

Transit System Productivity

A REPORT
OF THE
TRANSPORTATION TASK FORCE
OF THE

URBAN
CONSORTIUM
FOR TECHNOLOGY INITIATIVES



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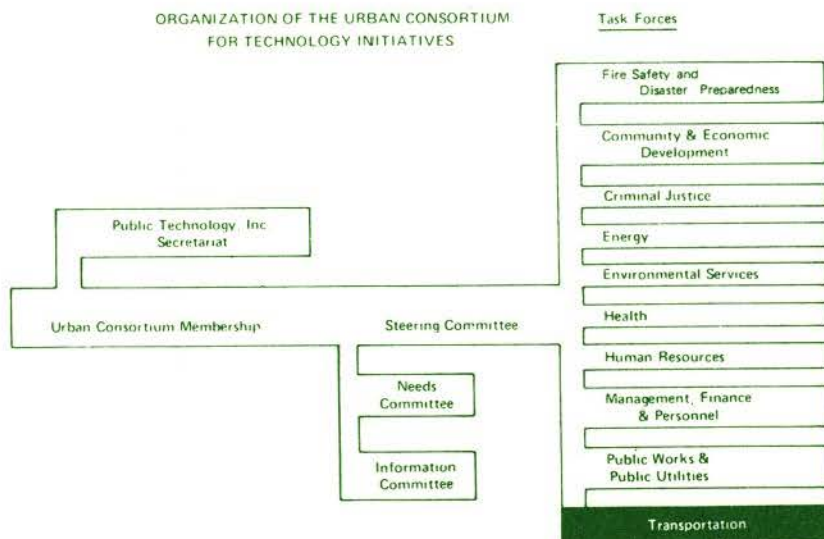
The Urban Consortium for Technology Initiatives was formed to actively pursue technological solutions to pressing urban problems. The Urban Consortium is a coalition of 34 major urban governments, 28 cities and 6 counties, with populations over 500,000. These 34 governments represent over 20% of the nation's population and have a combined purchasing power of over \$25 billion.

Formed in 1974, the Urban Consortium represents a unified local government market for new technologies. The Consortium is organized to encourage public and private investment to develop new products or systems which will improve delivery of local public services and provide cost-effective solutions to urban problems. The Consortium also serves as a clearing-house in the coordination and application of existing technology and information.

To achieve its goal, the Urban Consortium identifies the common needs of its members, establishes priorities, stimulates investment from federal, private and other sources and then provides on-site technical assistance to assure that solutions will be applied.

Public Technology, Inc. (PTI), a non-profit, tax-exempt, public interest organization serves as Secretariat to the Urban Consortium. PTI was established in December 1971, by The Council of State Governments, The International City Management Association, The National Association of Counties, The National Governors' Conference, The National League of Cities and The U. S. Conference of Mayors. The staff of PTI provides both technical and organizational services to the Urban Consortium and its Task Forces.

The work of the Urban Consortium for Technology Initiatives is focused through the ten Task Forces shown below. These Task Forces were formed as a result of the needs identification process used by the Consortium. An eleven member Steering Committee, whose members are chosen from among the participating jurisdictions, guides the activities of the Urban Consortium for Technology Initiatives.



Initial funding for the Urban Consortium for Technology Initiatives was obtained from the National Science Foundation /Research Applied to National Needs and from the Office of the Secretary, Department of Transportation. Additional funding has been provided by the Department of Housing and Urban Development, the Environmental Protection Agency, the Urban Mass Transportation Administration and the Federal Highway Administration of the U.S. Department of Transportation, and the National Fire Prevention and Control Administration of the U.S. Department of Commerce.

This report is a product of the activities of the Transportation Task Force. The work has been supported by the U. S. Department of Transportation; Office of the Secretary, Urban Mass Transportation Administration and Federal Highway Administration.

Transit System Productivity

REVISED EDITION
JULY 1978

Prepared by

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URBAN CONSORTIUM FOR TECHNOLOGY INITIATIVES

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PREFACE

This is one of ten in the second series of Information Bulletins produced by the Transportation Task Force of the Urban Consortium for Technology Initiatives. Each Bulletin in this series addresses a priority transportation need area identified in the second annual needs selection by member jurisdictions of the Urban Consortium. The Bulletins are prepared by the staff of Public Technology, Inc. (PTI) for the Transportation Task Force.

The eight transportation needs which this second series of Information Bulletins cover are:

- Accelerated Implementation Procedures
- Center City Circulation
- Neighborhood Traffic Controls
- Parking Management
- Transit Marketing
- Alternative Work Schedules
- Traffic Performance Measurement
- Urban Goods Movement

There will also be two Updates to Information Bulletins printed in 1977:

- Improving Transit Systems Productivity
- Institutional Framework for Integrated Transportation Planning

The needs highlighted by the Information Bulletins are selected in an annual process of needs identification used by the Urban Consortium. By identifying and then focusing on the priority needs of member jurisdictions, the Consortium assures that resultant research and development efforts are directly responsive to existing or anticipated local government problems.

Each Bulletin provides a nontechnical overview, from the local government perspective, of issues and problems associated with each need. Current research efforts and approaches to the problem used by local governments are also briefly identified. The Bulletins are not meant to be an in-depth review of the state-of-the-art or the state-of-the practice. Rather, they serve as an information base from which the Transportation Task Force selects several needs for more attention. The Information Bulletins have also proved useful to persons such as elected officials for whom transportation represents but one of many areas of concern.

The results of the needs selection process used by the Urban Consortium have been promising. Of the ten priority needs identified in the first annual needs selection, four were addressed by subsequent Transportation Task Force projects:

- To pursue the need for Preferential and Exclusive Lanes, a Manual for Planning and Implementing Priority Techniques for High Occupancy Vehicles (composed of a Chief Executive Report, Program Manager's Report, and Technical Guide) was developed. The methodology outlined in the manual is now being tested in Buffalo, St. Louis, San Francisco, and San Jose. A revised manual based on these demonstrations will be available in July, 1978.
- A National Conference on Transit Performance was organized to address the need for Transit System Productivity. The Conference, held in Norfolk, Virginia, in September, 1977, was attended by 200 government, industry, labor, and academic participants.
- To facilitate the provision of Transportation for Elderly and Handicapped Persons, an outline for a manual on techniques of providing such transportation services is being developed.
- Finally, two documents relating to the need for Transportation Planning and Impact Forecasting Tools are being prepared: (1) a paper describing local transportation planning issues and concerns directed to the Urban Mass Transportation Administration (UMTA); and (2) a management-level document for local officials describing UMTA's currently available tools and how they can be applied in local government.

Of the remaining six needs identified in the first annual selection, two remained as priority needs in the second annual needs selection. The Information Bulletin for "Institutional Framework for Integrated Transportation Planning" was included in the first series of Bulletins and will be revised as necessary. The Information Bulletin for "Accelerated Implementation Procedures" is part of this second series of Bulletins.

For the remaining four needs, the Transportation Task Force felt that current research directed toward them was adequate and that the Information Bulletins themselves fulfilled the Task Force's information dissemination goals. Thus, these needs have been dropped from the priority list.

It is hoped that further research projects will be directed to the

new priority transportation needs of the Urban Consortium for Technology Initiatives.

The support of the Technology Sharing Division, Office of the Secretary; Federal Highway Administration; and the Urban Mass Transportation Administration of the U.S. Department of Transportation has been invaluable in the work of the Transportation Task Force of the Urban Consortium for Technology Initiatives and its staff from Public Technology, Inc. The guidance offered by the Task Force members will continue to insure that the work of the staff will meet the urgent needs which have been identified by members of the Urban Consortium for Technology Initiatives.

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TABLE OF CONTENTS

<u>Chapter</u>		<u>Page</u>
1	ISSUES AND PROBLEMS	1
	The Concept of Productivity	2
	Varying Institutional Perspectives	3
	Government	3
	Transit Operators	4
	Transit Labor	5
	Productivity Indicators	5
	Efficiency Indicators	6
	Effectiveness Indicators	7
	Data Needs	7
	Labor Productivity	8
	Service Characteristics and Pricing	9
	Constraints	9
	Opportunities	10
	Maintenance, Organization, and Purchasing	11
	Conclusion	12
2	CASE STUDY--SEATTLE TO USE PART-TIME BUS DRIVERS	13
	Background	13
	The Work Rules	14
	The Contract Negotiations	15
	The Agreement	15
	Provisions Relating to Tripper Operators	16
	Opposing Views on the Major Issue	18
	What Next?	18
	Broader Implications of the Seattle Agreement	19
	City-County Officials	20
	Sources: Persons Interviewed	21
3	CONTACTS AND CURRENT PROGRAMS	23
	Contacts	23
	Current Programs	24
4	ANNOTATED BIBLIOGRAPHY	27
APPENDIX A	CHRONOLOGY OF EVENTS SEATTLE PART-TIME BUS DRIVER AGREEMENT	41
APPENDIX B	EXCERPTS FROM THE SEATTLE AGREEMENT RELATING TO TRIPPER OPERATORS	45

CHAPTER 1

ISSUES AND PROBLEMS

Since World War II, decreasing patronage and increasing costs have resulted in a steady decline in the financial condition of transit properties. Since 1968, operating costs have increasingly outstripped revenues; by 1975 operating revenues covered barely half of operating expenses for the average transit property.

In order to maintain current levels of transit service and stabilize fares, government has provided funds to offset deficits. In 1975 local, State, and Federal governments contributed \$699, \$410, and \$302 million respectively, for a total of over \$1.4 billion, in operating assistance. The unprofitability of transit, and the emerging conception of transit as a public service like police protection and street maintenance, in recent years has led to widespread public takeover of transit systems. Publicly-owned systems now carry about 90% of all revenue passengers and employ 86% of all workers industry-wide.¹

Increased public responsibility for the provision of transit services has generated a new concern for transit productivity on the part of government officials and transit management. Productivity standards are seen as a new way to judge transit performance and allocate transit resources, replacing the private industry standard of profitability. However, there is much disagreement regarding the definition, measurement, and significance of transit productivity. This disagreement is paralleled by confusion over institutional responsibilities for productivity improvement.

This bulletin explores the subjects of transit productivity measurement and potential for productivity improvement. The following topics are discussed:

- The Concept of Productivity
- Varying Institutional Perspectives
- Productivity Indicators
- Labor Productivity
- Service Characteristics and Pricing
- Maintenance, Organization, and Procurement

¹ Data taken from American Public Transit Association, Transit Fact Book (75-76 ed.), (Washington, D.C.: American Public Transit Assoc., 1976).

THE CONCEPT OF PRODUCTIVITY

There is no single definition of productivity. The concept originated in industrial production, as a means of showing the relationship of resource inputs (e.g., labor or capital) to product outputs. According to this concept, the productivity of labor might be described in terms of units produced per labor hour.

