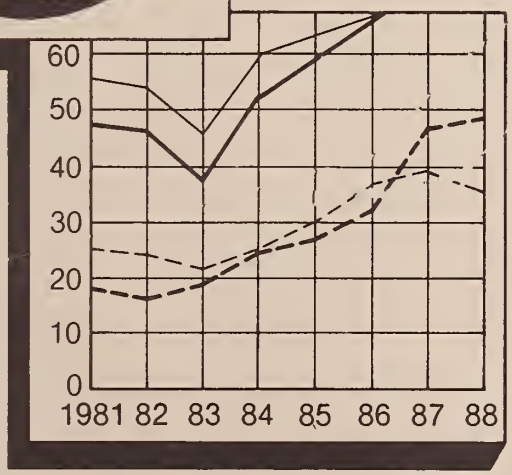
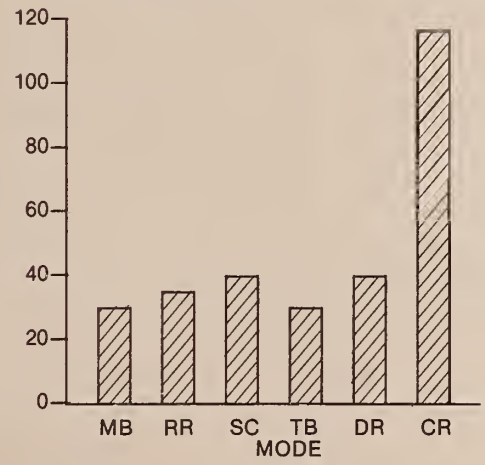
U.S. Department
of Transportation

**Urban Mass
Transportation
Administration**

COMPENDIUM OF NATIONAL URBAN MASS TRANSPORTATION STATISTICS

from the 1988 Section 15 Report





UMTA Office of Grants Management
Office of Capital and Formula Assistance
Audit Review and Analysis Division

COMPENDIUM

OF

NATIONAL URBAN MASS

TRANSPORTATION STATISTICS

FOR THE 1988 REPORT YEAR

FROM THE SECTION 15 REPORT

MAY 1991

OFFICE OF CAPITAL AND FORMULA ASSISTANCE
AUDIT REVIEW AND ANALYSIS DIVISION

Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.

4. Title and Subtitle

COMPENDIUM OF NATIONAL URBAN MASS TRANSPORTATION STATISTICS: 1988 REPORT YEAR

5. Report Date
May 1991

6. Performing Organization Code

7. Author(s)

F. T. PACHLER, JR., R. L. JORDAN, J. PAI, B. A. LEDERER

8. Performing Organization Report No.

9. Performing Organization Name and Address

Materials, Communication and Computers, Inc.
1500 N. Beauregard Street, Suite 207
Alexandria, Virginia 22311

10. Work Unit No. (TRAIS)

11. Contract or Grant No.
DTUM60-89-C-41008

12. Sponsoring Agency Name and Address

U.S. Department of Transportation
Urban Mass Transportation Administration
400 Seventh Street, S.W.
Washington, D.C. 20590

13. Type of Report and Period Covered

Annual Report,
January 1, 1988 to
December 31, 1988

14. Sponsoring Agency Code
UGM

15. Supplementary Notes

16. Abstract

This report provides summary statistics on the finances and operations of the United States' public transit systems for the 1988 calendar year. These statistics were derived from the database developed through the Urban Mass Transportation Administration's Section 15 Reporting System. This report is intended to complement the National Urban Mass Transportation Statistics: Section 15 Annual Report issued by the Urban Mass Transportation Administration since 1980. That report contains aggregate transit statistics, but focuses principally on the finances and operations of individual transit systems. By contrast, the Compendium provides a national, policy-oriented perspective, highlighting aggregate financial and operational characteristics.

In this report, national transit industry financial operational characteristics are illustrated through use of 1) graphics designed to emphasize key transit industry patterns, 2) policy relevant statistics and aggregations, and 3) trend information incorporating statistics from the Section 15 database 1984, 1985, 1986, 1987 and 1988. These characteristics are examined in three chapters: Chapter I - Financial Statistics; Chapter II - Operational Statistics; and Chapter III - Performance Measures. The report also includes an Introduction designed to acquaint readers with the statistics and alert them to issues affecting their use.

17. Key Words	18. Distribution Statement
Mass and Public Transportation Revenues, Expenses, Performance Measures Urbanized Area, Service Supply, Service Utilization, Fleet Size, VOMS	This report is available to the public through the National Technical Information Service in Springfield, VA 22161

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price
UNCLASSIFIED	UNCLASSIFIED	193	

INSIDE

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

LIST OF TABLES

PREFACE

PREFACE

The 1988 Compendium of National Urban Mass Transportation Statistics (the Compendium) was prepared by Materials, Communication & Computers, Inc. in association with Hickling Corporation, under contract #DTUM60-89-C-41008 with the U.S. Department of Transportation, Urban Mass Transportation Administration (UMTA), Office of Grants Management. It furnishes a national, policy-oriented perspective on the finances, operations and performance of the U.S. public transportation industry. The Compendium complements the Section 15 Reporting System's annual publication, National Urban Mass Transportation Statistics: 1988 Section 15 Annual Report (commonly known as the Annual Report).

The Annual Report focuses on individual transit system statistics. The Compendium takes an industry-wide view, emphasizing statistics and aggregations that are useful in policy setting. The Compendium grows out of an effort to construct a Section 15 micro-computer database that can be easily accessed by researchers, transit managers, and policy analysts. To create this database, information from the Section 15 data tapes, produced at the Transportation Systems Center, is tabulated using Lotus 1-2-3. The resulting formatted database can be used to conduct statistical analyses. The 1988 version of the database was used in developing this report. The Compendium also includes information from the Annual Report of fiscal years 1984, 1985, 1986, 1987, 1988.

The Compendium uses graphs extensively. Many users of the Annual Report have felt that the great volume of statistics and tables in the Annual Report obscures important patterns. The graphic representations included in the Compendium are intended to help the reader visualize those patterns and trends. Graphs and tables appear together, for quick interpretation of the information presented in the tables. In some cases, the graphs include all the information in the tables. In other cases, graphs trace only the more significant data items and patterns.

INTRODUCTION

INTRODUCTION - UNDERSTANDING AND USING THIS REPORT

This is the seventh Compendium of National Urban Mass Transportation Statistics; the first, a prototype, was intended largely for use by UMTA staff. The second and third Compendium, which were distributed more widely, provided summary statistics on the finances and operations of U.S. public transit systems for calendar years 1983 and 1984. This Compendium generally follows the content and format of the 1987 Compendium and is, like it, intended for national distribution.

The statistics were derived from a database developed through the Urban Mass Transportation's Section 15 Reporting System. The Compendium complements the National Urban Mass Transportation Statistics: the Section 15 Annual Report issued by the Urban Mass Transportation Administration since 1981 beginning with data from 1979. That report contains aggregate transit statistics, but focuses principally on the finances and operations of individual transit systems. By contrast, the Compendium provides a national, policy-oriented perspective highlighting aggregate financial and operational characteristics and trend information for key statistics and performance indicators. The level of accuracy of the data between the Annual Report and the Compendium is the same.

In this report, national transit industry financial and operational characteristics are illustrated through 1) graphic displays designed to show key transit industry patterns, 2) policy-relevant statistics and aggregations, and 3) trend information incorporating statistics from the Section 15 database for years 1984 through 1988.

Efforts have been made to present this information logically and consistently and to direct the reader's attention to key trends and patterns. Each chapter contains an introduction designed to help the reader interpret and use the statistics. Brief commentaries highlight salient patterns and trends revealed in the charts and tables. The report is also organized in a way that permits researchers and analysts to reference the Annual Report for more in-depth examinations of industry and transit agency statistics.

REPORT ORGANIZATION

The Compendium is organized into three chapters:

CHAPTER I - FINANCIAL STATISTICS - This chapter describes transit agency revenue sources and expenses, grouping this information according to fleet size and urbanized area population.

CHAPTER II - OPERATING STATISTICS - This chapter describes the scope and magnitude of public transit operations in terms of inputs (labor and vehicles)and outputs (services provided and public use of these services).

CHAPTER III - PERFORMANCE MEASURES - This chapter contains selected service performance measures. Indices of this type typically relate service output and use to service cost or other measures. These relationships can be used to gain broad insights into the industry's efficiency and effectiveness in serving public transportation markets.

ORGANIZATION OF TABLES AND GRAPHS

The tables analyze transit system statistics according to system fleet size and according to urbanized area population size.

System size groups correspond to the transit agency aggregations used in the Annual Report. Fleet size groups are based on the number of vehicles operated in maximum service. Maximum service is the revenue vehicle count taken during the reporter's maximum season of the year, on the week and day that the maximum occurs (but not if a special event or extreme set of circumstances fell on this day). It reflects a recurring maximum (or peak) service requirement. Productivity and performance measures relating to fleet size thus reflect regular peak service rather than fleet held for spares and other purposes.

There are seven fleet sizes:

- 1) less than 25 vehicles;
- 2) 25-49 vehicles;
- 3) 50-99 vehicles;
- 4) 100-249 vehicles;
- 5) 250-499 vehicles;
- 6) 500-999 vehicles; and
- 7) 1000 and more vehicles.

Depending on the specific table, the seven fleet size categories are applied in one of two ways. When a table describes system-wide characteristics, fleet size refers to all the vehicles in the fleet in every mode. When a table describes modal characteristics, fleet size refers to the number of vehicles of that particular mode only in the fleet.

The second type of classification, size of urbanized area, is used to furnish a policy perspective, reflecting the fact that the Section 9 block grant program, the principle source of Federal transit support, apportions funds to urbanized areas. Six urbanized area population sizes are employed in the report:

- 1) 50,000-99,999;
- 2) 100,000-199,999;
- 3) 200,000-499,999;
- 4) 500,000-999,999;
- 5) 1,000,000-1,999,999; and
- 6) 2,000,000 and over.

The financial and operational data in this report generally use the statistical classifications used in the Annual Report. Transit revenues are classified by object class. Each class represents a specific type of revenue source and are reported by transit system totals and not by individual modes. Operating expenses are organized into object class and function categories and are reported by individual modes. The object classes (i.e., expense categories) define the kind of expenditure (labor, fringe benefits, materials, etc.) and the function categories define the type of activity performed in incurring the expense (vehicle operations, vehicle maintenance, non-vehicle maintenance and general administration).

Operational statistics also are grouped in the same manner as in the Annual Report such as the number of vehicle miles, passenger miles, accidents, and employees.

In keeping with this document's national focus, the statistics in the Compendium have, in some cases, required combining two or more of the Section 15 object classes in order to focus more sharply on statistics of interest to policy analysts and researchers. When expense object classes have been combined, these aggregations are described in the chapter introductions.

DATA SOURCES AND ACCURACY

All public transit systems receiving Federal funds through the Section 9 block grant program are required to file an annual Section 15 report; other public and private transit systems may report but are not required to do so. The financial and operational information in Section 15 reports is the most comprehensive source of information on transit revenues, expenses and operations.

Before the information is entered into the database, each system's report is reviewed for inconsistencies and errors. This review identifies and resolves questions of data completeness and accuracy. UMTA must give final approval to a system's data before it can be entered into Section 15 database and Annual Report. UMTA can reject a transit system's report if the report is not in full compliance with reporting requirements or UMTA can choose not to enter any data item that seems unreliable. UMTA does not, however, change any reported data; all data changes are made by the transit system.

The review involves a series of range and reasonableness checks to screen questionable data. These procedures, referred to as the "data validation process," are central to efforts to create an accurate and reliable database. UMTA has sought to improve data validation procedures from the very outset of the Section 15 program through the development of more thorough, organized, and focused data screening procedures. Nevertheless, the limitations of range and reasonableness checks and the vast amount of information that must be validated make it likely that some errors will still find their way into the database.

Inconsistencies stem from difficulties experienced by transit systems in obtaining accurate information and in interpreting certain reporting requirements. Those difficulties will be remedied as transit systems become more familiar with Section 15 reporting guidelines and as UMTA works to specify those guidelines more clearly.

CHANGES TO THE ANNUAL SECTION 15 DATABASE

This document contains trend information covering five Section 15 reporting years, 1984 through 1988. Certain changes in the Section 15 database during these five years affect the comparability of the information and the validity of the trends presented in this report. Although the original Section 15 reporting requirements have remained largely intact since the program's implementation, the quality of information in the database, the composition of the database itself, and the way in which the reported statistics are aggregated have changed.

Data Quality

Every year refinements in the data validation process have led to improvements in the reliability and consistency of Section 15 information. The degree of improvement is difficult to quantify, but clearly the databases are improving. However, there are still problems. For example, some transit systems have reported total vehicle miles and hours equal to vehicle revenue miles and hours (implying vehicles are always providing service to passengers and never deadhead). This reporting practice generally overreporting revenue service. Secondly, some transit systems data for vehicle revenue miles, unlinked passenger trips, and passenger miles were recorded as zeros; this leads to some underreporting. We do not believe that these errors significantly affect the data presented in the Compendium, especially since the data are aggregated and presented in broad categories in most of the tables.

Database Composition

Changes in the composition of the Section 15 database, for the 1984 through 1988 report years, are easier to pinpoint. Between 1984 and 1988, the number of transit systems included in the Section 15 database increased from 438 to 468 (see Table I-1). This 7 percent increase is largely attributable to growth in the number of applications for Federal assistance, and the fact that transit systems now have a better understanding of Section 15 reporting requirements and therefore are more likely to have their reports incorporated into the annual database. Table I-2 lists the six major public transit modes and shows how many systems reported in each mode included in the Section 15 database for the 1984 through 1988 report years.

Perhaps the single greatest change in the composition of the Section 15 database was the addition of commuter rail services in 1983. UMTA had sought in previous years to collect commuter rail statistics and incorporate them into the database, but confusion about how and even whether Section 15 reporting requirements

Table I-1
SECTION 15 DATABASE: SYSTEM COMPOSITION, 1984 to 1988

Fiscal Year End	1984	1985	1986	1987	1988
Number of Systems	438	453	432	451	468

TABLE I-2
SECTION 15 DATABASE: MODAL COMPOSITION, 1984 TO 1988

Fiscal Year	1984	1985	1986	1987	1988
Motor Bus	379	396	374	383	393
Rapid Rail	12	12	12	12	12
Streetcar	9	8	10	12	14
Trolley Bus	5	5	5	5	5
Demand Response	238	243	245	261	287
Commuter Rail	18	16	15	14	14

applied to commuter rail services limited the number of commuter rail reporters. Much of the confusion, however, was resolved with the establishment of Section 9 funding provisions that apportioned Federal funds on the basis of Section 15 operating statistics. Most commuter rail systems are now reporting regularly under the Section 15 program. In order to accommodate these new reporters, UMTA initially reduced Section 15 reporting requirements for commuter rail reporters. In the 1985 Compendium, complete commuter rail data are presented along with data for the other five modes.

Direct and Purchased Service Guidelines

The third change in the Section 15 database relates to the way in which purchased transportation statistics are reported and aggregated. Until the 1983 reporting year, Section 15 reporting procedures did not require that transit agencies list the full costs of providing purchased transportation, nor did they require that agencies allocate transit operating statistics between directly operated and purchased services. Reporting agencies were required simply to report the expense of purchasing transportation as a single line item and to report purchased transportation operating statistics, such as vehicle miles and passenger trips, as part of overall system operating statistics. Since the cost of purchasing transportation generally reflects contract costs only and not the full costs (such as contract administration, marketing and other costs provided by some municipalities) incurred in supplying the services, service costs were underrepresented and the relationships among service costs, service supply, and service use were misrepresented.

New purchase-of-service reporting guidelines have remedied these two interrelated problems. The guidelines require that 1) contract carriers using fifty or more vehicles to supply contract services must file a full Section 15 report, and 2) reporting agencies must distinguish between operating statistics for directly operated services and for purchased services. The benefits of these guidelines are clear and evident in this report: more accurate representation of costs and a clearer picture of direct and purchased services. Nevertheless, it is important to recognize that the introduction of the guidelines affects the comparability of the statistics from year to year, notably the trend information in Chapter III, "Performance Measures."

Reporting Cycle

Starting with the 1983 report, UMTA changed to a calendar year reporting period, i.e., a reporting period that runs from January 1 to December 31. In previous reporting years, the Section 15 reporting system used a July 1 to June 30 reporting year. Thus, reports submitted, for example, by transit systems with fiscal years ending 30 September 1982 and 30 June 1983 would ordinarily be grouped into the 1983 database and the statistics from those reports would appear in the 1983 Annual Report. The calendar reporting period, by contrast, yields a somewhat different grouping of reports. Under

it, all transit agencies whose fiscal year ends in the same calendar year (i.e. January 1 through December 31) are grouped into the same database and Annual Report. Thus, the 1983 database contains information from reports that cover fiscal years ending between January 1, 1983, and December 31, 1983, only.

