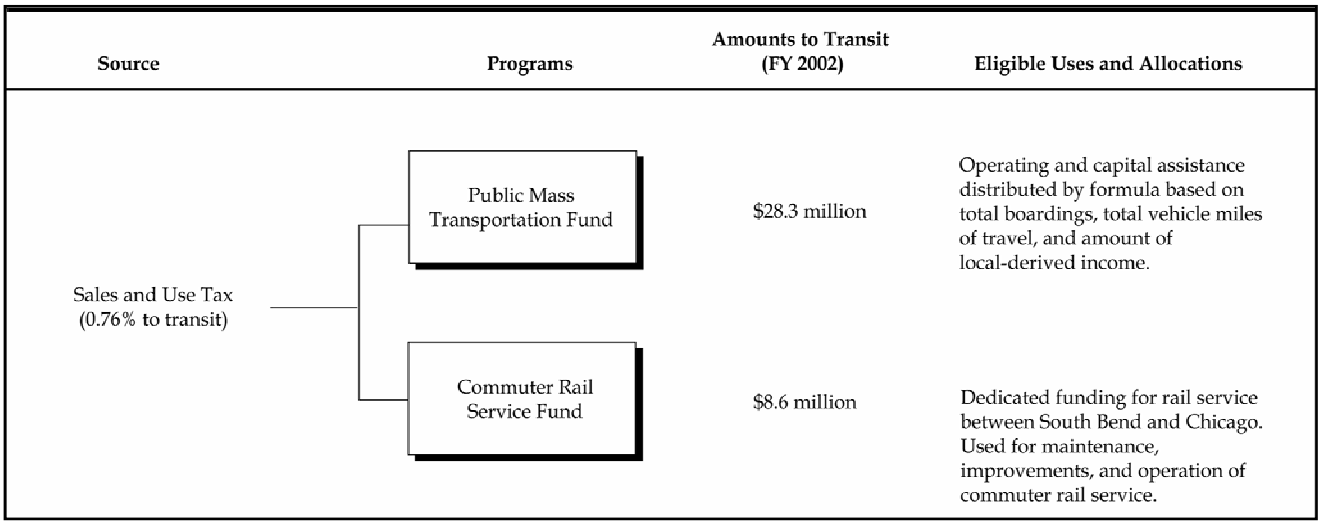


FIGURE 3 Indiana state transit funding: Program structure and characteristics. [*Source: TCRP Research Results Digest 60: Characteristics of State Funding for Public Transportation—2002* (*5*).]

TABLE 22
PUBLIC MASS TRANSIT FUND ALLOCATION ACROSS BUS PEER GROUPS

| Group | Definition | Group Split (percent) | FY 2004 Funding |
|---|---|---|---|
| Large Fixed Route | Systems operating an average of more than 1 million total vehicle miles per year with more than 50% of total vehicle miles operated in fixed-route service | 74.66 | $19,306,692 |
| Small Fixed Route | Systems operating fewer than 1 million total vehicle miles per year | 10.87 | $2,810,399 |
| Urban Demand Response | Systems operating 50% or more of their total vehicle miles in demand-response or deviated fixed-route service<br>Systems that operate in urbanized areas with greater than 50,000 population | 5.62 | $1,452,046 |
| Rural Demand Response | Included services in urbanized areas with less than 50,000 population as well as rural countywide services | 8.86 | $2,290,563 |
| Total Groups | | 100.00 | $25,859,700[1] |

[1]$25,859,700 = 87.66% of Public Mass Transit Fund.

improvements, and operation of the commuter rail service. As the only rail service in Indiana, the NICTD is separated from the other providers to create more coherent peer groups.

The additional 52 transit systems in Indiana provide bus services and are divided into four groups: large fixed-route, small fixed-route, urban demand-response, and rural demand-response systems. The PMTF supports all bus services through the remaining 87.66% of dedicated transit funds. The PMTF funds are allocated to each bus peer group based on the group's share of total operating expenses (see Table 22). As a result of a 1997 study, the peer group classification has been based on total vehicle miles, urbanized or nonurbanized service area, and proportion of fixed-route service in comparison with demand-response service.

Within each peer group funding for operations is allocated based on a three-part formula:

1. Passengers/operating expense (33%), weighted by passengers;
2. Miles/operating expense (33%), weighted by total vehicle miles; and
3. Locally derived income (LDI)/operating expense (33%), weighted by LDI.

The Indiana DOT calculates the PMTF allocation formula based on a system's reported data for the previous 3 years. Using a rolling average for vehicle miles, passengers, operating expense, and LDI creates stability and predictability in the allocation percentages. The only exception is the restriction that a system cannot receive funds in excess of 50% of its most recently reported annual operating expenses.

#### Other Funding Programs

The Electric Rail Service Fund (ERSF) is a dedicated program that provides financial assistance to commuter transportation districts that have a majority of their services provided by electric-powered railroads. The ERSF is gen-

erated from property tax on a railroad company's distributable property. In 2002, $135,989 was allocated from the ERSF to the NICTD, the only eligible transit service.

#### Equity

The Indiana DOT treats service size (total vehicle miles) and service use (total passenger trips) equally in the allocation of operating funds.

#### Summary

The 1997 report, *Public Mass Transportation Funding Allocation Study*, helped the Indiana DOT solidify the role of performance measures and other factors in its transit system. Today, measures and factors serve two main functions for the agency: (1) allocation of PMTF transit operating funds, and (2) monitoring of its 53 transit providers.

#### Future Directions in Transit Funding Allocation

Indiana DOT staff did not express any strong positive or negative opinions about the benefits and drawbacks of using performance measures in transit fund allocation. Respondents indicated that of the potential issues with using traditional performance measures, only data quality and consistency proposed a small problem. The Indiana DOT appears satisfied with the funding allocation system and does not foresee any plan to reevaluate the system in the near future.

### NORTH CAROLINA

#### Background

The North Carolina DOT Public Transportation Division (PTD) supports planning and delivery of public transportation services through more than 120 operating agencies serving all 100 North Carolina counties. The program provides nearly $85 million annually through 12 programs that are designed to meet a wide range of needs as well as maximize the flexible use of federal transit funds available to the state and its operating agencies.

Transit services are available in the six urbanized areas ranging in size from 200,000 to 1 million in population and in an additional 10 urbanized areas with populations ranging from 50,000 to 200,000. In addition, the PTD has long had a requirement for coordination of transit and human services transportation at the county level in each of the state's 100 counties. As a measure of the state's continued interest in efficient and effective service delivery, the coordination requirement involves preparation of a county transportation development plan and designation of a lead agency at the county level to receive all transportation funding. In addition, the state serves as a central procurement source for a variety of equipment and services and develops statewide marketing and communications strategies for public transportation (see www.ncdot.org/transit/transitnet/publicinfo/AboutUs.htlm and www.dot.fta.gov).

The North Carolina DOT transit programs and fund allocation processes are examined here for these reasons: (1) North Carolina transit programs are among the few that are using true traditional performance measures in the allocation of funds and (2) North Carolina is currently sponsoring its own review of fund allocation processes and the role of performance measures and other factors in fund allocation. Figure 4 highlights the current transit programs offered by the North Carolina DOT.

#### Transit Goals and Performance Monitoring

North Carolina DOT transit program goals are broad in scope and speak to the need to better coordinate services, enhance efficiency and effectiveness, expand transportation system management strategies, encourage innovation in service design, meet state and federal planning requirements including integration with highway planning, and administer state and federal funds effectively. Increasing the mobility options for North Carolinians is also an expressed goal of the state's transit program and is monitored through the review of ridership statistics, vanpool and carpool formation as part of local transportation demand management programs, and state funding levels.

The PTD annually monitors operating statistics and financial information reported by state grantees. Although actual traditional performance measures are used in fund allocation, PTD staff believes that they have had a minimal effect on system performance.

#### Funding Allocation Approaches and Effectiveness

As mentioned, North Carolina is one of the four states responding to the survey that uses traditional performance measures in the allocation of funds to transit agency grantees. Four of the state's transit assistance programs distribute funding by formula:

1. Urban and Regional Maintenance Assistance Program, which provides operating assistance to urban systems;
2. Rural General Public Program, which provides operating assistance through a combination of formula and discretionary allocation procedures;

| Source | Programs | Amounts to Transit (FY 2002) | Eligible Uses and Allocation |
|---|---|---|---|
| At least $0.50 multiplied by the total number of registered vehicles in the state is allocated to transit from the Highway Fund | Urban and Regional Assistance Program | $32.4 million | Dedicated allocation for operating costs of urban and regional transit system services. Formula based on ridership, revenue service hours, fares, and local match. |
| | Urban and Regional Technology Program | $1.0 million | State matches 90% of project costs of advanced technologies to improve efficiency and information of transit services. |
| | New Starts | $20.1 million | State share of 25% of costs to plan, design, and build fixed-guideway projects. |
| | Statewide Grants | $4.6 million | State share for urban, regional, and rural transit systems, including planning and demonstration projects. |
| Balance from state Highway Trust Fund | Rural Capital Program | $7.75 million | State share of 90% for purchases of vehicles, lifts, and communication systems. |
| | Facility Improvement Program | $4.0 million | State share of 90% to construct/ improve public transportation facilities. |
| | Technology Program | $0.5 million | State share of 90% for advanced public transportation technologies. |

| Source | Programs | Amounts to Transit (FY 2002) | Eligible Uses and Allocation |
|---|---|---|---|
| At least $0.50 multiplied by the total number of registered vehicles in the state is allocated to transit from the Highway Fund | Rural General Public Program | $4.1 million | Formula allocation of $2.5 million with 50% based on rural population and 50% equity. Discretionary allocation of $1.6 million for general public service. State funding share is 90% to 10% local. |
| | Regional and Intercity Service Program | $400,000 | Operating assistance to improve/ expand regional and intercity transportation services. Funding with 100% state funds or used to match Section 5311 (f) funds on 50% state basis. |
| | Elderly and Disabled Transportation Assistance Program | $5.5 million | Operating assistance provided with 100% state funds allocated as follows: 50% equally divided among counties, 22.5% based on number of disabled residents,and 5% based on population density. |
| | Human Services Transportation Management Program | $2.4 million | Administrative assistance to community transportation systems. Funding provided up to maximum amount at 85% state–15% local matching ratio. |
| Balance from state Highway Trust Fund | Work First/ Employment Transportation Assistance Program | $1.75 million | Formula allocation of $1.0 million to each county for operating expenses. Allocation split is 45% based on population, 45% based on Work First caseloads, and 10% equity. The transportation assistance program is covered by 100% state funds. An additional $750,000 is provided for operating assistance for demonstration projects. |

FIGURE 4 North Carolina state transit funding: Program structure and characteristics. [*Source: TCRP Research Results Digest 60: Characteristics of State Funding for Public Transportation—2002* (*5*).]

TABLE 23
OPERATING ASSISTANCE FUND ALLOCATION FACTORS

| Program, Target Market, and Agency Type | Fund Allocation Factors |
|---|---|
| Urban and Regional Maintenance Assistance Program for Urbanized Area Systems | 60% performance:<br>30% passengers per hour<br>30% net cost per trip<br>30% locally derived revenue<br>10% equal share of annual program level |
| Rural General Public Program | 50% equal allocation among eligible counties<br>50% of county rural population as a percentage of state total |
| Elderly and Disabled Transportation Assistance Program | 50% equal share to all counties<br>22.5% of elderly (60 and older) residents in each county as a percentage of state total<br>22.5% of disabled residents in each county as a percentage of state total<br>5% population density factor |
| Work First Employment Program | 10% equal share to all counties<br>45% population of each county as a percentage of state total<br>45% of Work First cases as a percentage of state total |

3. Elderly and Disabled Transportation Assistance Program, which provides operating assistance to support travel by elderly and disabled residents; and
4. Work First Employment Program, which provides operating assistance linked to a county's state Work First Block Grant program.

Only the first of these programs, however, uses traditional performance measures in the allocation process. Table 23 highlights the performance measures and other factors used in fund allocation for these four PTD programs.

The PTD program structure and these allocation factors are enacted either in state law or by the North Carolina Board of Transportation and have been in place without change for more than 5 years. The PTD staff judged that the use of performance factors in allocating operating funds through the Urban and Regional Maintenance Assistance Program have generally proven very effective, as has the use of area characteristics for allocation of operating funds to rural areas. The largest advantages of these allocation methods are believed to be

- Recognition for the better-performing systems and agencies,
- Equity that comes from minimum allocations, and
- Inducement to maintain or increase locally derived support.

The allocation of capital funds to transit systems in North Carolina is done largely through discretionary programs. In some cases when expansion of service and vehicle fleets is being considered, the PTD will evaluate existing service levels and passengers per vehicle to gauge utilization of existing system capacity in making funding decisions. Also, a minimum mileage threshold is set for vehicle replacement. This approach is considered somewhat effective by PTD staff, and the use of vehicle mileage minimums for replacement is considered very effective in managing resources and system performance. There are also disadvantages associated with the approach, as noted by PTD staff. Areas with larger than normal local dedicated revenue sources can embark on more aggressive expansion programs that, in turn, require more of the limited state funding available regardless of system performance. Also, the approach does not take into consideration the effects of highly varied topography and geography across the state.

#### Equity

As indicated in Table 23, equity in funding allocation involves formula factors that address geographic equity and, to a lesser degree, transportation needs, through the use of minimum allocations and population factors. Also, geographic equity is addressed somewhat informally in consideration of discretionary capital funding requests. The Elderly and Disabled Transportation Assistance Program and the Work First Employment Program, however, do incorporate socioeconomic measures of equity through the use of elderly and disabled population figures and Work First caseload factors.

