Public Transportation Performance Monitoring

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INTRODUCTION

The objective of this paper is to provide background, raise issues, and stimulate discussion on the topic of transportation monitoring.

CONCERN FOR PERFORMANCE

Since the mid-1970s, local officials, the federal government, state governments, and transit systems have had an increased interest in public transportation performance. This interest is the product of several economic, social, and political forces—

- escalating public transportation industry costs
- greater competition for limited public funds
- new fiscal conservatism at the local, state, and national levels
- public transportation revenues out-of-step with inflation (despite fare increases in most communities)
- continued demand for clean, safe, on-time, affordable public transportation services

As public transportation monitoring procedures have evolved, three general aspects of performance have proven useful to public officials, system managers, and researchers. These aspects are—

- **Cost Effectiveness** — The consumption of public transportation services in relation to resources expended. This performance measure attempts to answer the question, "How much public transportation service is used or passenger revenue is received per dollar or resource expended?" Consumption is measured by passenger trips or revenues received and, as above, costs are measured in terms of resources expended to provide the public transportation service. The more passengers carried or revenues received in relation to resources expended, the more cost effective the service.

- **Service Effectiveness** — The consumption of public transportation service in relation to the amount of service available. This performance measure attempts to answer the question, "How much public transportation service is consumed (or revenue received), at an established fare, in relation to the amount of service available?" The

more service consumption (or passenger revenue) in relation to service output or availability, the higher the level of service effectiveness. Factors reflecting service quality and influencing the use of and perceptions about public transportation services by the public are important elements of service effectiveness. Service quality indicators include availability, reliability, attractiveness, safety, and comfort of the public transportation services. In many respects, these are qualitative issues in which performance is less easily prescribed than other areas.

- **Resource Efficiency** – The amount of public transportation service produced for the community in relation to the resources expended. This measure attempts to answer the question, "How much public transportation service is produced per dollar or resource expended?" Service is measured in terms of outputs such as vehicle hours or vehicle miles. Resources expended include labor, capital, materials and services. The more service produced per resource expended, the greater the resource efficiency of the public transportation service.

All three aspects are integral to public transportation performance monitoring systems. Figure 1, a performance evaluation tree, shows how the aspects are related: cost effectiveness results from doing things right (resource efficiency) and doing the right things (service effectiveness).

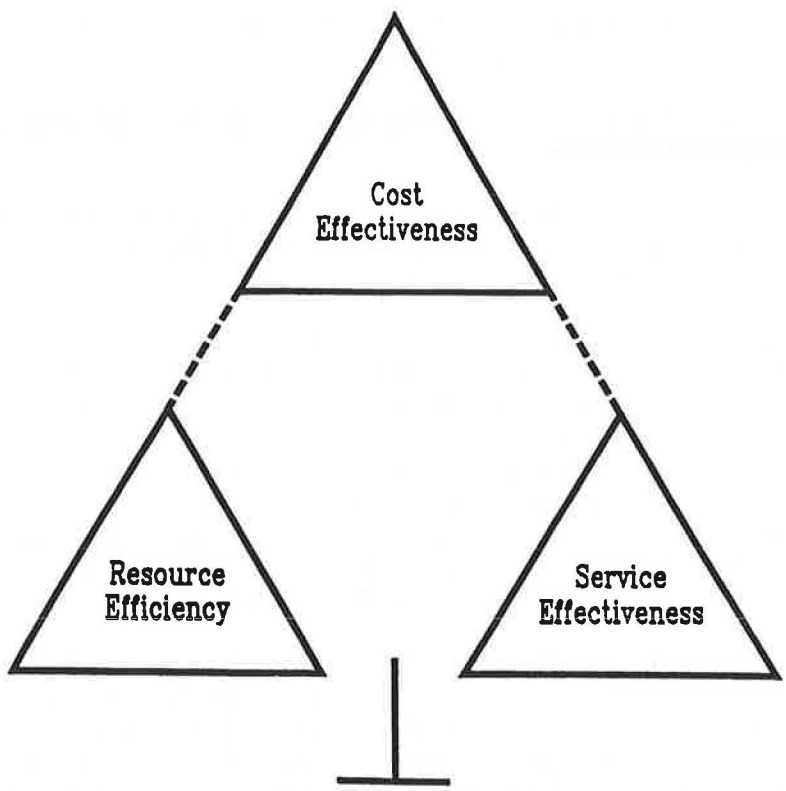

FIGURE 1 Performance Evaluation Tree

According to a 1984 AASHTO survey on the use of UMTA Section 15 data, 25 of 40 states that reported collecting transit operating and/or financial data use the data to evaluate performance. A comparative analysis of five state DOTs (California, Michigan, New York, Pennsylvania, and Wisconsin) conducted by the author in 1983 showed that only seven "performance indicators," out of the five-state total of 132 indicators, appeared in a majority of the reported information. These were—