The concept is difficult to apply in the public sector, since governments do not produce goods, but rather deliver services. Government success in the achievement of specified social goals is not entirely reflected by the quantities of services provided; quality must be considered as well. Indicators reflecting quantity of service outputs--such as caseloads or inspections per employee--are often termed efficiency measures. Indicators reflecting quality of service provided--such as service accessibility and user satisfaction--are often termed effectiveness measures.

Finding a meaningful definition of productivity for transit is hampered by the ambiguity of transit outputs. Transit service is never completely utilized; outputs can be expressed in terms of total service provided (e.g., seat-miles or vehicle hours) or service utilized (e.g., passenger miles or passenger trips). A service that is efficient in terms of cost per hour of operation may be underutilized, while a service with a high cost per hour of operation may be in great demand.

Productivity relates not only to overall transit system operations, but also to individual aspects of a system. One can explore the relative productivity of different routes within a transit system, as well as the productivity of various functions internal to the system such as management, maintenance, and procurement. The focus in any productivity study depends on the particular concerns to be addressed.

Measures of transit system productivity reflect much more than the quality or economy of system management. They reflect government policies directly or indirectly affecting transit operations, local operating conditions and local transit usage patterns. For example, increased average operating speeds for buses improve productivity, since drivers service more route miles in a given time period; however, bus operating speeds are largely determined by street system characteristics and local traffic policies, and only marginally affected by transit operating policy.

Recent computations of productivity for fourteen California transit properties showed significant variation between properties for four of the five productivity indicators calculated. Variations were attributed to the differences between operations--specifically, to the extent to which an operation was oriented to commuter service.²

² Gordon T. Fielding and Roy E. Glauthier, Distribution and Allocation of Transit Subsidies in California, (Irvine, Calif.: Institute of Transportation Studies, University of California, 1976) pp. 23-28.

Obviously great caution must be exercised when comparing the productivity of different transit properties. A more meaningful application of the concept would be to use several measures to monitor different aspects of performance over time for a single property. Even for a single property, productivity should not be the exclusive basis for overall evaluation of a single system. Non-productivity factors--such as social welfare concerns, energy conservation, and pollution reduction--must be considered in determining how transit operations contribute to the achievement of the overall goals and objectives of a jurisdiction.

VARYING INSTITUTIONAL PERSPECTIVES

Different groups involved in transit tend to define productivity according to their own perspectives. Three institutional perspectives can be identified--those of government, transit operators, and transit labor--although variations in perspectives can be distinguished for different levels of government as well.

Government

Local, State, and Federal governments provide operating assistance to supplement fare box revenues. Although the rationale for operating assistance recognizes the public benefits of good transit service, governments cannot afford to provide ever-increasing levels of assistance. The rapid growth of deficits in recent years raises questions of funding priorities for transit in relation to other services, acceptable assistance levels, and acceptable fare and service levels.

Federal Perspective. The Federal government has already taken the initiative to encourage local activities to improve transit productivity through the Transportation Improvement Program Regulations issued jointly by the Federal Highway Administration and the Urban Mass Transportation Administration (UMTA).³ These regulations are a condition of UMTA program approvals and financial assistance for all urbanized areas with populations over 200,000. They require local programming of low capital intensive projects to improve overall transportation system efficiency, including projects to improve transit service and internal transit management efficiency. Such projects must be coordinated at the regional level by metropolitan planning organizations.

State Perspective. At the State level, officials are becoming concerned about increasing transit deficits, and looking for ways to evaluate transit productivity. The State of Pennsylvania regularly monitors operating and financial performance of transit properties that receive State assistance. However, a recent report to the California Legislature states the problem

³ UMTA & FHWA, "Transportation Improvement Program," Federal Register, Vol. 40, No. 181, September 17, 1975, pp. 42976-42984.

faced by most States:

There is no system for routinely measuring the efficiency and effectiveness of California's transit systems. Therefore, legislators and citizens do not know if they are getting adequate service for the fares and subsidies they provide.⁴

It is likely that State governments providing operating assistance to transit will be looking for productivity improvements to justify increasing levels of financial support.

Local Perspective. State and Federal governments supply aid to many transit operators and consequently are less concerned with the details of the operating environment and operating characteristics of transit properties and more concerned with aggregate system-wide productivity measures. While local governments are concerned with overall system efficiency, they are politically sensitive to fare levels and service quality issues as well, since they may be held politically accountable for fare increases or service reductions. Local governments have a more detailed view of transit productivity, and focus on service quality and effectiveness. In a local context, they want better techniques for establishing productivity standards, better criteria for determining appropriate service levels, and a means to tie wage increases to labor productivity.

Transit Operators

Transit operators recognize that increased reliance on tax revenues, particularly at the local and State levels, has forced transit into competition with other vital public services. Operators are aware of the government concern for overall productivity evaluation but, understandably, fear national or state-wide comparisons that might overlook crucial differences in service delivery (e.g., safety, convenience, and comfort) and in demographic characteristics (e.g., population densities, prevailing wage rates, and living costs). Transit operators are also particularly sensitive to policy-imposed service requirements (e.g., late night service) that lower values for system-wide productivity measures.

In response to pressure to improve productivity, some transit operators have drawn up new standards for transit service evaluation. Such standards provide a basis for the evaluation of present service on a route by route basis, as well as for planning and implementation of new, and discontinuance of old service. The actual specification of service standards is usually preceded by a discussion of legal and policy requirements for service. The standards themselves fall into the following categories:

Service design standards, including such considerations as route spacing, frequency of service, distance between stops;

⁴ Calif. Office of the Auditor General. Financing and Evaluating Public Transit Systems in California. Report of the Office of the Auditor General to the Joint Legislative Audit Committee, (Sacramento, Calif.: 1977) p. 31.

- Operating performance standards, including operating speed, load factors, labor productivity, and service quality; and
- Economic/social/environmental standards, including cost-revenue considerations and service usage.

Finally, service standards documents outline a process for regular data collection and evaluation of route performance, and consequent service modifications. Service standards provide transit operators with a means of monitoring system performance so as to provide a rationale for operating decisions, and to satisfy the productivity concerns of public officials.

Transit Labor

Transit labor unions are primarily concerned about wages and working conditions, although the plight of the transit industry has, in at least one instance, resulted in a new interest in productivity. New York City's financial crisis forced a choice between service cut backs (and employee layoffs) or productivity improvement. To preserve employment, New York City transit workers agreed to tie future wage increases to productivity improvements. The New York City/Transport Workers Union contract calls for the formation of a Joint Steering Committee on Productivity to find ways to achieve maximum efficiency and utilization of the transit system. In return for their cooperation in this effort, union members will receive cost of living salary adjustments (COLA) from savings resulting from increases in productivity. Several facets of this agreement are noteworthy, not the least of which is the optimism and trust explicitly stated in the agreement:

. . . joint good faith implementation of the productivity provisions of the contracts will generate savings in operating costs at least sufficient to meet any reasonably foreseeable increase in the cost of living allowances provided by the contracts.⁵

PRODUCTIVITY INDICATORS

Just as there is no consensus on the definition of productivity in transit, neither is there an all-encompassing measure for transit productivity. A variety of ratios and indicators describe various aspects of transit efficiency and effectiveness; some can be used in the evaluation of overall system performance and/or route performance, others in the evaluation of a single transit function, such as maintenance.

⁵ Supplemental Agreement (May 19, 1976) Between New York City Transit Authority, Manhattan and Bronx Surface Transit Operating Authority and Transport Workers Union of America (AFL-CIO), and Amalgamated Transit Union (AFL-CIO).

The measures alone are not sufficient for evaluating transit performance, since they do not take into consideration the constraints on performance posed by policy and the transit operating environment. Furthermore, increased productivity, as measured by a particular indicator, may not reflect cost savings. For example, by running buses all day long an operator might increase revenue miles per driver; however, the added costs of operation would probably not be covered by fare revenues collected on the additional runs. The importance and utility of any given measure depends on the perspective of those interpreting it.

Productivity indicators can be grouped into two major categories-- efficiency and effectiveness. Most efficiency indicators are input/output ratios, with output measured in terms of service provided rather than service utilized. Effectiveness indicators are measures describing service coverage, service quality, and service utilization.

Efficiency Indicators

Within the efficiency category, four types of measures can be identified--measures of cost efficiency, labor productivity, vehicle utilization, and maintenance efficiency.

Common cost efficiency indicators include operating cost per revenue vehicle mile, and operating cost per revenue vehicle hour. They reflect the cost of providing a unit of service output, whether for an entire system, or a single bus route. Since higher operating speed reduces labor costs per mile, operating cost per revenue vehicle mile is greatly affected by operating speed. Operating cost per revenue vehicle hour is much less sensitive to variations in speed.

A related indicator, operating cost per passenger trip, is often used to compare the performance of transit systems. This measure does not, however, reflect the efficiency of system operations, since a high cost per passenger trip might reflect low transit usage rather than high operating costs.

Labor productivity indicators include annual revenue vehicle hours per employee and annual revenue vehicle miles per employee. The first measure reflects the utilization of the labor force, which is a function of scheduling efficiency and the extent of variation in peak hour and off-peak ridership; labor agreements sometimes limit split shift scheduling and the hiring of part-time workers, hindering transit management efforts to schedule workers for the peak hours only. The second measure, annual revenue vehicle miles per employee, is affected by the additional factor of operating speed.

Annual revenue miles per vehicle and annual revenue hours per vehicle are measures of vehicle utilization. Equipment utilization rates are primarily affected by variations in peak and off-peak ridership-- if ridership levels are fairly constant throughout the day, most equipment can be used all day long, whereas high peak ridership and low off-peak ridership results in a large number of vehicles being used only during peak periods. Annual revenue miles per vehicle are also affected by operating speed.

Maintenance efficiency measures include the number of maintenance employees per vehicle and vehicle miles per maintenance hour. These measures are affected to some extent by the age and mileage of equipment.

Effectiveness Indicators

Effectiveness indicators are of three types: accessibility measures, quality of service measures, and service utilization measures.

Accessibility measures indicate the number of people who have access to (live within walking distance of) transit, and reflect policy decisions about route coverage. Percent of population served and percent transit dependent served are examples of accessibility measures.

Quality of service indicators include system reliability (% trips on time), and vehicle revenue miles per square mile of service area. These indicators reflect scheduling effectiveness and the quantity of service available respectively. The first can be calculated for the entire system, or a single route.

Service utilization indicators include passenger trips per population served, passengers per revenue vehicle hour, and passengers per revenue vehicle mile. They can be calculated for an entire system or a single route. These indicators are similar to some efficiency indicators, except they reflect the amount of service used, rather than the amount provided. To some extent transit usage levels reflect public acceptance of transit and public perception of service quality; however, population densities and urban configurations are probably more significant factors influencing the value of these measures.

Data Needs

Studies of transit system productivity have been hindered by lack of a common data base in the industry. Inconsistent data element definition limits comparability of some productivity indicators. For example, revenue passenger totals based on fares collected vary depending on whether a transit system distributes free transfers. This affects comparability of indicators using passenger trip data. Other particularly useful measures cannot be calculated because of data deficiencies. For example, ratios of output per employee hour, more precise than ratios of output per employee, cannot be calculated because of the lack of publicly available data on part time and overtime work hours of transit employees.