#### Summary

The North Carolina state transit programs are among the few that continue to use traditional performance measures in fund allocation, and PTD staff members are of the opinion that their process and approach is fairly effective, although direct ties to goal achievement are not clearly measured or assessed. As will be indicated, however, an effort is under way by the PTD to review national experiences in the use of performance measures in funding allocation. This effort clearly shows an interest in improving

the linkage between fund allocation and system performance.

#### Future Directions in Transit Funding Allocation

The study currently under way by the North Carolina State University Institute for Transportation Research and Education for the PTD is designed to examine options to fund allocation procedures now in use by the PTD. This interest has been driven by concern that performance across transit systems in the state, as reported to the PTD, varies widely, whereas fund allocations do not reflect these differences. As a result, there is some concern that the allocation processes being used do not provide a strong enough incentive or leverage to enhance performance where it is lowest.

PTD staff somewhat agreed, according to the survey response, that greater use could be made of traditional performance measures in capital funding allocation to help with decisions about the extent of service expansion to support and in what locales. Standard measures—such as vehicle hours per peak vehicle, passengers per vehicle mile, and passengers per vehicle hour—were suggested in the survey response as performance measures to be considered in revising capital funding allocation mechanisms.

The survey response also indicated some agreement that traditional performance measures should play a larger role in allocating operating funds, including operating cost per vehicle hour, passengers per vehicle hour, and operating income per operating expense. There was also strong agreement that other factors should play an even larger role. Because there are constrained funding conditions, and given North Carolina's largely rural character, geographic and population-based allocation factors as well as minimum allocations are viewed as important. Also important is the notion that the application of performance measures be used as an incentive and not have the effect of penalizing systems in the allocation process.

With respect to issues involved in the use of traditional performance measures in fund allocation, PTD staff cited two problems as most pronounced: (1) data quality and consistency and (2) lack of consensus among transportation professionals on the best measures to be used for fund allocation.

Cited as somewhat lesser problems were

- Lack of consensus among policymakers on the best measures,
- That many measures are not intuitively understood by policymakers, and
- With constrained funding levels, rewarding performance can unfairly disadvantage other funding recipients.

### OHIO

#### Background

For the last 30 years, the Ohio DOT has overseen public transit services in the state. Currently, Ohio DOT's Office of Transit administers programs supporting 62 transit systems and 19 coordination projects through technical, operating, capital, or planning assistance. The passenger and freight rail system is under the supervision of the Ohio Rail Development Commission. State transit funding has declined more than 60% since 2000, and additional budget cuts have been mandated. Figure 5 highlights the current transit program structure administered by the Ohio DOT.

The Ohio DOT is included as a case study in this report for the following reasons:

1. The Ohio DOT revised its transit fund allocation procedures in 1995 for small urban and rural systems (Section 5311 recipients) and in 1998 for urbanized area systems (Section 5307 recipients) after an extensive study.
2. Its current allocation process combines traditional performance measures and other factors.
3. The Ohio DOT is currently reevaluating the link between performance and funding allocation decisions to further improve its public transit service delivery to citizens.

#### Transit Goals and Performance Monitoring

The Ohio DOT does not currently have transit-specific goals, but the Office of Transit is working to include such goals in Ohio's next long-range plan. In regard to performance monitoring, the Ohio DOT has historically collected data on performance and other factors from each transit system, including cost per mile, passenger data (ridership or demographics), and share of locally contributed funding. In the past, the data have been provided to the transit system for their review, but recently the agency has been analyzing the data independently to evaluate overall transit performance across the state.

#### Funding Allocation Approaches and Effectiveness

The Ohio Public Transportation Grant Program (OPTGP) provides the majority of the state's transit capital and operating funds (see Figure 5). The OPTGP can be separated into two funding programs. The discretionary capital pro-

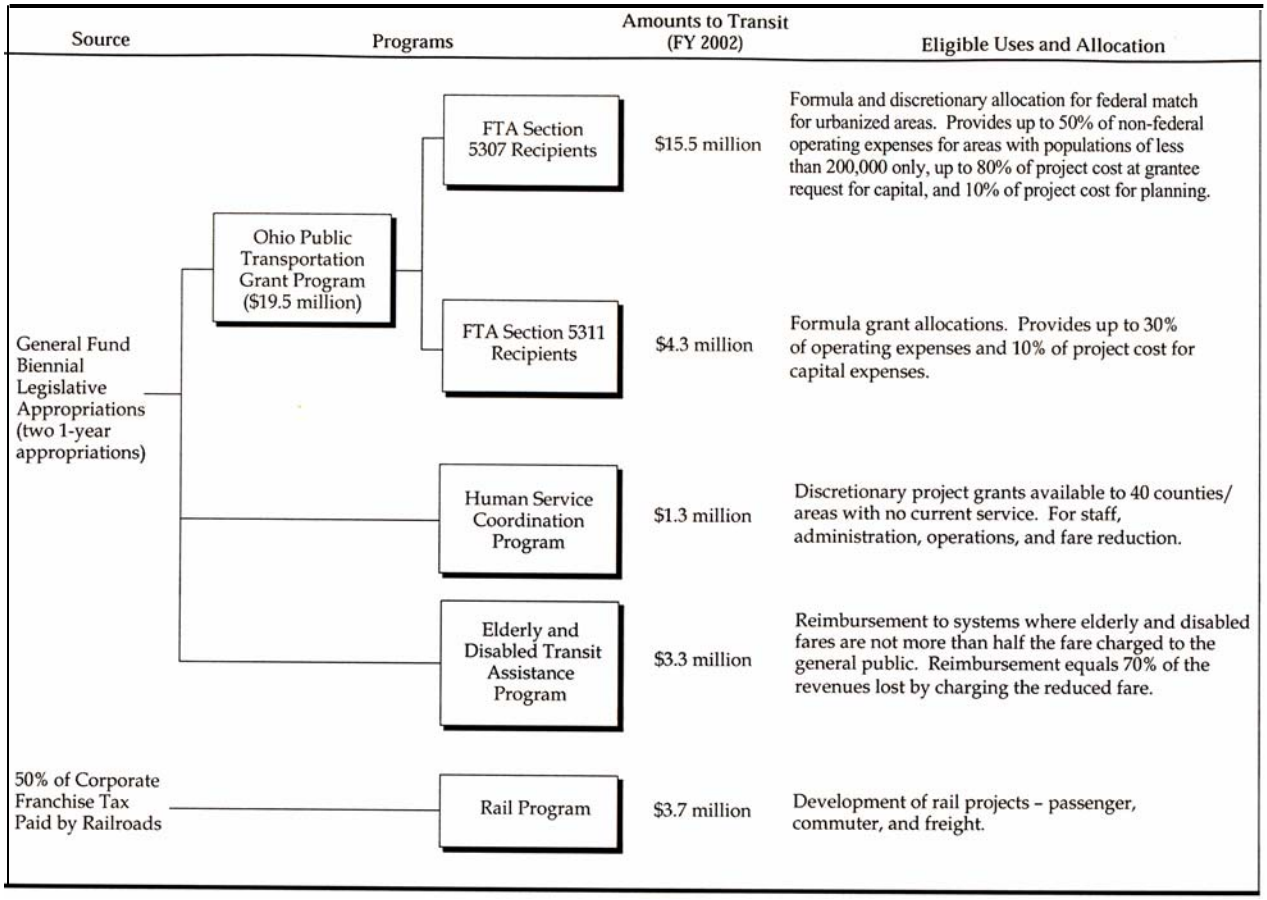


FIGURE 5 Ohio state transit funding: Program structure and characteristics. [*Source: TCRP Research Results Digest 60: Characteristics of State Funding for Public Transportation—2002* (*5*).]

gram covers bus and major equipment purchases as well as major transit facilities (e.g., transit centers, bus terminals, rail terminals, and passenger transfer facilities). Discretionary capital fund allocation is based on a project-by-project evaluation by the Ohio DOT. Each project is scored according to a set of standard criteria (local support, socioeconomic information, level of joint development, and intermodal benefits) and a set of criteria based on project type (e.g., vehicle, facility, or other).

Formula program funding is first allocated among six transit system categories (five urban and one rural) based on system size. State funding supports capital and planning projects across the state, but it provides operating assistance only in areas with populations of less than 200,000. The Ohio DOT places a strong emphasis on oversight and technical support. The allocation of FY 2004 formula funds after the rural set-aside programs is listed in Table 24 by system category. The allocation percentages are based on the share of population and mileage for each category in comparison with statewide totals.

Following apportionment to each category of system, the funds within each category are distributed among the service providers. Operating assistance is determined by a formula that incorporates both traditional performance measures and other factors. The categorization of systems before fund allocation allows transit providers to be evaluated along with their peers. Table 25 lists the factors, measures, and relative weights used to allocate funds within each system category.

Operating assistance levels are also adjusted to ensure that no less than 95% and no more than 105% of actual state and federal funds are expended during the calendar year and 2 proceeding years. In addition, the Ohio DOT has established administrative criteria that must be met by each system to receive its full allocation. These criteria include timely submission of quarterly invoices and operating data, among others.

The operating assistance formulas in Table 25 reflect revisions that occurred in 1995 and 1998 for small urban and rural systems (Section 5311 recipients) and urbanized area systems (Section 5307 recipients, respectively. Previously performance measures were not taken into consideration. For example, all rural transit providers used to receive the same level of support: 30% of total operating expenses from the

TABLE 24
TRANSIT SYSTEM CATEGORY AND ALLOCATION PERCENTAGES IN OHIO

| Category | Designation | Systems | Formula Funds Allocated (percent) | Funds Available[1] (FY 2004) |
|---|---|---|---|---|
| I | Rail/bus system | Greater Cleveland RTA | 21.03 | $2,134,841 |
| II | Large bus systems | Southwest Ohio RTA<br>Central Ohio Transit Authority<br>Greater Dayton RTA | 36.04 | $3,658,567 |
| III | Mid-sized bus system | Metro RTA (Akron)<br>Toledo Area RTA | 13.73 | $1,393,788 |
| IV | Intermediate bus system | Laketran<br>Stark Area RTA<br>Western Reserve Transit Authority | 11.18 | $1,134,927 |
| V | Small bus system | Allen County RTA<br>Clermont Transportation Connection<br>Eastern Ohio RTA<br>Greene County<br>Land of Legend (Licking County)<br>Lorain County Transit<br>Miami County Transit<br>Middletown Transit System<br>Newark—Health Taxi Program<br>Portage Area RTA<br>Richland County Transit<br>Sandusky Transit System<br>Springfield City Area Transit<br>Steel Valley RTA<br>Community Action Bus Line (Washington County) | 18.02 | $1,829,284 |
| VI | Nonurbanized bus systems | All nonurbanized public transportation systems | Administratively established each fiscal year | $4,310,715 |

[1]Estimated funds available. Subject to state budget appropriation. RTA = Regional Transportation Authority.

TABLE 25
OPERATING ASSISTANCE ALLOCATION FORMULA

| | | Operating Fund Allocation Parameters | |
|---|---|---|---|
| Area | Mode | Other Factors | Measures |
| Small Urban (50,000 to 200,000 population) | Bus and demand response | 50% system data<br>20% ridership<br>20% revenue miles<br>10% farebox revenue | 50% performance data<br>20% cost per hour<br>20% passengers per mile<br>10% farebox recovery |
| Rural | Bus and demand response | 50% passenger<br>25% revenue miles<br>25% local share | |

state and 30% of provider's net operating deficit from the federal government. This approach required Ohio DOT staff members to review each budget line item to ensure that projected costs were reasonable based on past expenditures and service plans. Accountability concerns and staff resource requirements led to the shift from this policy of support to a performance-based allocation process.

The Ohio DOT describes three main benefits of performance-based allocation:

> It links performance with funding, emphasizes the needs of the customers, and makes transit systems as well as Ohio DOT accountable to their funding agencies.
>
> It has built-in incentives but leaves the choice of what service a community will provide and how it will spend its money with local officials. If a system wishes to expand its service, it can do so either within its Federal and state allocation or with additional local funds; it has the option to do so.
>
> It reduces, and in some cases eliminates Ohio DOT scrutiny of budget details and time-consuming follow-up and allows Ohio DOT to focus on providing technical assistance to its grantees [Ohio DOT, *Rural Transit Program Manual*, 2001 (*6*)].

#### Other Funding Programs

The Ohio Human Services Coordination Program and Ohio Elderly and Disabled Transit Fare Assistance Program are two additional Ohio DOT transit funding programs. The Human Services Coordination Program provides discretionary project grants to the 28 counties with no public transportation systems. Eligible projects must demonstrate a level of interagency coordination in their local areas, and

only operational expenditures qualify. The Elderly and Disabled Transit Fare Assistance Program provides reimbursements to systems for elderly and disabled fares. Eligible services include fixed route, demand response, and point/route deviation, a combination of fixed- and demand-responsive service. For a system to qualify for reimbursement, the fare for elderly and disabled passengers must be no greater than 50% of the general public fare.

#### Equity

The Ohio DOT uses factors in both capital and operating fund allocation that address equity by system size. As mentioned previously, all transit systems are separated into six categories based on system size and population (see Table 24). The categorization of systems is the first step in allocating the OPTGP formula funds, the largest pool of transit funds. However, the Ohio DOT is currently looking to revamp its process, and the staff predicts that equity will not be as large a factor, if it is considered at all, in the future.