- total operating expense per vehicle mile (resource efficiency)
- total operating expense per vehicle hour (resource efficiency)
- revenue passengers per vehicle mile (service effectiveness)
- revenue passengers per vehicle hour (service effectiveness)
- total operating revenue per total operating expense (cost effectiveness)
- total operating expense per revenue passenger (cost effectiveness
- vehicle miles per vehicle hour (performance descriptor)

While the above indicators show a balance between resource efficiency, service effectiveness, and cost effectiveness, the five DOTs focused mainly on resource efficiency as the preferred measure.

FACTORS THAT INFLUENCE PUBLIC TRANSPORTATION PERFORMANCE

Numerous factors influence public transportation performance. Table 1 lists some of these factors in two categories: controllable and noncontrollable factors. Controllable factors are those influenced by the decisions and actions of the public transportation board and its executives, managers, and employees. Factors that cannot be influenced by system managers, their boards, or other local decision-makers are noncontrollable.

Certain features of public transportation service are largely determined by the public transportation board, reflecting public need for transit services and the willingness and ability of the community to support these services. For example, the level and extent of service provided (determined by service area coverage and frequency) and pricing or fare policies are generally determined by board decisions. These decisions are critical to performance since they influence ridership, passenger revenues, and the cost of operating the public transportation system.

Public transportation performance is also affected by shared decisions made by system executives, board members, and, in some cases, other local elected officials and the public. Examples of matters on which such decisions are made are—

- safety and security of patrons, to the extent this can be maintained through transit system or community law enforcement

TABLE 1 FACTORS THAT AFFECT PUBLIC TRANSPORTATION PERFORMANCE

Controllable Factors[1]

- Overall mission of the transit system
- Level and extent of service offered to the public including–
  - days and hours of operation
  - service area coverage
  - frequency or level of service
  - directness and speed of service accessibility, e.g., stop spacing
- Pricing policies, including–
  - full fares
  - transfer charges
  - reduced fares
  - special events fares
- Quality of transit service, including–
  - reliability and schedule adherence
  - comfort, seating availability, and climate control
  - cleanliness and repair
  - interior lighting
  - passenger shelters
  - driver courtesy
  - safety
  - information services, including–
    - -- telephone assistance
    - -- public schedules
  - public image
- Labor conditions, including labor agreement provisions, work rules, and/or employee policies and procedures
- Equipment and facilities
- External administrative and managerial support and maintenance, e.g., accounting system and payroll functions

Noncontrollable Factors

- Environmental conditions under which transit systems operate including–
  - urban area structure and configuration
  - population size and density
  - locations of employment and urban activities
  - roadway topography conditions
  - weather and climate
  - historical transit riding habits and/or propensity toward public use
  - competitive advantages of other modes of travel including private automobiles, taxis, etc.
- Economic conditions of the urban area (i.e., unemployment rates and disposable income)

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[1]The final three controllable factors (labor conditions, equipment and facilities, and external administrative and mangerial support) are generally only controllable over a long period of time.

- labor costs for the wages and benefits of vehicle operators, maintenance employees, and, often, clerical staff, when these costs are determined through the collective bargaining process

- equipment and facilities that may require long-term commitment through bonds or other funding mechanisms to fleet procurement, construction of facilities and buildings, or, in some cases, fixed rail rights-of-way

Often, decisions on these matters have a long-term influence on public transportation performance, requiring a multiyear commitment to a course of action. These decisions generally result in costs that affect the quality or effectiveness of system performance.

Some factors affecting public transportation performance are largely within the control of a system's managers and supervisors and are affected by their daily decisions and actions. These factors clearly influence efficiency, because they affect the management and utilization of available resources, and effectiveness, because they affect the quality of public transportation services (reliability, on-time-performance , vehicle cleanliness, and accident record). However, some experts in the evaluation of public transportation management and performance believe the decisions of transit managers have only a marginal influence on the efficiency or effectiveness of performance. By and large, service levels and total funding have the most significant influence on performance, and decisions on these matters are generally not made by public transportation managers.