Many of these problems will be corrected with the implementation of the Uniform System of Accounts and Records⁶ developed by UMTA with the assistance of a committee of transit industry representatives. Beginning July 1, 1978, all transit operators receiving operating or capital assistance under Section 5 of the Urban Mass Transportation Act of 1964, as amended, will have to report detailed operating and financial data specified in the Uniform System. Data elements reported are drawn from the Financial Accounting and Reporting Elements System (commonly known as Project FARE) developed for UMTA.⁷ Additional, more general data on all transit properties will be reported by metropolitan planning organizations.

LABOR PRODUCTIVITY

Among the categories of efficiency discussed earlier, labor productivity is of particular concern to policy makers and transit management since labor costs account for about 67-85% of operating expenses, industry-wide. Section 13(c) of the National Urban Mass Transportation Act of 1964 protects the bargaining rights, compensation, and working conditions of employees of transit properties receiving capital grants or operating assistance.⁸ Management and labor disagree as to the effect of 13(c) on labor settlements.

Although transit wages have climbed in recent years, increasing 73.3 percent between 1967 and 1974, real wages adjusted for inflation during this period increased at an average yearly rate of less than 2 percent.⁹ According to a recent study of transit labor, the most significant factors in transit wage rates are the average manufacturing wage for the urbanized area, the number of employees in the transit system (larger properties pay slightly higher wages), and region of the country (wages are slightly lower in the South and Southwest and higher on the Pacific Coast). Type of ownership (public or private) and level of subsidization were not found to be significant factors.¹⁰

⁶ Urban Mass Transportation Administration, "Uniform System of Accounts and Records; Implementation," Federal Register, Vol. 42, No. 13, January 19, 1977, pp. 3772-3779.

⁷ Arthur Andersen and Co., Project FARE Task IV Report: Urban Mass Transportation Industry Financial and Operating Data Reporting System, (Washington, D.C.: U.S. Dept. of Transportation, 1973), NTIS PB 226-353.

⁸ Urban Mass Transportation Act of 1964, as amended, Section 13(c), 49 U.S.C.A., Section 160g (1971).

⁹ Robert C. Lieb, Labor in the Transit Industry, (Washington, D.C.: U.S. Department of Transportation, 1976), pp. 12-15.

¹⁰ Darold T. Barnum, From Public to Private: Labor Relations in Urban Mass Transit. Lubbock, Tex.: Texas Tech University Press, forthcoming.

The primary obstacles to improvements in labor productivity are the peaked nature of transit use and traffic congestion. Union work rules may limit the ability of management to schedule split shifts or hire part-time drivers to accommodate heavy rush hour transit use; consequently some properties must hire more full time drivers than they would with greater scheduling flexibility. Traffic congestion reduces speed and therefore, mileage per driver.

Given the constraints of peaking, labor agreements, and traffic congestion, there is still some potential for increased labor productivity. More efficient scheduling and work assignments may be possible even within union work rules. Some individual attempts have been made to streamline the traditional manual scheduling process, and Federal and local cooperation has produced a computerized run-cutting and scheduling package (RUCUS), which has been used successfully in some jurisdictions. Other techniques for improving labor productivity are discussed in the next section.

SERVICE CHARACTERISTICS AND PRICING

Transit productivity can be improved through changes in service characteristics and fare structure. However, the potential for such improvements is limited by the characteristics of the local operating environment and local government policy.

Constraints

Characteristics of the local operating environment that have the most significant impact on productivity are urban configuration, transit usage patterns, and street system congestion. Urban configuration greatly constrains transit utilization. Newer, more spread out cities are less effectively served by transit because users are not concentrated along centralized routes as in older ones. Changing urban configuration and travel patterns have altered transit usage, with an increasing disparity between peak and off-peak use; work trips constitute an increasingly large proportion of total passenger trips. Finally, rising levels of automobile use have increased urban traffic congestion, particularly in older urban centers, resulting in lower bus operating speeds and higher costs. A recent study of 12 transit properties in New York State indicated that an increase of one mile per hour in the average system operating speed would reduce per-mile operating expenses by 8 to 19%.¹¹

The flexibility necessary to adapt service to the local operating environment is limited by policy constraints. First, provision of a basic level of transit service even on routes where utilization is low is often dictated by public policy. Such service, which may not be

¹¹

New York State Department of Transportation, "Cost Increases, Cost Differences, and Productivity of Transit Operations in New York State," prepared by William C. Holthoff and Robert G. Knighton, (Albany, New York: 1976) p. 24.

economically efficient, serves the needs of transit dependent groups such as the poor, elderly, and handicapped. Second, political desirability of uniform fares and service quality limits the creativity of transit management in tailoring fares and service to the needs of different transit markets. Finally, local government control over policies affecting vehicle movement in street systems limits attempts by transit management to increase operating speeds.

Opportunities

Although constraints limit the opportunities for productivity improvements, some steps can be taken. Opportunities for increasing productivity fall into three categories: increasing ridership and revenues, accommodating transit usage patterns, and increasing operating speed.

Ridership and revenues are determined by fare and service policy. The effect of fare changes varies for different groups of transit riders; for example, elderly and off-peak riders are more sensitive to fare changes, while higher income commuters are relatively unaffected. In general, service improvements have a greater effect on ridership than fare changes. Improvements resulting in greater frequency of service, shortened travel times, and increased comfort and dependability, make transit a more attractive alternative to the automobile.¹²

These characteristics of transit demand provide the framework for policy choices. Off-peak ridership might be increased by lowering fares for the elderly or for all riders during off-peak periods. Revenues might be boosted by providing higher priced, premium service to higher income commuters, who are willing to pay more for high quality service. When service quality is uniform, however, policy choices usually involve trade-offs between revenue and ridership. In a study of time-of-day fare combinations in several cities in New York State, it was found that no differential fare combination increased both ridership and revenue.¹³ Thus local officials must decide which is more important--ridership or revenues.

Fare and service policies are very sensitive politically, and transit operators' flexibility is limited. Another approach is to find more efficient ways of accommodating present transit usage patterns. Productivity could be increased through the use of larger capacity equipment during peak periods, reducing peak period labor and vehicle requirements (although increased capital costs might offset savings in operating expenses). Peak period requirements might also be reduced through a city-wide policy of staggered work hours. Overall transit ridership might be improved through substitution of paratransit service in areas with low transit utilization.

¹² Peat, Marwick, Mitchell and Co., Study of Public Transportation Fare Policy; Summary, Prepared for U.S. Dept. of Transportation, (Washington, D.C.: 1976), pp. 10-11.

¹³ New York State Dept. of Transportation, "Revenue, Ridership, and Equity of Differential Time of Day Fares," prepared by David L. Weiss and David T. Hartgen (Albany, New York: 1976).

Increased operating speed not only reduces operating costs, but increases the attractiveness of transit, potentially boosting ridership and revenues. Priority treatment techniques, such as exclusive lanes for buses and taxicabs, or traffic signal preemption devices, are a means of increasing speeds. Express bus service, where demand warrants, and techniques to reduce boarding time, such as monthly flash passes, can also speed operations.

MAINTENANCE, ORGANIZATION, AND PURCHASING

Overall system productivity can often be improved through changes in maintenance operations, organizational structure and staffing, and procurement practices.¹⁴

Detailed vehicle maintenance records and regular maintenance scheduling improve vehicle performance. Work standards developed either internally or through comparisons with other systems can help ensure that routine maintenance tasks are performed in a reasonable amount of time. The New York State controller's 1976 report on New York City transit operations estimated a savings of nearly \$35 million per year (5% of the 1974 labor payroll) by establishing vehicle maintenance schedules, maintenance performance standards and labor requirements.¹⁵

Maintenance record-keeping and scheduling may be improved through implementation of the UMTA-sponsored Service Inventory and Maintenance System (SIMS). This computerized information system schedules standardized bus maintenance activities; however, some transit operators have criticized SIMS for being too complicated and costly, and industry acceptance has been limited.

Efficiencies in maintenance operations might also be effected through more systematic location of facilities and better internal layout and design. Information on this subject is contained in a bus maintenance facilities handbook¹⁶ developed by the Mitre Corporation.

¹⁴ This section is based on discussions in U.S. Department of Transportation, Urban Mass Transportation Administration, "Transit Performance, Productivity, and Efficiency," prepared by Doug Gerleman (Washington, D.C.: 1977), draft paper.

¹⁵ New York State, Office of the State Controller, Summary of Audit Reports on New York City Transit Authority Operations (Albany, N.Y.: 1976).

¹⁶ The Mitre Corporation, Bus Maintenance Facilities: A Transit Management Handbook, prepared for the U.S. Department of Transportation, (Washington, D.C.: 1975).

The organizational structure and staffing of a transit property often have an impact on morale and the efficiency of operations. Management studies can often recommend ways to increase administrative effectiveness and reduce costs.

Although transit management has little control over the unit costs of materials, supplies, or services such as fuel, parts, and insurance, bidder competition and consortium buying are two ways to achieve cost reductions. Better parts inventory control can also reduce costs, reduce storage space requirements and inventory size.

CONCLUSION

The complexity of transit productivity issues contributes to the disparity of viewpoints on the subject. Government officials might think of productivity in terms of cost reductions, transit management in terms of ridership increases, or bus drivers in terms of traffic congestion. Differences of opinion reflect the particular concerns of different transportation actors. An analytical framework must be developed that provides a common basis for examining the tradeoffs involved in policy and management decisions affecting transit operations. Effective programs for productivity improvement will require mutual recognition by all concerned of their respective responsibilities, interests, and institutional constraints.

CHAPTER 2

CASE STUDY--SEATTLE TO USE PART-TIME BUS DRIVERS

Seattle Metro Transit and Division 587 of the Amalgamated Transit Union recently entered into an agreement which permits the use of part-time bus drivers during weekday peak periods. Seattle Metro Transit sees this as an important step toward bringing its operating costs under control. Division 587, however, believes that the use of part-time drivers will prove unsatisfactory and will result in higher labor costs in the long run than if only full-time drivers were employed.

BACKGROUND

Metro Transit, a division of the Municipality of Metropolitan Seattle, provides transit services in King County and, under contract, to cities in adjacent counties. It operates 75,000 miles of service on the average weekday over 120 routes, using 536 buses and 59 trolley coaches. The system has some 1,800 employees and carries more than 40 million revenue passengers a year.

Beginning in 1973, when it assumed responsibility for transit services in the Seattle urban area, Metro Transit rapidly increased service and inaugurated an aggressive marketing program directed at a goal of 57 million riders in 1980. In three years patronage increased 29%--from 32.4 million riders in 1973 to 41.8 million riders in 1976. A marketing survey in the fall of 1976 indicated that the off-peak market was largely saturated and that the transit system should put more of its resources into peak-period service.