The change to calendar year reporting was made to help end confusion between transit agencies' fiscal years and the Section 15 reporting year. It did not affect Section 15 reporting requirements, transit system fiscal years, or the types of data contained in the Section 15 reports submitted by transit systems. The change created a one time only 6-month transition period for transit systems with fiscal years ending on or between July 1, 1982 and December 31, 1982. The data from these systems were not published, but were stored in the computerized database. The data summarized in the 1988 Annual Report and Compendium are from transit system's fiscal years ending on or between January 1, 1988 and December 31, 1988.

CHAPTER I

CHAPTER I -- FINANCIAL STATISTICS

OVERVIEW

Chapter I examines transit industry revenue sources and operating expenses. Revenue information comes from the Section 15 200 series forms, while the expense information comes from 300 series forms. Only selected R ("Required") level information is used. For more detailed information on individual transit system revenues for fiscal year 1988, the reader is directed to Table 3.01 through Table 3.06 in the Annual Report. For detailed expense information, the reader is directed to Table 3.07 through Table 3.10.

Several common features in the graphs and tables are presented in this Chapter. All numbers are in percentages except for the second total, (marked $ million, this is the second-to-the last row), which reflects total dollars and the row denoting the "Systems Reporting" (this is the last row). Thus to determine the actual dollar amount for a specific data item, you need only multiply the percentage by the total dollar amount presented in the same column. System-wide percentages and totals are presented on most charts and tables.

The financial data in this chapter are aggregated according to fleet size and urbanized area size. Both the revenue and expense information are categorized by fleet size. Urbanized area size categories groupings, by contrast, are applied to revenue source breakdowns only, reflecting the fact that UMTA transit assistance programs apportion monies to urbanized areas, not individual transit systems. The revenue tables and charts offer policy analysts a clearer picture of the impacts of funding decisions and of the relationship between Federal, state, and local assistance and other revenue sources.

TRANSIT SYSTEM REVENUES

Under Section 15 reporting guidelines, transit systems report their revenues by source across the entire system not by mode. In the Compendium, system-wide totals are aggregated in urbanized area and system fleet size peer groups, and are examined from the perspective of two time periods: 1) the 1988 reporting year and 2) the 1984 through 1988 reporting years. Tables and charts for 1988 supply a "snapshot" of transit agency and urbanized revenue sources for the most recent year covered in the Section 15 database. Those covering five fiscal years point up revenue source trends for the entire industry.

Transit Operating Revenue

To best describe the sources of transit industry operating revenue, the ten revenue source categories in the Section 15 Report are collapsed into seven categories. The seven revenue source categories (and their relationship to the categories in the Annual Report) are as follows:

- Passenger Fares - This category corresponds directly to the Annual Report's Passenger Fare and Other Transportation Revenue.
- System Generated - This category corresponds to the Annual Report's Non-transportation Revenue.
- Local Assistance - This category includes the Annual Report's Local Cash Grants and Reimbursements and Local Special Fare Assistance.
- State Assistance - This category the includes the Annual Report's State Cash Grants and Reimbursements and State Special Fare Assistance.
- Federal Assistance - This category corresponds directly to the Annual Report's Federal Cash Grants and Reimbursements.
- Taxes Levied by Transit Systems - This category corresponds directly to the Annual Report's Taxes Levied by Transit System category.

- Miscellaneous - This category corresponds directly to the Annual Report's Other Revenue.

Transit Capital and Operating Assistance

For the same reason, the categories describing capital assistance and operating assistance sources are also aggregations of the categories employed in the Annual Report. Here capital and operating assistance are both defined under five general categories:

- Federal Assistance - For operating assistance, this category includes the Annual Report's Section 5, Section 9 and Other Federal Funds. For capital assistance, it includes UMTA Section 3 and Section 5 and 9 programs and other UMTA, DOT and Federal sources.

- State General Revenue - These funds are appropriated by the state out of its general revenue funds.

- State Dedicated Revenue - For operating assistance and capital assistance, this category includes dedicated funds from taxes, tolls and other sources.

- Local General Revenue - These funds are appropriated by the locality out of its general revenue funds.

- Local Dedicated Revenue - For operating assistance and capital assistance, this category includes dedicated funds from taxes, tolls and other sources.

TRANSIT SYSTEM OPERATING EXPENSES

In the Section 15 reporting system, operating expenses are reported by mode. In each mode, expenses are jointly allocated among functional categories and object class categories. Functional categories are the general operational areas in which expenses are incurred, including Vehicle Operations, Vehicle Maintenance, Non-Vehicle Maintenance, and General Administration. Object classes categories are the purposes for which the expenditure was made, such as labor, supplies, or fringe benefits. Thus, the direct labor expense for a maintenance mechanic repairing a vehicle would be recorded within the expense object class "labor" and under the function class "vehicle maintenance" .

Seven object class categories are employed in the statistical tables in this report. These categories represent an aggregation of the fourteen Required Level object classes utilized in the Section 15 Annual Report. The seven object class categories include:

- Labor - This category includes the Annual Report's Operator Salaries and Wages and Other Salaries and Wages.

- Fringes - This category corresponds directly to the Annual Report's Fringe Benefits.

- Services - This category corresponds directly to the Annual Report's Services object class.

- Materials - This category includes the Annual Report's Fuel & Lubricants, Tires & Tubes, and Other Materials & Supplies.

- Utilities - This category corresponds to the Annual Report's Utilities.

- Purchased Transportation - This category combines the Annual Report's Purchased Transportation object class for services involving fifty or fewer vehicles with the Purchased Transportation object class for services involving more than fifty vehicles.

- Miscellaneous - This category includes the Annual Report's Casualty & Liability Expense, and Other Expense.

Together, the tables and charts in this report present expense object class breakdowns for six major public transit modes: Motor Bus, Rapid Rail, Streetcar, Trolley Bus, Commuter Rail, and Demand Response.

Overall expenses are slightly understated for two reasons. First, for any given mode, total object class expenses do not include joint modal expenses reported by multi-modal transit systems; these operating expenses are not solely attributable to a single mode. In the Annual Report, joint expenses are summarized without respect to mode in a separate table. No attempt, however, has been made to allocate joint expenses among object classes.

Second, reconciling items (e.g., interest expenses, depreciation, leases and rentals) are excluded from operating expenses. Section 15 does not require that these expenses be disaggregated by mode. It is therefore not possible to allocate these expenses by mode. This exclusion does not undermine the usefulness of the data presented here. Indeed, analysts using Section 15 data typically remove reconciling items from operating costs. Reconciling items are fundamentally incomparable because of the diversity of accounting practices used to handle such expenses.

PATTERNS AND TRENDS

Below are descriptions of some of the key financial patterns revealed in the tables and charts in this chapter.

Transit System Revenues

- Passenger fares, which were 37.6 percent of total system operating revenues in 1988, represented the largest single source of operating revenues for transit systems. Passenger fares generated $3.23 billion for the ten largest transit systems in 1988.

- Generally, local (dedicated and general) assistance was the second largest source of operating revenue. State and local governments furnished the bulk of transit subsidies, together providing 44.9 percent of the transit system revenues in 1988. About forty percent of state and local revenues were dedicated revenues; the balance were general funds.

- In general, smaller transit systems tended to rely more on Federal assistance. In 1988 Federal funds represented 17.6 percent of the operating revenue for transit systems with 25 to 49 vehicles and only 4.5 percent of the operating revenue for transit systems with 1,000 or more vehicles. Overall Federal funds provided 6.2 percent of transit operating revenue in 1988.

- Between 1984 and 1988 the following changes occurred in funding sources for transit operating assistance:

  -- Federal operating assistance declined by $71.7 million, an average 2.0 percent per year.

  -- State operating assistance increased by 47.0 percent (from $1,744.3 million to $2,564.7 million). This was an average increase in state operating assistance of 10.1 percent per year.

  -- Local operating assistance increased by 36.2 percent (from $2,707.9 million to $3,687.2 million). This was an average increase in local operating assistance of 8 percent per year.

- Between 1984 and 1988 operating revenues have increased by $3.84 billion, from $10.04 billion to $13.88 billion, an average annual increase of 8.4 percent. There was increase of 28 systems reporting in 1988 over 1984, increasing from 436 systems to 464 systems.

- While passenger fares between 1984 and 1988 represents the largest single source of operating revenue for transit systems, its share has declined from 39.3 percent to 37.6 percent of operating revenue. However, the total dollar value has increased from $3.95 billion in 1984 to $5.22 billion in 1988, an increase of $1.27 billion or an average annual increase of 7.3 percent.

- Total percentage of Federal capital assistance (from all Federal sources) declined from 69.6 percent to 66.6 percent, total dollars decreased from about $2.4 billion to about $2.3 billion ($70.9 million) between 1987 and 1988.

- State and local revenues represented 33.5 percent of the total capital assistance for transit in 1988. About 56 percent of these revenues were from dedicated funds and 44 percent were from general funds. This is a reversal from 1987 when the bulk of state and local revenues came from general revenues.

- The $2.5 billion in Federal revenues applied to transit capital projects in 1988 were distributed as follows:

  -- $1.7 billion (73.5 percent) was used by transit systems in urbanized areas with 2 million or more residents.

  -- $356.2 million (15.6 percent) was used by transit systems in urbanized areas with between 1 and 2 million residents.

  -- $187.3 million (8.2 percent) was used by transit systems in urbanized areas with between 200,000 and 1,000,000 residents.

  -- $61.5 million (2.7 percent) was used by transit systems in urbanized areas with less than 200,000 residents.

- There has been an overall reduction in capital assistance In 1988 over 1984. The amount of the reduction is $ 434.4 million, an average annual decrease of 3 percent.

Transit System Expenses

- Overall expenses for all transit systems increased from $9.35 billion to $12.97 billion, an increase of $3.62 billion or an average annual increase of 8.5 percent in 1988 over 1984.

- Vehicle operations, the most labor-intensive function, generally represented the greatest expenses for all modes of public transportation. The one exception is rapid rail, where general administration represented the highest proportion of operating expenses, 32.3 percent. Trolley bus vehicle operations constituted 60.0 percent of total expense while rapid rail vehicle operations were only 26.3 percent.

- Overall, vehicle maintenance expense represented about 20.3 percent of total transit system operating expenses. For the fixed route modes, this function generally represented the second highest percentage of expenses with between 18 and 25 percent of total operating expenses.

- General administration expenses as a percent of total expenses were highest for rapid rail (32.3 percent) and lowest for demand response (-21.6 percent).

- Purchased transportation was used extensively to obtain demand response services. (About 60 percent of the expenses for these services were incurred through purchased services.) Commuter rail was the second most likely transit service to be obtained through a purchase of service arrangement (9.5 percent of the expenses for these services was incurred through purchased

services which is twice the amount in 1988 than in 1987.) The other transit modes were infrequently obtained through purchased services.

- Together labor and fringe benefit costs ($9.46 billion) were 73 percent of transit system operating expenses in 1988. These expenses accounted for 53.9 percent of transit system operating costs in the smallest transit systems and 77.9 percent in the largest systems.

- Demand response was the only mode which labor and fringe benefits did not constitute a majority of its expenses. There was a reduction in costs for labor and fringes from about one third of its expenses to about 25 percent of its operating expenses. The largest expense category for demand response is the contracting for transportation "purchase transportation" expense category which rose from 50.7 percent of operating expenses in 1984 to 63.1 percent in 1988.

- Public transit systems incurred operating expenses of approximately $13.0 billion in 1988 distributed as follows:

  -- 76.8 percent of operating expenses were incurred by transit systems in urbanized areas with 2 million or more residents.

  -- 13.3 percent of operating expenses were incurred by transit systems in urbanized areas with between 1 and 2 million residents.

  -- 7.2 percent of operating expenses were incurred by transit systems in urbanized areas with between 200,000 and 1,000,000 residents.

  -- 2.7 percent of operating expenses were incurred by transit systems in urbanized areas with less than 200,000 residents.

I. TRANSIT INDUSTRY FINANCE EXHIBITS


A. TRANSIT INDUSTRY REVENUE SOURCES

SOURCES OF TRANSIT OPERATING REVENUE
ALL SYSTEMS BY FLEET SIZE
SECTION 15 1988

- Passenger fares, which were 37.6 percent of total system operating revenues in 1988, represented the largest single source of operating revenues for transit systems. Passenger fares generated $3.23 billion for the ten largest transit systems in 1988.

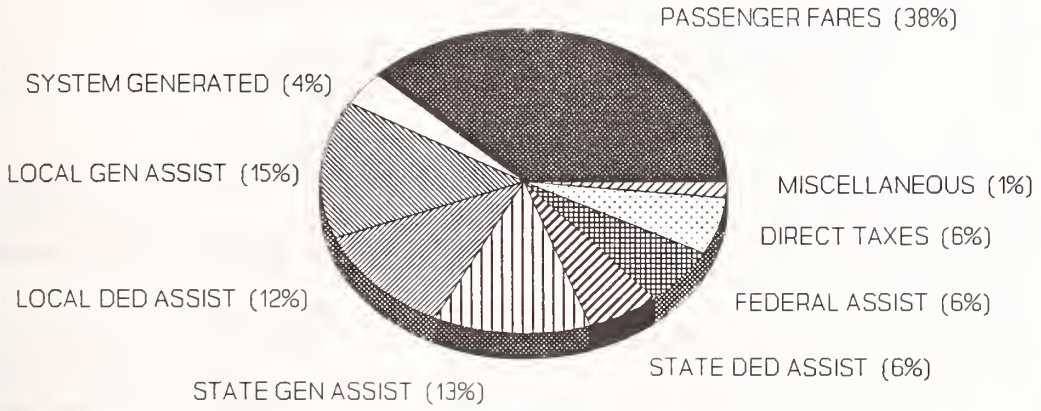
- Generally, local (dedicated and general) assistance was the second largest source of operating revenue. State and local governments furnished the bulk of transit subsidies, together providing 44.9 percent of the transit system revenues in 1988. About 40.0 percent of state and local revenues were dedicated revenues; the balance were general funds.

- Direct taxes (i.e. taxes levied directly by a transit authority) were not a widely used source of revenue for the majority of transit systems. Transit systems that range in size from 100 to 1000 vehicles (about 21 percent of the systems) used this source more than the other transit systems.

- In general, smaller transit systems tended to rely more on Federal assistance. In 1988, Federal funds represented 17.6 percent of the operating revenue for transit systems with 25 to 49 vehicles and only 4.5 percent of the operating revenue for transit systems with 1,000 or more vehicles. Overall, Federal funds provided 6.2 percent of transit operating revenue in 1988.