#### Summary

The Ohio DOT transit funding procedure combines both discretionary and formula-based allocation. The changes adopted in 1995 reflected an effort to increase the accountability and effectiveness of transit investments. The new performance-based allocation procedure was a joint effort between the Ohio DOT and the transit providers. Both parties agreed that using traditional performance measures and other factors ensures that providers that are successfully managing their systems will be rewarded. In addition, a large administrative burden was removed from Ohio DOT staff. Through gradual phase-in of the changes, fluctuation in year-to-year funding levels was reduced, and stronger support among transit system providers was gained. Nevertheless, the Ohio DOT acknowledges that the allocation method should be continually evaluated to make certain that no system provider is unduly harmed.

#### Future Directions in Transit Funding Allocation

As for expanded use of traditional performance measures in transit fund allocation, the Ohio DOT survey respondents indicated that the following were the most significant concerns: data quality and consistency and varied goals across systems and service types.

Conversely, the following issues were *not* viewed as serious deterrents to the future use of performance measures in allocating funds in Ohio:

- Data collection effort required,
- Measured elements largely outside agency control,
- Lack of consensus on best measures among transportation professionals and policymakers, and
- Measures not intuitive to policymakers.

The Ohio DOT continually evaluates its funding allocation procedures and works with transit providers to identify areas of improvement. With limited resources, the agency is more concerned than ever about equitably distributing funding to systems with the greatest need. Within the Ohio DOT, survey respondents noted that level of service, accessibility, quality of service (capacity), response time, and reliability could potentially be linked to the allocation of operating funds. Ideally, these factors and measures would also be connected to new state transit goals.

Currently, neither traditional performance measures nor other factors are used to allocate capital funds. However, the Ohio DOT believed that a base level of service needs to be established for the state and that capital funds should be awarded to the areas with the most need, to raise them to the base level of service. To accomplish this, the Ohio DOT is evaluating the implementation of a grading system. A potential system would rate each transit system on a scale of "A" to "F," based on criteria such as vehicle condition and age of the system and their relation to safety and maintenance costs. The agency would then focus on improving systems having lower grades, "E" or "F." Besides establishing a base service level across the state, a grading system would help defend transit funds against those for other state interests such as education and prison requirements.

The Ohio DOT is also collecting data on automobile ownership and income to estimate the transit propensity of each county. With this information, the agency plans to evaluate an area's transit propensity in relation to the quality of the services provided. The goal is not only to assess where additional services may be needed but also to gain a better understanding of where services are inadequate. To date, the Ohio DOT has discovered that certain areas with low transit propensity have a mix of both high-quality and low-quality services, suggesting that both the management of a system and the transportation characteristics of local residents have a strong impact on the extent and quality of the service provided.

### PENNSYLVANIA

#### Background

Pennsylvania has one of the largest transit programs in the country, investing nearly $800 million annually in public transportation across the state. Through seven major Pennsylvania DOT (PennDOT) programs, the state supports services provided in these ways:

- Twenty-one urban public transportation systems ranging in size from the multimodal regional systems serving Philadelphia and Pittsburgh, with populations of 3.7 million and 1.5 million, respectively, to Pottstown, with a population of 45,000;
- Twenty-one rural transit systems serving 26 counties;
- Fifty-three fixed-route operators serving older residents in 50 counties and 61 shared-ride operators serving older residents in all 67 counties;
- Thirty-three Welfare-to-Work projects serving 43 counties; and
- Amtrak, operating nearly 100 daily trains through the state (see www.dot.state.pa.us).

PennDOT transit programs and fund allocation processes are examined here for several reasons:

- The PennDOT experience was featured as a case study in the previously mentioned 1994 TCRP study on performance measures and fund allocation (*2*) and therefore represents an opportunity to chart change over time in the application of performance measures in fund allocation.
- Measures used to allocate transit funds in Pennsylvania have remained stable over time and have enjoyed the continuing support of a wide range of operating agencies, funding agencies, and local governments.
- PennDOT, like most transit-intensive states that provide substantial support to transit, maintains a strong commitment to the efficiency and effectiveness of state-supported transit services and the use of state funds.

Figure 6 highlights the current transit program structure administered by PennDOT.

#### Transit Goals and Performance Monitoring

PennDOT transit program goals are oriented toward the department's administration of the overall state program and the delivery of resources as well as the level of participation by Pennsylvania counties in the various state programs. State grantees are surveyed annually based on 15 measures of goal achievement intended to assess the efforts of the PennDOT Bureau of Public Transportation. Illustrative measures include

- Clarity of application instructions and program policies,
- Opportunity for policy input,
- Timeliness of state grant payments and response to inquiries, and
- Extent to which grantee's technical assistance needs are met.

PennDOT and transit agency concern for transit system performance is addressed through two streams of activity outside the grant-making process. To comply with a requirement of state legislation enacted in 1997, state grant recipients must conduct and report the results of rider satisfaction surveys to be undertaken every 2 years in Philadelphia and Pittsburgh and every 3 years for other urban systems. Satisfaction is measured across five attributes and provides the state and the operating agencies with a continuous stream of data on customer perspectives.

In addition, the same legislation requires periodic formal performance evaluations to be conducted, also independent of the annual funding cycle. Philadelphia and Pittsburgh conduct their evaluations on a 5-year cycle. The remaining urban systems are on a 7-year cycle of formal performance evaluations, and rural systems are on a 10-year cycle. Comprehensive reporting of financial and operational data by operating agencies is also compiled and published by the Bureau of Public Transportation. This independent approach to performance monitoring is considered effective in reinforcing attention to and the importance of improvements in transit system performance.

#### Funding Allocation Approaches and Effectiveness

The four major formula-based state programs provide more than 80% of the state's transit capital and operating funding to operating agencies, as shown in Figure 6. The remainder of the state's funding is provided through discretionary state programs, largely for capital expenditures and support for special programs. Although PennDOT tracks transit system performance through the use of traditional performance measures, the measures are not used in the funding allocation process. Instead, a series of other performance-related external factors and service area characteristics are used, as described in the tables that follow.

The allocation of state transit funds in Pennsylvania is a multilayered process. The legislature has set funding percentages for various classes of systems across the state, defined by the size of the systems. The Southeastern Pennsylvania Transportation Authority (SEPTA) in Philadelphia and the Port Authority of Allegheny County (Port Authority Transit, or PAT) in Pittsburgh individually represent independent classes in this system. The remaining smaller urban bus systems represent another class, as do the rural systems. From amounts appropriated annually by the state legislature to each class of system, allocations are made to individual smaller urban and rural systems through formulas and factors also established in statute. They are highlighted in the Tables 26 and 27.

As shown in the tables, the Pennsylvania allocation method relies heavily on previous years' historical shares

| Source | Programs | Amounts to Transit (FY 2002) | Eligible Uses and Allocation |
|---|---|---|---|
| General Fund | Operating Assistance | $270.8 million | Allocation is by legislative formula: $268.1 million for Urban; and $2.7 million for Rural. Eligible uses include all standard categories of operating assistance. |
| Dedicated Funds: *Public Utility Realty Tax (7.6 mills)* *Auto Rental Tax ($2 per day)* *Vehicle Lease Tax (3% of price)* *Tire Fee ($1 per tire)* *Annual Transfer of .52% Sales Tax - Sales Proceeds Equivalent to 6% Sales Tax on Periodicals and Selected Truck Leases* | Dedicated Public Transportation Assistance Fund (PTAF) | $181.6 million | Allocation is by legislative formula: $172 million Urban; $4.9 million Rural; $2.3 million Community Transportation; and $2.4 million Technical Assistance.<br><br>Eligible uses include capital assistance for Urban, Rural, and Community Transportation Systems. Up to 50% of Urban or Rural PTAF funds may be used for Asset Maintenance. Technical Assistance funds may also be used for Training and Demonstration Projects. |
| Supplemental Dedicated Funds: Transfer of 1.22% of Sales Tax Proceeds not to exceed $75 million annually | Dedicated Supplemental Funding (Act 3 Revenue Enhancement Initiative) | $75.0 million | Allocation by legislative formula: $69 million Urban; $4.8 million Rural; and $1.2 million for Community Transportation.<br><br>Eligible uses include capital assistance only for Community Transportation and Capital or Operating assistance for Urban and Rural. Urban systems may use approximately 75% of funds for Operating Assistance, including Asset Maintenance, and the balance for Capital Assistance. Rural systems may use all funds for Operating Assistance. |
| Lottery Funds and Supplemental General Funds ($118.9 million Lottery/ $16.1 million Supplemental General Funds) | Senior Citizen Transportation Program: Fixed-Route and Shared-Ride Service | $135.0 million | Allocation is by legislative formula based on senior citizen ridership and average or base fare levels. Urban systems received $121.5 million and Rural systems $13.5 million.<br><br>Funds are used to provide 100% fare reimbursement to systems for providing free senior citizen fares during off-peak hours for Fixed-Route Service, and for reimbursement of 85% of eligible fares for Shared-Ride Service, which has no peak-hour restriction. Shared-Ride Program was exclusively funded with $63.1 million Lottery funds. Fixed-Route Program was funded with $55.8 million of Lottery Funds and $16.1 million of Supplemental General Funds. |
| General State Obligation Bond Proceeds | Discretionary Capital Assistance Program | $121.9 million | Discretionary allocation is to specific capital projects authorized in periodic State Capital Budgets. Generally, annual policy allocation approximates Urban and Rural legislative formula allocations (e.g., 97% urban/ 3% rural).<br><br>Eligible uses include all standard categories of capital assistance and vehicle overhaul costs. |
| General Funds | Intercity Transportation Program | $5.7 million | Discretionary allocation is for specific projects as determined by the department. Funds were used for operating assistance only, and included $4.1 million for the Intercity Rail Program and $1.6 million for the Intercity Bus Program. |
| General Funds | Miscellaneous Other Program | $1.8 million | Discretionary allocation for specific projects as determined by the department. Eligible uses include operating assistance for Persons with Disabilities Demonstration Program; consultant oversight costs for State Rail Transit Oversight Program, and Operating Assistance for the Jbb Access Program. Amount includes $1.1 million for Persons with Disabilities Demonstration Program; $0.5 million for State Rail Transit Safety Oversight Program; and $0.2 million for the Jbb Access Program. |

FIGURE 6 Pennsylvania state transit funding: Program structure and characteristics. [*Source: TCRP Research Results Digest 60: Characteristics of State Funding for Public Transportation—2002* (*5*).]

TABLE 26
OPERATING ASSISTANCE FUND ALLOCATION FACTORS IN PENNSYLVANIA

| Transit System Type (Class) | Fund Allocation Factors |
|---|---|
| Operating assistance for SEPTA in Philadelphia (Class I) and PAT in Pittsburgh (Class II) from the Operating Assistance program | Amounts based on fixed percentages set by the state legislature:<br>70% to SEPTA<br>25.3% to PAT |
| Operating assistance for Class III smaller urban and Class IV rural systems | Amount based on fixed percentage set by the state legislature (4.7%) |
| Allocations to Class III smaller urban bus systems | 50% on historical shares of state funding<br>25% on annual vehicle miles<br>25% on annual operating revenue |
| Allocations to Class IV rural bus systems | 50% on historical shares of state funding<br>25% on annual vehicle miles<br>25% on annual vehicle hours |

Notes: SEPTA = Southeastern Pennsylvania Transportation Authority; PAT = Port Authority Transit.

TABLE 27
DEDICATED PUBLIC TRANSPORTATION ASSISTANCE FUND CAPITAL ASSISTANCE

| Transit System Type (Class) | Fund Allocation Factors |
|---|---|
| Capital funds for SEPTA in Philadelphia (Class I) and PAT in Pittsburgh (Class II) from the Dedicated Public Transportation Assistance Fund (PTAF) | Amounts based on fixed percentages set by the state legislature<br>70.3% to SEPTA<br>25.4% to PAT |
| Capital funds for Class III small and medium bus systems, Class IV rural bus systems, community transportation, and technical assistance from the PTAF | Amount based on percentage established by the state legislature (4.3%) |
| Allocations to Class III small and medium bus systems and allocations to Class IV rural bus systems | 50% on historical shares (25% state shares; 25% federal shares)<br>16.6% on annual vehicle miles<br>16.6% on annual vehicle hours<br>16.6% on annual total passengers |

of funding, which has the advantage of providing stability and predictability in the flow of funds from year to year, a feature that is extremely important in attempts to plan and manage a major public service and related assets. Service factors—hours, miles, and passengers—make up the remaining factors used in the allocation process. Both PennDOT and its grantee agencies have remained comfortable with this process since its inception in 1987.

The current allocation framework and process was borne out of a need in the mid-1980s to ensure that services in Philadelphia and Pittsburgh received an adequate and predictable flow of funds, and a recognition that no combination of data-driven allocation factors could be uniformly applied to all transit systems in the state and produce an acceptable or stable distribution of funds. As a result, performance-based transit management by PennDOT and the allocation of state transit funds have proceeded effectively under two separate but parallel processes. Among the advantages of this approach are that funding levels are responsive to the modest growth and/or decline of the systems from year to year without introducing too much instability in funding. That is, there is some advance knowledge by transit operators of prospective changes in funding levels. Among the disadvantages are that improvements in one transit system can be overshadowed by larger improvements in another, potentially disadvantaging the first unfairly.

In responding to the survey, PennDOT staff believed that performance measures should play a somewhat lesser role in capital fund allocation and a somewhat larger role in allocating operating assistance. It was suggested that the ridership factor be removed from the capital fund allocation to Class III urban systems and that ridership (total revenue passengers) replace the revenue factor now used in allocating operating assistance to Class III urban systems. It was further recommended that either miles or hours be removed from the Class IV rural operating assistance allocation procedure and that revenue or ridership (total revenue passengers) be added in allocating operating assistance to Class IV rural systems.