While ridership increased spectacularly from 1973 to 1976, the increase in transit operating costs over the same period was even more spectacular. It was clear that unless costs were curbed they would soon outstrip revenues and the maximum financial assistance available through a local sales and use tax and the Federal Urban Mass Transportation program.

Faced with the need to increase peak-period service and with a cash-flow problem of serious proportions, Metro Transit management launched a series

of actions designed to meet its 1980 patronage goal while cutting back the rate of increase in operating costs to not more than a projected 6% annual inflation rate.¹

THE WORK RULES

Because the work rules embodied in the labor agreement are a major determinant of operating costs, Metro Transit began, early in 1977, a series of studies and discussions of the then-current agreement, which would expire October 31, 1977. Over a period of several months, work rule options were identified, analyzed, and costed out. Many of these were advanced during the subsequent contract negotiations.

In March, Metro Transit management decided that the most effective way of holding down the rate of increase in operating costs was to make use of part-time drivers.² The principal alternative still under consideration when this decision was reached would have sought to eliminate the 8-hour daily guarantee that was placed in the contract in 1974.

The management decision was affirmed by the Metro Council in May, when it adopted a 1980 budget which was based explicitly on the use of part-time drivers during peak periods.³

In the remaining months before contract demands were exchanged on August 1, Metro Transit staff assembled a detailed negotiations manual, developed a negotiating strategy, and prepared a complete revision of the

¹This background is condensed from a case study prepared by Public Technology, Inc. and published with the Proceedings of the First National Conference on Transit Performance, which was held at Norfolk, Va. in September 1977. The Proceedings are available through the National Technical Information Service, Springfield, Virginia 22161 (Report No. UMTA-DC-06-0814-77 1). The full range of planned actions involves the marketing program, work rules, manpower requirements, driver performance, standards of service, and a management-by-objectives budget program.

²Interestingly, Seattle Metro already has a "D Board," consisting of drivers with one or more years of continuous service who want to attend school. Group D drivers earn regular rates of pay, without fringes, vacations, or guarantees; work at least five days a week; and can (with limited exceptions) work on weekday trippers only.

³The governing body of the Municipality of Metropolitan Seattle. A 36-member board composed of elected and appointed officials representing principally the local general purpose governments.

labor agreement which embodied the results of the earlier discussions concerning work rules. Concurrently, programs were developed for a desk-model computer, which later enabled the negotiating team to price out almost instantaneously proposed changes in any item in the labor contract.

THE CONTRACT NEGOTIATIONS

Demands were exchanged on August 1, 1977.

- Division 587 presented a list of 68 items, some of which consisted of a number of parts.
- Metro Transit presented a draft agreement, in which virtually every section of the existing agreement had been rewritten.

Negotiations began on September 1. On October 28, a Federal mediator appeared on the scene. The old contract expired on October 31.

After prolonged negotiations, a strike vote, job actions which temporarily crippled service, and agreement at the bargaining table when it became apparent that Metro Transit was prepared to take a strike, Division 587 voted on January 9, 1978, 725 to 606, to accept a contract which permits the use of part-time drivers, under specified conditions, during peak periods.

A detailed chronology is given in Appendix A.

THE AGREEMENT

The principal features of the final agreement are:

- A 6% increase in hourly rates for all job classifications, retroactive to November 1, 1977. This increased the top step for transit operators from \$7.55 to \$8.00 an hour.
- Cost of living increases, to be computed semiannually and applied to the base wage on November 1, 1977, for each step of each job classification. The minimum increase is 2%. There is no maximum.
- Additional hourly-rate increases for specified job classifications.
- A 50¢ per hour premium for driving an articulated bus, provided the driver has not had more than 2 preventable accidents while driving an articulated bus during the preceding 6 months.

- First-day sick leave coverage, replacing a two-day waiting period.
- Five-day increases in vacation time after 10 and 30 years of service.
- Provision for the use of part-time drivers (see below).
- A provision that runs and trippers on a single line may be operated out of different bases.⁴
- A provision that trippers operating out of the same base must be combined into a run if it is possible to do so and create an assignment of more than 7 hours and 11 minutes within a 12-1/2 hour spread.

PROVISIONS RELATING TO TRIPPER OPERATORS⁵

A tripper operator is defined in the agreement as "a person who is employed by Metro on a continuing basis whose regularly scheduled assignment shall be trippers and who will be guaranteed one and one-half (1-1/2) hours straight time pay or actual hours worked, whichever is greater, for each tripper worked." The agreement provides that a tripper operator--

- Will be assigned by Metro to a specific tripper.
- Will not work on Saturdays, Sundays, or holidays.
- Will serve a probationary period of 1044 work hours--equivalent to 6 months full-time work.
- Will be paid at the same hourly rates, including step increases, as regular drivers.
- Is eligible only for limited benefits:
 - Standard uniform allowance
 - Transit system pass
 - Social security coverage
 - Retirement, if eligible under State law.

⁴A run is defined as straight-through work or combinations of not more than three pieces of work that exceed a total of 7 hours 11 minutes during a 12-1/2 hour spread. A tripper is defined as an assignment of less than 7 hours and 11 minutes.

⁵Part-time drivers are referred to as tripper operators in the agreement. The contract provisions relating to tripper operators and the provisions protecting regular and extra board operators are reproduced in Appendix B. The agreement does not change the status or use of Group D drivers.

Tripper operators are required to join Division 587, and will come under the provisions of the labor agreement relating to the maintenance of union membership, grievances, arbitration, and union representation.⁶

The contract provides specific protection to full-time drivers in a series of provisions which are effective only when tripper operators are actually employed. These include:⁷

- A floor of 900 in the number of full-time drivers.
- A ceiling of 700 in the number of part-time drivers.
- An agreement by Metro Transit to effect any reduction in the present number of full-time drivers (1150) by voluntary attrition and to hire at least 100 new full-time drivers during the three-year life of the contract.
- An agreement by Metro Transit to maintain the number of runs that were posted and subject to driver selection on November 1, 1977, for assignment to full-time drivers. However, up to 10% of this work may be discontinued in the event of low ridership or revenue.
- An agreement by Metro Transit to maintain the level of overtime trippers available to full-time drivers, and to increase their number by 10% in 1978 and 10% in 1979.
- Full-time drivers will not be required to accept tripper operator status, nor will full-time drivers be laid off until after all tripper operators have been laid off.
- Reservation of certain work to full-time drivers.
 - Reports. Since there is no extra board for the tripper operators, this reserves to full-time drivers all work left vacant by the absence of either a full-time driver or a part-time driver.
 - Specials, leases, and vacation reliefs.

⁶Metro Transit is a union shop. New employees are required to join the union within 30 days and to maintain membership as a condition of employment.

⁷The list which follows summarizes the principal conditions. The full text of these conditions appears in Appendix B.

OPPOSING VIEWS ON THE MAJOR ISSUE

The major issue which arose during the negotiations, and the issue which prevented early agreement, was the use of part-time drivers.

Metro Transit felt that it had to secure the right to use part-time drivers in peak periods in order to provide the service necessary to reach its 1980 patronage goal. This was the kingpin in its plan to keep operating cost increases within tolerable limits.

Division 587 had two principal concerns. The first was for the jobs and pay, including overtime, of the full-time drivers it represented. The second was for the integrity of the union itself, which some saw threatened by the influx of a substantial number of members who held part-time jobs and whose interests might be different from, or even in conflict with, the interests of members who held full-time jobs with Metro Transit.

Other union concerns were expressed for the professionalism and status of bus drivers, possible safety hazards arising out of the use of drivers with limited training and part-time work experience, and the public relations aspects of using drivers who were not familiar with the transit system as a whole and who might not be able to provide the traditional information assistance to transit patrons.

WHAT NEXT?

Seattle Metro now has 280 trippers, averaging 2 hours and 20 minutes of work each. Sixty of these, under the agreement, will go out as overtime work to full-time drivers. The remainder can be assigned to part-time tripper operators.

By the middle of February, Metro Transit had received about 500 applications for part-time work. From among those passing the standard Chicago test for transit drivers, Metro expected to hire between 200 and 300 tripper operators by the end of 1978. The first three-week training class was scheduled to graduate at the end of March.

Metro officials indicate that there is a substantially greater demand for afternoon work than for morning work. The best sources of recruitment in the Seattle area appear to be teachers, off-duty policemen, and housewives. A few former drivers, retired from the city-owned system before 1973, have already been hired.

Students are not a good source, based on Metro's experience with Group D employees, because their work has to be arranged around class and test schedules. Off-duty firemen cannot be used because their tours of duty rotate between day and night shifts.

Seattle Metro estimates that total transit operating costs in fiscal year 1981 will be \$61.5 million, or \$6.2 million less than had agreement not been reached on the use of part-time drivers.

Union representatives question whether this savings can be realized. They believe that in the long run labor costs will be higher than they would have been without the use of tripper operators under the agreement. In support of this contention they refer to the requirement that a sufficient number of full-time drivers be held ready at all times to handle work left vacant because of the absence of tripper operators, the possibility of more grievances arising under the arbitration provisions of the contract, and the fact that the tripper operators will be represented by Division 587 at the next contract negotiations--in 1980--and may be expected to seek greater guarantees and benefits than are afforded them in the present agreement.

Which of these views is wholly or partially correct cannot be determined now. Some indication of how well the new arrangements are working, and how much they are costing, should be available by the end of 1978. A full accounting cannot be rendered until more experience has been gained and, in any event, not until after the 1980 contract has been negotiated.

BROADER IMPLICATIONS OF THE SEATTLE AGREEMENT

The question is: Will the Seattle agreement set a pattern?

Transit managers often mention the use of part-time drivers as a way of increasing system productivity. Many of them would agree with union leaders that part-time drivers, with less training and less experience on the street, may not perform as well as full-time drivers; but they counter this with the assertion that operating costs cannot be controlled unless transit employees are paid only for the time they actually work.

Transit managers will watch the Seattle experience closely. Some will wait to see what happens there. Others--how many is uncertain, but the Washington Metropolitan Area Transit Authority has already followed suit--will seek in their next contract negotiations to secure agreement on the use of part-time drivers. It is safe to predict that all who do so will resist inclusion in the agreement of the restrictions and guarantees that finally were written into the Seattle contract.

The International President of the Amalgamated Transit Union sees the Seattle agreement as a threat to the union and its members. In the February 1978 issue of In Transit, the Union's official journal, President Maroney writes:

...we are not so naive as to mistake the clear implications of having this clause included in the [Seattle] contract. Make no

mistake about it, it is a precedent. It is something that every transit management throughout the country will be looking for in upcoming contract talks.... We cannot overemphasize to all ATU bargaining units the need to resist by all means available the inclusion of a part-time employees provision in collective bargaining agreements....

President Maroney has subsequently expressed his doubt that transit managers will find the use of part-time drivers attractive enough to pursue the issue vigorously in contract negotiations. He points out that experience shows a high rate of turnover among part-time drivers, with consequent increases in training costs and accident rates.

Management, basically, has a single reason for wanting to use part-time drivers. It believes that the use of part-time drivers will reduce the rate at which operating costs have been increasing in recent years.