SOURCES OF TRANSIT OPERATING REVENUE

ALL SYSTEMS



SOURCES OF TRANSIT OPERATING REVENUE
ALL SYSTEMS BY FLEET SIZE
SECTION 15 1988

FLEET SIZE -->	<25	25-49	50-99	100-249	250-499	500-999	1000 AND OVER	ALL SYSTEMS
PASSENGER FARES	11.5%	22.1%	33.8%	38.6%	32.1%	34.5%	43.9%	37.6%
SYSTEM GENERATED	1.6%	1.7%	2.0%	1.9%	4.7%	6.8%	3.2%	3.6%
LOCAL GENERAL ASSISTANCE	18.6%	23.3%	13.5%	9.6%	11.5%	6.9%	17.6%	14.8%
LOCAL DEDICATED ASSISTANCE	25.9%	14.2%	12.1%	17.6%	14.1%	15.9%	7.3%	11.7%
STATE GENERAL ASSISTANCE	11.3%	9.6%	7.7%	7.9%	6.0%	0.6%	18.4%	12.5%
STATE DEDICATED ASSISTANCE	22.8%	8.2%	13.6%	3.7%	11.8%	6.9%	1.8%	5.9%
FEDERAL ASSISTANCE	7.6%	17.6%	13.8%	9.8%	7.2%	4.5%	4.5%	6.2%
DIRECT TAXES	0.5%	2.7%	4.6%	9.3%	12.5%	21.0%	1.4%	6.2%
MISCELLANEOUS	0.2%	0.1%	0.1%	1.4%	0.1%	0.0%	1.9%	1.1%
TOTAL (PERCENTAGE)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
TOTAL (MILLIONS)	$942.6	$364.6	$470.1	$1,091.4	$1,821.2	$1,829.8	$7,356.8	$13,876.6
SYSTEMS REPORTING	200	95	62	59	25	13	10	464

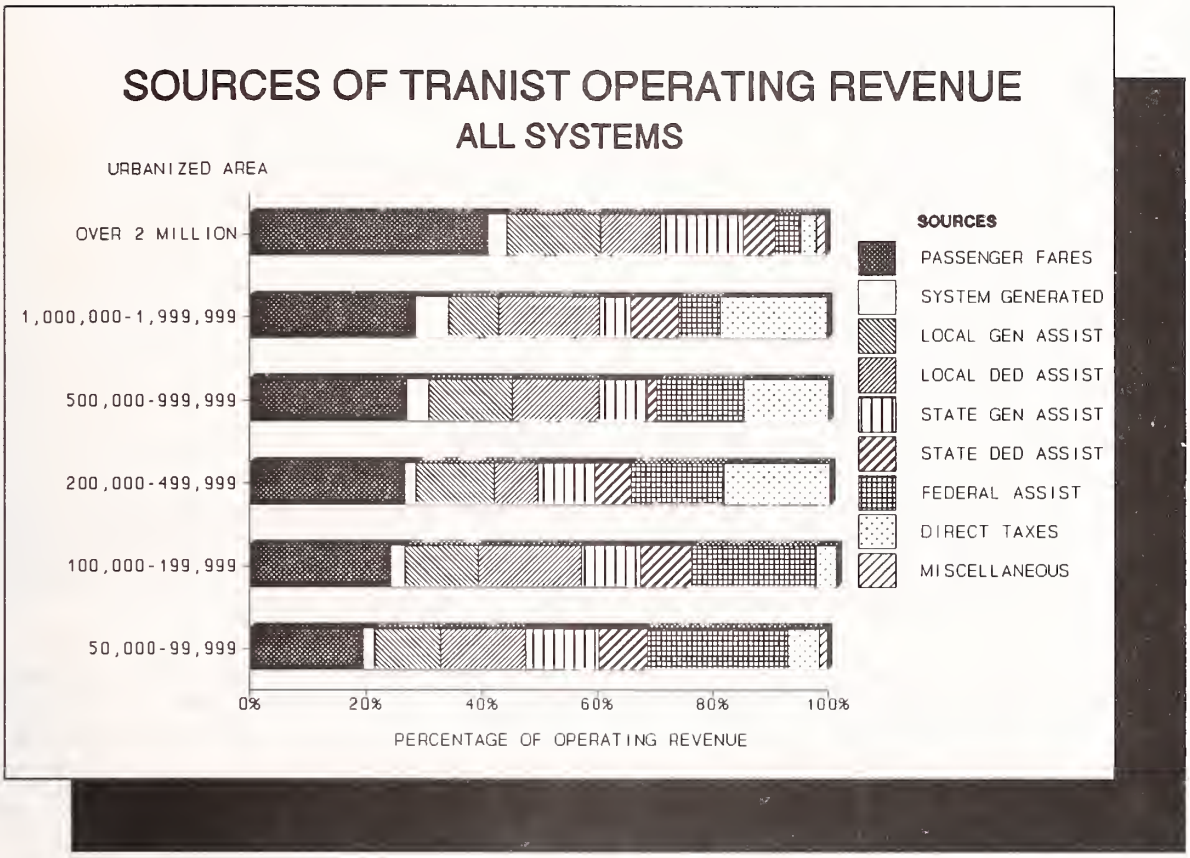
SOURCES OF TRANSIT OPERATING REVENUE
ALL SYSTEMS BY URBANIZED AREA
SECTION 15 1988

- In 1988, passenger fares represented between 19.5 and 41.1 percent of operating revenue for U.S. transit systems. Transit systems in smaller urbanized areas derived a smaller portion of their revenues from passenger fares than transit systems in larger urbanized areas.

- Local general and dedicated assistance plus direct taxes generally exceeded the operating revenues generated for transit systems by passenger fares. Consequently, revenues generated by passengers, or provided by local communities and transit systems, represented between 53.0 and 79.0 percent of transit system operating revenues in 1988.

- State general and dedicated assistance represented 18.4 percent of transit system operating revenue overall. Most urbanized areas received between 13.7 and 21.2 percent of their transit operating revenues from state assistance in 1988. However, transit systems in urbanized areas with populations between 500,000 and 999,999 received only 10.0 percent of their operating revenues from state funds.

- Federal operating assistance typically constituted a larger share of operating revenues for transit systems in smaller urbanized areas than for systems in larger urbanized areas. More specifically, in 1988 Federal assistance represented between 4.3 and 7.2 percent of the operating revenue of transit systems in urbanized areas with 1 million or more residents. However, for urbanized areas with less than 1 million residents, Federal assistance was between 15.1 percent and 24.3 percent of operating revenues.



SOURCES OF TRANSIT OPERATING REVENUE
ALL SYSTEMS BY URBANIZED AREA
SECTION 15 1988

POPULATION -->	50,000 TO 99,999	100,000 TO 199,999	200,000 TO 499,999	500,000 TO 999,999	1 MILLION TO 2 MILLION	OVER 2 MILLION	TOTAL
PASSENGER FARES	19.5%	24.2%	26.7%	27.0%	28.7%	41.1%	37.6%
SYSTEM GENERATED	2.0%	2.4%	1.9%	3.9%	5.6%	3.3%	3.6%
LOCAL GENERAL ASSISTANCE	11.4%	12.7%	13.5%	14.4%	8.6%	16.3%	14.8%
LOCAL DEDICATED ASSISTANCE	14.7%	17.8%	7.6%	15.2%	17.6%	10.4%	11.7%
STATE GENERAL ASSISTANCE	12.7%	10.3%	9.8%	8.3%	5.3%	14.4%	12.5%
STATE DEDICATED ASSISTANCE	8.5%	8.9%	6.3%	1.7%	8.4%	5.5%	5.9%
FEDERAL ASSISTANCE	24.3%	21.5%	16.1%	15.1%	7.2%	4.3%	6.2%
DIRECT TAXES	5.4%	3.4%	18.2%	14.6%	18.5%	2.7%	6.2%
MISCELLANEOUS	1.3%	0.2%	0.1%	0.0%	0.0%	1.5%	1.1%
TOTAL (PERCENTAGE)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
TOTAL REVENUES (MILLIONS)	$138.3	$265.9	$495.5	$565.4	$2,089.6	$10,322.1	$13,876.6
SYSTEMS REPORTING	118	92	78	32	48	95	463*

*Systems reporting (463) is based on Table 3.01

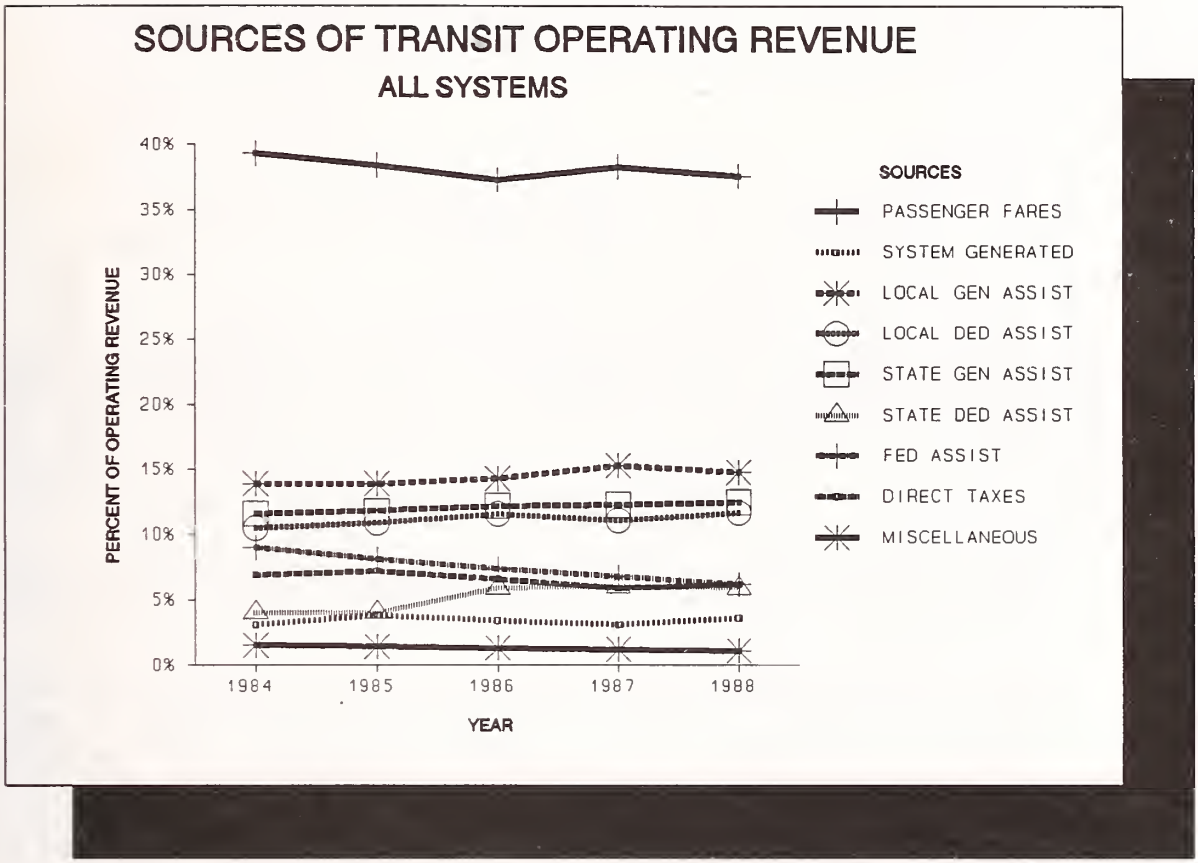
SOURCES OF TRANSIT OPERATING REVENUE
ALL SYSTEMS TRENDS
SECTION 15 1984-1988

- Between 1984 and 1988 operating revenues have increased by $3.84 billion, from $10.04 billion to $13.88 billion, an average annual increase of 8.4 percent. From 1984 to 1988, there was an increase in the number of systems reporting from 436 to 464.

- While passenger fares between 1984 and 1988 represent the largest single source of operating revenue for transit systems, its share has declined from 39.3 percent to 37.6 percent of operating revenue. However, the total dollar value has increased from $3.95 billion in 1984 to $5.22 billion in 1988, an increase of $1.27 billion or an average annual increase of 7.3 percent.

- Local (general and dedicated) assistance was the second largest source of operating revenues. Local and State assistance provided 44.9 percent of the operating revenues in 1988 versus 40 percent in 1984. The amount provided increase from $4.02 billion in 1984 to $6.23 billion in 1988, an average annual increase of 11.6 percent.

- The Federal contribution declined as a percentage of operating revenues from 9 percent ($903.5 million) of operating revenues in 1984 to 6.2 percent ($860.3 million) in 1988, an average annual decrease of 1.2 percent.



SOURCES OF TRANSIT OPERATING REVENUE
ALL SYSTEMS
SECTION 15 1984-1988

	1984	1985	1986	1987	1988
PASSENGER FARES	39.3%	38.4%	37.3%	38.3%	37.6%
SYSTEM GENERATED	3.1%	3.8%	3.4%	3.1%	3.6%
LOCAL GENERAL ASSISTANCE	13.9%	13.9%	14.3%	15.3%	14.8%
LOCAL DEDICATED ASSISTANCE	10.5%	10.9%	11.6%	11.1%	11.7%
STATE GENERAL ASSISTANCE	11.6%	11.8%	12.2%	12.3%	12.5%
STATE DEDICATED ASSISTANCE	4.0%	4.0%	5.9%	6.0%	5.9%
FEDERAL ASSISTANCE	9.0%	8.1%	7.4%	6.8%	6.2%
DIRECT TAXES	6.9%	7.2%	6.6%	5.9%	6.2%
MISCELLANEOUS	1.5%	1.9%	1.3%	1.2%	1.1%
TOTAL (MILLIONS)	$10,038.5	$10,608.0	$12,101.6	$13,383.5	$13,876.6
SYSTEMS REPORTING	436	431	425	446	464

SOURCES OF PUBLIC OPERATING ASSISTANCE

SECTION 15 1984-1988

- Total expenditures for transit operating assistance increased by $1,720.9 million between 1984 and 1988, from $5,383.5 million to $7,104.4 million. This represents an average increase of 7.2 percent per year.

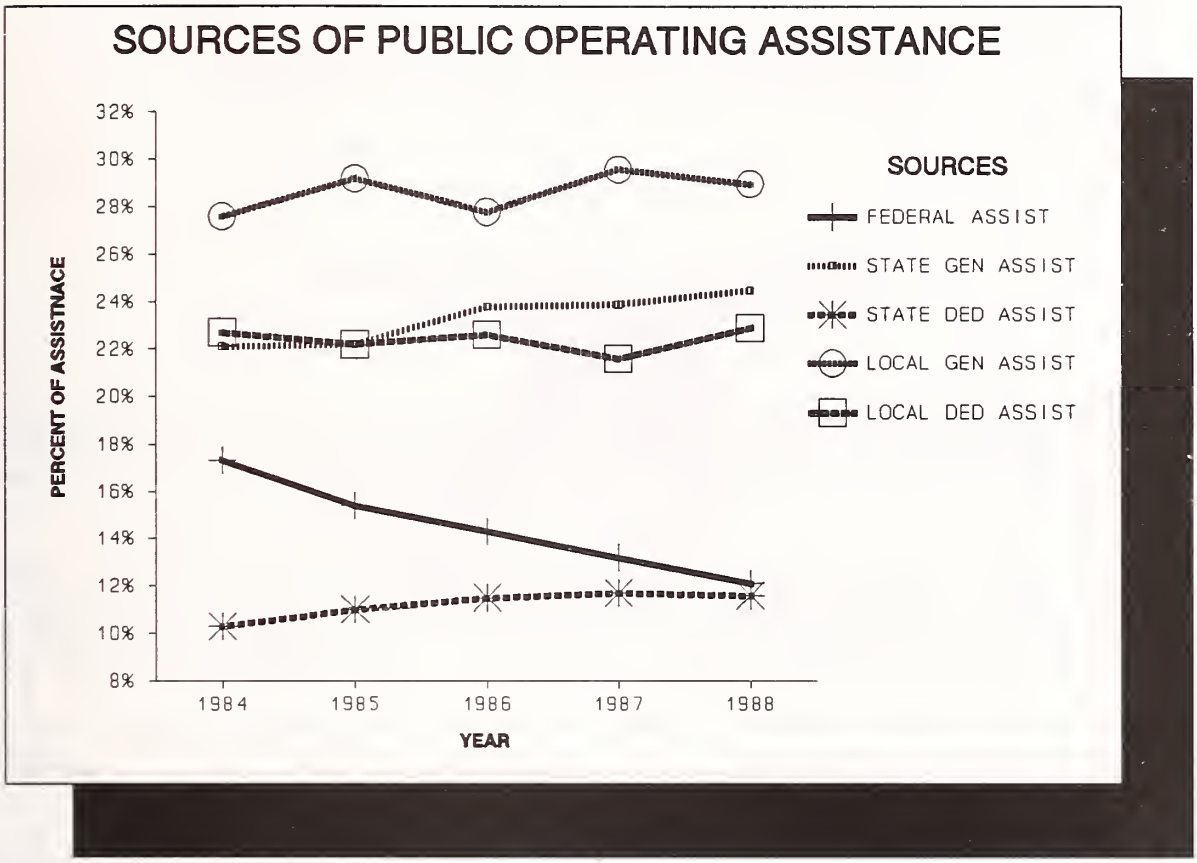
- Between 1984 and 1988 the following changes occurred in funding sources for transit operating assistance:

  -- Federal operating assistance declined by $71.7 million, an average 2.0 percent per year.

  -- State operating assistance increased by 47.0 percent (from $1,744.3 million to $2,564.7 million). This was an average increase in state operating assistance of 10.1 percent per year. State general assistance increased from $1,189.8 million to $1,740.6 million (46.3 percent or 10.0 percent per year) and state dedicated assistance increased from $554.5 million to $824.1 million (48.6 percent or 10.4 percent per year).

  -- Local operating assistance increased by 36.2 percent (from $2,707.9 million to $3,687.2 million). This was an average increase in local operating assistance of 8 percent per year. Local general assistance increased from $1,485.9 million to $2,060.3 million (38.7 percent or 8.5 percent per year) and local dedicated assistance increased from $1,222.1 million to $1,626.9 million (33.1 percent or 7.4 percent per year).

- Local (general and dedicated) assistance together were the largest source of operating assistance for public transit systems during 1984 through 1988. These revenues have increased from 50.3 percent to 51.9 percent of the total assistance received by public transit systems.