In addition, PennDOT has found only minor correlations between changes in ridership and capital funding needs. This result likely reflects that there is generally some excess capacity available to meet small incremental increases in ridership in most systems. That is, capital needs are a “step function” and largely dependent on expansion plans and the age and condition of assets. As a result, needs do not rise uniformly as the number of individual riders increases.

### *Dedicated Supplemental Funding or Act 3 Funds*

Act 3 funds were appropriated by the state legislature in 1997 to help lessen the impact of the loss of federal operating assistance through the early and mid-1990s. The funds can be used for capital or operating assistance within some limits set by state statute. Act 3 funds are allocated through

two subdistributions. The first is set in statute by the legislature with fixed percentages going to Class I (54%), Class II (17.2%), and Class III (28.8%) systems. The allocation of Act 3 funds to Class III smaller urban systems is based on their respective shares of federal operating assistance in the base year of 1993 to 1994.

The second subdistribution of Act 3 funds is allocated across all Class I, Class II, and Class III systems based on the Public Transportation Assistance Fund formula shown in Table 27.

*Senior Citizen Transportation Programs*

PennDOT's Senior Citizen Transportation Program remains a unique and long-standing effort to support transit use by senior citizens throughout the state. Funded by state lottery proceeds and supplemental general fund revenues, the program provides funds for 100% fare reimbursements to systems providing free off-peak rides to seniors on fixed-route services, and 85% fare reimbursements to systems for seniors using shared-ride services at any time of the day. Reimbursements are made based directly on elderly customer's ridership and on revenue.

#### Equity

Within the PennDOT transit programs, equity is defined by two dimensions. First, where formulas are used to allocate funds, level of service factors—miles and hours—play a prominent role and system use—ridership and revenue—a somewhat lesser role. Second, there is strong reliance on prior historical levels of funding.

Equity for the larger Class I and Class II systems—SEPTA in Philadelphia and PAT in Pittsburgh—is defined indirectly as a matter meeting comparable levels of need, determined by and negotiated within the state legislature. Equity has *not* taken on demographic or socioeconomic dimensions in any of the PennDOT formula programs, although it may be inferred that discretionary programs and the negotiated percentages of formula funds provided to SEPTA and PAT may reflect some consideration of need according to income and/or ethnic characteristics of the community served.

#### Summary

Transit funding in Pennsylvania is allocated first through the legislative process that presumably satisfies the competing needs of systems that vary dramatically in size. Allocation of funds among systems in the same size class is done largely on the basis of factors other than traditional measures of performance, which are also established in state law.

As transit funding has been increased statewide over the years, the preferred approach has been to create a new program through which the added funds are to flow, but to rely on existing formulas for allocation of new funds. Revenue enhancements for transit have been enacted a number of times (1987, 1991, and 1997), and they are under consideration in 2004. Such enhancements have been passed in large part because they have combined increases in funding for both highways and transit in a single bill.

As noted, current transit fund allocation processes have been in place since 1987 and are considered to be generally effective and pragmatic given the wide range of systems, services, and environments in which transit operates in Pennsylvania. Traditional performance measures are, however, compiled, monitored, and published on an annual basis by the Bureau of Public Transportation. Their lack of use in fund allocation, therefore, does not signal a lack of concern or attention to transit performance on the part of the state.

### Future Directions in Transit Funding Allocation

Although for a long time both the state and its grantees have been satisfied with the current process, some tensions arise between the needs of communities that are growing rapidly and those that are more stable. With constrained funding, the need to increase funding for growing communities can be met only through funding reductions for communities that are not growing. Members of the Pennsylvania Public Transportation Association are exploring allocation schemes that might address such needs and disparities as part of the current effort to introduce new legislation for state transit programs. The outcome of this effort, and whether it will alter the long-standing allocation mechanisms, is uncertain.

PennDOT survey responses noted several significant problems with the increased use of traditional performance measures in funding allocation. Among the most significant are the following:

- Lack of consistency in data and related definitions,
- Inability to meet legitimate needs when performance is rewarded under constrained funding conditions,
- Likelihood that performance-based awards under constrained funding conditions would be too small to serve as any kind of incentive for improving performance, and

- Unpredictability in estimating local matching needs caused by lags in data reporting.

Conversely, the following issues were *not* viewed as serious deterrents to the future use of traditional performance measures in allocating transit funds in Pennsylvania:

- Data collection effort,
- Presence of varied goals across systems or service types,
- Lack of linkages between performance measures and agency goals, and
- Lack of consensus on what measures are best.

Ultimately, it is unlikely that the review of PennDOT's long-standing allocation processes under way by the state's transit association will lead to greater use of traditional performance measures for the allocation of state transit funds in the near future.

CHAPTER FIVE

# CONCLUSIONS

This synthesis used a limited sample of survey responses, case studies, and a review of recent literature to study performance-based measures in transit fund allocation. A number of general findings and conclusions can be drawn.

- Transit system performance continues to be of considerable importance when viewed across the full spectrum of processes, activities, and organizations involved in the design, funding, operation, and oversight of transit services.
- The allocation of funds for transit takes place at several levels and a differing mix of performance measures and other allocation factors is in evidence at each level. State departments of transportation (DOTs) allocate funds to local and regional systems for capital and operations; metropolitan planning organizations (MPOs) prioritize capital projects for funding within their respective regions; and transit agencies regularly evaluate and alter services at the route level and adjust associated operating budgets.
- Management and oversight of transit performance and the allocation of funds to transit systems are being pursued increasingly as independent activities. Reporting of and monitoring performance in traditional ways are carried out aggressively even though traditional performance measures are not widely used in fund allocation.
- Transit system performance measurement is broadening to include progress against wide-ranging community goals and objectives that extend beyond efficiency in the use of available resources.
- There has been no apparent increase in the use of traditional internal measures of performance in fund allocation at either the state or regional level since the 1994 publications of *TCRP Synthesis of Transit Practice 6: The Role of Performance-Based Measures in Allocating Funding for Transit Operations*. Responses suggest that traditional performance measures may indeed have become less of a factor in fund allocation.
  - Where traditional performance measures are used by survey respondents, it is for allocation of operating funds (Indiana, Iowa, North Carolina, and Ohio); no responding state uses traditional performance measures to allocate capital funds.
  - In none of these four cases, however, are operating funds allocated only through the use of traditional performance measures; in each case, traditional performance measures are combined with other factors in the allocation process.
  - Six traditional performance measures are used by the four states in allocating operating funds: (1) passengers per operating expense, (2) miles per operating expense, (3) cost per hour, (4) cost per mile, (5) passengers per hour, and (6) cost per trip.
- There are a wide array of perspectives and approaches to achieving equity in fund allocation. States generally define equity in one of several dimensions and use related one-dimensional factors in attempting to establish equity in fund allocation; for example, population, system size, service use, and area needs. Transit agencies define equity more often in terms of allocations based on ridership and socioeconomic factors. MPOs define equity more often in terms of allocations made on a geographic or jurisdictional basis or by the extent of financial need that is met.
- There appears to be a high level of stability and limited impetus for change in fund allocation processes and the measures and factors currently used. Survey respondents indicated no significant plans to move toward greater use of traditional performance measures in fund allocation. This finding likely reflects that renegotiating fund distribution according to relatively constant funding levels can promote disagreements and disruptions, and that resulting problems frequently get resolved in the political arena rather than in the operating or program management arena.
- The use of traditional performance measures in fund allocation can conflict with the desire for stable and reliable funding needed to sustain basic levels of service. In addition, survey respondents perceived problems with expanded use of traditional performance measures in fund allocation. Problems ranged from data quality and consistency to varied goals to outside forces and influences.
  - States noted that data quality and consistency are sometimes questionable; inflexibility that results under constrained funding, that is, performance-based allocations, may make it more difficult to meet legitimate needs; and inequities result, that is, some recipients may perform well but lose funds if others perform better.
  - Transit agencies noted that varied goals and variability in operating conditions and markets from system to system pose problems, and consensus on what measures to use is often difficult to achieve among recipient systems.

  - MPOs noted that traditional performance measures are sometimes hard to understand intuitively for nonprofessionals, and outside forces and influences often have large impacts on performance.
- There appears to be a lack of clarity outside the transit industry in differentiating traditional internal measures of performance (ratio measures of inputs and outputs measuring efficiency, effectiveness, and organizational productivity) from other factors measuring agency or community goal achievement. A gap exists between the understanding of and application of traditional performance measures used by state DOTs and MPOs and the understanding and application of traditional performance measures used by transit agencies.

The current review of transit fund allocation and the use of performance measures do not suggest a large ongoing research agenda. However, several suggestions were evident from the synthesis study.

- Periodic review of fund allocation measures and processes can be a worthwhile endeavor. However, the review should not be focused exclusively on traditional performance measures. Instead, it should cover state DOT funding allocation, MPO priority setting and programming, and transit agency budget development—key actions that involve the flow of funds to transit and processes to guide allocations at each level. Such a periodic review should also retain a focus on performance monitoring frameworks and measures, regardless of the linkage to fund allocation, because the greatest use of performance measures appears to occur outside of but parallel to fund allocation processes.
- The recently completed *TCRP Research Results Digest 60: Characteristics of State Funding for Public Transportation* could be used as a database for funding allocation and related state program details. Periodic updates of that digest would provide full, comprehensive, and easily updated data on fund allocation for all 50 states. Such an opportunity would provide comprehensive descriptions of state programs rather than rely on sampled data, as the current and past synthesis projects have. Companion surveys could be done to elicit perspectives on key questions and issues covered through the current survey and case study efforts.
- A research piece on the varied definitions and specifications of performance measures and measures of goal achievement and their application may be useful, whether in fund allocation or simple service monitoring. Such a product should be geared to the needs of state DOT and MPO program managers and staff—presented not as an academic inquiry but as a guide to practical program design and management. One objective would be to reduce the apparent confusion about varying aspects of transit performance and of performance measures and their applications. Another objective would be to create a common reference to serve as a base of information and understanding for major actors in transit funding and decision making.
- An assessment should be done of why data quality and consistency problems persist in the reporting and use of traditional performance measures. Problems pertaining to data were cited by state DOTs as the most significant in the use of performance measures despite years of formalized and recently updated federal procedures for data collection and reporting. One explanation may be related to turnover among relatively junior transit agency staff responsible for reporting and the resulting need for continuous or improved training. Other topics are certain to arise in such an assessment.

# REFERENCES


1. *Public Transportation Fact Book*, 54th ed., American Public Transportation Association, Washington, D.C., 2003, 242 pp.
2. Hartman, R.J., E.M. Kurtz, and A.B. Winn, *TCRP Synthesis of Transit Practice 6: The Role of Performance-Based Measures in Allocating Funding for Transit Operations*, Transportation Research Board, National Research Council, Washington, D.C., 1994, 52 pp.
3. Cheung, C. and M. Daney, "Comprehensive Process for Evaluating Existing and New Transit Services: San Diego Metropolitan Transit Development Board," *Transportation Research Record 1835*, Transportation Research Board, National Research Council, Washington, D.C., 2003, pp. 10–18.
4. *Annual Report: Indiana Public Transit*, Indiana Department of Transportation, Indianapolis, 2002.
5. *TCRP Research Results Digest 60*: *Characteristics of State Funding for Public Transportation—2002*, Transportation Research Board, National Research Council, Washington, D.C., July 2003.
6. *Rural Transit Program Manual*, Ohio Department of Transportation, Columbus, 2001.

# ANNOTATED BIBLIOGRAPHY

A literature review was conducted at the outset of the study to gather information on issues related to the use of performance measures in transit fund allocation. The literature review was concentrated on material produced in the past 5 years and material submitted by the TCRP panel. The effort included searches of the National Technical Information Service and Transportation Research Information System databases. In addition, inquiries were made of selected state departments of transportation (DOTs), transit agencies, university transportation research centers, and consultants for work on transit funding allocation systems and measures that had been completed but not formally published.

The literature review revealed a limited number and scope of materials. This finding demonstrates that there is finite use of or evaluation of the use of performance measures in transit fund allocation. Annotations from a selected group of the most relevant sources are provided here.

"Use of Performance Standards and Measures for Public Transportation Systems: Technical Memorandum #1—Background Information," Institute for Transportation Research and Education, North Carolina State University, Raleigh, Feb. 9, 2004.

This report is the first product of a continuing effort to examine the use of performance measures in transit planning, operations, and finance. It covers the development and application of performance measures in public transportation in general, and their use by state DOTs in particular. Results from a literature review and a 2003–2004 survey of state DOTs, nationwide, are reported and are integrated with results of North Carolina stakeholder interviews as well results of a 2003 survey of participants in a North Carolina Community Transportation Conference. The use of current and past performance measures is described for 14 states—Arizona, California, Florida, Indiana, Iowa, Minnesota, Missouri, Nevada, New York, Ohio, Oregon, Pennsylvania, Texas, and Wisconsin. Results indicate limited use of traditional performance measures for fund allocation but broad use of traditional performance measures and other factors for monitoring transit service delivery.

Stanley, R.G., *TCRP Research Results Digest 60: Characteristics of State Funding for Public Transportation—2002*, Transportation Research Board, National Research Council, Washington, D.C., 2003, 124 pp.

The digest provides a detailed description of the various funding sources for transit services in each of the 50 states, a breakdown of funding sources by state program, and the funding levels for FY 2002. The report also includes a brief description of the eligible uses and allocation parameters for the various transit funds. Where applicable, allocation formulas and related factors are listed.