Some factors that are critical to performance cannot be controlled or influenced by system managers, their boards, or other local decisionmakers. For example–

- Bad weather is likely to decrease the reliability of public transportation services.

- Changes in the urban environment (including population density, workplace location, and congestion) are likely to affect ridership and the ability of existing public transportation modes to serve local travel needs.

- Swings in the local and national economy also affect ridership, the cost of providing services, and the availability of revenue for a public transportation system's operating budget.

Consequently, in many cases communities and transit managers must simply accept the strengths and limitations of their system's performance. There will usually be some aspects of performance that are determined by noncontrollable factors, not by ability to manage or willingness to support the services. Public transportation managers have often put forth this view, stressing that each system is a unique amalgam of controllable and noncontrollable factors.

BASIS FOR EVALUATING PUBLIC TRANSPORTATION PERFORMANCE

In evaluating performance, some standard must be set against which to measure performance. The determination of that standard depends on numerous factors, many of which may be subjective. At least three general approaches can be used to establish the basis for evaluation of public transportation system performance. These approaches can be used alone or in combination.

Peer Comparison

Peer comparison is one of the procedures most commonly used for evaluating public transportation performance. Procedurally, statistics and performance indicators of one system are compared with the same statistics and indicators of another system that is considered a peer. Size and geographic location are often the characteristics used to define peer systems. This comparison of statistics and indicators leads to conclusions about the performance of the public transportation system being investigated.

The development of uniform data definitions and statistical reporting formats that provide comparable information on all public transportation systems is an important consideration when using peer comparison procedures. While establishing uniform definitions and reporting formats may be relatively easy, comparing information between transit systems requires some care.

As previously discussed, numerous factors influence transit performance. Some factors are controllable, while others are not. Although noncontrollable factors may be difficult to quantify, they have a significant influence on the performance of public transportation service. Therefore, the question is not whether performance information is comparable but whether the conditions and restraints under which performance is achieved are comparable.

Longitudinal or Time Series Analyses

A second and increasingly popular procedure for evaluating performance is longitudinal or time series analyses. This procedure avoids some of the difficulties associated with peer comparisons by evaluating the performance of a single public transportation system over time. This method provides a way to evaluate current performance against past performance. The weakness of this approach, however, lies in having sufficient confidence to positively answer the questions–

- Are we doing things right? (efficiency)
- Are we doing the right things? (effectiveness)

Evaluation Against Prescribed Performance Objectives or Standards

This approach to evaluation requires that standards or objectives for transit performance be set in advance and that actual performance be measured by them. The standards or objectives may be established in one of two ways:

- **Fixed Values** – such as "no more than X accidents per 1,000 hours of transit service"

- **Values in Relation to Improvement of Past Performance** – such as "5 percent reduction in incidents of unscheduled employee absenteeism"

These types of standards can be used alone or in combination with others in an evaluation system.

At least two approaches can be used to evaluate public transportation performance against prescribed standards or objectives. One approach requires that government, i.e., the state, set standards or objectives for public transportation systems. In this case, the standards may be tailored to each system, established for groups of systems, or set uniformly for all systems. The second approach requires that each public transportation system set its own objectives or standards. The first approach significantly increases the role and involvement of government in providing and/or determining the type of local public transportation services. The second approach is more consistent with local control of public transportation service policy and management.

STRUCTURING APPROPRIATE PERFORMANCE INDICATORS

Gathering and reporting data on performance and using this data for management and policy decisionmaking is a well-established practice in the public transportation industry, as it is in other public and private sector organizations. Many aspects of performance can be quantified using available data. Such information can capture current performance levels, changes in performance, and progress on meeting the goals and objectives established for the system as a whole or for its various responsibility centers.

Data Requirements

The following categories can be used to describe and measure public transportation system performance:

- **Resource Inputs** – Resources expended in providing public transportation service. These include labor, materials, services, and other measurable items. Inputs may be classified as either financial or nonfinancial.

- **Service Outputs** – Nonfinancial operating results of resource expenditures. These may be expressed as service quantity outputs such as miles or hours of service or service quality statistics such as accidents, road calls, or delays.