SOURCES OF PUBLIC OPERATING ASSISTANCE
SECTION 15 1984-1988

	1984	1985	1986	1987	1988
FEDERAL ASSISTANCE	17.3%	15.4%	14.3%	13.2%	12.1%
STATE GENERAL ASSISTANCE	22.1%	22.2%	23.8%	23.9%	24.5%
STATE DEDICATED ASSISTANCE	10.3%	11.0%	11.5%	11.7%	11.6%
LOCAL GENERAL ASSISTANCE	27.6%	29.2%	27.8%	29.6%	29.0%
LOCAL DEDICATED ASSISTANCE	22.7%	22.2%	22.6%	21.6%	22.9%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%
TOTAL (MILLIONS)	$5,383.5	$5,916.9	$6,217.3	$6,895.4	$7,104.4

SOURCES OF PUBLIC CAPITAL ASSISTANCE
ALL SYSTEMS BY FLEET SIZE
SECTION 15 1988

- Total percentage of Federal capital assistance (from all Federal sources) declined from 69.6 percent to 66.6 percent. Total dollars decreased from about $2.4 billion to about $2.3 billion ($70.9 million) between 1987 and 1988.

- There was a small increase in capital assistance of $46.2 million in 1988 over 1987. Those systems with 1,000 or more vehicles received $131.7 million more in 1988 over 1987. Conversely, those systems with between 250 to 499 vehicles received $117.3 million less in 1988 over 1987.

- The nine largest transit systems in the U.S. received $1,979.9 million (57.6 percent) of the total capital assistance in 1988. About 69 percent ($1,358.2 million) of these revenues were from Federal sources.

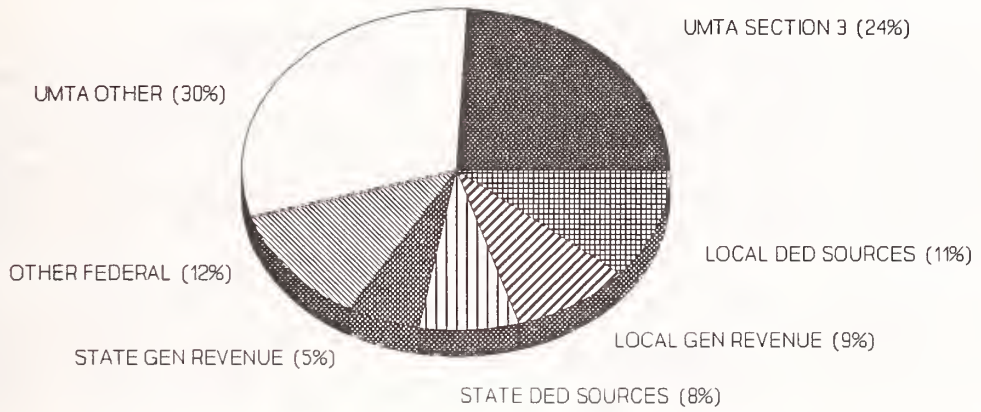
- State and local revenues represented 33.5 percent of the total capital assistance for transit in 1988. About 56 percent of these revenues were from dedicated funds and 44 percent were from general funds. This is a reversal from 1987 when the bulk of state and local revenues came from general revenues.

- Local capital general assistance increased by $75.5 million between 1987 and 1988 while local dedicated capital assistance also increased from $383.1 million (11.3 percent of total capital revenues in 1987) to $384.9 million (11.2 percent of total capital revenue in 1988), an increase of 1.8 million.

- State capital assistance increased by $40.0 million between 1987 and 1988. This overall increase resulted with a rise in both general revenue funds and dedicated revenues.

SOURCE OF PUBLIC CAPITAL ASSISTANCE

ALL SYSTEMS



SOURCES OF PUBLIC CAPITAL ASSISTANCE
ALL SYSTEMS BY FLEET SIZE
SECTION 15 1988

FLEET SIZE -->	<25	25-49	50-99	100-249	250-499	500-999	1000 AND OVER	ALL SYSTEMS
UMTA SECTION 3	13.1%	10.6%	4.9%	6.4%	28.7%	30.7%	26.9%	24.2%
UMTA SECTION 5, 9a and/or 9	39.2%	54.4%	65.6%	56.5%	32.5%	31.5%	23.7%	30.5%
OTHER FEDERAL	1.3%	2.0%	3.8%	7.2%	1.7%	6.3%	18.0%	11.9%
STATE GENERAL REVENUE	12.5%	10.2%	6.3%	7.1%	3.4%	0.3%	5.4%	5.5%
STATE DEDICATED SOURCES	12.7%	5.1%	7.9%	4.9%	9.7%	5.7%	6.9%	7.6%
LOCAL GENERAL REVENUE	1.1%	7.2%	6.8%	5.3%	8.6%	0.0%	12.9%	9.2%
LOCAL DEDICATED SOURCES	20.0%	12.3%	4.8%	12.6%	15.3%	25.5%	6.3%	11.2%
TOTAL (PERCENTAGE)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
TOTAL (MILLIONS)	$338.2	$51.6	$80.8	$199.2	$420.4	$366.7	$1979.9	$3436.8
SYSTEMS REPORTING	171	82	54	49	21	12	9	398

SOURCES OF PUBLIC CAPITAL ASSISTANCE
ALL SYSTEMS BY URBANIZED AREA
SECTION 15 1988

- Total transit capital revenues were greatest in the largest urbanized areas. Areas with 2 million or more residents received $2.5 billion (74.0 percent) of total capital revenues in 1988. Urbanized areas with between 1 and 2 million residents received $554.9 million (16.1 percent) of the total capital revenues. All other urbanized areas together received $338.2 million (9.8 percent) of total capital revenues in 1988.

- For all urbanized area groups, Federal assistance constituted the major source of capital funding. This accounts for between 64.1 percent of total capital revenues (in urbanized areas with between 1 and 2 million residents) and 77.2 percent of total capital revenues (in urbanized areas with 200,000 to 500,000 residents).

- The $2.5 billion in Federal revenues applied to transit capital projects in 1988 were distributed as follows:

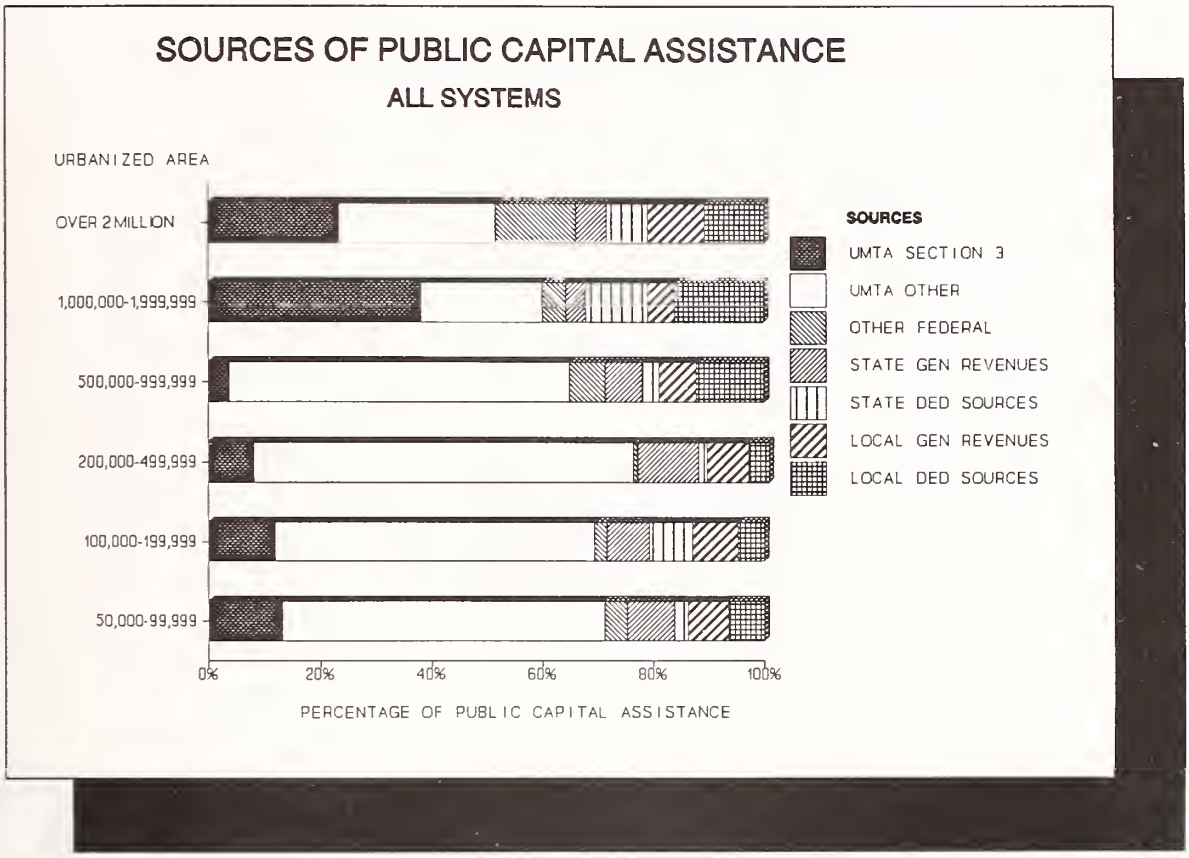
  -- $1.7 billion (73.5 percent) was used by transit systems in urbanized areas with 2 million or more residents.

  -- $356.2 million (15.6 percent) was used by transit systems in urbanized areas with between 1 and 2 million residents.

  -- $187.3 million (8.2 percent) was used by transit systems in urbanized areas with between 200,000 and 1,000,000 residents.

  -- $61.5 million (2.7 percent) was used by transit systems in urbanized areas with less than 200,000 residents.

- Between 1987 and 1988 Federal capital funding decreased more in urbanized areas with between 1 and 2 million residents than anywhere else. The amount decreased by $87 million, from $444.9 to $356.2 million. Federal capital funding increased in the largest urbanized areas by $30 million from $1.65 to $1.68 billion.



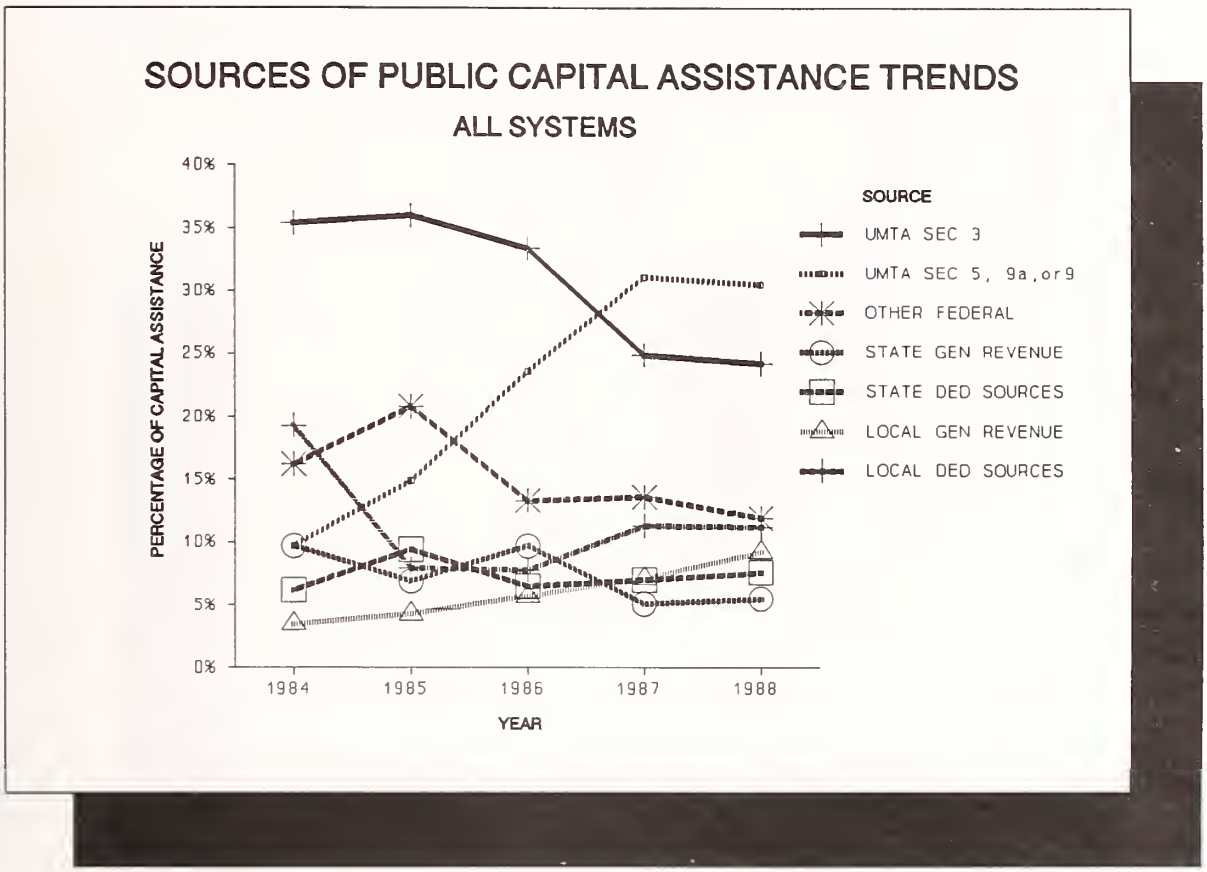
SOURCES OF PUBLIC CAPITAL ASSISTANCE
ALL SYSTEMS BY URBANIZED AREA
SECTION 15 1988

POPULATION -->	50,000 TO 99,999	100,000 TO 199,999	200,000 TO 499,999	500,000 TO 999,999	1 MILLION TO 1,999,999	OVER 2 MILLION	ALL SYSTEMS
UMTA SECTION 3	13.2%	12.0%	8.1%	3.8%	38.2%	23.4%	24.2%
UMTA SECTION 5, 9a, AND/OR 9	58.0%	57.4%	68.4%	61.0%	21.8%	28.1%	30.5%
OTHER FEDERAL	4.1%	2.3%	0.7%	6.5%	4.2%	14.6%	11.9%
STATE GENERAL REVENUES	8.5%	7.7%	11.1%	6.8%	3.6%	5.5%	5.5%
STATE DEDICATED SOURCES	2.4%	7.7%	1.5%	3.0%	11.3%	7.4%	7.6%
LOCAL GENERATED REVENUES	7.3%	8.2%	7.5%	6.7%	4.8%	10.4%	9.2%
LOCAL DEDICATED SOURCES	6.5%	4.7%	3.7%	12.2%	16.0%	10.5%	11.2%
TOTAL (PERCENTAGE)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
TOTAL (MILLIONS)	$41.2	$42.5	$98.4	$156.1	$554.9	$2,543.8	$3,436.8

SOURCES OF PUBLIC CAPITAL ASSISTANCE TRENDS
ALL SYSTEMS
SECTION 15 1984-1988

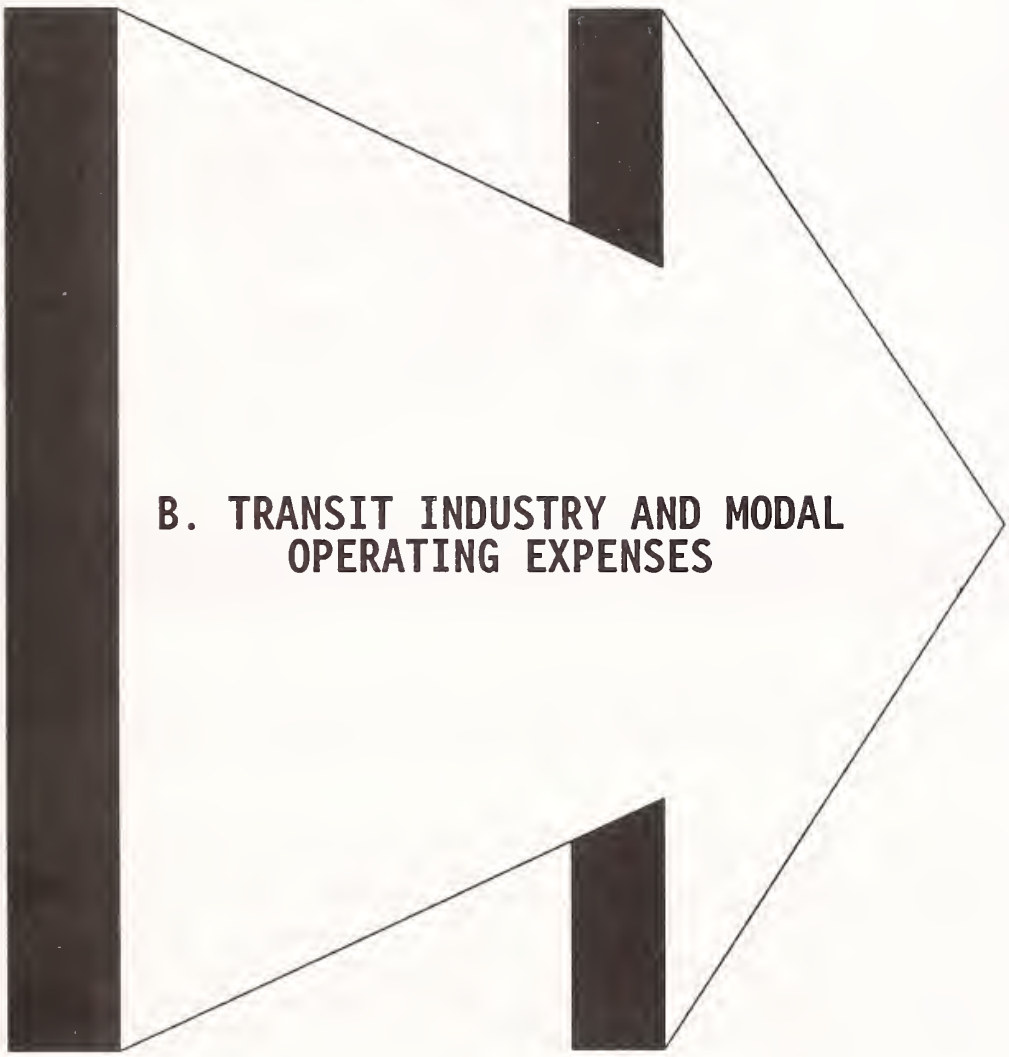
- There has been an overall reduction in capital assistance in 1988 over 1984. The amount of the reduction is $434.4 million, an average annual decrease of 3 percent.