Labor, on the other hand, has a number of concerns about the employment of part-time drivers.

- It believes that the employment of part-time drivers poses a threat to the jobs, pay, and benefits of full-time drivers.
- It believes that the employment of part-time drivers will dilute the strength of its bargaining units, because part-time employees are less likely than full-time employees to join the transit union. Seattle Metro Transit's union shop agreement is almost unique among public agency labor contracts.
- It believes that, in cases where substantial numbers of part-time drivers do join the transit union, there is the possibility of internal conflict within the local division due to differences in interests and outlooks between full-time and part-time employees.

CITY-COUNTY OFFICIALS

Where does this leave the legislative and executive officials of general purpose units of government who are responsible for providing local financial support for transit agencies, and who are increasingly concerned about the escalating costs of all governmental services?

Many legislators, mayors, administrators, and managers have reacted to the way urban transit systems operate by saying, "Why don't you use part-time drivers?"

Peak periods are a fact of transit life. The use of part-time drivers

is one response to the peaking characteristics of urban transit operations. There are, however, problems associated with the use of part-time employees, and doubts as to the efficacy of this response, of which local government officials should be aware. It is these problems and doubts which are being tested in Seattle.

SOURCES: PERSONS INTERVIEWED

The main sources for this case study of the Seattle agreement were individuals who were directly involved in the decision to seek the right to use part-time drivers and in the negotiation of the new labor agreement. These individuals were very frank and very helpful, and their assistance is gratefully acknowledged. Their names are given below:

Charles T. Collins, Director of Transit, Metro
Wendell Duncan, President, Division 587, Amalgamated Transit Union
Dan Graczyk, Management Analyst, Metro
Bruce Haulman, Transit Budget Administrator, Metro
Ruth Hertz, Public Information Supervisor, Metro
Susan Pavlou, Manager, Personnel Division, Metro
Melvin W. Schoppert, International Vice President, Amalgamated
Transit Union, Portland, Oregon
Carol Sperling, Administrative Assistant, Metro
Larry Steele, Press and Media Relations Specialist, Metro.

The following International officers of the Amalgamated Transit Union at its Washington, D.C. headquarters discussed in some depth with the writer the problems involved in the use of part-time employees generally in the transit industry. Their contribution was thoughtful and substantial. It is greatly appreciated.

Dan V. Maroney, Jr., International President
Raymond C. Wallace, International Secretary-Treasurer
Earle W. Putnam, General Counsel

CHAPTER 3

CONTACTS AND CURRENT PROGRAMS

CONTACTS

Urban Mass Transportation Administration-U.S. Dept. of Transportation

Responsibility for transit system productivity programs is shared by several Urban Mass Transportation Administration (UMTA) offices. UMTA staff in Washington is housed in two locations:

- Departmental Headquarters (DOT)
Nassif Building
400-7th Street, S.W.
Washington, D.C. 20590
- TransPoint Building (TRPT)
2100-2nd Street, S.W.
Washington, D.C. 20590

Also, please note that the code following each name is for identification and should be included in written correspondence.

UMTA program activities and contact persons are listed below:

- Office of Policy and Program Development.
Within this Office, The Program Evaluation group is developing techniques and approaches for improving transit performance.
Contact: Bruce Barkley, UPP-20, DOT-Room 9311
(202) 426-4080.
- Office of Transportation Management and Demonstrations.
This Office is divided into two groups: 1) The Office of Transit Management, sponsors projects aimed at improving the internal management efficiency of transit agencies, including computerized routing and scheduling (RUCUS) and Service Inventory and Maintenance System (SIMS).
Contact: Brian Cudahy, UPM-40, TRPT - Room 6408,
(202) 426-9274.

2) The Office of Service and Methods Demonstrations.
Sponsors demonstrations of innovative service delivery techniques, such as preferential treatment for high occupancy vehicles, user-side subsidies, fare-free zones, and van-pools. Contact: Ronald J. Fisher, UPM-30 TRPT-Room 6412, (202) 426-4995.

- Office of Research and Development.
Contributes to new technology development. For rail technology. Contact: Jeffrey Mora, UTD-30, TRPT-Room 6426D, (202) 426-0090.

For bus technology, including Transbus, small bus and vehicle lifts, Contact: Charles Daniels, UTD-21, TRPT-Room 6104B, (202) 426-4035.

CURRENT PROGRAMS

Research and Special Programs Administration

LORAN-C Applications Project:

The U.S. Coast Guard operates LORAN (Long Range Navigation)-C, a radio navigation system which has been used in marine applications. Several land-based applications of the system are being investigated, including automatic vehicle monitoring for police or transit vehicles, automatic vehicle location or dispatch, and site registration (e.g., Highway Accident Location) and highway inventory. It has been determined that LORAN-C can technically, operationally, and economically satisfy many precise position identification requirements of state and local governments. In addition, major productivity improvements associated with application of the technology seem probable.

Existing LORAN-C coverage of the U.S. East Coast is presently being expanded to include the Gulf of Mexico and the West Coast. These signals will also cover over 2/3 of the United States. Additional stations to provide coverage of the entire continental United States are being examined.

For further information contact: William B. Mohin, DPB-6, DOT-Room 9117, (202) 426-9520.

Urban Mass Transportation Administration

The UMTA Office of Policy and Program Development, through its Office of Program Evaluation, is currently sponsoring research into improving transit performance. Issues being addressed include:

- Concepts and Indicators
- Service Characteristics and Policies
- Pricing
- Labor/Management Relations
- Internal Systems Management

For information on this project contact: Bryan Green, UPP-20, DOT-Room 9311, (202) 426-4060.

The UMTA Office of Service and Methods Demonstrations has as one of its five major objectives increasing productivity. Demonstration programs are tailored to the achievement of economic efficiency in the operating and scheduling of transit vehicles, as well as raising the occupancy of all passenger carrying vehicles.

An early demonstration in this area was the Washington, D.C. minibus, which provided low fare downtown circulation service in an attempt to attract high ridership for short trips. The service concept was eventually expanded to include feeder service from in-town employment centers to the downtown commercial district, and is now known as the Washington Downtowner Midibus. The buses operate in this higher density area during the base day at a cost of \$12.54 per vehicle hour versus a system average of \$18, and generate ridership averaging 9 passengers per vehicle mile, compared to a system average of 3 passengers per vehicle mile. Several cities around the country are adopting similar service to improve their downtown circulation.

Reserved and exclusive lane operations, such as the Shirley Highway and Marin County (Golden Gate) projects, not only increase ridership, and thus productivity, but also increase speed and schedule assurance. This permits the operators to utilize individual vehicles for more runs during a given period than would otherwise be feasible. In Marin County an additional 15 trips have been scheduled within the same period of time during the evening peak. It is estimated that an additional 23 buses would be required to operate the Shirley Highway service without the exclusive bus lane.

In Rochester, as mentioned earlier, dial-a-ride service was substituted for lightly patronized fixed route service in an attempt to increase the efficient utilization of resources. Introduction of computerized routing and scheduling of demand responsive vehicles, together with direct digital communications from the computer to the buses are also expected to improve productivity.

An increase in bus capacity can result in productivity improvements where demand is high. On the El Monte Busway in Los Angeles, a demonstration is being sponsored using double-deck buses which seat 84 passengers compared to the conventional 45-50 passenger bus. In Manhattan, 64-passenger double-deck buses are to be demonstrated on routes with high passenger demand.

During the sixties a series of experiments was performed in Boston and Philadelphia to test rider sensitivity to fare and service changes. It was shown that higher service levels were a stronger influence than fare changes in achieving increased ridership. The Service and Methods Demonstration Program has continued to study this area to further clarify the value of various service and fare changes. In Amherst, Massachusetts, a demonstration of free fare transit combined with auto restrictions achieved high ridership and vehicle productivity. Clearly, free fare and prepaid passes encourage ridership while also having the potential to reduce costs associated with fare collection.

ANNOTATED BIBLIOGRAPHY

This selective bibliography was compiled by the staff of Public Technology, Inc., in conjunction with the Office of Policy and Program Development, Urban Mass Transportation Administration, U.S. Department of Transportation. In general, works are included which are recent publications, reflect a local government perspective rather than a highly theoretical one, and pertain to transit productivity. This bibliography is organized under these categories--

- I Public Sector Productivity
- II Labor and Financial Statistics
- III Transit Productivity
 - A. Performance Indicators
 - B. Fiscal Issues
 - C. Levels of Service
 - D. Labor
 - E. Maintenance

PUBLIC SECTOR PRODUCTIVITY

Balk, Walter L. "Improving Government Productivity: Some Policy Perspectives." Sage Professional Papers in Administrative and Policy Studies, Volume 3, Series no. 03-025. Beverly Hills, Calif.: Sage Publications, 1975.

Theoretical approach to forming policy for productivity improvement programs. Emphasis on motivation techniques, measurement, information systems, and implementation of programs. Includes examples of existing programs.

Committee for Economic Development. Improving Productivity in State and Local Government. New York, N.Y.: 1976.

Defines the dimensions of state and local government productivity, identifies the principal areas for improvement, outlines approaches that can motivate jurisdictions to take action, and proposes steps that the states and Federal government can take to encourage productivity.

International City Management Association. Guide to Productivity Improvement Projects. Third edition. Washington, D.C.: U.S. GPO, 1976.

(Formerly called the Jurisdictional Guide to Productivity Improvement Projects.) Compilation of productivity improvement projects undertaken by cities and countries of all sizes; discusses the problem, the solution, the results, and provides a contact in the city or county for further information.

Urban Institute and International City Management Association. Measuring the Effectiveness of Basic Municipal Services; Initial Report. Washington, D.C.: 1974.

Identifies measures of service effectiveness to determine the extent to which goals and objectives of various city and county services are being met. Suggests data collection procedures for specific effectiveness measures.

LABOR AND FINANCIAL STATISTICS

American Public Transit Association. Labor Information Review. Revised edition, 2 Vols. Management Seminar, Las Croabas, Puerto Rico, March 14-18, 1976. (Available to APTA Members Only).

"Second annual summary of APTA Statistical Department current labor information records contributed by APTA Labor Practice Service Participants." Volume I includes top wage rates and 1975 labor agreement provisions for vehicle operators and mechanics, and reprints of recent articles on transit labor practices. Volume II includes alphabetical list of transit systems in U.S. and Canada, ranked list of transit systems by population size or urbanized area and labor agreements information.

American Public Transit Association. Transit Fact Book. Washington, D.C.: Annual.

Summary of information for the U.S. transit industry for each calendar year in such areas as total passengers, passenger revenue, operating revenue, labor costs. Includes brief history of U.S. transit industry.

American Public Transit Association. Transit Financial Assistance Reported for Calendar/Fiscal Year 1974. Washington, D.C.: 1976. (Available to APTA Members Only).

Annual financial information based upon voluntary responses by transit operators to APTA questionnaires. Includes information on operating assistance, capital assistance, reimbursements, demonstration grants and taxing authority.