- **Public Consumption Statistics** – The actual results of service outputs and the pricing or fare structure. Such information can be expressed in financial or nonfinancial terms. For example, the number of

passenger boardings is nonfinancial, while passenger revenue is financial.

In any performance monitoring system, it is important that the financial and nonfinancial data used be defined consistently over time. Data quality is critical, since the accuracy and reliability of data determine the usefulness of any conclusions drawn. Problems in the data should be eliminated as a first step in any data-intensive process.

Performance Indicators: Structure and Content

Figure 2 shows how the three categories of data are combined to develop performance measures or indicators of resource efficiency, service effectiveness, and cost effectiveness. By combining the data into ratios, performance is normalized and can be more usefully considered over time, as performance changes, and among transit systems. For example, dividing total passenger revenue by total operating expense provides an important measure of transit service cost effectiveness, often called the farebox recovery ratio. This indicator measures how effectively passengers cover transit system costs. Clearly, it is important to understand how the numerator and denominator of each ratio are related—i.e., whether improvements in the operating ratio reflect additional revenue or lower cost.

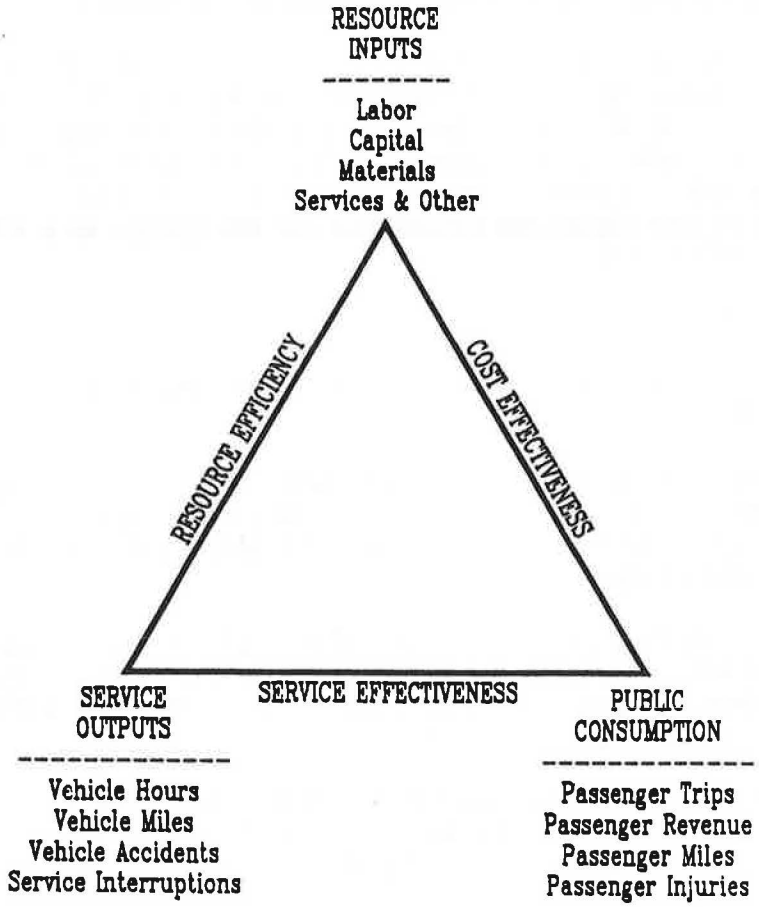

FIGURE 2 Transit Performance Indicators

Developing performance indicators that divide outputs by inputs imposes a managerial perspective in that performance or results are always considered in relation to the resources needed for their attainment. Higher or increasing values for these indicators imply better or improving performance. Similarly, lower or decreasing indicator values suggest poorer or declining performance. The consistent application of this approach eases the interpretation of performance; the simple rule "higher is better" can generally be applied.

Transit managers and monitoring systems that use performance indicators traditionally have not prescribed the development or use of performance indicators at this level of precision. Performance indicators have been developed inconsistently. In some cases, outputs are divided by inputs; in other cases, inputs are divided by outputs, such as operating costs per vehicle service mile.