- While the Federal, State, and local shares of capital assistance have fluctuated during this period, the Federal share was about two-thirds and the State and local shares were about one third.



SOURCES OF PUBLIC CAPITAL ASSISTANCE TRENDS
ALL SYSTEMS
SECTION 15 1984-1988

	1984	1985	1986	1987	1988
UMTA SECTION 3	35.4%	36.0%	33.4%	24.9%	24.2%
UMTA SECTION 5, 9a and/or 9	9.7%	14.9%	23.6%	31.1%	30.5%
OTHER FEDERAL	16.2%	20.7%	13.3%	13.6%	11.9%
STATE GENERAL REVENUE	9.7%	6.9%	9.7%	5.1%	5.5%
STATE DEDICATED SOURCES	6.2%	9.3%	6.5%	7.0%	7.6%
LOCAL GENERAL REVENUE	3.5%	4.3%	5.7%	7.1%	9.2%
LOCAL DEDICATED SOURCES	19.3%	7.9%	7.8%	11.3%	11.2%
TOTAL (MILLIONS)	$3,871.2	$3,398.2	$3,833.4	$3,390.6	$3,436.8
SYSTEMS REPORTING	438	390	373	388	398


B. TRANSIT INDUSTRY AND MODAL
OPERATING EXPENSES

TRANSIT OPERATING EXPENSES BY FUNCTION
BY MODE
SECTION 15 1988

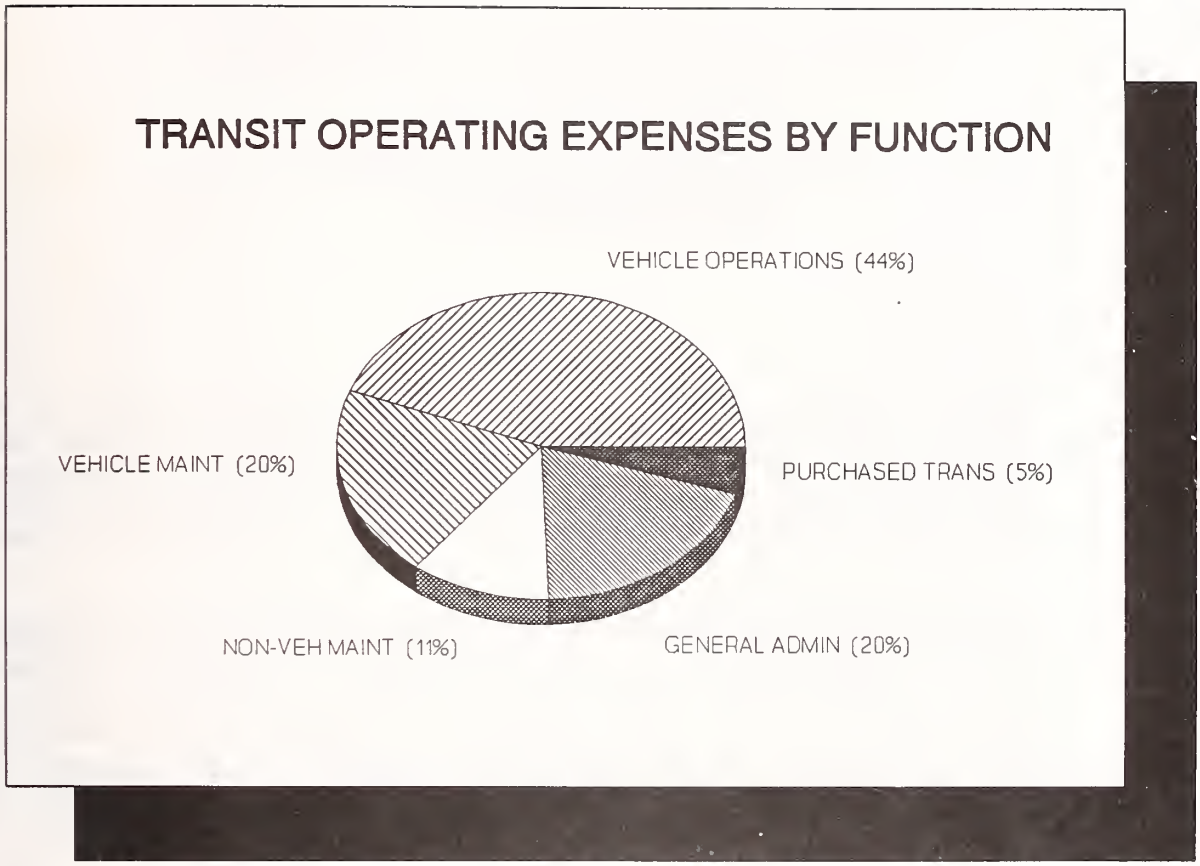
- Vehicle operations, the most labor-intensive function, generally represented the greatest expenses for all modes of public transportation. The one exception is rapid rail, where general administration represented the highest proportion of operating expenses, 32.3 percent. Trolley bus vehicle operations constituted 60.0 percent of total expense while rapid rail vehicle operations were only 26.3 percent.

- Overall, vehicle maintenance expense represented about 20.3 percent of total transit system operating expenses. For the fixed route modes, this function generally represented the second highest percentage of expenses with between 18 and 25 percent of total operating expenses.

- The non-vehicle maintenance proportion of total expenditures was higher for fixed guideway systems; it was highest for rapid rail, at 23.5 percent, next highest for commuter rail, at 17.8 percent and next highest for streetcar, at 17.3 percent. Motor bus and demand response, two non-rail modes, reported 3.5 and 0.7 percent respectively for non-vehicle maintenance.

- General administration expenses as a percent of total expenses were highest for rapid rail (32.3 percent) and lowest for demand response (-21.6 percent).

- Purchased transportation was used extensively to obtain demand response services. About 60 percent of the expenses for these services were incurred through purchased services. Commuter rail was the second most likely transit service to be obtained through a purchase of service arrangement (9.5 percent of the expenses for these services was incurred through purchased services which is twice the amount in 1988 than in 1987.) The other transit modes were infrequently obtained through purchased services.



TRANSIT OPERATING EXPENSES BY FUNCTION
BY MODE
SECTION 15 1988

	MOTOR BUS	RAPID RAIL	STREET CAR	TROLLEY BUS	COMMUTER RAIL	DEMAND RESPONSE	ALL SYSTEMS
VEHICLE OPERATIONS	54.1%	26.3%	37.5%	60.0%	38.9%	54.5%	44.1%
VEHICLE MAINTENANCE	21.7%	17.9%	25.4%	20.1%	22.6%	6.6%	20.3%
NON-VEHICLE MAINTENANCE	3.5%	23.5%	17.3%	5.2%	17.8%	0.7%	11.0%
GENERAL ADMINISTRATION	16.9%	32.3%	19.8%	14.8%	11.2%	-21.6%	19.5%
PURCHASED TRANSPORTATION	3.9%	0.0%	0.0%	0.0%	9.5%	59.7%	5.1%
TOTAL (PERCENTAGE)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
TOTAL (MILLIONS)	$6,948.1	$3,521.7	$197.2	$101.7	$1,717.7	$247.0	$12,973.0*
SYSTEMS REPORTING	390	12	14	5	14	284	460

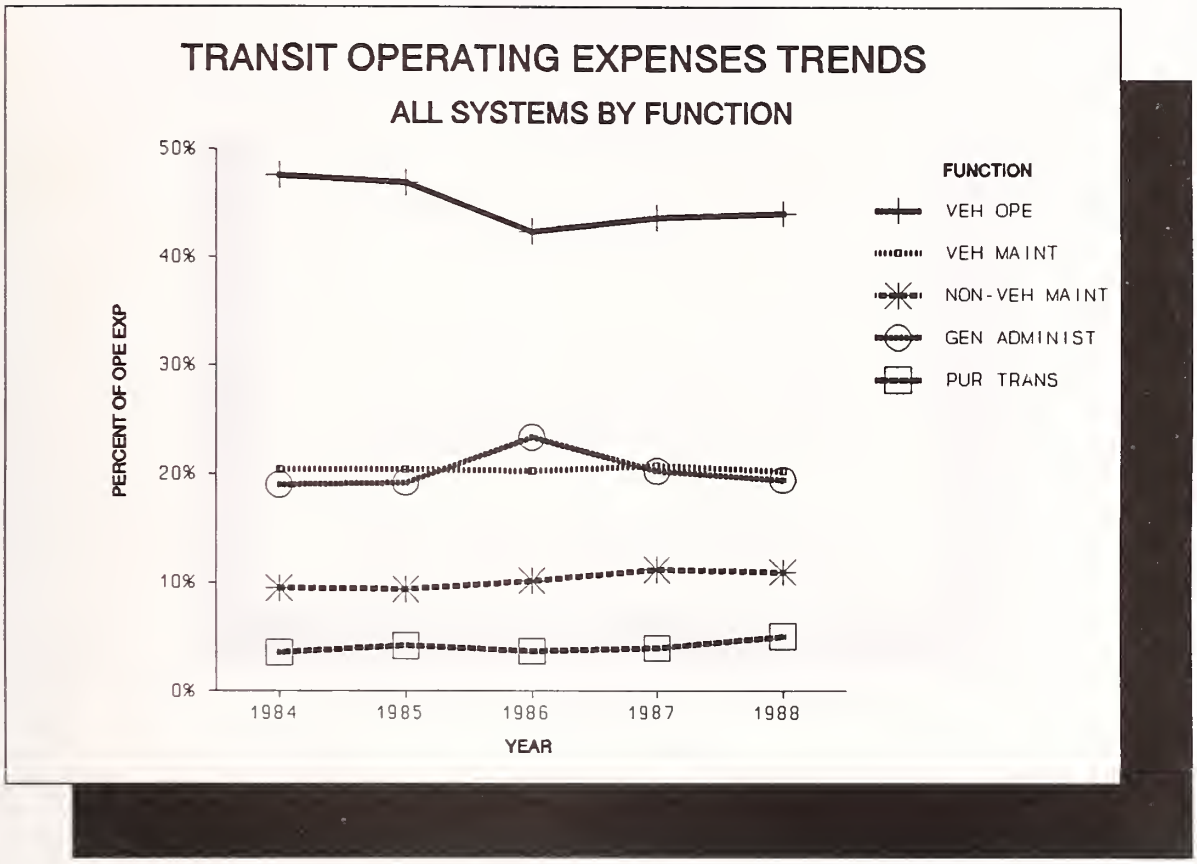
*All systems total is based on Table 2.06.1

TRANSIT OPERATING EXPENSES TRENDS
ALL SYSTEMS BY FUNCTION
SECTION 15 1984-1988

- While the overall transit operating expenses have increased by an average annual rate of 8.5 percent between 1984 and 1988, the relative level of expenditures by functions on which these expenses were based has remained fairly constant. Vehicle operations continued to represent the greatest expense for all modes except rapid rail and demand response.

- Demand response was the only mode to experience significant changes in the composition of its operating expenses. Vehicle operations increased from 37.5 percent of its operating expenses in 1984 to 54.5 percent in 1988. Also, purchased transportation increased from 48.6 percent of its operating expenses in 1984 to 59.7 percent in 1988. Finally, general administration went from representing an operating expense (4.1 percent) to becoming an operating credit (-21.6 percent).

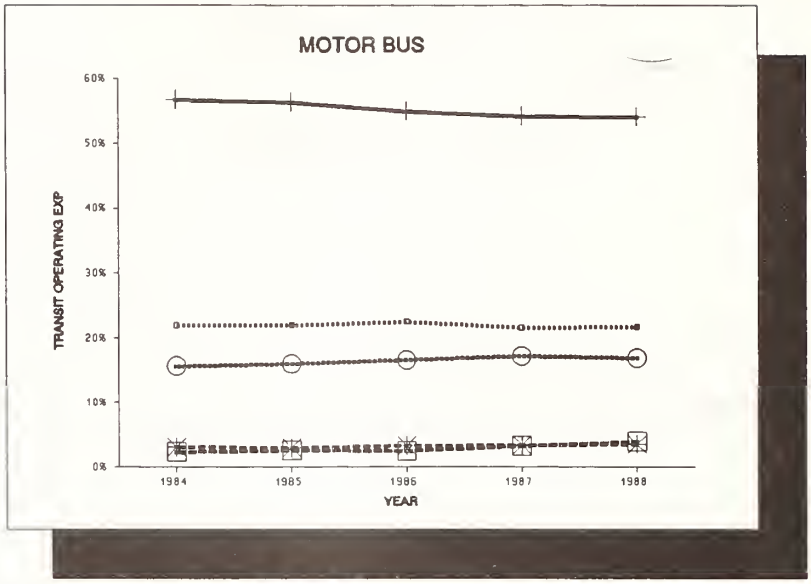
NOTE: The trends for all systems are shown on Page 37. The trends in Operating expense for each mode are shown on pages 38, 39, and 40.