American Public Transit Association. Transit Operating Report for Calendar/Fiscal Year 1975. Washington, D.C.: 1976.

Annual financial data and operating statistics based upon voluntary responses to APTA questionnaires. Includes information on individual transit system sector bus operations, heavy rail operations, light rail operations, trolley coach, inclined plane, and ferries. Indexes by population size, vehicle fleet size, operating expense, total passengers carried, and vehicles operated.

U.S. Department of Labor, Bureau of Labor Statistics. Current Wage Developments. Washington, D.C.: U.S. GPO. Monthly.

Monthly report summarizing wage and benefit changes in major collective bargaining situations and unilateral management decisions.

U.S. Department of Labor, Bureau of Labor Statistics. Handbook of Labor Statistics, 1976, Bulletin 1905. Washington, D.C.: U.S. GPO, 1976.

Annually published handbook on labor statistics which compiles major series of Dept. of Labor. Supplements the 1975 Reference edition which contains complete historical data. The 1976 edition begins with 1967 data through 1975 calendar year. See especially Table 91, "Average Union Rates for Selected Trades by City, 1967-74", which includes transit vehicle operators wage rates for cities of 100,000 population or more. Essential reference manual on labor statistics.

U.S. Department of Labor, Bureau of Labor Statistics. Statistics on State and Local Government Employment and Payrolls. Monthly publication.

U.S. Department of Labor, Bureau of Labor Statistics. Union Wages and Hours: Local-Transit Operating Employees. Washington, D.C.: U.S. GPO, Annual

Essential reference for local transit wage statistics in selected cities of the U.S. Data based upon collective bargaining agreements. Recommend comparing figures for local transit to those of local trucking industries and book and job printing.

TRANSIT PRODUCTIVITY

Altshuler, Alan. "The Decision-Making Environment of Urban Transportation." Public Policy (Spring 1977), forthcoming.

Examines urban transportation's political decision-making environment in light of the predominance of the private sector. Emphasizes the paradox between the collective and individual forces of the American public. As a collective political force, the American public brought about a remarkable shift in the national transportation investment priorities (highways to transit), while individually in the market place, Americans resist interference in their lives, including the right to drive their own cars. Concludes that this problem accounts for the overall ineffectiveness in shaping the urban transportation pattern.

Council on Municipal Performance. City Transportation. New York, N.Y.: 1975.

Citizen's guide to evaluating public transportation. Provides criteria for the quantity and type of transportation cities should offer. Evaluates public transportation performance in 28 cities based upon ability to get citizens to and from work. Looks at hidden costs of America's car dependence and problems due to automobile subsidies.

Control Data Corporation. Wells Research Company. Trends in Bus Transit Operations, 1960-1974. Prepared for the U.S. Department of Transportation. Washington, D.C.: U.S. Department of Transportation, 1977.

Analyzes fifty of the most complete sets of APTA bus transit financial and operating records from 1960 through 1974. Studies patronage versus supply of services, revenue versus costs, trends in selected cost categories, utilization of employees and vehicles, and fuel consumption costs.

Dajani, Jarir S., and Gorman Gilbert. "Measuring the Performance of Transit Systems." Transportation Planning and Technology (1978), Vol. 4, pp. 97-103.

Presents a framework for the evaluation of transit system performance and discusses the application of this framework in fund allocation.

Eisele, Donald O. "Operational Efficiency of Suburban Railroads." Proceedings of the Speciality Conference on Urban Transportation Efficiency. New York, N.Y., July 26-27, 1976. New York, New York: American Society of Civil of Engineers, 1977.

Examines ways to improve productivity in railroad operations, including revenue collection, fare structures, scheduling, and implementation problems.

Gomez-Ibanez, Jose A., and John R. Meyer. "Productivity Growth and Labor Relations in Urban Mass Transit." Presented at the Transportation Research Board Conference on Labor Relations Issues in Urban Public Transportation, December 6-7, 1976, Washington, D.C. (unpublished).

Explores opportunities for improving transit productivity, many of which can be quickly implemented. These include increased express services, bus priority techniques, deployment of some buses larger and smaller than the standard model, negotiation of changes in split shift rules, adoption of computerized scheduling, and tailoring of fares, service quality, and schedules to conform to transit's distinct markets.

Jones, David W., Jr. The Politics of Metropolitan Planning and Programming-- Implications for Transportation System Management. Prepared for U.S. Department of Transportation. Berkeley, Calif.: University of California. Institute of Transportation Studies, 1976.

Case studies and analysis of planning and implementation of Transportation System Management strategies in Metropolitan Chicago, Los Angeles, Minneapolis-St. Paul, and the San Francisco Bay Area. Examines obstacles to productivity improvement posed by inter-jurisdictional and inter-agency conflict.

Regional Plan Association. Urban Densities for Public Transportation. Prepared for the Tri-State Planning Commission. New York, N.Y.: 1976

Chapter Three, "Costs of Supplying Public Transportation," provides a comparison of costs for different transit modes, including operating and capital costs. Modes include fixed rail, bus, taxi, dial-a-bus, and guideway. Discussion of how costs can be reduced and cost-benefit considerations in allocation of resources to transit construction.

U.S. Department of Transportation, Urban Mass Transportation Administration; Urban Consortium/Public Technology, Inc.; and American Public Transit Association. Proceedings of the First National Conference on Transit Performance. Washington, D.C.: 1978. (NTIS UMTA-DC-06-0814-77-1)

Contains conference summary; issue papers on concepts and indicators, revenue policy and pricing, service characteristics, labor-management relations, and international management; and background papers on transit performance indicators, the New York City productivity agreement, revenue policy options, fare changes, and service evaluation.

PERFORMANCE INDICATORS

Arthur Anderson and Company. Project FARE Task IV Report: Urban Mass Transportation Industry Financial and Operating Data Reporting System. Washington, D.C.: U.S. Dept. of Transportation, Urban Mass Transportation Administration, 1973. (NTIS PB 226-353).

The report contains a description of the uniform reporting system for the urban mass transit industry designed and tested in Project FARE, including methodology, research summary, reporting system forms and instructions.

Fielding, Gordon J. (Pete), and Roy E. Glauthier. Distribution and Allocation of Transit Subsidies in California. Irvine, Calif.: University of California, Irvine. Institute of Transportation Studies, 1976.

Analyzes 49 performance indicators on the basis of data availability, methodological correctness, and bias. Five are selected which measure system effectiveness and efficiency and allow comparison of one system to another. The measures are analyzed with data for several California transit operations. The study suggests that performance indicators might be used in an incentives program to supplement fixed subsidy of basic transit services.

Fielding, Gordon J. (Pete), and Roy E. Glauthier. Obstacles to Comparative Evaluation of Transit Performance. Irvine, Calif.: University of California, Irvine. Institute of Transportation Studies, 1977.

Prepared for presentation at the National Planning Conference of the American Society of Planning Officials, San Diego, California, April 20-28, 1977. Reviews data collection problems and extent to which Section 15 Reporting Requirements may solve these problems. Concludes that "accurate financial and operating data for the public transit industry is presently not available nor can it be reasonably collected" (p.2), and that without such data, comparability between systems cannot be expected.

Gilbert, Gorman, and Jarir Dajani. Measuring the Performance of Transit Service. Durham, N.C.: Duke University, 1975.

Examines 5 different perspectives (Federal, State, local, transit user, and transit operator) on performance indicators and their interrelated nature. The conceptual framework outlines three levels of indicators--efficiency, effectiveness, and impact measures--with emphasis on effectiveness, defined as public mobility. Explores ways in which funding could be allocated to increase effectiveness.

Kansas City Area Transportation Authority. Planning Department. "Transit Route Monitoring and Planning System." Kansas City, Mo.: 1977.

Companion to transit standards and criteria published in 1976 (see "Levels of Service"). Specifies data to be collected and measures to be calculated to determine whether standards and criteria are being met. Characteristics of each route to be monitored include usage, financial performance, and operational effectiveness. A process for using data and measures in evaluation and analysis is outlined. Covers maximum headways, minimum number of trips, revenue and ridership minimums, load limits, and express service criteria.

Meyer, John R., and Jose A. Gomez-Ibanez. Measurement and Analysis of Productivity in Transportation Industries. Cambridge, Mass.: Harvard University, Department of City and Regional Planning, 1975.

Analyzes problems of assessing output of transit industry. Emphasizes need to consider social characteristics, quality of service, and history of the industry. Indicates that performance indicators are designed and used for different purposes. Concludes that vehicle-miles, although a crude measure, is useful insofar as it reflects to some extent both passenger service and social outputs which transit produces.

Roess, Roger P. "Criteria for Measuring Rail Transit Efficiency." Proceedings of the Specialty Conference on Urban Transportation Efficiency. New York, N.Y., July 26-27, 1976. New York, N.Y.: American Society of Civil Engineers, 1977.

Reviews indicators of overall operating efficiency and labor productivity. Discusses problems in comparisons, factors affecting values of the measures. Recommends disaggregation of labor measures by type of work. Also mentions non-efficiency criteria that should be considered in evaluation of service.

Tomazinis, Anthony R. Productivity, Efficiency, and Quality in Urban Transportation Systems. Lexington, Mass.: D.C. Heath and Co., 1975.

Theoretical study of how to evaluate performance of total transportation systems, public and private. Discusses a number of measures applicable to transit. Emphasis on four actors: operator, user, society, government.

U.S. Department of Transportation. Urban Mass Transportation Administration. "Comparing the Efficiency of Privately- and Publicly-Owned Bus Systems." Prepared by Cindy Burbank. Washington, D.C.: 1976. Draft Paper.

Discussion of efficiency measures and factors affecting efficiency. Data from an UMTA survey of 25 largest urbanized areas is used to show that public operators are as efficient or perhaps more efficient with respect to service offered than private.

U.S. Department of Transportation. Urban Mass Transportation Administration. "Transit Performance, Productivity, and Efficiency." Prepared by Doug Gerleman. Washington, D.C.: 1977. Draft Paper.

This study of transit performance indicators analyzes what various commonly used quantitative measures (such as passengers/vehicle-mile, farebox revenue/operating expense, and vehicle-maintenance employee/vehicle) indicate about a transit operation and city. The study is aimed at assisting transit funding and review agencies at the Federal, State, and local levels who wish to evaluate transit systems without spending the time, manpower, and funds needed to perform more detailed analyses of transit performance and efficiency.

Vuchic, Vukan R., et al. Design for a National Urban Transportation Reporting System--Final Report. Philadelphia, Pa.: University of Pennsylvania, 1976.

Based on reporting system of the Pennsylvania Department of Transportation. Recommends set of data items and indicators for evaluating transit system efficiencies and their comparative analysis.

FISCAL ISSUES

California. Office of the Auditor General. Financing and Evaluating Public Transit Systems in California; Report of the Office of the Auditor General to the Joint Legislative Audit Committee. Sacramento, Calif.: 1977.