Statewide Public Transit Performance Measures—Memorandum, Kittelson & Associates, 2003.

This memorandum for Cambridge Systematics, as part of the Virginia Public Transportation plan, describes the statewide transportation goals and objectives for Florida, Maryland, North Carolina, Pennsylvania, and Virginia. The existing transit performance measures used to track progress toward statewide goals and objectives were presented for Florida, Maryland, and North Carolina; Pennsylvania is currently developing measures. The formulas and performance measures used to allocate transit operating funds in North Carolina were also described.

Kittelson & Associates, *TCRP Report 88: A Guidebook for Developing a Transit Performance-Measurement System*, Transportation Research Board, National Research Council, Washington, D.C., 2003, 382 pp.

The guidebook provides a step-by-step process for developing a performance measurement program that includes both traditional and nontraditional performance indicators that address customer-oriented and community issues. The document includes a summary of 32 organization interviews in regard to their performance measures program. More than three-quarters of the transit agencies interviewed use their performance programs as management tools; the majority of the measures used are economic. Generally, the programs were not tied to specific agency goals and objectives. However, several organizations reported using performance measures to prioritize transit investments and create financial incentives. The report also contains an extensive annotated bibliography on transit performance measures.

Cambridge Systematics, Bus Transit Governance, Management, and Finance Study Technical Memorandum, Connecticut Department of Transportation, Hartford, 2002.

The report describes the institutional structure, management approach, funding sources, resource allocation procedures, performance monitoring mechanisms, and coordination approaches used by transit agencies in nine states. The goal of the study was to provide Connecticut with some evaluation strategies and actions to improve its bus

transit system. Information is presented in both general descriptions and detailed tables. Typically, federal funds are made available to urban and rural agencies though formula-based and discretionary programs. States allocate funds to transit agencies based on operating deficit and/or needs established through population, service levels, and historical shares. However, a few states have introduced performance factors into their allocation processes (e.g., passengers, passenger revenue, cost per trip, and cost per hour). Local funds are most often allocated to specific transit programs, projects, and budget line items through the annual budget process. The report concludes that federal transit programs have dictated and guided, at least minimally, the structure of state and local programs and funding procedures.

Cheung, C. and M. Daney, "Comprehensive Process for Evaluating Existing and New Transit Services: San Diego Metropolitan Transit Development Board," *Transportation Research Record 1835*, Transportation Research Board, National Research Council, Washington, D.C., 2003, pp. 10–18.

In 2002, the San Diego Metropolitan Transit Development Board analyzed its evaluation procedures of existing and new transit services. The motivation behind the study was to develop more meaningful measures and targets that better reflected the goals and objectives identified in the short-range transit plan. The recommendations included adding "passenger per revenue hour" to address the concerns of suburban operators where service operated at higher speeds as a result of lower pass densities, adding a new service category for performance standard development, and adding qualitative measures into the project ranking process. This paper provides an extensive description of the board's transit fund allocation process.

Deakin, E., C. Ferrell, J. Mason, and J. Thomas, "Policies and Practices for Cost-Effective Transit Investments: Recent Experiences in the United States," *Transportation Research Record 1799*, Transportation Research Board, National Research Council, Washington, D.C., pp. 1–9, 2002.

"The purpose of this study was to identify the methods and procedures being used to evaluate and select major transit projects" (e.g., policy objectives, social equity, and land use patterns). Twenty-one transit agencies that had recently developed a major transit system expansion project (New Starts) completed surveys describing their project selection processes. According to the paper, "The study found that most agencies use federal guidance and regulation on the evaluation of transit investment as a starting point, but give equal weight in project design and selection to state and local policy objectives such as social equity, economic development, and 'fair share' distribution of projects among local communities. The availability of public or private funding contributions is increasingly important in prioritizing projects." Several agencies also give priority to projects in jurisdictions with transit-supportive land use patterns or plans.

Deakin, E., M. Payne, and V. Menotti, Development of the BART System Expansion Criteria and Process (unpublished), no date.

The paper describes the process that Bay Area Rapid Transit (BART) uses to evaluate expansion options and the newly developed criteria for BART's current policy goals. BART uses Strategic Opportunities Assessment as an "initial sketch-planning evaluation tool and then applies criteria and a rating system to evaluate preliminary proposals as well as project alternatives." The developed criteria included cost-effectiveness (cost per rider, cost per new rider, and overall transportation system user benefits), ridership, cost (total project costs and cost to BART), transit-supportive land use and development plans, transit-supportive access, regional network connectivity, system capacity, finance, and partnerships. The identified criteria have not only helped staff in project evaluation and development, but they also let local governments, other transportation agencies, and the broader public know the qualities BART is looking for in a project. "Application of the new process has led to transit-supportive plans and zoning changes in several jurisdictions."

Khasnabis, S., E. Alsaidi, L. Liu, and R.D. Ellis, "Comparative Study of Two Techniques of Transit Performance Assessment: AHP and GAT," *Journal of Transportation Engineering*, Vol. 128, No. 6, 2002, pp. 499–508.

The paper presents the findings of a research project that developed performance assessment tools for Michigan transit agencies. Two tools, Analytic Hierarchy Process and Goal Achievement Technique, were used to evaluate the performance of 81 transit agencies. The authors recommended the Analytic Hierarchy Process as a slightly better tool for assessing performance. Although the paper focuses on the selection of peer agencies and the ranking of agency performance based on the two tools, there is some discussion about how agencies could use performance to allocate transit funds.

Cambridge Systematics, *NCHRP Report 446: A Guidebook for Performance-Based Transportation Planning*, Transportation Research Board, National Research Council, Washington, D.C., 2000, 113 pp.

The guidebook establishes the rationale for performance-based planning and provides practical guidance for a wide

range of potential applications, including transit operations and planning. It presents a general overview, basic principals and terms, development process, data and analysis toolbox, and case studies summary for performance-based planning. The document also contains a performance measures library for all modes of transportation. Research findings do not warrant the endorsement of using performance measures as a way of replacing the current transportation project prioritization and selection process with purely analytical, quantitative methods. Indeed, many participants in the case studies and workshops emphasized that it is undesirable to attempt to replace an inherently complex, political process with one that is overly simplified or purely quantitative. Most practitioners appeared to agree that the most they can expect to accomplish in the near term is to provide better quality, more goal-relevant information to an inherently political decision-making process.

Basile, C. and D. Lee, Use of Performance Measures and Customer Surveys by Governmental Regulation Agencies to Monitor Privatized Transit Operations in Three Latin American Cities, Presented at the 78th Annual Meeting of the Transportation Research Board, Washington, D.C., Jan. 1999.

The paper describes how three Latin American cities (Buenos Aires, Argentina, and Curitiba and San Paulo, Brazil) integrate performance measures and customer surveys in the transit regulatory process. All transit operations analyzed are performed by private "concessionaires" under contract to public regulatory agencies. "Favorable rail performance in Buenos Aires is rewarded by granting fare increases, while adverse performance results in financial penalties." Curitiba bus system operators can increase profits by achieving efficiency improvements (e.g., accident prevention, absenteeism control, and preventive maintenance). The state-managed transit services in San Paulo have proposed substituting public opinion polls for governmental inspection as the basis for incentives and penalties for performance to allow the marketplace rather than the government to evaluate quality. The locally managed San Paulo services planned to pool 2% of total revenue to be administered as incentive bonuses, but the arrangement was so unpopular among operators that it was abandoned.

*Distribution of State and Federal Aid to Mass Transit Programs: Report to the Governor and General Assembly Members*, Virginia Department of Rail and Public Transportation, Richmond, 1999.

The report documents the current procedures in Virginia for federal and state transit fund allocation. It highlights concerns about the current state funding formulas (e.g., the formula assistance program is too complicated) and evaluates four options for improving state formula distribution. The report concludes that Virginia should adopt a variation of the current assistance process, whereby allocation is based on the level of local transit investment and a composite fiscal stress factor that addresses areas that cannot afford needed transit services. In addition, a "hold harmless" provision is recommended to eliminate the "efficiency penalty," in which an agency receives less state assistance if operating expenses are lowered without decreasing services.

Cambridge Systematics, New Approaches to Transit System Performance Measurement. Presented at the Non-MTA Service Standards Conference, Syracuse, N.Y., 1998.

The paper describes commonly used transit performance measures and recent efforts to develop measures that better reflect the range of objectives and expectations that the industry is being asked to meet. Efforts in Ohio, Florida, the Twin Cities, Minnesota DOT, and Delaware DOT were highlighted. Ohio's approach attempted to link transit funding to operational performance and to create an incentive to improved operational performance.

Marshment, R., *Establishing Subsidy Levels for Rural Public Transportation Systems*, Oklahoma Department of Transportation, Oklahoma City, 1998.

The study reviews the funding allocation process for rural public transportation systems supported by FTA Section 5311. It summarizes the state of the practice using information gathered through a survey of 49 state agencies, 6 in-depth interviews in Oklahoma, and a literature review. The study concluded that the inherent conflict among the multiple goals of rural transit systems result in a wide variety of allocation procedures across the country. From the gathered information the study develops and tests improved financial and performance evaluation procedures. The study recommends evaluating an agency's average subsidy per trip when allocating Section 5311 funds.

Matherly, D., "Developing a Performance-Based Transit Allocation Formula: Case Study for a Participatory Process," *Transportation Research Record 1604*, Transportation Research Board, National Research Council, Washington, D.C., 1997, pp. 83–91.

The paper describes the process of developing the funding mechanism in Indiana for operating assistance to transit operators. Included is a summary of the study performed to evaluate the transit funds allocation methodology with the participation of affected transit systems and the Indiana DOT. The development of the performance-based alloca-

tion mechanism and specific elements was done in collaboration with the affected transit systems and the Indiana DOT. The mechanism distributes funds to each transit agency according to a base allocation percentage, with a portion distributed based on performance. The performance-based funds are first distributed to transit peer groups, identified based on operating expense, and then they are allocated within each peer group based on performance.

COMIS Corporation and RLS Associates, Inc., *Public Mass Transportation Funding Allocation Study: Final Report and Recommendations for the Indiana Department of Transportation*, Indianapolis, 1996.

The purpose of the study was to "create a rational and equitable mechanism for the distribution of state operating assistance to urban and rural transit providers throughout the state of Indiana. The final recommendation provides a funding mechanism that rewards the transit systems that are best serving their customers and providing cost-effective service to their communities, and provides incentives and time for all systems to improve."

McCollom Management Consulting, Proposed Urban Transit Allocation Method, Ohio Department of Transportation, Columbus, 1996.

The study describes the existing operating assistance program in the Ohio DOT, reviews practices at other state DOTs, and outlines a new assistance formula. The report recommends that the Ohio DOT use a formula consisting of passenger usage (50% of state support), service provided (25% of state support), and local funding levels (25% of state support). To implement the new program, the authors recommend a phase-in period and imposing a penalty if six planning and administrative deadlines are not met.

Taylor, B., "Program Performance Versus Transit Performance: Explanation of Ineffectiveness of Performance-Based Transit Subsidy Programs," *Transportation Research Record 1496*, Transportation Research Board, National Research Council, Washington, D.C., 1995, pp. 43–51.

The paper summarizes a study of the operating subsidy programs in 16 states and describes the programs in three states—California, Michigan, and Pennsylvania—in some detail to indicate that "the programmatic goals of distributional equity supersede efforts to motivate improved transit performance." The paper includes a discussion of the rationale for linking transit performance to funding allocations and concludes with some recommendations on how distributional equity requirements might be redefined to be more consistent with performance-based programs.

MacDorman, L.C., *Transportation Research Circular 343: State Role in Public Transportation: Public Transportation Performance Monitoring*, Transportation Research Board, National Research Council, Washington, D.C., 1988, pp. 19–36.

The article presents a comprehensive overview of performance monitoring in the public transportation sector. Included is a discussion of the motivation and benefits of performance monitoring. A general description of various factors that influence performance and the means of monitoring performance are also included. The article does not, however, address how transportation agencies are connecting performance monitoring to budget allocation decisions.

Miller, J., "The Use of Performance-Based Methodologies for the Allocation of Transit Operating Funds," *Traffic Quarterly*, Vol. 34, No. 4, 1980, pp. 555–585.

The paper is an early attempt to develop a performance measure framework that could be linked to funding decisions. A set of measures were presented to represent "affordable mobility" or transit services that are efficient and effective. The paper also describes how Pennsylvania uses a funding bonus (up to 10% of the state grant) to reward agencies that maintain or improve their performance.

# APPENDIX A

## Survey Instruments

Each of the survey instruments used in the synthesis study is included in this appendix. Although the thrust and general content of the questions for state DOTs, MPOs, and transit agencies are the same, the survey instruments were tailored to the particular mission and function of each type of agency in managing the flow of funds to transit.

STATE DOT SURVEY
State: _____

**TCRP Synthesis on**

**THE USE OF PERFORMANCE-BASED MEASURES IN ALLOCATING TRANSIT FUNDING**

### SURVEY PURPOSE

The purpose of this survey is to identify how transit performance measures—and other factors—are currently being used to allocate funding for transit, how their use has changed in recent years, and what changes are being anticipated in the future.

### PERFORMANCE MEASURE DEFINITION*

Performance measurement concepts vary widely. The questions below are meant to focus on the extent to which transit funds are allocated using (1) traditional "performance measures" (i.e., ratios of efficiency, effectiveness, and productivity); and (2) "other factors" (single data elements that may measure aspects of goal achievement or community impact such as ridership, market share, service levels, emission reductions, etc.).