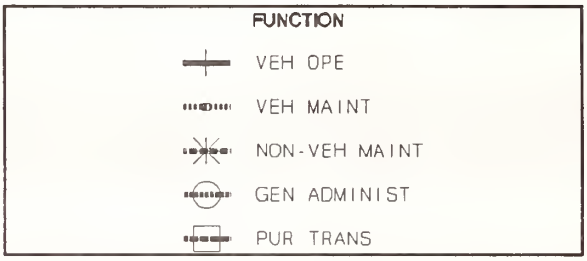


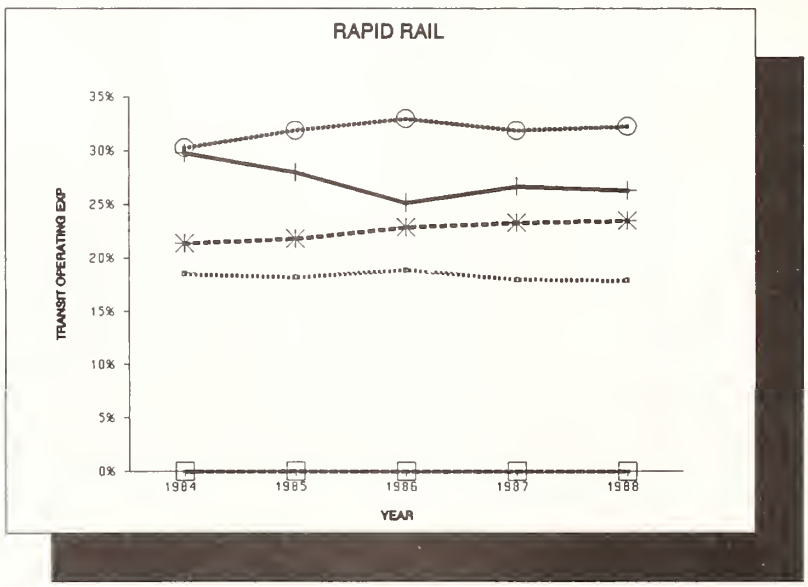
TRANSIT OPERATING EXPENSES TRENDS
BY FUNCTION
SECTION 15 1984-1988

	1984	1985	1986	1987	1988
VEHICLE OPERATIONS	47.6%	46.9%	42.4%	43.7%	44.1%
VEHICLE MAINTENANCE	20.4%	20.4%	20.3%	20.8%	20.3%
NON-VEHICLE MAINTENANCE	9.5%	9.4%	10.2%	11.2%	11.0%
GENERAL ADMINISTRATION	19.0%	19.2%	23.4%	20.3%	19.5%
PURCHASED TRANSPORTATION	3.6%	4.2%	3.7%	4.0%	5.1%
TOTAL (MILLIONS)	$9,346.3	$10,197.0	$11,751.3	$12,175.4	$12,973.0
SYSTEMS REPORTING	430	443	426	443	460

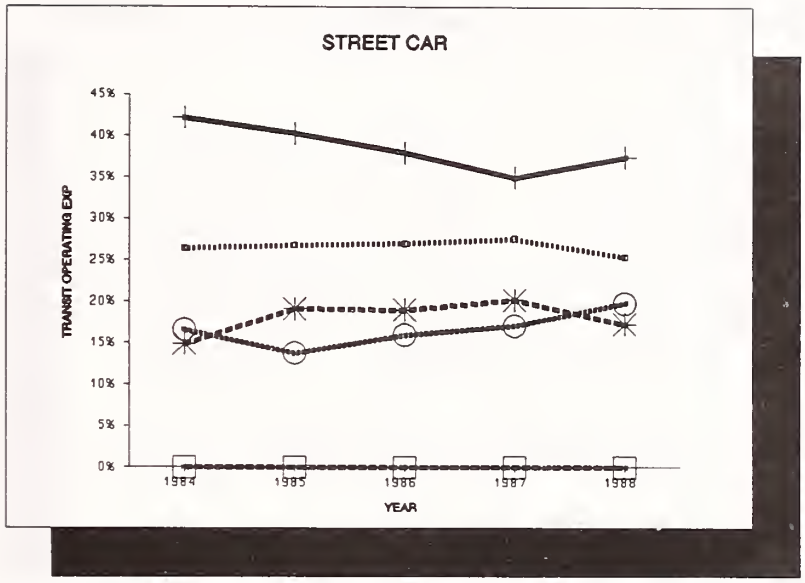
TRANSIT OPERATING EXPENSES TRENDS
BY FUNCTION BY MODE
SECTION 15 1984-1988

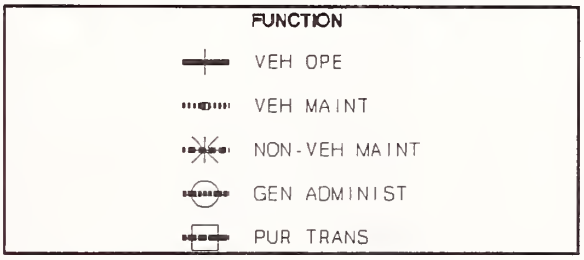


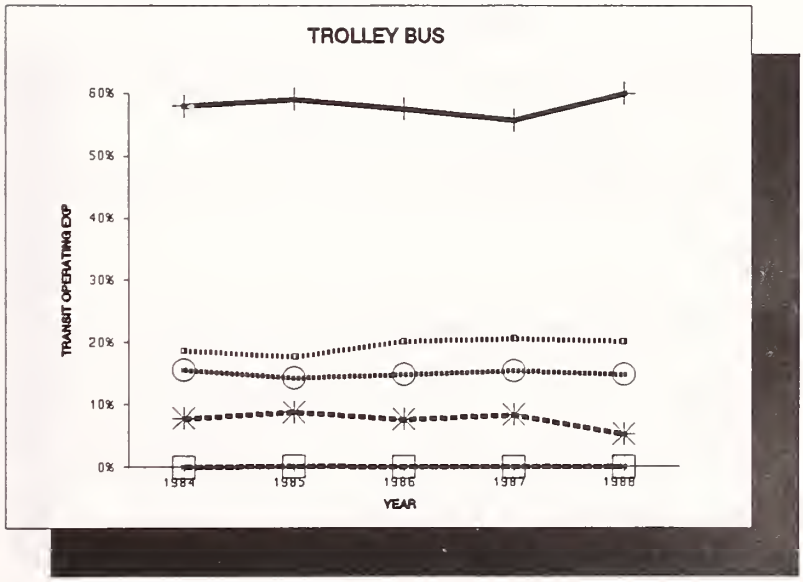




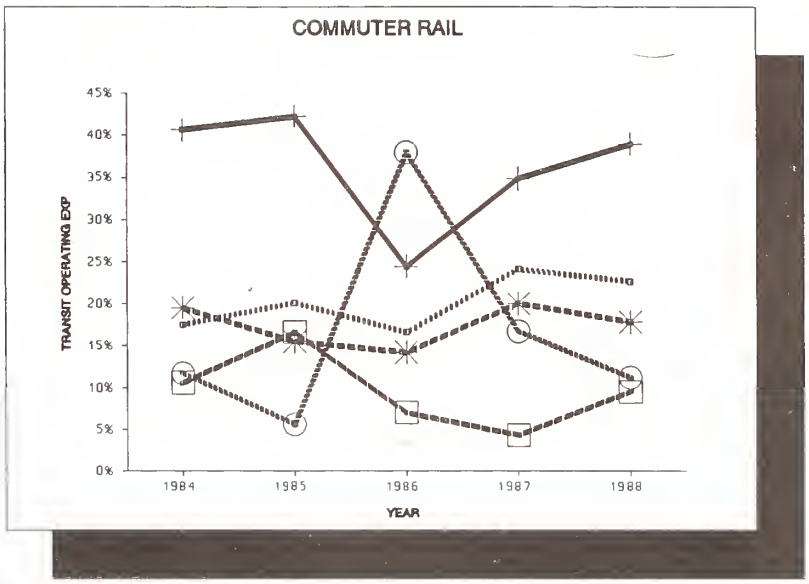
TRANSIT OPERATING EXPENSES TRENDS
BY FUNCTION BY MODE
SECTION 15 1984-1988

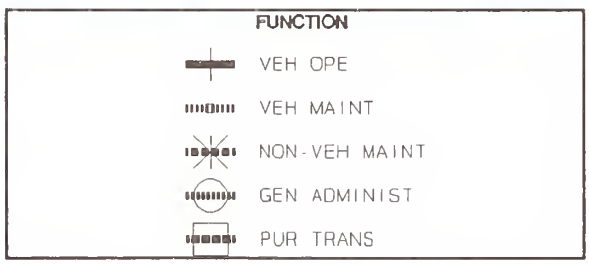


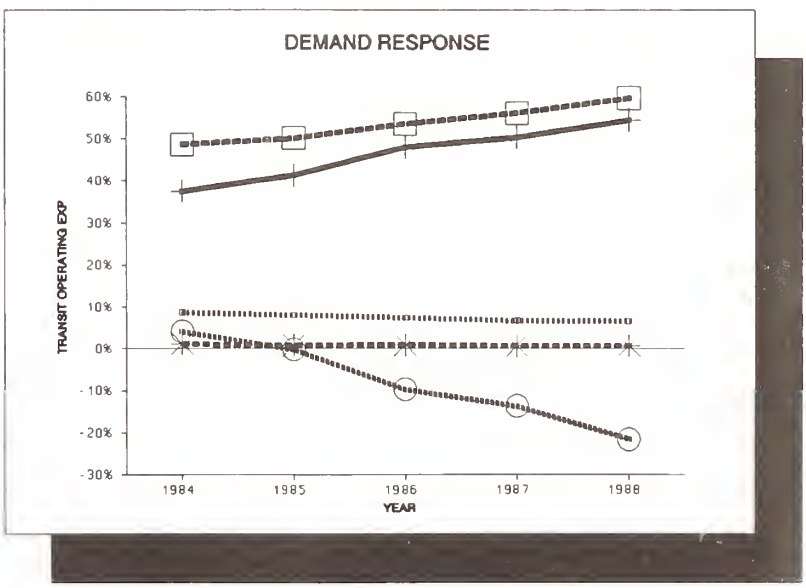




TRANSIT OPERATING EXPENSES TRENDS
BY FUNCTION BY MODE
SECTION 15 1984-1988







TRANSIT OPERATING EXPENSES TRENDS
BY FUNCTION BY MODE
SECTION 15 1984-1988

MOTOR BUS

	1984	1985	1986	1987	1988
VEHICLE OPERATIONS	56.8%	56.4%	55.0%	54.2%	54.1%
VEHICLE MAINTENANCE	22.0%	22.0%	22.5%	21.6%	21.7%
NON-VEHICLE MAINTENANCE	3.1%	3.0%	3.3%	3.4%	3.5%
GENERAL ADMINISTRATION	15.7%	16.0%	16.6%	17.2%	16.9%
PURCHASED TRANSPORTATION	2.3%	2.6%	2.5%	3.3%	3.9%
TOTAL (MILLIONS)	$5,652.5	$6,017.2	$6,366.0	$6,606.4	$6,948.1
SYSTEMS REPORTING	378	391	372	381	390

RAPID RAIL

	1984	1985	1986	1987	1988
VEHICLE OPERATIONS	29.8%	28.0%	25.2%	26.7%	26.3%
VEHICLE MAINTENANCE	18.5%	18.2%	18.9%	18.0%	17.9%
NON-VEHICLE MAINTENANCE	21.4%	21.8%	22.9%	23.3%	23.5%
GENERAL ADMINISTRATION	30.3%	31.9%	33.0%	31.9%	32.3%
PURCHASED TRANSPORTATION	0.0%	0.0%	0.0%	0.0%	0.0%
TOTAL (MILLION)	$2,594.2	$2,847.5	$3,101.6	$3,232.3	$3,521.7
SYSTEMS REPORTING	12	12	12	12	12

STREET CAR

	1984	1985	1986	1987	1988
VEHICLE OPERATIONS	42.2%	40.3%	38.0%	35.0%	37.5%
VEHICLE MAINTENANCE	26.4%	26.8%	27.0%	27.6%	25.4%
NON-VEHICLE MAINTENANCE	14.9%	19.1%	19.0%	20.2%	17.3%
GENERAL ADMINISTRATION	16.6%	13.8%	16.0%	17.1%	19.8%
PURCHASED TRANSPORTATION	0.0%	0.0%	0.0%	0.0%	0.0%
TOTAL (MILLIONS)	$127.3	$140.1	$158.2	$171.6	$197.2
SYSTEMS REPORTING	9	8	10	12	14

TRANSIT OPERATING EXPENSES TRENDS
BY FUNCTION BY MODE
SECTION 15 1984-1988

TROLLEY BUS

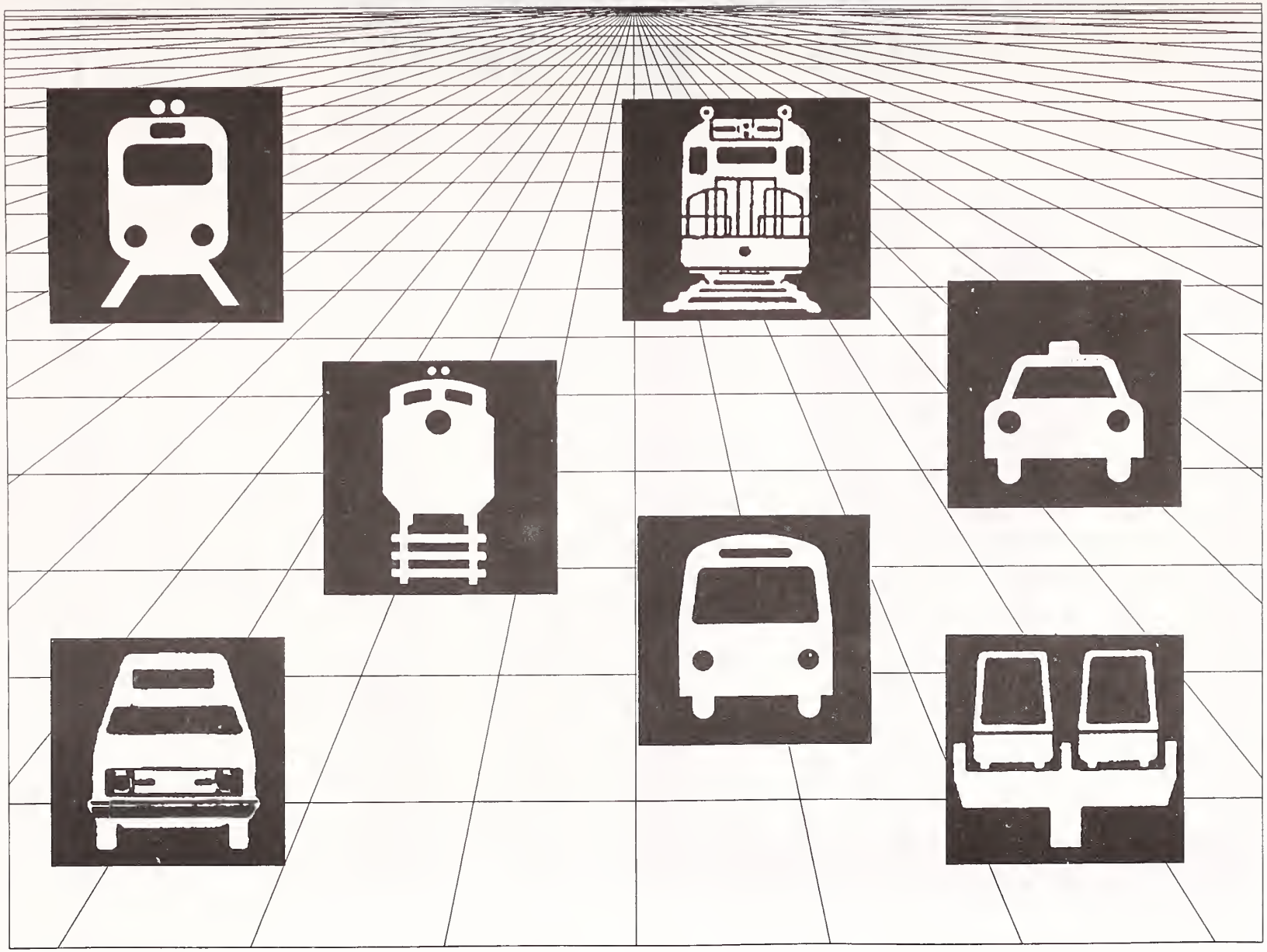
	1984	1985	1986	1987	1988
VEHICLE OPERATIONS	58.0%	59.1%	57.5%	55.7%	60.0%
VEHICLE MAINTENANCE	18.7%	17.7%	20.1%	20.6%	20.1%
NON-VEHICLE MAINTENANCE	7.8%	8.8%	7.6%	8.3%	5.2%
GENERAL ADMINISTRATION	15.6%	14.3%	14.8%	15.4%	14.8%
PURCHASED TRANSPORTATION	0.0%	0.1%	0.0%	0.0%	0.0%
TOTAL (MILLIONS)	$83.2	$89.5	$98.5	$97.5	$101.7
SYSTEMS REPORTING	5	5	5	5	5

COMMUTER RAIL

	1984	1985	1986	1987	1988
VEHICLE OPERATIONS	40.6%	42.2%	24.4%	34.8%	38.9%
VEHICLE MAINTENANCE	17.5%	20.1%	16.6%	24.1%	22.6%
NON-VEHICLE MAINTENANCE	19.5%	15.5%	14.2%	20.0%	17.8%
GENERAL AOMINISTRATION	11.7%	5.6%	37.9%	16.7%	11.2%
PURCHASEO TRANSPORTATION	10.6%	16.6%	7.0%	4.3%	9.5%
TOTAL (MILLIONS)	$566.4	$731.7	$1,640.3	$1,650.7	$1,717.7
SYSTEMS REPORTING	11	12	14	14	14

OEMANO RESPONSE

	1984	1985	1986	1987	1988
VEHICLE OPERATIONS	37.5%	41.3%	48.0%	50.4%	54.5%
VEHICLE MAINTENANCE	8.7%	8.0%	7.4%	6.7%	6.6%
NON-VEHICLE MAINTENANCE	1.2%	0.8%	0.9%	0.6%	0.7%
GENERAL ADMINISTRATION	4.1%	-0.2%	-9.7%	-13.7%	-21.6%
PURCHASEO TRANSPORTATION	48.6%	50.1%	53.5%	56.1%	59.7%
TOTAL (MILLIONS)	$126.7	$154.4	$176.2	$206.7	$247.0
SYSTEMS REPORTING	237	243	245	259	284



TRANSIT OPERATING EXPENSES BY OBJECT CLASS
ALL SYSTEMS BY FLEET SIZE
SECTION 15 1988

- Labor expenses were the largest single operating expense for transit systems, representing between 38.1 and 49.0 percent of total expenses. The proportion of total operating expenses represented by labor expenses varied among the different transit system size groups. The two groups that include the largest transit systems expend the most on labor related expenses.