The disadvantage of an inconsistent approach is that users of the indicators must continually interpret the indicator values and their trends, distinguishing when higher (increasing) vs. lower (decreasing) indicator values reflect better (improving) or worse (declining) performance. This interpretive burden is particularly difficult when there are many indicators and when indicators are being considered by individuals who are not familiar with detailed issues of transit performance, for example, public transportation board members, budget analysts, and elected officials. Developing performance indicators with the same structure significantly simplifies interpretation.[1]

Performance Descriptors vs. Performance Indicators

Many ratios can be developed from transit operating statistics. Such ratios can describe an aspect of the transit system, such as the operating characteristics or environment, but they do not measure requirements against resulting outputs, as do the performance indicators used in this system. Such indicators are descriptive but are not measures of performance. For example, vehicle miles divided by vehicle hours measures average speed. Although average speed may be related to the efficiency of transit operations, it usually reflects other factors, i.e., the extent of congestion in the area and whether the service is express (higher speed results from making fewer stops).

Another such ratio is labor cost divided by labor hours. This ratio measures average wages. Although potentially useful in understanding public transportation performance, this ratio is not recommended since it does not divide outputs by inputs to measure performance. Instead, a measure such as vehicle service hours divided by labor expense should be used. This measure relates the production or delivery of transit services to labor costs. This indicator would be considered with measures of labor utilization, such as vehicle service hours divided by employee labor hours. Together, these ratios measure the efficiency and productivity of the transit system workforce, as a whole or by function.

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[1] In several cases, indicators are developed with inputs divided by outputs to maintain a "higher is better" structure. In these instances, the outputs are negative aspects of performance (i.e., accidents, injuries, etc.) that a transit system should reduce or control to attain better performance.

PROSPECTIVE CHANGES IN UMTA SECTION 15 REPORTING

Many states currently use information from UMTA Section 15 reports for monitoring the performance of public transportation systems. Other states use partial information or terms and definitions provided by UMTA. While basic reporting forms and definitions have undergone only modest change since their development in 1971, a 5-year comprehensive review of Section 15 requirements by the American Public Transit Association has resulted in recommendations for extensive changes, which are being submitted to UMTA. If adopted, these recommendations may affect the amount and type of information available for performance monitoring. A summary of recommended changes to Section 15 reporting requirements is given in Appendix A.

PERFORMANCE MONITORING ISSUES

Both states and public transportation systems have expressed opinions and concern over the state role in performance monitoring (and evaluation) of public transportation systems. Some of these concerns include—

- collecting more data than necessary
- adequacy and reliability of reported data
- use of reported data and information

The remainder of this paper presents public transportation performance monitoring issues in the form of questions with discussion by the author.

Are states trying to monitor or evaluate the performance of public transportation systems?

This is an interesting question because it relates to the appropriateness of the state role in public transportation. Monitoring performance implies a role as an overseer or viewer of public transportation efficiency and effectiveness—a guardian of public funds who provides checks and balances as well as enforces the rules and regulations of state government. Evaluating performance invokes a different perspective—one who judges the value or worthiness of public transportation investments and activities.

Based on the quantity of data and information being requested of public transportation systems, it appears many states are attempting to evaluate performance rather than simply monitor performance. Unless the data are needed by states for other purposes, the requirements for monitoring performance seem unnecessary and burdensome. If states feel they must evaluate performance to fulfill their public accountability role, they should consider procedures such as those used in California, where independent performance audits are conducted of each public transportation system. It is not realistic for states to believe they can make value judgments from their offices in state capitals based on the receipt of reported data and information.

Can states rely on the data and information being reported to be accurate and reliable?

Experienced users of UMTA Section 15 have learned they must always approach reported information with caution. Today, there is general consensus among these users that data and information are being more accurately reported than in earlier years, but errors and improbable information still persist. While reported financial statistics appear to be more reliable than nonfinancial statistics, problems associated with allocation and depreciation procedures still remain (e.g., passenger fares and administrative expenses by mode).

Inaccuracies in nonfinancial statistics are still the focus of most reporting problems by public transportation systems. Terms that are commonly used by the public transportation industry are not always defined in the same manner. Despite attempts by UMTA to provide clear definitions, public transportation reporters often continue to use other definitions, sometimes through choice or habit and sometimes because of misunderstandings. Additionally, many nonfinancial statistics that are reported are not actually collected data but are derived through inappropriately designed sampling techniques, formulas, or other algorithmic methods.

States and other users of public transportation data and information should use a validation or screening process to assist in developing consistent and reliable statistics. It is also prudent to request that public transportation systems periodically report on their data collection methods and techniques to ensure acceptable procedures.