1. Has your agency analyzed or studied the use of performance measures in allocating funds in the past five years?
   Y N (Circle one) If "Yes," please enclose relevant reports/findings, if possible.

### SECTION 1

#### Transit Program Goals and Performance Monitoring

2. Does your state's transit program have established goals? Y N (Circle one)

3. Briefly list state transit goals and the measures and/or factors that are used to assess/report progress toward goal achievement (but not necessarily used to allocate funding).

| Goal | Measure |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |

4. What other measures and/or factors do you use to regularly monitor transit system performance?

5. Performance monitoring (not linked to fund allocation) has been effective in improving transit system performance. (Check one)

O----------O----------O----------O----------O

| Strongly Agree | Somewhat Agree | Uncertain | Somewhat Disagree | Strongly Disagree |
|---|---|---|---|---|

*See Attachment A for examples of performance measures and other factors used in fund allocation.

**SECTION 2**

**Performance Measures and Transit Capital Funding**

6. Are measures of system performance (PMs) and/or other factors (OFs) currently used to allocate transit capital funds? (Circle Y or N for each)

| State capital funds | | | Federal capital funds | | |
|---|---|---|---|---|---|
| PMs | Y | N | PMs | Y | N |
| OFs | Y | N | OFs | Y | N |

7. If "Yes," for either state or federal funds, what areas and modes are performance measures or other factors used to allocate capital funds? (Check all that apply) ☐ Not applicable

| | Metro Areas (>200 k) | | Small Urban (<200 k) | | Rural | |
|---|---|---|---|---|---|---|
| | Perf. Meas. | Other Factors | Perf. Meas. | Other Factors | Perf. Meas. | Other Factors |
| Rail | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Bus | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Demand Responsive | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

8. What specific measures of system performance and/or other factors are used in allocating funds for transit capital? What weight is given to each, if any? ☐ Not applicable

| Performance Measure or Factor | Area and Mode | Weight* |
|---|---|---|
| (e.g., pass./vehicle mi., population, service levels) | (e.g., metro, rail) | (e.g., 10%) |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

*If used in a formula, what percentage of the formula is based on this measure?

Attach an additional sheet to highlight how capital funds are allocated, if appropriate.

9. What changes have been made in the past five years in measures and factors used to allocate funds for transit capital?
☐ Not applicable

Measures/factors added? _____

_____

_____

Measures/factors dropped? _____

_____

_____

10. What was the reason for the change(s) noted in Question 9? ☐ Not applicable
(Describe briefly)

_____
_____
_____
_____
_____

11. The following categories of performance measures and/or factors have been effective mechanisms for allocating capital funds.
(Check one for each category)

| | | |
|---|---|---|
| Measures of System Performance (e.g., pass./veh.-mi.) | O----------O----------O----------O----------O<br>Very Effective / Somewhat Effective / Uncertain / Somewhat Ineffective / Very Ineffective | ☐ Not applicable |
| Asset Age/Condition (e.g., veh. age) | O----------O----------O----------O----------O<br>Very Effective / Somewhat Effective / Uncertain / Somewhat Ineffective / Very Ineffective | ☐ Not applicable |
| Service Levels (e.g., veh.-mi. or veh.-h) | O----------O----------O----------O----------O<br>Very Effective / Somewhat Effective / Uncertain / Somewhat Ineffective / Very Ineffective | ☐ Not applicable |
| Area Characteristics (e.g., population) | O----------O----------O----------O----------O<br>Very Effective / Somewhat Effective / Uncertain / Somewhat Ineffective / Very Ineffective | ☐ Not applicable |

12. What are the pros and cons of using performance measures and/or other factors to allocate capital funds?

Performance Measures
Pros: _____
_____
_____
Cons: _____
_____
_____

Other Factors
Pros: _____
_____
_____
Cons: _____
_____
_____

**SECTION 3**

**Performance Measures and Transit Operating Funding**

13. Are measures of system performance (PMs) and/or other factors (OFs) currently used to allocate operating funds?
(Circle Y or N for each)

| | | |
|---|---|---|
| PMs | Y | N |
| OFs | Y | N |

14. If "Yes," for what areas and modes are performance measures or other factors used to allocate operating funds? (Check all that apply)

| | Metro Areas (>200 k) | | Small Urban (<200 k) | | Rural | |
|---|---|---|---|---|---|---|
| | Perf. Meas. | Other Factors | Perf. Meas. | Other Factors | Perf. Meas. | Other Factors |
| Rail | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Bus | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Demand Responsive | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

15. What specific measures of system performance and/or other factors are used in allocating funds for transit operations? What weight is given to each, if any? ☐ Not applicable

| Performance Measure or Factor | Area and Mode | Weight* |
|---|---|---|
| (e.g., pass./vehicle mi., population, service levels) | (e.g., metro, rail) | (e.g., 10%) |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

*If used in a formula, what percentage of the formula is based on this measure?

Attach an additional sheet to highlight how capital funds are allocated, if appropriate.

16. What changes have been made in that past five years in measures and/or factors used to allocate funds for transit operations? ☐ Not applicable

Measures/factors added? _____

_____

Measures/factors dropped? _____

_____

17. What was the reason for the change(s) noted in Question 16? ☐ Not applicable
(Describe briefly)

_____

_____

_____

_____

_____

18. The following categories of performance measures and/or factors have been effective mechanisms for allocating operating funds.
(Check one for each category)

Measures of System Performance (e.g., pass./veh.-mi.)
O----------O----------O----------O----------O ☐ Not applicable
Very Effective | Somewhat Effective | Uncertain | Somewhat Ineffective | Very Ineffective

Asset Age/Condition (e.g., veh. age)
O----------O----------O----------O----------O ☐ Not applicable
Very Effective | Somewhat Effective | Uncertain | Somewhat Ineffective | Very Ineffective

| | | | | | | |
|---|---|---|---|---|---|---|
| Service Levels (e.g., veh.-mi. or veh.-h) | O | O | O | O | O | ☐ Not applicable |
| | Very Effective | Somewhat Effective | Uncertain | Somewhat Ineffective | Very Ineffective | |
| Area Characteristics (e.g., population) | O | O | O | O | O | ☐ Not applicable |
| | Very Effective | Somewhat Effective | Uncertain | Somewhat Ineffective | Very Ineffective | |

19. What are the pros and cons of using performance measures and/or other factors to allocate operating funds?

Performance Measures
Pros: _____
_____
_____
Cons: _____
_____
_____

Other Factors
Pros: _____
_____
_____
Cons: _____
_____
_____

**SECTION 4**

**Equity in Funding Allocation**

20. Is "equity" a factor in allocating capital funds? Y N (Circle one)

In allocating operating funds? Y N (Circle one)

21. How is "equity" considered in your funding allocation process? (Check all that apply)

☐ By geography (e.g., jurisdictions treated equally; a uniform funding "floor")
☐ By area/agency "needs" (e.g., equivalent proportion of "needs" funded for all recipients)
☐ By population (e.g., equal per capita allocations)
☐ By system size (e.g., equal amounts based on service levels—vehicles, miles, hours, etc.)
☐ By service use (e.g., equal amounts based on ridership, utilization)
☐ By socio-economic (e.g., compensating investment to areas with more lower income characteristics or transportation disadvantaged households/population)
☐ Other (specify):_____
☐ Do not have a specific "equity" measure

**SECTION 5**

**Looking Ahead**

22. Measures of performance and/or factors should play a larger role in allocating transit capital funds in the future. (Check one)

Performance Measures O----------O----------O----------O----------O

| Strongly Agree | Somewhat Agree | Uncertain | Somewhat Disagree | Strongly Disagree |
|---|---|---|---|---|

Other Factors O----------O----------O----------O----------O

| Strongly Agree | Somewhat Agree | Uncertain | Somewhat Disagree | Strongly Disagree |
|---|---|---|---|---|

23. Why? Or why not? _____

_____

_____

_____

_____

24. What performance measures or factors would be most useful/effective in allocating transit capital funding? (List)

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

25. Measures of performance and/or factors should play a larger role in allocating transit operating funds in the future. (Check one)

Performance Measures O----------O----------O----------O----------O

| Strongly Agree | Somewhat Agree | Uncertain | Somewhat Disagree | Strongly Disagree |
|---|---|---|---|---|

Other Factors O----------O----------O----------O----------O

| Strongly Agree | Somewhat Agree | Uncertain | Somewhat Disagree | Strongly Disagree |
|---|---|---|---|---|

26. Why? Or why not? _____

_____

_____

_____

_____

27. What performance measures or factors would be most useful/effective in allocating transit capital funding? (List)

_____ _____
_____ _____
_____ _____
_____ _____
_____ _____

28. What are the major problems in using traditional "measures of system performance" (ratios of efficiency, effectiveness, productivity) to allocate transit funds? (Check the size of each problem)

| | Size of the Problem | | | | | |
|---|---|---|---|---|---|---|
| Problem | No Problem | 1 Small | 2 | 3 | 4 | 5 Large |
| Data collection effort required | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Data quality/consistency | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Varied goals across systems/service types | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Lack of connection to agency goals | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Lack of consensus on best measures | | | | | | |
| among transportation professionals | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| among transportation policy-makers | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| measures not intuitive to policy-makers | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Funding limits—Unable to reward performance | | | | | | |
| without disadvantaging others | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| and still meet all legitimate needs | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| when funding is too limited to be an effective incentive for performance improvements | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Measured elements are largely outside agency control | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Others (List)_____ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| _____ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| _____ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| _____ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

**PLEASE FILL OUT AND RETURN**

Your name: _____
Title: _____
Organization: _____
Address: _____
_____
Telephone: _____ Fax: _____ E-mail: _____

Would you be willing to be contacted for further information about the application of performance measures in fund allocation in your state? (Check one) Y N

**THANK YOU FOR YOUR PARTICIPATION**

**RESPONSES SHOULD BE MAILED OR FAXED TO:**

**Trish Hendren, Ph.D.**
**Cambridge Systematics, Inc.**
**4445 Willard Avenue**
**Chevy Chase, MD 20815**
**Phone: (301) 347-0100**
**Fax: (301) 347-0101**

**ATTACHMENT A**

**Example Performance Measures and Other Allocation Factors**

Common Allocation Factors

| | | |
|---|---|---|
| Population | Population density | Service levels (h/mi) |
| Ridership | Market share | Operating deficit |
| Local match/share | Previous funding levels | Locally derived income |
| Farebox recovery | | |

Common Performance Measures

<table>
<tr>
<td>System Cost Efficiency<br>Financial efficiency<br>• Total operating expenses/vehicle mile<br>• Total operating expenses/vehicle hour<br>• Total operating expenses/peak vehicle<br><br>Labor efficiency<br>• Vehicle hours/employee<br>• Total employees/peak vehicle<br>• Vehicle miles/employee<br>• Total operating expenses/employee<br><br>Vehicle efficiency<br>• Park vehicles/total vehicle<br>• Vehicle hours/peak vehicle<br>• Vehicle hours/active vehicle<br>• Vehicle miles/peak vehicle<br>• Vehicle miles/active vehicle</td>
<td>Cost-Effectiveness<br>• Total operating expenses/passenger<br>• Total operating expenses/passenger mile<br>• Passengers/employee<br>• Passenger revenue/total cost<br>• Subsidy/passenger<br><br>Service Effectiveness<br>Utilization of service<br>• Passengers/vehicle mile<br>• Passengers/vehicle hour<br>• Passengers/peak vehicle<br>• Passenger miles/passenger<br><br>Social effectiveness<br>• Passengers/population<br><br>Revenue generation<br>• Passenger revenue/vehicle mile<br>• Passenger revenue/vehicle hour<br>• Passenger revenue/peak vehicle<br>• Passenger revenue/passenger</td>
</tr>
<tr>
<td colspan="2">Functional Cost Efficiency</td>
</tr>
<tr>
<td>Transportation efficiency<br>• Pay hours/platform hour<br>• Pay hours/work time<br>• Pay hours/operator<br>• Transportation expenses/vehicle hour<br>• Transportation expenses/peak vehicle<br>• Park vehicles/transportation employee (non-driver)<br>• Vehicle hours/transportation employee (non-driver)<br>• Vehicle miles/accident<br><br>Administrative efficiency<br>• Peak vehicles/administrative employee<br>• Administrative expenses/peak vehicle<br>• Administrative expenses/vehicle hour</td>
<td>Maintenance efficiency<br>• Average fleet age<br>• Vehicle miles/road call<br>• Vehicle miles/maintenance employee<br>• Vehicle miles/mechanic<br>• Vehicle miles/gallon of fuel<br>• Peak vehicles/maintenance employee<br>• Maintenance expenses/peak vehicle<br>• Maintenance expenses/vehicle mile</td>
</tr>
</table>

MPO SURVEY
Agency: _____

**TCRP Synthesis on**

**THE USE OF PERFORMANCE-BASED MEASURES IN ALLOCATING TRANSIT FUNDING**

### SURVEY PURPOSE

The purpose of this survey is to identify how transit performance measures—and other factors—are currently being used to allocate funding for transit, how their use has changed in recent years, and what changes are being anticipated in the future.

### PERFORMANCE MEASURE DEFINITION*

Performance measurement concepts vary widely. The questions below are meant to focus on the extent to which transit funds are allocated using (1) traditional "performance measures" (i.e., ratios of efficiency, effectiveness, and productivity); and (2) "other factors" (single data elements that may measure aspects of goal achievement or community impact such as ridership, market share, service levels, emission reductions, etc.).