Reviews trends in public transit in California. Notes the inadequacy of current auditing procedures, and the need for a system for measuring transit system efficiency and effectiveness. Includes recommendations to reduce or minimize transit deficits, to establish a performance evaluation system, and to improve audit requirements. Evaluates a number of performance indicators.

Comprehensive Planning Organization. Transit Operators Performance Audit Guide. Prepared by Peat, Marwick, Mitchell and Co. San Diego, Calif.: 1976.

A step-by-step guide to compliance with California statutes requiring measurement of bus transit operators' efficiency and effectiveness reviews.

New York State. Department of Transportation. "Cost Increases, Cost Differences, and Productivity of Transit Operations in New York State." Preliminary Research Report 110. Prepared by William C. Holthoff and Robert G. Knighton. Albany, N.Y.: 1976.

This study analyzes transit costs and operational productivity in New York State public transit properties. A breakdown of costs is presented. Differences in productivity from one property to another are identified, but productivity is not rigorously defined. One conclusion of the study is that average vehicle speed increases of 1 mile per hour would result in cost savings of 8 to 19%.

New York State. Department of Transportation. "Revenue, Ridership, and Equity of Differential Time-of-Day Fares." Preliminary Research Report 99. Prepared by David L. Weiss and David T. Hartgen. Albany, N.Y.: 1976.

Examines the impact of different time-of-day fares on transit ridership, revenue, and equity in seven cities in New York State. The advantages of higher peak period fares are the reduction of ridership

losses that result from a uniform fare increase and an improved distribution of costs and benefits. The study found that--

- Ridership and revenues cannot both be increased through differential fare policies
- Some fare policies can improve revenue or ridership with less than 5% loss in the other
- Fare increases result in permanent loss of riders
- Increased ridership with a slight loss of revenue is preferable over the long term

Peat, Marwick, Mitchell and Co. Study of Public Transportation Fare Policy. Two volumes. Prepared for the U.S. Department of Transportation. n.p.: 1976.

Examines transit fare policy from three perspectives--institutional, demand, and pricing rationale. Institutional considerations include fare trends, types of fares, fare collection techniques, and the groups affecting fare policy. Demand considerations include the effects on ridership of changes in fares and service characteristics. Pricing rationale considerations emphasize the costs of providing transit service.

Reilly, Jack. "Transit Costs During Peak and Off-Peak Hours." Presented at 1977 Annual Meeting of the TRB, Washington, D.C. Albany, N.Y.: Capital District Transportation Authority, 1977.

Compares the relative costs of providing peak and off-peak transit service in Albany, New York. Implications for transit pricing policies are examined from the perspective of economists and transit operators.

Simpson and Curtin. Standards for Bus Service Contract Payments and a System of Incentives. Prepared for the New Jersey Department of Transportation. n.p.: 1976.

Presents a complex formula for determining operating assistance levels to private transit companies in New Jersey. Operating assistance is based on the difference between projected revenues and "standard costs" calculated on a route by route basis. Employee-related and other company specific costs are determined for each company. Operating, maintenance, and administrative costs are standardized for all operators. Revenues in excess of projections are kept, and short falls absorbed by operators. Additional incentive payments or penalties would be applied on the basis of service quality evaluation.

U.S. Department of Transportation. Urban Mass Transportation Administration. Transit Performance and the Impact of the Section 5 Program. Washington, D.C.: 1976.

A study of the impact of the Section 5 program--where funds are used, for what purposes, and to what effect. Also examines transit trends, and provides statistical data on the use of Section 5 funds.

LEVELS OF SERVICE

Allen, William G., Jr., and Frank Dicesare. Transit Service Evaluation: An Introduction and Preliminary Identification of Variables Characterizing Level of Service. Prepared for presentation at the 55th Annual Meeting of the Transportation Research Board, Washington, D.C., January 1976.

Goeddel, Dennis L. An Examination of the Run Cutting and Scheduling (RUCUS) System--A Case Analysis. Cambridge, Mass.: U.S. Department of Transportation, Transportation Research Center, n.d.

Examines the utility of RUCUS in preparing driver and vehicle work schedules for the Massachusetts Bay Transportation Authority (MBTA). The system, developed for the U.S. Department of Transportation by the Mitre Corporation, generated schedules in close agreement with manual MBTA schedules, demonstrating a capability to produce reliable and cost efficient schedules.

Kansas City Area Transportation Authority. Public Transportation Standards and Criteria: Kansas City Metropolitan Region. Kansas City, Mo.: 1976.

Provides a set of standards responsive to the needs of local transit management, the regional planning agency, and Federal regulations. Emphasizes performance and operating criteria for individual bus routes. Also covers paratransit, transit services for the elderly and handicapped, non-scheduled service, fares, and criteria for capital improvements.

Massachusetts Bay Transportation Authority. Service Policy for Surface Public Transportation. Boston, Mass.: 1975.

Outlines legal and policy framework, service goals and objectives, service design standards, operating standards, and other standards, along with process for evaluation of present service, and service improvements or reductions.

Metropolitan Dade County Department of Traffic and Transportation. Dade County Transit Development Program, Vol. 1, Report in Brief and Mass Transit Service Standards. Miami, Fl.: 1973.

Outlines steps for:

- Establishment of local transit service standards
- Measurement of present system against these standards
- Correction of present and projected deficiencies through a program of service improvements

Service standards presented in this report are designed particularly for Dade County, with the assistance of County agencies. Fourteen quantifiable or observable evaluation categories are established and performance criteria are specified for each.

Mitre Corporation. Vehicle Scheduling and Driver Run Cutting, RUCUS Package Overview. Prepared by K.R. Roberts. McLean, Va.: 1971.

This brochure describes the Run Cutting and Scheduling (RUCUS) package, a set of computer programs to assist in headway sheet development, vehicle scheduling and driver run cutting developed under the sponsorship of the Office of Research, Development and Demonstration, Urban Mass Transportation Administration.

National Committee on Urban Transportation. Better Transportation for City. Procedure Manual 4A: Measuring Transit Service. Procedure Manual 8A: Recommended Standards, Warrants, and Objectives for Transit Service and Facilities. Chicago: Public Administration Service, 1958.

These reports were among the first to address the planning of transportation as a comprehensive urban system and to specify service standards, objectives, and measurement techniques for transit.

Pennsylvania Department of Transportation. Operating Guidelines and Standards for the Mass Transportation Assistance Program. Jan. 1973.

Presents standards for level of service and marketing activities for Pennsylvania transit properties receiving operating assistance funds.

Tober, Ronald J. "Improving Service Quality and Efficiency Through the Use of Service Standards." Paper presented at TSM Conference, Transportation Research Board, November 7-10, 1976, Hotel Leamington, Minneapolis, Minnesota.

Paper describes the MBTA's Service Policy for Surface Public Transportation and its use in urban transportation system management. Asserts that such a policy provides framework for monitoring service performance and identifying remedial actions to improve quality of service and allocation of resources.

Toronto Transit Commission. Policies for Discussion: Standards for Evaluating Existing and Proposed Routes. Toronto: 1977.

Presents a methodology for evaluating existing and proposed routes on basis of route economics, access to transit, transit dependency, transit travel time, land use planning impacts, and physical constraints. Provides detailed methods for determining economic performance and access characteristics of routes, along with initial discussion. Methods of projecting ridership on new routes are discussed and a case study included.

Vuchic, Vukan R., Edson L. Tennyson, and William C. Underwood. "Application of Guidelines for Improving Transit Service and Operating Efficiency." Transportation Research Record, No. 519, 1974.

Review of the evaluation processes for grant requests within the Pennsylvania Mass Transportation Assistance Program. The Pennsylvania system specifies operating guidelines and service standards, then establishes the evaluation and enforcement procedures necessary to ensure compliance--either voluntarily or through fiscal leverage.

LABOR

Barnum, Darold T. From Public to Private: Labor Relations in Urban Mass Transit. Lubbock, Tex.: Texas Tech University Press, forthcoming.

Comprehensive study of collective bargaining in American urban transit, including history of the transit unions, membership problems, the Federal role in shaping bargaining, and productivity. Chapters Five and Six focus on worker earnings, fringe benefits, and productivity. Provides a statistical analysis of productivity in bus transit systems for last decade. Determines that type of ownership (public or private) and property size (number of employees) were the significant factors determining worker productivity. Concludes that public ownership and smaller size, lead to higher productivity.

Lieb, Robert C. Labor in the Transit Industry. Washington, D.C.: U.S. Department of Transportation, 1976.

This study examines the labor component of the transit industry to provide an understanding of this matter which might be useful in developing future policies and programs. Among the matters examined are employment and compensation trends, labor/management relations, government involvement in transit labor and employee productivity.

Mundy, Ray A., and John C. Spsychalski. Managerial Resources and Personnel Practices in Urban Mass Transportation. n.p.: The Pennsylvania State University College of Business Administration, 1973.

A survey of urban transit managerial personnel conditions, practices and policies in transit systems in the U.S. and Canada. Findings: lack of planning for management personnel development; inadequate personnel resources, training and development programs; most trained management people will retire soon, with few back-up people trained to replace them.

New York State. Office of the State Controller. Summary of Audit Reports on New York City Transit Authority Operations. Albany, N.Y.: New York State. Office of the State Controller, 1976.

The audits examined employee utilization and productivity in car cleaning, car inspection, maintenance, and token booth operations, as well as purchasing and inventory practices, over-time practices, and other matters. Comparisons were made with other properties. Recommendations for improved performance and lower costs were included.

Yunich, David L. "Public Transportation Efficiency and Productivity." Paper presented at the 1976 APTA Annual Meeting, Hilton Hotel, San Francisco, California, October 20, 1976.

Outlines the New York Metropolitan Transportation Authority's productivity bargaining labor contract, as well as their productivity improvement manuals for servicing vehicles.

Wilson, David Gordon. "Incentives in a Metropolitan Public Transportation System." Proceedings of the 1976 Intersociety Conference on Transportation, Los Angeles, July 1976.

MBTA legislation claims that early legislation affecting MBTA had widespread disincentives to productivity due to (1) accounting practices that assessed communities based on number of passengers picked up, (2) bus costing procedures, (3) decreased employee morale due to political patronage system, (4) veto power of every group over other groups, (5) increased union competition and overall increased wage and benefits, (6) lack of incentives for individual sections to be efficient. Reviews proposed legislation which revises accounting of bus costs to reflect fixed costs, hourly (peak vs. off-peak) costs, and mileage costs, which would provide incentives to increase ridership in off-peak. Also encourages employees to provide better service at lower costs by instituting profit-sharing for towns and employees.

MAINTENANCE

Haenisch, George C., and Floyd G. Miller. "Increasing Productivity in Bus Maintenance Functions." Proceedings of the 27th Annual AIEE Conference and Convention. St. Louis, May 18-21, 1976. Atlanta, Ga.: American Institute of Industrial Engineers, 1976.

Describes a joint effort between members of the Methods and Standards area of the Chicago Transit Authority and the Department of Systems Engineering, University of Illinois at Chicago Circle. Objective is to determine standard performing times and procedures for specific bus maintenance tasks. As a result of the study, productivity gains are in excess of 30%.