Although states provide significant aid and assistance to public transportation systems, is it appropriate for them to impose standards that may constrain local initiatives?

States that require public transportation systems to perform in accordance with prescribed standards seem to overly restrict local jurisdictions in providing appropriate services. For example, a number of states require that a specified percentage of operating expenditures be covered by passenger or farebox revenues. This requirement means that the states are fundamentally establishing pricing policies for services and that user fees must be part of the way local government pays for such services. It would seem that pricing policies, like other operating policies, are a local prerogative and that the way communities pay for services should be their choice, not the state's. Under a state standard, for example, if a community chose to pay for its fair share with general or tax revenues, and not from the farebox, it would be precluded from doing so even though it might meet state funding and matching requirements.

Some states have considered imposing operating standards on public transportation systems to maintain eligibility for funding assistance. Standards such as stop spacing, route spacing, frequency of service, etc., often do not consider the unique character of local operating environments and may cause excessive expenditures.

Many local government decisions do not result in the most efficient or effective public transportation service. Often, such decisions are viewed as being political. Alternatively, such decisions might be considered part of the democratic process. After all, whose money are the states using to assist local public transportation systems? States should influence public transportation performance through procedures that recognize need based on principles of equity and fairness, not by establishing standards that impose external value judgments.

Should states modify their approaches to monitoring the performance of public transportation capital improvements?

Past methods employed to distribute capital funds by federal and state governments have traditionally led local governments and their public transportation systems to seek new equipment and facilities under very attractive terms. There is little documented evidence that shows the benefits of public transportation capital investments exceed their costs. Because of the financing arrangements, public transportation systems generally do not maintain capital recovery accounts because it is almost always more favorable to purchase new equipment or construct new facilities than it is to maintain or refurbish them. Consequently, federal and state governments, through current financing arrangements, may be encouraging local governments and their public transportation systems to adopt a "throw-away" philosophy for certain capital items, particularly vehicles.

The performance data and information collected and used by states is quite often insufficient to address capital investment strategies. Therefore, the issue is whether states should become more actively involved in the business of collecting life cycle cost performance information or begin to rely more on block grants, thus deferring capital investment decisions to local governments.

Do states collect enough data and information to measure the quality of public transportation performance?

This question is particularly relevant in light of current privatization initiatives. The answer is generally no, although it may be argued that the results of performance such as passengers per vehicle service hour, farebox recovery ratios, etc., do implicitly measure the quality of service. However, it is imprecise to compare the performance of public transportation systems using miles and hours of reported service when the quality of those miles and hours is unknown. Quality, in this example, refers to on-time performance.

Should performance measures based on reported data be used by states to allocate assistance through incentive/disincentive formulas?

About 20 percent of states that provide operating assistance to public transportation systems use financial incentives to distribute funding. Each incentive financing approach is intended to induce public transportation systems to stabilize or improve the efficiency and/or effectiveness of their services. The incentive funding procedures of these states include three general objectives:

- those that encourage stable or improved performance through financial rewards
- those that deter performance degradation through reduced financial allocation or penalties
- those that encourage improved performance by requiring transit systems to compete for available resources

The most frequently used method for incentive financing requires that a pre-established farebox recovery ratio be reached or maintained annually. This ratio is composed either of farebox revenues divided by operating expenditures or farebox revenue plus local operating assistance divided by operating expenditures. While the performance standard for funding eligibility and the specific use of ratios varies among states, and even within certain states for systems of different sizes, the general intent of this method is to encourage transit systems to stabilize or improve effectiveness through increased ridership and improve efficiency through controlled costs.

The central issue, of course, is not whether performance measures should be used, per se, but whether the concept of financial incentives (or disincentives) for operating performance is an effective method of allocating state operating assistance. This issue is difficult to address because such funding methods are not widely used nor has there been sufficient experience at this time to judge the success or failure of existing methods. The conclusions contained in this section of the paper are, therefore, principally based on the author's perspective of the incentive methods currently used.

Whether the concept of incentive financing is an effective method of allocating operating assistance may depend on several factors, including—

- the overall level and general availability of funds beyond farebox revenues that are not dependent on operating performance
- the overall level of patronage and the potential for increased revenues through changing the fare structure or level
- how the incentive (or disincentive) financing procedures are structured

General Availability of Funds — The effectiveness of incentive financing for allocating state operating assistance seems to depend in large measure on the overall level and general availability of funds beyond farebox revenues that are not conditional on operating performance. In cases where sufficient funds are received by public transportation systems through federal assistance and dedicated state or local revenues, there may be little opportunity for incentive financing to improve performance.