1. Has your agency analyzed or studied the use of performance measures in allocating transit funds in the past five years?
   Y N (Circle one) If "Yes," please enclose relevant reports/findings, if possible.

### SECTION 1

#### Transit Program Goals and Performance Monitoring

2. Does your agency's long-range transportation plan have explicit goals established for public transportation?
   Y N (Circle one)

3. If "Yes," list those transit goals and the measures and/or factors that are used to assess/report progress toward goal achievement (but not used to allocate funding).

| Goal | Measure |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |

4. Does your agency formally monitor transit performance? Y N (Circle one)

*See attachment A for examples of performance measures and other factors used in fund allocation.

5. What other measures and/or factors (not used for fund allocation) do you use to monitor transit system performance? (List)

_____ _____
_____ _____
_____ _____
_____ _____
_____ _____
_____ _____

6. Performance monitoring (not linked to fund allocation) has been effective in improving transit system performance. (Check one)

O----------O----------O----------O----------O

| Strongly Agree | Somewhat Agree | Uncertain | Somewhat Disagree | Strongly Disagree |
|---|---|---|---|---|

**SECTION 2**

**Transit Performance Measures and TIP Prioritization and Programming**

7. For how many transit operating agencies do you program funds in your TIP? (List number)

| | Federal Funds | State and Local Funds |
|---|---|---|
| No. of Urbanized Area Systems/Agencies | | |
| No. of Small Urban/Rural Systems/Agencies | | |

8. Are transit performance measures and/or factors currently used to prioritize/program transit capital or operating funds through the TIP process in your the region? Y N (Circle one)
(If "No," go to Question 10)

(Check all applicable)

| | Capital | Operating |
|---|---|---|
| Urbanized Area Rail | ☐ | ☐ |
| Urbanized Area Bus | ☐ | ☐ |
| Urbanized Area Demand Response/Paratransit | ☐ | ☐ |
| ADA Services | ☐ | ☐ |
| Small Urban/Rural Bus | ☐ | ☐ |
| Small Urban/Rural Demand Response/Paratransit | ☐ | ☐ |
| Other (specify): | ☐ | ☐ |

9. What specific transit performance measures or other factors are used to prioritize/program transit capital or operating funds? What weight is given to each, if any? (List)

_____ _____
_____ _____
_____ _____
_____ _____
_____ _____
_____ _____

Capital Funds

| Performance Measure or Factor | Type of service | Weight* |
|---|---|---|
| (e.g., pass./veh.-mi., population, service levels) | (e.g., rail, bus, demand response) | (e.g., 10%) |
| | | |
| | | |
| | | |
| | | |
| | | |

*If used in a formula, what percentage of the formula is based on this measure?

Operating Funds

| Performance Measure or Factor | Type of service | Weight* |
|---|---|---|
| (e.g., pass./veh.-mi., population, service levels) | (e.g., rail, bus, demand response) | (e.g., 10%) |
| | | |
| | | |
| | | |
| | | |
| | | |

*If used in a formula, what percentage of the formula is based on this measure?

Attach an additional sheet to highlight how funds are allocated, if appropriate.

10. What changes have been made in the past five years in measures and/or other factors used to prioritize/program transit capital or operating funds? ☐ Not applicable

| | Capital Funds | Operating Funds |
|---|---|---|
| Measures/factors added? | _____ | _____ |
| | _____ | _____ |
| Measures/factors dropped? | _____ | _____ |
| | _____ | _____ |

11. What was the reason for the change(s) in question 10 ☐ Not applicable
(Describe briefly)

_____

_____

_____

12. Performance measures and/or other factors have been an effective mechanism for prioritizing/programming transit funds. (Check one for each category)

Capital Funds

| | | | | | | |
|---|---|---|---|---|---|---|
| Measures of System Performance (e.g., pass./veh.-mi.) | O---------- Very Effective | O---------- Somewhat Effective | O---------- Uncertain | O---------- Somewhat Ineffective | O---------- Very Ineffective | ☐ Not applicable |
| Asset Age/Condition (e.g., veh. age) | O---------- Very Effective | O---------- Somewhat Effective | O---------- Uncertain | O---------- Somewhat Ineffective | O---------- Very Ineffective | ☐ Not applicable |

| | | |
|---|---|---|
| Service Levels (e.g., veh.-mi. or veh.-h) | O----------O----------O----------O----------O<br>Very Effective / Somewhat Effective / Uncertain / Somewhat Ineffective / Very Ineffective | ☐ Not applicable |
| Area Characteristics (e.g., population) | O----------O----------O----------O----------O<br>Very Effective / Somewhat Effective / Uncertain / Somewhat Ineffective / Very Ineffective | ☐ Not applicable |

Operating Funds

| | | |
|---|---|---|
| Measures of System Performance (e.g., pass./veh.-mi.) | O----------O----------O----------O----------O<br>Very Effective / Somewhat Effective / Uncertain / Somewhat Ineffective / Very Ineffective | ☐ Not applicable |
| Asset Age/Condition (e.g., veh. age) | O----------O----------O----------O----------O<br>Very Effective / Somewhat Effective / Uncertain / Somewhat Ineffective / Very Ineffective | ☐ Not applicable |
| Service Levels (e.g., veh.-mi. or veh.-h) | O----------O----------O----------O----------O<br>Very Effective / Somewhat Effective / Uncertain / Somewhat Ineffective / Very Ineffective | ☐ Not applicable |
| Area Characteristics (e.g., population) | O----------O----------O----------O----------O<br>Very Effective / Somewhat Effective / Uncertain / Somewhat Ineffective / Very Ineffective | ☐ Not applicable |

13. What are the pros and cons of using performance measures and/or other factors to prioritize or program transit funds?

Performance Measures

Pros: _____

_____

_____

Cons: _____

_____

_____

**SECTION 3**

**Equity in Funding Allocation**

14. Is "equity" a factor in prioritizing/programming transit capital funds in the region? Y N
in prioritizing/programming transit operating funds? Y N

15. How is "equity" considered in prioritizing/programming transit funds? (Check all that apply)

☐ By geography (e.g., jurisdictions treated equally; a uniform funding "floor")
☐ By area/agency "needs" (e.g., equivalent proportion of "needs" funded for all recipients)
☐ By population (e.g., equal per capita allocations)
☐ By system size (e.g., equal amounts based on service levels—vehicles, miles, hours, etc.)
☐ By service use (e.g., equal amounts based on ridership, utilization)

☐ By socio-economic (e.g., compensating investment to areas with more lower income or characteristics transportation disadvantaged households/population)
☐ Other (specify): _____
☐ Do not have a specific "equity" measure

**SECTION 4**

**Looking Ahead**

16. Performance measures and/or other factors should play a larger role in prioritizing and programming transit capital funds in the future? (Check one)

| | | | | | |
|---|---|---|---|---|---|
| Performance Measures | O---------- | O---------- | O---------- | O---------- | O |
| | Strongly Agree | Somewhat Agree | Uncertain | Somewhat Disagree | Strongly Disagree |
| Other Factors | O---------- | O---------- | O---------- | O---------- | O |
| | Strongly Agree | Somewhat Agree | Uncertain | Somewhat Disagree | Strongly Disagree |

17. Why? Or why not? _____

18. Performance measures and/or factors should play a larger role in prioritizing and programming transit operating funds in the future? (Check one)

| | | | | | |
|---|---|---|---|---|---|
| Performance Measures | O---------- | O---------- | O---------- | O---------- | O |
| | Strongly Agree | Somewhat Agree | Uncertain | Somewhat Disagree | Strongly Disagree |
| Other Factors | O---------- | O---------- | O---------- | O---------- | O |
| | Strongly Agree | Somewhat Agree | Uncertain | Somewhat Disagree | Strongly Disagree |

19. Why? Or why not? _____

20. What performance measures and/or other factors would be most useful/effective in prioritizing/programming transit funds? (List)

| Capital Funds | Operating Funds |
|---|---|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

21. What are the major problems in using traditional “measures of system performance” (ratios of efficiency, effectiveness, productivity) to allocate transit funds? (Check the size of each perceived problem)

| Problem | Size of the Problem | | | | | |
|---|---|---|---|---|---|---|
| | No Problem | 1 Small | 2 | 3 | 4 | 5 Large |
| Data collection effort required | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Data quality/consistency | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Varied goals across systems/service types | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Lack of connection to agency goals | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Lack of consensus on best measures | | | | | | |
| among transportation professionals | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| among transportation policymakers | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| measures not intuitive to policymakers | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Funding limits—Unable to reward performance | | | | | | |
| without disadvantaging others | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| and still meet all legitimate needs | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| when funding is too limited to be an effective incentive for improving performance | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Measured elements are largely outside agency control | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Others (List)_____ _____ _____ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

**PLEASE FILL OUT AND RETURN**

Your name: _____
Title: _____
Organization: _____
Address: _____
_____
Telephone: _____ Fax: _____ E-mail: _____

Would you be willing to be contacted for further information about the application of performance measures in fund allocation in your state? (Check one) Y N

**THANK YOU FOR YOUR PARTICIPATION**

**RESPONSES SHOULD BE MAILED OR FAXED TO:**

**Trish Hendren, Ph.D.**
**Cambridge Systematics, Inc.**
**4445 Willard Avenue**
**Chevy Chase, MD 20815**
**Phone: (301) 347-0100**
**Fax: (301) 347-0101**

**ATTACHMENT A**

**Example Performance Measures and Allocation Factors**

Common Allocation Factors

| | | |
|---|---|---|
| Population | Population density | Service levels (h/mi) |
| Ridership | Market share | Operating deficit |
| Local match/share | Previous funding levels | Locally derived income |
| Farebox recovery | | |

Common Performance Measures

<table>
<tr>
<td>System Cost Efficiency<br>Financial efficiency<br>• Total operating expenses/vehicle mile<br>• Total operating expenses/vehicle hour<br>• Total operating expenses/peak vehicle<br><br>Labor efficiency<br>• Vehicle hours/employee<br>• Total employees/peak vehicle<br>• Vehicle miles/employee<br>• Total operating expenses/employee<br><br>Vehicle efficiency<br>• Park vehicles/total vehicle<br>• Vehicle hours/peak vehicle<br>• Vehicle hours/active vehicle<br>• Vehicle miles/peak vehicle<br>• Vehicle miles/active vehicle</td>
<td>Cost-Effectiveness<br>• Total operating expenses/passenger<br>• Total operating expenses/passenger mile<br>• Passengers/employee<br>• Passenger revenue/total cost<br>• Subsidy/passenger<br><br>Service Effectiveness<br>Utilization of service<br>• Passengers/vehicle mile<br>• Passengers/vehicle hour<br>• Passengers/peak vehicle<br>• Passenger miles/passenger<br><br>Social effectiveness<br>• Passengers/population<br><br>Revenue generation<br>• Passenger revenue/vehicle mile<br>• Passenger revenue/vehicle hour<br>• Passenger revenue/peak vehicle<br>• Passenger revenue/passenger</td>
</tr>
<tr>
<td colspan="2">Functional Cost Efficiency</td>
</tr>
<tr>
<td>Transportation efficiency<br>• Pay hours/platform hour<br>• Pay hours/work time<br>• Pay hours/operator<br>• Transportation expenses/vehicle hour<br>• Transportation expenses/peak vehicle<br>• Park vehicles/transportation employee (non-driver)<br>• Vehicle hours/transportation employee (non-driver)<br>• Vehicle miles/accident<br><br>Administrative efficiency<br>• Peak vehicles/administrative employee<br>• Administrative expenses/peak vehicle<br>• Administrative expenses/vehicle hour</td>
<td>Maintenance efficiency<br>• Average fleet age<br>• Vehicle miles/road call<br>• Vehicle miles/maintenance employee<br>• Vehicle miles/mechanic<br>• Vehicle miles/gallon of fuel<br>• Peak vehicles/maintenance employee<br>• Maintenance expenses/peak vehicle<br>• Maintenance expenses/vehicle mile</td>
</tr>
</table>

TRANSIT AGENCY SURVEY
Agency: _____

**TCRP Synthesis on**

**THE USE OF PERFORMANCE-BASED MEASURES IN ALLOCATING TRANSIT FUNDING**

**SURVEY PURPOSE**

The purpose of this survey is to identify how transit performance measures—and other factors—are currently being used to allocate funding for transit, how their use has changed in recent years, and what changes are being anticipated in the future.

**PERFORMANCE MEASURE DEFINITION***

Performance measurement concepts vary widely. The questions below are meant to focus on the extent to which transit funds are allocated using (1) traditional "performance measures" (i.e., ratios of efficiency, effectiveness, and productivity); and (2) "other factors" (single data elements that may measure aspects of goal achievement or community impact such as ridership, market share, service levels, emission reductions, etc.).

**SECTION 1**

**Transit Agency Goals and Performance Monitoring**

1. What are your agency's goals and the principal measures and/or factors used in reporting progress toward goal achievement? (List)

| Goal | Measure |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |

2. What other performance measures and/or other factors do you use to regularly monitor system performance? (List)

| | |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |

Attach additional material highlighting your agency's performance measurement system, if appropriate.

*See attachment A for examples of performance measures and other factors used in fund allocation.