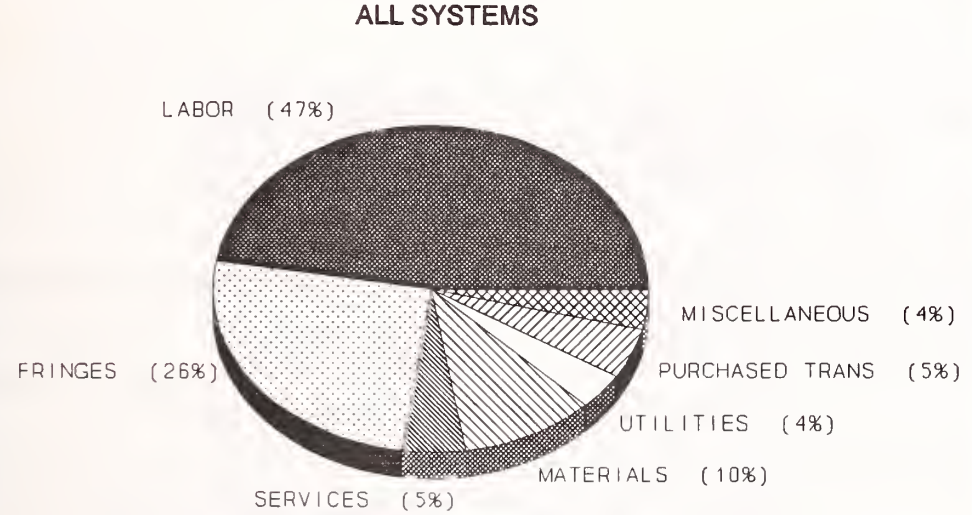
- Fringe benefit expenses ranged from 12.6 percent to 28.9 percent of total transit system operating expenses. These expenses increased (as a percentage of total system expense) with transit system size.

- Together labor and fringe benefit costs ($9.46 billion) were 73 percent of transit system operating expenses in 1988. These expenses accounted for 53.9 percent of transit system operating costs in the smallest transit systems and 77.9 percent in the largest systems.

- Public transit systems with more than 1,000 vehicles including commuter rail service, accounted for 55.3 percent of all transit operating expenses in 1988.

- Purchased transportation increased from 4.0 percent of total transit system operating expenses in 1987 to 5.1 percent of total operating expenses in 1988. Total expenditures for purchased transportation increased from $487.0 million in 1987 to $661.6 million in 1988.

TRANSIT OPERATING EXPENSES BY OBJECT CLASS

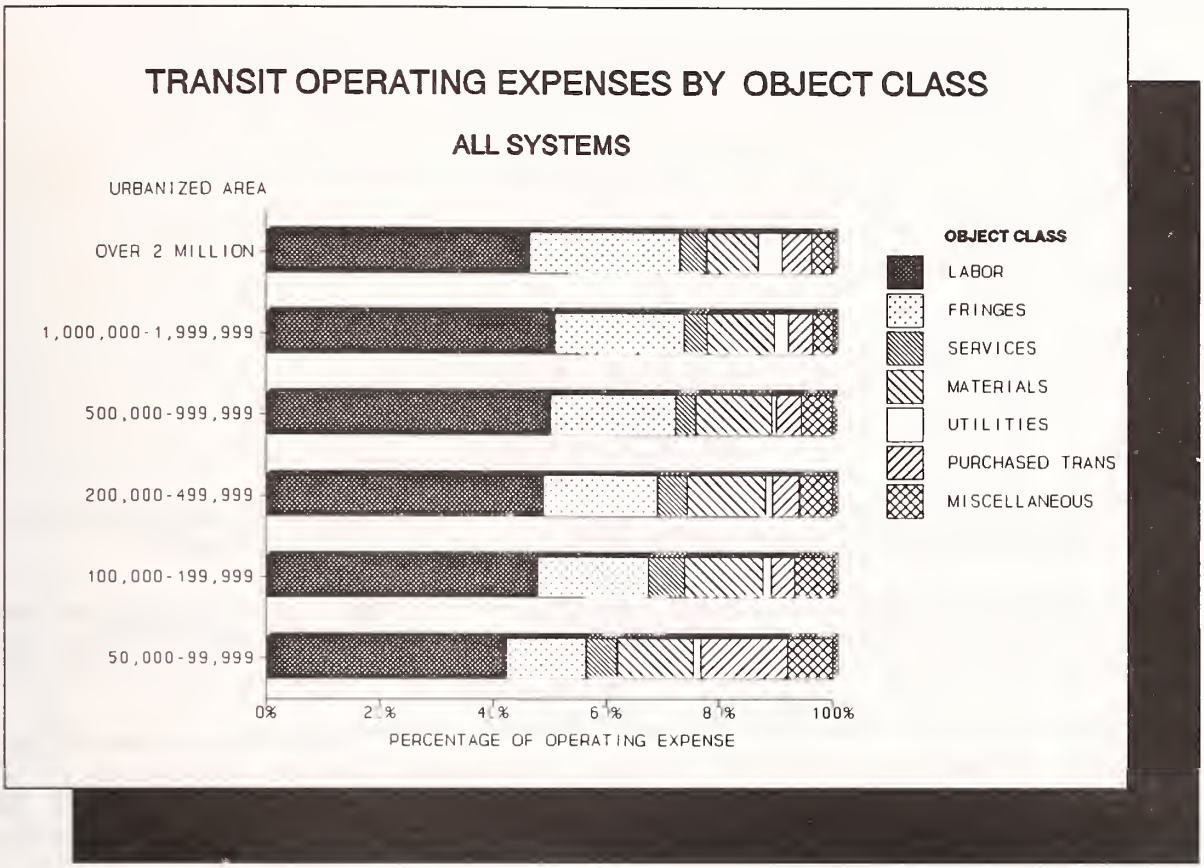


TRANSIT OPERATING EXPENSES BY OBJECT CLASS
ALL SYSTEMS BY FLEET SIZE
SECTION 15 1988

FLEET SIZE-->	<25	25-49	50-99	100-249	250-499	500-999	1000 AND OVER	ALL SYSTEMS
LABOR	46.9%	38.1%	45.0%	47.0%	42.3%	48.3%	49.0%	47.3%
FRINGES	12.6%	15.8%	19.0%	20.8%	21.6%	24.7%	28.9%	25.6%
SERVICES	5.3%	5.8%	5.3%	4.9%	6.1%	5.7%	3.9%	4.7%
MATERIALS	14.3%	11.7%	11.2%	12.7%	9.1%	9.7%	9.4%	9.9%
UTILITIES	1.6%	1.9%	1.8%	1.2%	2.9%	3.4%	4.6%	3.7%
PURCHASED TRANSPORTATION	9.7%	19.8%	9.1%	5.8%	12.2%	5.2%	2.0%	5.1%
MISCELLANEOUS	9.5%	6.9%	8.5%	7.5%	5.9%	2.9%	2.3%	3.9%
TOTAL (PERCENTAGE)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
TOTAL (MILLIONS)	$310.3	$336.5	$439.9	$1,039.3	$1,839.0	$1,831.4	$7,176.8	$12,973.2
SYSTEMS REPORTING	197	94	62	59	25	13	10	460

TRANSIT OPERATING EXPENSES BY OBJECT CLASS
ALL SYSTEMS BY URBANIZED AREA
SECTION 15 1988

- Public transit systems incurred operating expenses of approximately $13.0 billion in 1988 distributed as follows:
  - -- 76.8 percent of operating expenses were incurred by transit systems in urbanized areas with 2 million or more residents.
  - -- 13.3 percent of operating expenses were incurred by transit systems in urbanized areas with between 1 and 2 million residents.
  - -- 7.2 percent of operating expenses were incurred by transit systems in urbanized areas with between 200,000 and 1,000,000 residents.
  - -- 2.7 percent of operating expenses were incurred by transit systems in urbanized areas with less than 200,000 residents.
- In 1988 transit system labor (i.e. salaries and wages) costs, as a percentage of total operating expenses, ranged from 42.3 to 50.9 percent. Fringe benefit expenses tended to increase with urbanized area population, ranging from 14.0 percent for transit systems in the smallest urbanized areas to 26.7 percent for transit systems in the largest urbanized areas.
- Purchased transportation was used most extensively in the smallest urbanized areas, where 15.2 percent of transit system operating expenses were represented by purchased transportation. In the other urbanized areas, purchased transportation represented between 4.1 percent and 5.2 percent of transit system operating expenses.



TRANSIT OPERATING EXPENSES BY OBJECT CLASS
ALL SYSTEMS BY URBANIZED AREA
SECTION 15 1988

Population -->	50,000 TO 99,999	100,000 TO 199,999	200,000 TO 499,999	500,000 TO 999999	1 MILLION TO 1,999,999	OVER 2 MILLION	ALL SYSTEMS
LABOR	42.3%	47.9%	49.0%	50.1%	50.9%	46.4%	47.3%
FRINGES	14.0%	19.4%	20.1%	22.1%	22.8%	26.6%	25.6%
SERVICES	5.5%	6.6%	5.2%	3.6%	4.1%	4.8%	4.7%
MATERIALS	13.4%	13.8%	13.8%	13.4%	11.9%	9.1%	9.9%
UTILITIES	1.4%	1.4%	1.3%	0.8%	2.5%	4.2%	3.7%
PURCHASED TRANS	15.3%	4.1%	4.8%	4.4%	4.3%	5.2%	5.1%
MISCELLANEOUS	8.0%	6.8%	5.9%	5.4%	3.5%	3.7%	3.9%
TOTAL (PERCENTAGE)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
TOTAL (MILLIONS)	$117.5	$238.2	$440.0	$495.3	$1,721.8	$9,960.5	$12,973.2

TRANSIT OPERATING EXPENSES BY MODE
AND OBJECT CLASS
SECTION 15 1988

- Motor bus and rapid rail accounted for 73.6 percent of public transit operating costs in 1988, 50.0 and 23.6 percent, respectively.

- On average in 1988, the operating costs for demand response systems were $835,357, not including joint expenses. The 280 systems reporting in 1988 represented about 1.8 percent of the total transit operating costs.

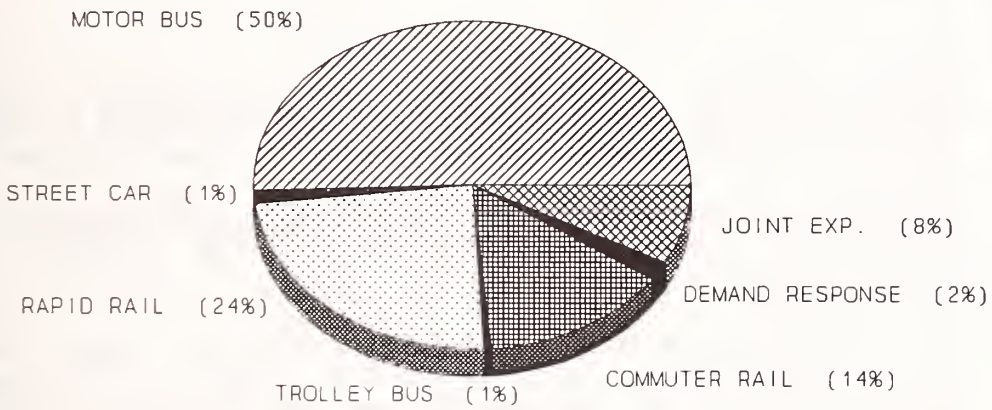
- Commuter rail and demand response services were the only two modes that were frequently provided through purchased service contracts. In particular, in 1988 more than 60 percent of the operating expenses for demand response services were incurred through purchased service agreements.

- Labor and fringe benefit expenses represented between 75.2 percent and 87.6 percent of total operating expenses for motor bus, rapid rail, streetcar, and trolley bus modes.

- Rapid rail transit systems had, on average, the highest operating costs per system. In 1988 the average cost per rapid rail system was $255.1 million. If New York City rapid rail system, with annual operating costs of $1.95 billion, is excluded, the average operating cost of all the other rapid rail systems would be $101.3 million.

TRANSIT OPERATING EXPENSES

BY MODE



The graph shows percentage of individual mode operating expenses to total operating expenses.

TRANSIT OPERATING EXPENSES BY MODE
AND OBJECT CLASS*
SECTION 15 1988

MODE -->	MOTOR BUS	RAPID RAIL	STREET CAR	TROLLEY BUS	COMMUTER RAIL	DEMAND RESPONSE	JOINT EXP.	ALL SYSTEMS
LABOR	50.2%	49.9%	51.5%	59.4%	38.4%	19.0%	39.8%	47.3%
FRINGES	25.0%	29.6%	26.3%	28.2%	24.5%	6.6%	24.5%	25.6%
SERVICES	4.0%	2.9%	4.5%	0.6%	5.3%	3.4%	13.8%	4.7%
MATERIALS	11.6%	8.0%	6.6%	5.5%	9.1%	4.5%	6.8%	7.7%
UTILITIES	1.0%	8.4%	9.2%	4.2%	5.8%	0.5%	3.2%	3.7%
PURCHASED TRANSPORTATION	4.1%	0.0%	0.0%	0.0%	14.0%	63.1%	0.1%	5.1%
MISCELLANEOUS	4.0%	1.2%	1.8%	2.1%	2.8%	2.9%	11.9%	3.9%
TOTAL (PERCENTAGE)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
TOTAL (MILLIONS)	$6,482.3	$3,060.9	$162.3	$73.2	$1,767.4	$233.9	$1,056.2	$12,973.2
SYSTEMS REPORTING	388	12	14	5	20	280	85	460

*Excludes JE except for ALL SYSTEMS

TRANSIT OPERATING EXPENSES TRENDS
BY OBJECT CLASS FOR ALL SYSTEMS
SECTION 15 1984-1988

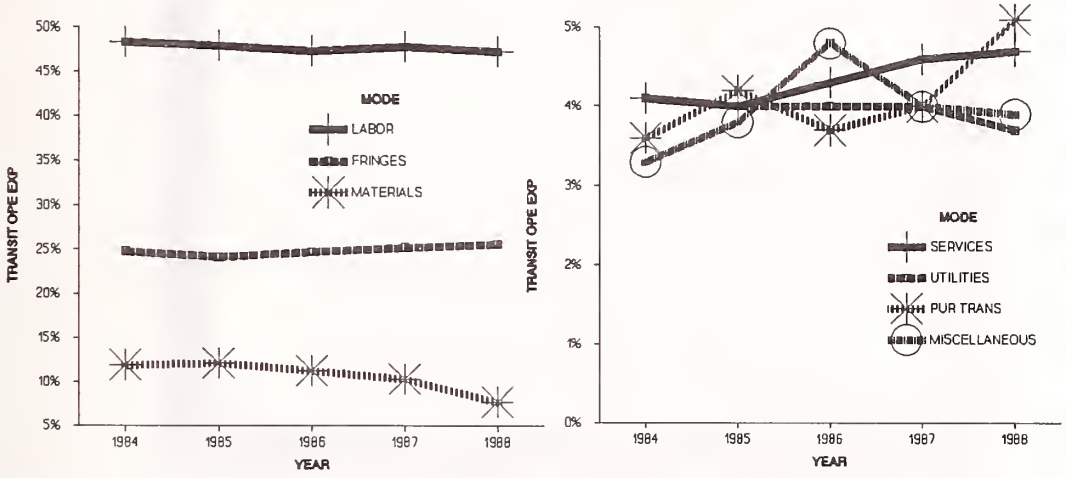
- Overall, expenses for transit systems increased from $9.35 billion to $12.97 billion. This represents an increase of $3.62 billion, or an average annual increase of 8.5 percent, in 1988 over 1984.

- During this five year period labor and fringes together have constituted a stable 73 percent of the operating expenses for all transit systems.

- Demand response was the only mode which labor and fringe benefits did not constitute a majority of its expenses. There was a reduction in costs for labor and fringes from about one third of its expenses to about 25 percent of its operating expenses. The largest expense category for demand response is the contracting for transportation "purchase transportation" expense category which rose from 50.7 percent of operating expenses in 1984 to 63.1 percent in 1988.

NOTE: The trends for all Systems are shown on Page 51. The trends in operating expense for each mode are shown on pages 52, 53, 54, and 55.