During 1985 in California, for example, 53 public transportation systems were provided with 9.3 percent more operating assistance than their counterparts in the rest of the United States, primarily due to favorable state legislation that provides dedicated revenues to transit. Despite their apparent ability to charge lower fares to the public for services, California systems attracted about the same number of passengers per vehicle service hour as the rest of the U.S. transit systems. While it may be argued that California transit systems operate in urban environments somewhat differently than the rest of the United States, the data may also suggest that higher levels of funding might possibly cause public transportation systems to be less sensitive to sustaining or improving performance.

Levels of Patronage – Large public transportation systems with relatively high levels of patronage may not be as sensitive to incentive financing as smaller systems because of their ability to leverage large amounts of operating revenue through modest fare increases. In 1985, for example, the 10 largest U.S. transit systems (i.e., those operating more than 1,000 vehicles in maximum service) received 41.3 percent of their revenues from passenger fares; the rest of the U.S. systems received only 30.4 percent in the same manner. The larger systems, while charging 4.2 percent higher fares per passenger trip, were able to operate more effectively than the other U.S. transit systems by attracting 31.2 percent more passenger trips per dollar of expenditure.

Although the 10 largest systems are over 46 percent less efficient than the rest of the U.S. transit systems, when measured by cost per vehicle service hour, the service provided by the larger systems attracted nearly twice as many passenger trips for each vehicle service hour. Therefore, it may be generally concluded that, despite the overwhelming differences in efficiency, smaller systems are likely to be more sensitive to incentive financing than larger systems because of their inability to leverage additional revenues through passengers.

Incentive Financing Structure – If incentive financing is used to allocate state operating assistance, several issues should be addressed when determining methods and procedures:

- **Should incentive (or disincentive) financing be the basis for all or only a portion of the funding allocation?** After reviewing incentive financing procedures from several states, the author's conclusion is that allocations of operating assistance should be based only partially on incentives. This approach provides transit systems and local governments more assurance and stability in transit funding, regardless of those performance factors that management cannot always control.

- **Should incentive procedures rely on the comparisons of peer transit systems or on the performance of the individual transit system over time?** The dissimilarity of public transportation systems and their operating environments, coupled with the difficulty of grouping such systems into peer classes within states, leads the author to believe that, if incentive financing were used to allocate state operating

assistance, it should be based on the performance evaluation of individual transit systems over time. Peer comparisons are often valid when the factors affecting performance are controlled by management and when the conditions and constraints under which performance is achieved are comparable. However, using performance indicators over time at individual systems allows each local government, in coordination with its public transportation management, to establish performance goals and objectives and to work toward their achievement without the potential loss of incentive funds through state allocation procedures that could penalize a system in spite of improved performance.

- **Can enduring standards of performance be established that serve as equitable thresholds of funding eligibility?** This issue relates to the use of incentive financing to discourage the degradation of performance below certain standards. As stated above, several states require that public transportation systems meet prescribed levels of performance, defined by operating statistic ratios, to be eligible for matching funds. Alternatively, financial penalties may be used that reduce funding. In either case, the funding method requires enduring and equitable performance thresholds that induce efficient and effective service without becoming unduly restrictive in distributing funds.

While the establishment of standards for funding eligibility is a complex issue, this incentive concept has potential merit. The funding donor (in this case, the state) should expect a reasonable return on its investment. This return should be in terms of results, such as patronage or operating revenues, together, if necessary, with a commitment of local government through local operating assistance.

Appendix A

FINAL RECOMMENDATIONS OF THE APTA SECTION 15 COMMITTEE

Two Reporting Levels, One Common Set of Forms

There would be only one set of forms, and two required reporting levels, depending on system size. The final committee recommendations make a distinction between "high" (more detailed) and "low" (less detailed) levels of reporting, but this only applies for the three expense forms (Forms 301A-B-C). All other forms are required for all reporters. This ensures maximum consistency and comparability across operators.

For small reports, only the existing four functional expense categories would be reported, while larger operators would report in nine functional expense categories. For operators with fewer than 100 peak vehicles, fewer columns on the expense forms would be filled out. Otherwise, there would be no difference in the reporting requirement across operators.