3. Performance monitoring has been effective in improving system performance. (Check one)

O----------O----------O----------O----------O

| Strongly Agree | Somewhat Agree | Uncertain | Somewhat Disagree | Strongly Disagree |
|---|---|---|---|---|

**SECTION 2**

**Performance Measures and Funding Allocation (Capital and Operating)**

4. Are performance measures and/or other factors currently used by the state or the MPO to allocate funding to your agency? (Check all that apply)

| | Rail | Bus | Demand Response | ADA | Other | |
|---|---|---|---|---|---|---|
| By the state | | | | | | |
| for capital | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ Not applicable |
| for operations | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ Not applicable |
| By the MPO | | | | | | |
| for capital | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ Not applicable |
| for operations | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ Not applicable |

5. What changes have been made in the past five years in performance measures and/or other factors used to allocate funds to your agency? (List)

| | Capital Funds | Operating Funds |
|---|---|---|
| Measures/factors added? | ☐ Not applicable | |
| By the state | _____ | _____ |
| | _____ | _____ |
| By the MPO | _____ | _____ |
| | _____ | _____ |
| Measures/factors dropped? | ☐ Not applicable | |
| By the state | _____ | _____ |
| | _____ | _____ |
| By the MPO | _____ | _____ |
| | _____ | _____ |

6. What was the reason for the change(s) noted in question 5? ☐ Not applicable
(Describe briefly)

_____

_____

_____

7. Performance measures and/or other factors have been effective mechanisms for allocating/programming transit funds. (Check one for each category) ☐ Not applicable

Capital Funds

| | | |
|---|---|---|
| Measures of System Performance (e.g., pass./veh.-mi.) | O----------O----------O----------O----------O<br>Very Effective / Somewhat Effective / Uncertain / Somewhat Ineffective / Very Ineffective | ☐ Not applicable |
| Asset Age/Condition (e.g., veh. age) | O----------O----------O----------O----------O<br>Very Effective / Somewhat Effective / Uncertain / Somewhat Ineffective / Very Ineffective | ☐ Not applicable |
| Service Levels (e.g., veh.-mi. or veh.-h) | O----------O----------O----------O----------O<br>Very Effective / Somewhat Effective / Uncertain / Somewhat Ineffective / Very Ineffective | ☐ Not applicable |
| Area Characteristics (e.g., population) | O----------O----------O----------O----------O<br>Very Effective / Somewhat Effective / Uncertain / Somewhat Ineffective / Very Ineffective | ☐ Not applicable |

Operating Funds

| | | |
|---|---|---|
| Measures of System Performance (e.g., pass./veh.-mi.) | O----------O----------O----------O----------O<br>Very Effective / Somewhat Effective / Uncertain / Somewhat Ineffective / Very Ineffective | ☐ Not applicable |
| Asset Age/Condition (e.g., veh. age) | O----------O----------O----------O----------O<br>Very Effective / Somewhat Effective / Uncertain / Somewhat Ineffective / Very Ineffective | ☐ Not applicable |
| Service Levels (e.g., veh.-mi. or veh.-h) | O----------O----------O----------O----------O<br>Very Effective / Somewhat Effective / Uncertain / Somewhat Ineffective / Very Ineffective | ☐ Not applicable |
| Area Characteristics (e.g., population) | O----------O----------O----------O----------O<br>Very Effective / Somewhat Effective / Uncertain / Somewhat Ineffective / Very Ineffective | ☐ Not applicable |

8. What are the pros and cons of using performance measures and/or other factors to allocate transit? capital funds?

Performance Measures

Pros: _____

_____

_____

Cons: _____

_____

_____

Other Factors

Pros: _____

_____

_____

Cons: _____

_____

_____

9. What are the pros and cons of using performance measures and/or other factors to allocate transit? operating funds?

Performance Measures
Pros: _____
_____
_____

Cons: _____
_____
_____

Other Factors
Pros: _____
_____
_____

Cons: _____
_____
_____

**SECTION 3**

**Agency Budget Allocation and Equity**

10. Do you use performance measures and/or other factors to prioritize projects or allocate budget among your agency's services/projects? (Circle one)

| | | |
|---|---|---|
| Capital projects/budget for capital maintenance/rehab/replacement? | Y | N |
| For capital improvements to improve operation of the existing system? | Y | N |
| For system/service expansion projects? | Y | N |
| Operating budget? | Y | N |

11. What performance measures and/or other factors are used in prioritizing capital projects/allocating capital budget? (List all applicable) ☐ Not applicable

_____
_____
_____

12. What performance measures and/or other factors are used in allocating operating budget? (List all applicable) ☐ Not applicable

_____
_____
_____

13. Is "equity" a factor in allocating funds to routes/areas served by your agency? (Circle one)
For capital funds Y N For operating budget Y N

14. How is "equity" considered in prioritizing/programming transit funds? (Check all that apply)

- ☐ By geography (e.g., jurisdictions treated equally; a uniform funding "floor")
- ☐ By area/agency "needs" (e.g., equivalent proportion of "needs" funded for all recipients)
- ☐ By population (e.g., equal per capita allocations)
- ☐ By system size (e.g., equal amounts based on service levels—vehicles, miles, hours, etc.)
- ☐ By service use (e.g., equal amounts based on ridership, utilization)
- ☐ By socio-economic (e.g., compensating investment to areas with more lower income characteristics or transportation disadvantaged households/population)
- ☐ Other (specify): _____
- ☐ Do not have a specific "equity" measure

**SECTION 4**

**Looking Ahead**

15. Performance measures and/or other factors should play a larger role in allocating, prioritizing, and programming transit capital funds in the future? (Check one)

| | | | | | |
|---|---|---|---|---|---|
| Performance Measures | O | O | O | O | O |
| | Strongly Agree | Somewhat Agree | Uncertain | Somewhat Disagree | Strongly Disagree |
| Other Factors | O | O | O | O | O |
| | Strongly Agree | Somewhat Agree | Uncertain | Somewhat Disagree | Strongly Disagree |

16. Why? Or why not? _____

17. What performance measures and/or other factors would be most effective in allocating transit capital funding? (List)

_____ _____
_____ _____
_____ _____
_____ _____
_____ _____
_____ _____

18. Performance measures and/or other factors should play a larger role in prioritizing and programming transit operating funds in the future? (Check one)

| | | | | | |
|---|---|---|---|---|---|
| Performance Measures | O | O | O | O | O |
| | Strongly Agree | Somewhat Agree | Uncertain | Somewhat Disagree | Strongly Disagree |
| Other Factors | O | O | O | O | O |
| | Strongly Agree | Somewhat Agree | Uncertain | Somewhat Disagree | Strongly Disagree |

19. Why? Or why not? _____

20. What performance measures and/or other factors would be most effective in allocating transit operating funds? (List)

_____ _____
_____ _____
_____ _____
_____ _____
_____ _____
_____ _____

21. What are the major problems in using traditional "measures of system performance" (ratios of efficiency, effectiveness, productivity) to allocate transit funds? (Check the size of each perceived problem)

| Problem | Size of the Problem | | | | | |
|---|---|---|---|---|---|---|
| | No Problem | 1 Small | 2 | 3 | 4 | 5 Large |
| Data collection effort required | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Data quality/consistency | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Varied goals across systems/service types | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Lack of connection to agency goals | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Lack of consensus on best measures | | | | | | |
| among transportation professionals | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| among transportation policymakers | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| measures not intuitive to policymakers | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Funding limits—Unable to reward performance | | | | | | |
| without disadvantaging others | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| and still meet all legitimate needs | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| when funding is too limited to be an effective incentive for improving performance | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Measured elements are largely outside agency control | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Others (List) _____ _____ _____ _____ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

**PLEASE FILL OUT AND RETURN**

Your name: _____
Title: _____
Organization: _____
Address: _____
_____
Telephone: _____ Fax: _____ E-mail: _____

Would you be willing to be contacted for further information about the application of performance measures in fund allocation in your state? (Check one) Y N

**THANK YOU FOR YOUR PARTICIPATION**

**RESPONSES SHOULD BE MAILED OR FAXED TO:**

**Trish Hendren, Ph.D.**
**Cambridge Systematics, Inc.**
**4445 Willard Avenue**
**Chevy Chase, MD 20815**
**Phone: (301) 347-0100**
**Fax: (301) 347-0101**

**ATTACHMENT A**

**Example Performance Measures and Allocation Factors**

Common Allocation Factors

| | | |
|---|---|---|
| Population | Population density | Service levels (h/mi) |
| Ridership | Market share | Operating deficit |
| Local match/share | Previous funding levels | Locally derived income |
| Farebox recovery | | |

Common Performance Measures

<table>
<tr>
<td>System Cost Efficiency<br>Financial efficiency<br>• Total operating expenses/vehicle mile<br>• Total operating expenses/vehicle hour<br>• Total operating expenses/peak vehicle<br><br>Labor efficiency<br>• Vehicle hours/employee<br>• Total employees/peak vehicle<br>• Vehicle miles/employee<br>• Total operating expenses/employee<br><br>Vehicle efficiency<br>• Park vehicles/total vehicle<br>• Vehicle hours/peak vehicle<br>• Vehicle hours/active vehicle<br>• Vehicle miles/peak vehicle<br>• Vehicle miles/active vehicle</td>
<td>Cost-Effectiveness<br>• Total operating expenses/passenger<br>• Total operating expenses/passenger mile<br>• Passengers/employee<br>• Passenger revenue/total cost<br>• Subsidy/passenger<br><br>Service Effectiveness<br>Utilization of service<br>• Passengers/vehicle mile<br>• Passengers/vehicle hour<br>• Passengers/peak vehicle<br>• Passenger miles/passenger<br><br>Social effectiveness<br>• Passengers/population<br><br>Revenue generation<br>• Passenger revenue/vehicle mile<br>• Passenger revenue/vehicle hour<br>• Passenger revenue/peak vehicle<br>• Passenger revenue/passenger</td>
</tr>
<tr>
<td colspan="2">Functional Cost Efficiency</td>
</tr>
<tr>
<td>Transportation efficiency<br>• Pay hours/platform hour<br>• Pay hours/work time<br>• Pay hours/operator<br>• Transportation expenses/vehicle hour<br>• Transportation expenses/peak vehicle<br>• Park vehicles/transportation employee (non-driver)<br>• Vehicle hours/transportation employee (non-driver)<br>• Vehicle miles/accident<br><br>Administrative efficiency<br>• Peak vehicles/administrative employee<br>• Administrative expenses/peak vehicle<br>• Administrative expenses/vehicle hour</td>
<td>Maintenance efficiency<br>• Average fleet age<br>• Vehicle miles/road call<br>• Vehicle miles/maintenance employee<br>• Vehicle miles/mechanic<br>• Vehicle miles/gallon of fuel<br>• Peak vehicles/maintenance employee<br>• Maintenance expenses/peak vehicle<br>• Maintenance expenses/vehicle mile</td>
</tr>
</table>

# APPENDIX B

## Survey Respondents

### State Departments of Transportation

| | | | |
|---|---|---|---|
| California | Michigan | Ohio | Virginia |
| Colorado | Missouri | Oklahoma | West Virginia |
| Illinois | New Hampshire | Pennsylvania | Wisconsin |
| Indiana | New Mexico | Rhode Island | Wyoming |
| Iowa | North Carolina | South Dakota | |
| Maryland | North Dakota | Vermont | |

### Transit Agencies

- CT Transit, Hartford, Connecticut
- Greater Dayton Regional Transit Authority, Dayton, Ohio
- Hillsborough Area Regional Transit Authority, Tampa, Florida
- Milwaukee County Transit System, Milwaukee, Wisconsin
- Regional Transportation District, Denver, Colorado
- Santa Clara Valley Transportation Authority, Santa Clara, California
- San Mateo County Transportation Authority, San Mateo, California
- Valley Ride, Meridian, Idaho

### Metropolitan Planning Organizations

- Capital District Transportation Committee, Albany, New York (survey not completed, but background material collected)
- Capital Region Council of Governments, Hartford, Connecticut
- Delaware Valley Regional Planning Commission, Philadelphia, Pennsylvania
- Denver Regional Council of Governments, Denver, Colorado
- Metroplan, Little Rock, Arkansas
- Metropolitan Council, St. Paul, Minnesota
- Metropolitan Orlando, Orlando, Florida
- Metropolitan Transportation Commission, Oakland, California
- San Diego Association of Government/Metropolitan Transit Development Board, San Diego, California

# APPENDIX C

## Case Survey Interviewees

#### Indiana

Public Transit Section Manager
Indiana Department of Transportation

#### North Carolina

Public Transportation Division
North Carolina Department of Transportation

#### Ohio

Public Transit Manager
Ohio Department of Transportation

#### Pennsylvania

Urban Transportation Division
Bureau of Public Transportation
Pennsylvania Department of Transportation

Abbreviations used without definition in TRB Publications:

| | |
|---|---|
| AASHO | American Association of State Highway Officials |
| AASHTO | American Association of State Highway and Transportation Officials |
| APTA | American Public Transportation Association |
| ASCE | American Society of Civil Engineers |
| ASME | American Society of Mechanical Engineers |
| ASTM | American Society for Testing and Materials |
| CTAA | Community Transportation Association of America |
| CTBSSP | Commercial Truck and Bus Safety Synthesis Program |
| FAA | Federal Aviation Administration |
| FHWA | Federal Highway Administration |
| FMCSA | Federal Motor Carrier Safety Administration |
| FRA | Federal Railroad Administration |
| FTA | Federal Transit Administration |
| IEEE | Institute of Electrical and Electronics Engineers |
| ITE | Institute of Transportation Engineers |
| NCHRP | National Cooperative Highway Research Program |
| NCTRP | National Cooperative Transit Research and Development Program |
| NHTSA | National Highway Traffic Safety Administration |
| NTSB | National Transportation Safety Board |
| SAE | Society of Automotive Engineers |
| TCRP | Transit Cooperative Research Program |
| TRB | Transportation Research Board |
| U.S.DOT | United States Department of Transportation |