Martin-Vega, Louis A. Increasing Efficiency in Bus Maintenance Operations. Prepared for Commonwealth of Puerto Rico Metropolitan Bus Authority. Mayaguez, Puerto Rico: Transportation Research Institute, University of Puerto Rico, 1976.

Shop performance and productivity is evaluated on the basis of fleet and shop analyses. An integrated control system is developed for routine utilization of shop data and monitoring of future shop performance. Recommendations for increasing maintenance efficiency are presented.

The Mitre Corporation. Bus Maintenance Facilities: A Transit Management Handbook. Washington, D.C.: U.S. Department of Transportation, 1975.

Guidelines are given for estimating the cost of a new maintenance facility by transit management. A background of recent construction costs is provided, including cost parameters (in dollars per square foot) for maintenance functions of bus storage, shops and servicing.

The Mitre Corporation. SIMS Implementation Handbook. Washington, D.C.: U.S. Department of Transportation, 1974.

The Service, Inventory, and Maintenance System (SIMS) has been developed to aid bus transit properties in managing their servicing and maintenance activities. This automated information system is currently operational and consists of three components: the Service/Unit Change System, Inventory System, and Repair Cost System. General descriptions of the system's data requirements and the reports it produces have been published, and detailed soft-ware documentation is available for each of the three components. This handbook furnishes guidance to management in planning the implementation of the SIMS components at individual properties by outlining such steps as data base generation, training, and acquisition of data processing services.

APPENDIX A
CHRONOLOGY OF EVENTS
SEATTLE PART-TIME BUS DRIVER AGREEMENT

- January 1977 Metro Transit begins an internal staff review of the work rules under the existing labor contract.
- March 1977 Metro Transit management decides to seek the use of part-time drivers.
- May 1977 Metro Council affirms this decision and staff begins preparations for the contract negotiations
- August 1, 1977 Metro Transit and Division 587 of the Amalgamated Transit Union exchange demands.
- September 1, 1977 Negotiations begin.
- October 28, 1977 Federal mediator appears.
- October 31, 1977 Old labor contract expires.
- Seattle City Council adopts and funds an emergency plan, to be used in the event of a transit strike, which provides for--
- Assistance in forming car pools.
 - Relaxed downtown parking restrictions.
 - Use of Kingdome and Seattle Center parking facilities.
 - Use of a private operator to shuttle parkers between Seattle Center and downtown at a 15¢ fare.
 - Special contract services for senior citizens.
- November 3, 1977 Division 587 authorizes a strike vote November 14. Union members and leaders are reported by the Post-Intelligencer to be talking about "strike alternatives," such as a sick-out or slow-down, starting the day after Thanksgiving. Division 587 Business Agent John A Senear refers to the "disastrous effects of a strike," citing the Boeing Company strike then in progress. Senear is reported as telling the union members that Metro has given the union "nearly everything it has asked for, except they want us to accept part-time employees, which we cannot do."
- November 6, 1977 Division 587 again authorizes a strike vote November 14.
- November 7, 1977 Seattle School District officials say they are planning alternative transportation for 1,700 students, using mainly the private contract carrier which already transports more than 11,000 Seattle students.

- November 14, 1977, Division 587 takes a formal strike vote. 870 voted. Senear says that the yes vote is "way over the required 66 per cent."
- November 16, 1977, Strike sanction is granted by the King County Labor Council.
- November 22, 1977, Some 170 drivers meet to discuss a slowdown. Senear says the meeting is not sanctioned by the union.
- November 25, 1977, Metro Transit annuls 141 of 540 morning runs and one-third of its afternoon peak runs when 234 drivers report sick. The normal sick report is 50.
- November 28, 1977, Metro Executive Director Peterson and Transit Director Collins enter the bargaining sessions for the first time.
- December 1, 1977, Division 587 officials recommend against acceptance of a contract proposed by Metro Transit because the part-time employee issue has not been resolved.
- December 2, 1977, 200 sick-outs cause 170 of 1,060 runs to be annulled.
- December 5, 1977, Division 587, with two-thirds of its members voting, rejects the Metro contract proposal by a majority of 96.5%.
- December 7, 1977, Metro Council Chairman C. Carey Donworth tells a press conference that the economic benefits which have been negotiated cannot be afforded unless the use of part-time drivers is permitted. Senear says, "I see no way out of a strike if they maintain their present position."
- December 8, 1977, The Post-Intelligencer says that "an early settlement appears remote" and quotes Division 587 President Wendell Duncan as saying "We want to avoid [a strike] at all costs."
- December 14, 1977, The third sick-out annuls 62 of 522 morning runs and 100 out of 550 afternoon runs. The sick-out continued on December 15.
- December 16, 1977, A second Metro Transit proposal goes to a vote with no recommendation from the union officials. The new proposal guarantees 900 full-time jobs, gives full retention priority to full-time drivers in the event of a layoff, and reserves runs for special events and on weekends to full-time employees. The proposal is defeated 788 to 568.
- December 19, 1977, A union meeting is held at 11 A.M. Only 19 of 247 buses remain in operation during the meeting. Metro Transit announces that it will take disciplinary action against the drivers--a threat which is later withdrawn because Metro wants "to set up the best possible atmosphere" for the resumption of negotiations.

- December 21, 1977, Negotiations resume. Some drivers refuse to accept overtime work, causing cancellation of 14 morning runs and 25 afternoon runs.
- December 27, 1977, Overtime work again refused.
- December 28, 1977, The Federal Mediator announces that a tentative agreement has been reached.
- December 29, 1977, Division 587 officials announce they will recommend acceptance of the tentative agreement.
- December 30, 1977, Metro Council labor subcommittee recommends that the Metro Council approve the tentative agreement.
- January 2, 1978, Dissident drivers lobby for the defeat of the tentative agreement and call for the resignation of the Division 587 Business Agent.
- January 9, 1978, The tentative agreement is accepted by Division 587 by a vote of 725 to 606.

APPENDIX B

EXCERPTS FROM THE SEATTLE AGREEMENT RELATING TO TRIPPER OPERATORS

ARTICLE XII

TRANSIT OPERATORS

SECTION 1 - DEFINITIONS OF EMPLOYEES

A. "Regular and Extra Board Operator" shall mean a person or persons employed by Metro on a regular full-time continuing basis. Upon qualification as a Transit Operator such employee will serve a six-month probationary period. When satisfactorily completing this evaluation period, the employee will enjoy all rights of the Metro regulations, including the right [of] appeal. Such employee will be eligible for qualified employee benefits the first of the month following thirty (30) days of service.

"Regular" shall refer to regular full-time employees who pick regular runs. "Extra Board" shall refer to regular full-time employees who work the extra board. The following conditions shall apply to full-time Transit Operators (Regular and Extra Board Operators) upon the employment of Tripper Operators by Metro.

1. Full-time Operators will not be required to accept Tripper Operator status.
2. Full-time Operators will not be subject to layoff until all Tripper Operators employed by Metro are laid off.
3. Assignment of specials and leases will be made to full-time Operators only.
4. The number of Regular and Extra Board Operators will always exceed the number of Tripper Operators.
5. Metro guarantees to full-time Operators the existing amount of overtime trippers worked on November 1, 1977, or the average of the overtime trippers worked in calendar year 1977 in the form of overtime trippers, or sixty (60) trippers, whichever is greater. This number will remain available for full-time Operators in 1978, 1979, and 1980. In addition, this overtime available to full-time Operators will be increased by 10% in 1978 and by 10% in 1979. If this work is not worked by Regular Operators, then it can be worked by Tripper Operators.

6. All reports will be worked by full-time Operators.
7. All vacation reliefs will be worked by full-time Operators.
8. Work left vacant because of the absence of full-time Operators will be worked by full-time Operators.
9. The number of all regular runs, frag runs, and combos in effect November 1, 1977, shall not be jeopardized by the hiring of Tripper Operators. Metro has no intention of changing, eliminating, or altering such runs to give Tripper Operators additional work. The current number of these runs shall remain in effect; however, Metro has the flexibility of eliminating up to 10% of all of these runs in the event of low ridership or low revenue.
10. Metro currently employs one thousand one hundred fifty (1,150) full-time transit operators. This number will be reduced only through voluntary retirements and attrition during the life of this Agreement provided the number of full-time Transit Operators shall not be reduced below nine-hundred (900). Any full-time Operator terminated by Metro for disciplinary reasons will be replaced by a full-time Transit Operator. During the life of this Agreement, Metro agrees to hire a minimum of one hundred (100) full-time operators.
11. In the event no Tripper Operators are employed, Metro shall not be bound by the guarantees numbered one through ten (1-10) in this Section of Article XII.

B. "Tripper Operator" shall mean a person who is employed by Metro on a continuing basis whose regularly scheduled assignment shall be trippers and who will be guaranteed one and one-half (1-1/2) hours straight-time pay or actual hours worked, whichever is greater, for each tripper worked. Tripper Operators will only be assigned to specific trippers by Metro. Tripper Operators will not be allowed to work on Saturday, on Sunday, or on holidays when a weekday schedule is not worked. Upon qualification as a Transit Operator, Tripper Operators will serve a probationary period of one thousand forty-four (1,044) work hours, the equivalent of six (6) months full-time work. The pay rate for Tripper Operators will be based on current rates in force for Transit Operators. For purposes of pay, Tripper Operators will be eligible for a step increase after completion of two thousand eighty-eight (2,088) hours of work and subsequently after completion of each one thousand forty-four (1,044) hours of work until the top step is reached. Tripper Operators will be eligible for only the following benefits: standard uniform allowance, transit pass, social security, and retirement, provided the employee meets eligibility requirements established by State law. Tripper Operators shall be required to become a member of the Union and Metro agrees

to deduct the regular initiation fee and regular monthly dues as specified in Article II, Section 1 and 2 of this Agreement. All Tripper Operators shall come under the conditions of this Agreement in reference to Union membership, grievance procedure, arbitration, and Union representation.

C. "Group D Operators" Regular and Extra Board Operators who desire to work on a part-time basis while attending school may be transferred to "Group D" providing they have completed one continuous year of service as a Regular or Extra Board Operator immediately preceding transfer to this group and subject to the following conditions:

1. Group D Operators will be paid their normal hourly rate per the wage agreement as Operators, but will not have any guarantee.
2. Group D Operators must be available seven (7) days per week and will work at least five (5) days per week, but will not have any regular days off.
3. Group D Operators work will be confined solely to trippers on weekdays but may be used on other work on Saturdays, Sundays, and holidays, providing that all full-time Operators will have preference over them in work assignments.
4. Group D Operators will not earn any vacation credit and will not be entitled to any fringe benefits, except the minimum standard uniform allowance, transit pass, social security and retirement, provided the employee meets eligibility requirements established by State law.
5. Operators desiring to transfer to Group D must first secure approval from the Union and Metro, and once transferred must remain in that group for the quarter or semester registered for, and up to and including the first day of the following quarter or semester or the last day of classes preceding the summer vacation period.