Correct the "Administration" and "Operations" Functions

The current system includes ticketing, security, marketing, and planning under "general administration." A survey of similar industries revealed that this was not the usual practice. This results in a serious overstatement of administrative costs for many agencies, while understating operating costs. The result is inaccurate and misleading comparisons with overhead costs of other industries.

The recommendations are—

- for all reporters, move the ticketing and security functions from the administration to the operations function
- for larger reporters, identify the marketing and planning subfunction separately from other administrative functions

Clarify Expense Reporting

The basic display of expenses by mode is retained, cross-classified by object and function. A new joint cost form (301B) is added to clarify the derivation of joint cost allocations across functions. A purchased service provider operating 25 or more vehicles for a "large" reporter would file a complete report. This will provide much more information than at the current form on the costs of contracted services but will take time to phase into contract provisions.

Simplify Revenue Reporting

Fare and other operating revenue data are combined on one form with all tax and subsidy revenue (Form 201). Capital funding is reported on a separate form (Form

103), revised to include the types of assets purchased. This addition was specifically requested by the UMTA committee.

Simplify Operating Data

The "Service Supplied and Consumed" form (406) would be substantially revised in content and concept. Much of the detailed time-of-day data would be eliminated, and the remainder would be based on the operators' estimates for their maximum season schedule, rather than sampled or computed averages. Only the passenger-mile data required for the Section 9 formula would be subject to statistical sampling requirements.

Clarify the Major Labor Expense Forms

Reporting of labor expenses is one of the most important topics in the national database. Two forms (321, Operators' Wages Subsidiary Schedule, and 404, Transit System Employee Equivalent Schedule) supplement the basic expense reporting forms in this area.

Form 321 would be reduced from 30 lines of information to only nine lines. Many of the 30 categories on the existing form are helpful. However, there are numerous problems in interpretation due to the complexity and unique factors governing individual labor contracts. The current format of the 321 form forces reporters to make their contracts fit the mold of the 30 categories. The existing form was judged to be too detailed for national reporting, yet not detailed enough for accurate, in-depth analysis of labor cost factors. The result has been a lack of comparability in the data across operators, which defeats the major purpose of the form. The proposed simplified form will be much more easily filled out by reporters and will result in much more comparable data.

The focus of the current Form 404 on employee equivalents now requires a transformation from actual data (labor hours) into an artificial construct (employee eqivalents) not normally used by transit management. To complete the form, the actual data are hidden and an arbitrary conversion factor (2,080 hours) is applied. In addition to ambiguity between "total work hours" and "total paid hours" as the numerator, the choice of the denominator may have nothing to do with what the actual standard hours in a work year are for a particular reporter. The proposed form would restrict reporting to actual hours from payroll records and leave any conversions to the specific needs of subsequent analysts.

Major Additions and Deletions

While many forms would be eliminated by consolidation, three forms (101, 331, and 402) were identified as warranting elimination on their merits.

The balance sheet (Form 101) is easily prepared as part of each operator's fiscal audit, but it violates many of the committee's principles:

- It is not comparable across operators because of the widely varying governmental settings for provision of transit services.

- It is misleading to use the "tangible property" valuation as a measure of transit assets.

- The data are not easily summarized and are not generally available to Section 15 users.

- The relevance of a public balance sheet for national analysis has never been established.

The pension plan (Form 331) is both difficult to complete and of questionable utility. On the one hand, it requests details that many transit reporters cannot provide because the plans are administered by third parties. On the other hand, the form contains insufficient detail to allow a meaningful analysis of pension provisions. This is a case where a special study, not aggregate national data, is required for useful analysis.

The maintenance performance part of Form 402 should to be eliminated because the accuracy of the principal data item, roadcalls, is highly suspect. The committee's survey indicated that there is little or no consistency across reporters on the definition of roadcalls. Until this problem can be resolved, the recommendation is to suspend reporting of these inaccurate and misleading data.

Two major additions are recommended. The first (uses of capital funds, Form 103) was mentioned above. The second is the addition of a form (409) to break down the vehicle fleet information into useful summary categories. This provides—

- an explicit basis for judging "large" or "small" reporting level
- new information on which to monitor fleet ownership composition
- precise definitions for spare ratios or other fleet analyses.

Presented by Joel E. Markowitz at the APTA Western Education and Training Conference, Monterey, California, April 1988.