TRANSIT OPERATING EXPENSES TRENDS
BY OBJECT CLASS FOR ALL SYSTEMS



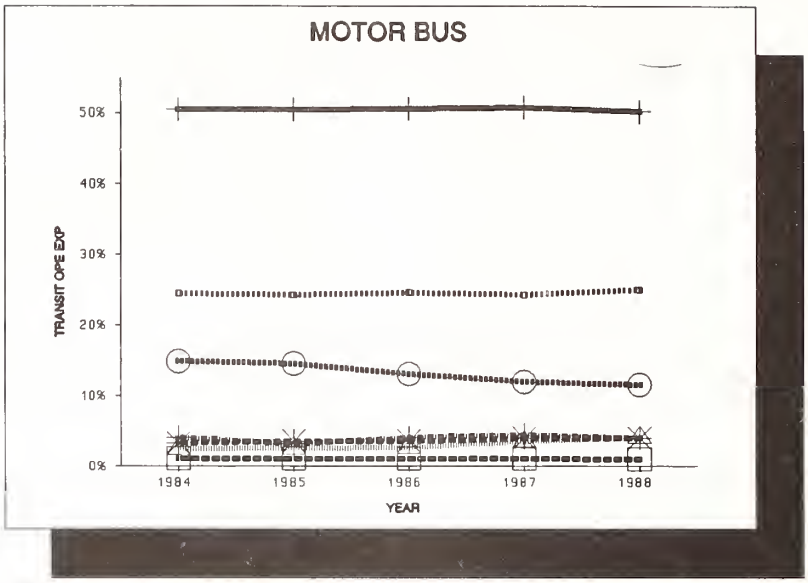
NOTE: ORIGIN STARTS AT 5% TRANSIT OPE EXP

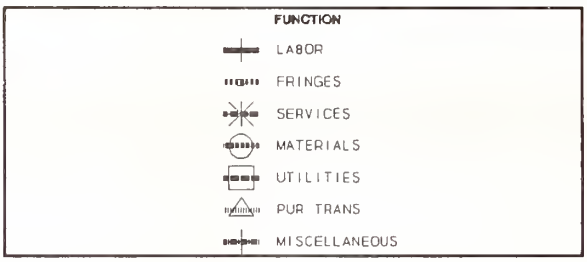
TRANSIT OPERATING EXPENSES TRENDS
BY OBJECT CLASS FOR ALL SYSTEMS
SECTION 15 1984-1988

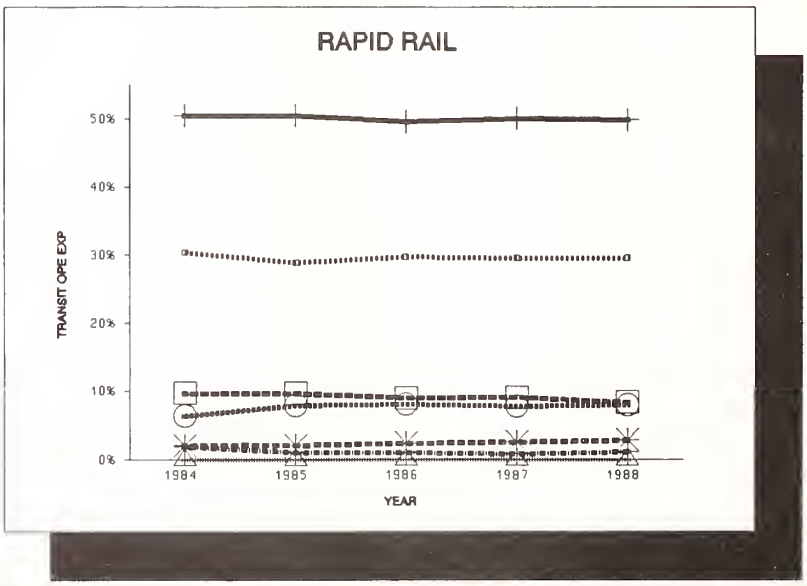
	1984	1985	1986	1987	1988
LABOR	48.3%	47.9%	47.3%	47.8%	47.3%
FRINGES	24.8%	24.1%	24.7%	25.2%	25.6%
SERVICES	4.1%	4.0%	4.3%	4.6%	4.7%
MATERIALS	11.9%	12.1%	11.2%	10.3%	7.7%
UTILITIES	4.1%	4.0%	4.0%	4.0%	3.7%
PUR TRANS	3.6%	4.2%	3.7%	4.0%	5.1%
MISCELLANEOUS	3.3%	3.8%	4.8%	4.0%	3.9%
TOTAL (MILLIONS)	$9,348.4	$10,196.5	$11,751.2	$12,175.4	$12,973.2
SYSTEMS REPORTING	430	443	427	443	460

NOTE: TOTAL (MILLIONS) includes Joint Expenses.

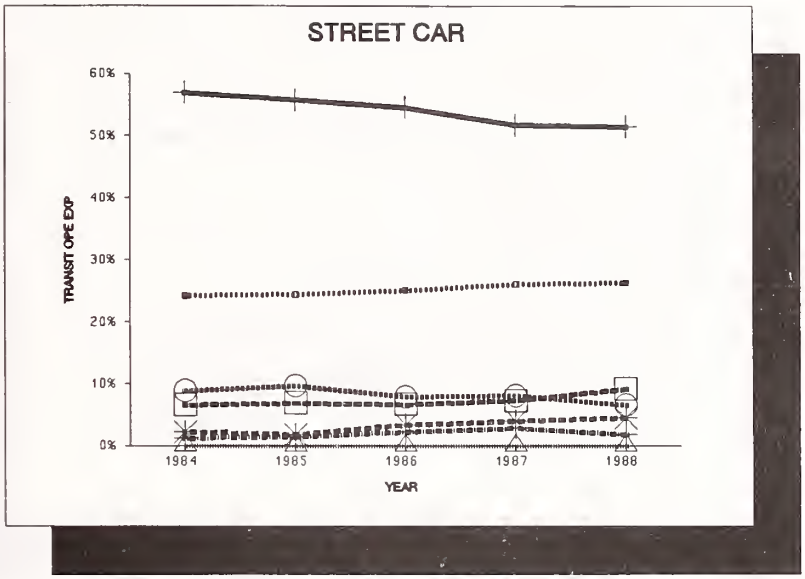
TRANSIT OPERATING EXPENSES TRENDS
BY OBJECT CLASS FOR ALL SYSTEMS
SECTION 15 1984-1988

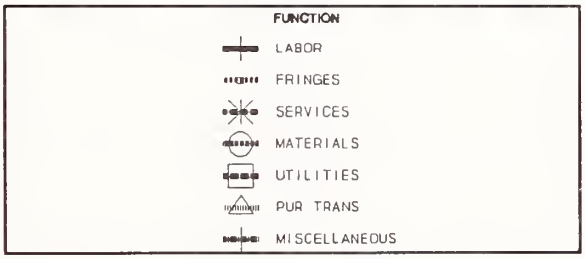


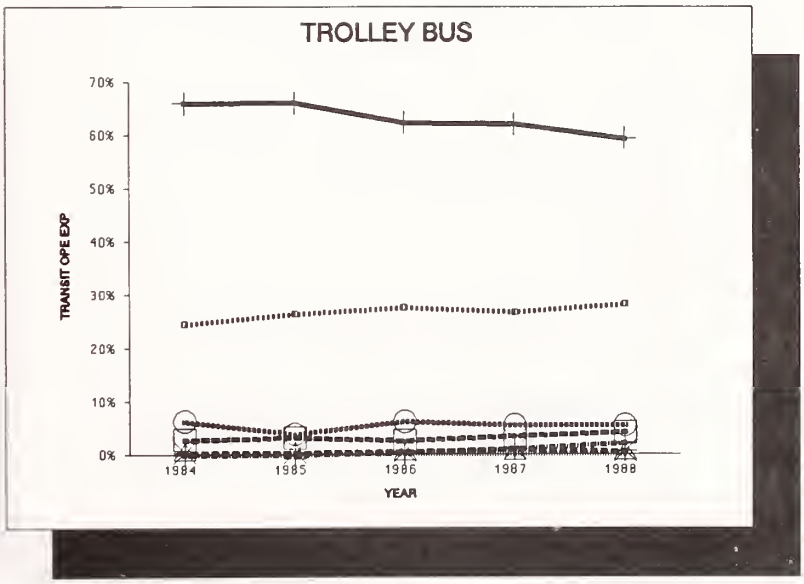




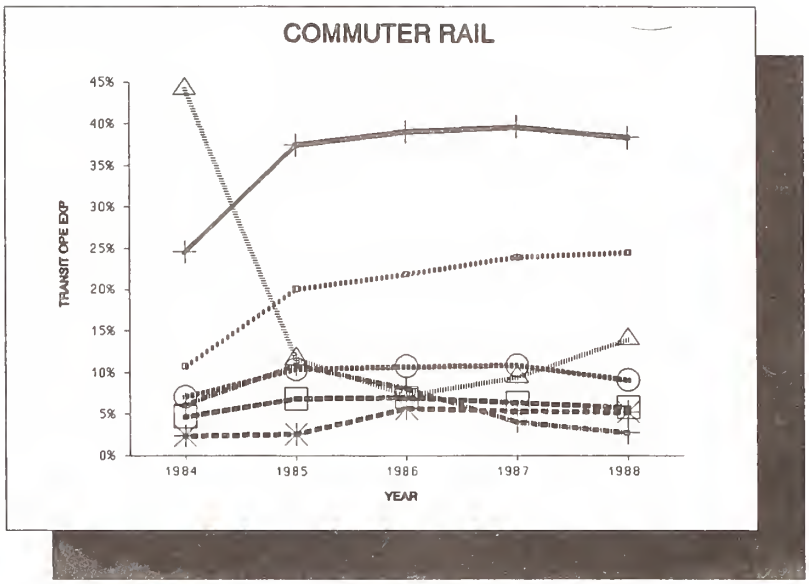
TRANSIT OPERATING EXPENSES TRENDS
BY OBJECT CLASS FOR ALL SYSTEMS
SECTION 15 1984-1988

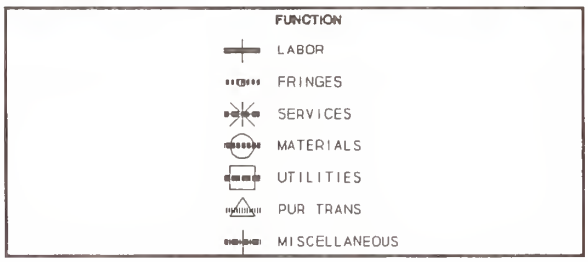


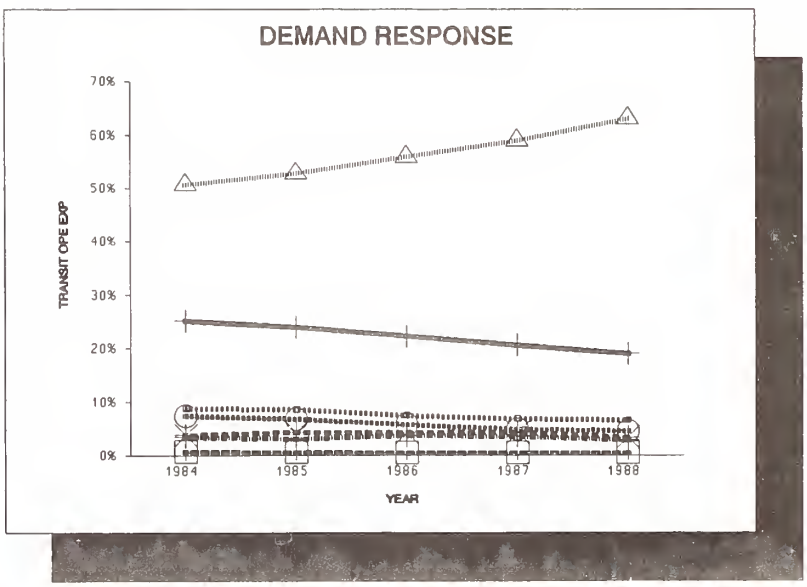




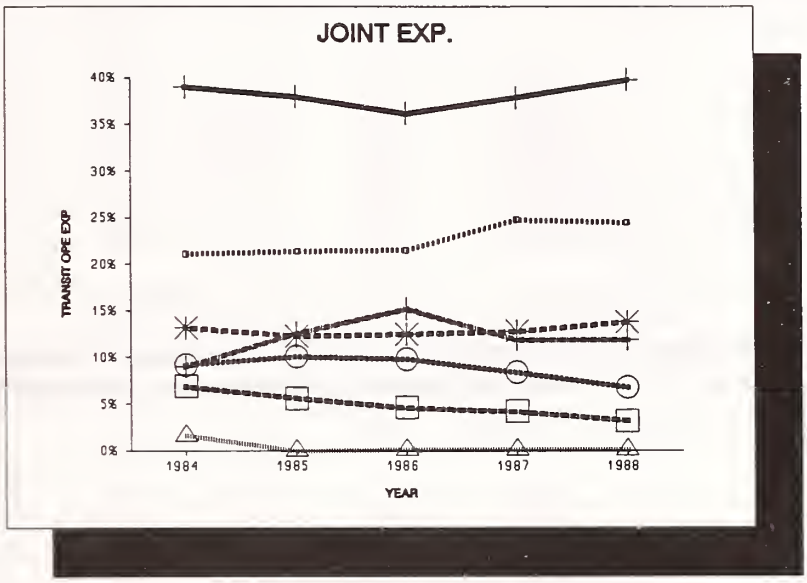
TRANSIT OPERATING EXPENSES TRENDS BY OBJECT CLASS FOR ALL SYSTEMS SECTION 15 1984-1988

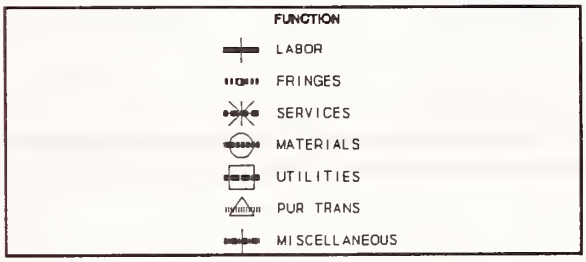






TRANSIT OPERATING EXPENSES TRENDS
BY OBJECT CLASS FOR ALL SYSTEMS
SECTION 15 1984-1988





TRANSIT OPERATING EXPENSES TRENDS
BY OBJECT CLASS FOR ALL SYSTEMS
SECTION 15 1984-1988

MOTOR BUS	1984	1985	1986	1987	1988
LABOR	50.5%	50.5%	50.6%	50.8%	50.2%
FRINGES	24.5%	24.3%	24.6%	24.3%	25.0%
SERVICES	3.3%	3.6%	3.6%	4.0%	4.0%
MATERIALS	14.9%	14.6%	13.1%	12.0%	11.6%
UTILITIES	1.1%	1.1%	1.1%	1.1%	1.0%
PURCHASED TRANSPORTATION	2.5%	2.6%	2.7%	3.5%	4.1%
MISCELLANEOUS	4.1%	3.2%	4.1%	4.5%	4.0%
TOTAL (MILLIONS)	$5,335.1	$5,691.2	$5,997.3	$6,181.0	$6,482.3
SYSTEMS REPORTING	378	391	373	379	388

RAPID RAIL	1984	1985	1986	1987	1988
LABOR	50.5%	50.5%	49.6%	50.1%	49.9%
FRINGES	30.4%	28.9%	29.7%	29.6%	29.6%
SERVICES	2.1%	2.1%	2.4%	2.6%	2.9%
MATERIALS	6.4%	7.9%	8.1%	7.8%	8.0%
UTILITIES	9.7%	9.7%	9.0%	9.1%	8.4%
PURCHASED TRANSPORTATION	0.0%	0.0%	0.0%	0.0%	0.0%
MISCELLANEOUS	1.9%	1.1%	1.1%	0.9%	1.2%
TOTAL (MILLIONS)	$2,296.2	$2,506.8	$2,691.1	$2,815.4	$3,060.9
SYSTEMS REPORTING	12	12	12	12	12

STREET CAR	1984	1985	1986	1987	1988
LABOR	57.0%	55.8%	54.6%	51.8%	51.5%
FRINGES	24.2%	24.4%	25.1%	26.1%	26.3%
SERVICES	2.2%	1.8%	3.4%	4.0%	4.5%
MATERIALS	8.9%	9.7%	7.9%	8.1%	6.6%
UTILITIES	6.6%	6.9%	6.7%	7.3%	9.2%
PURCHASED TRANSPORTATION	0.0%	0.0%	0.0%	0.0%	0.0%
MISCELLANEOUS	1.2%	1.4%	2.2%	2.9%	1.8%
TOTAL (MILLIONS)	$106.4	$117.8	$132.7	$142.7	$162.3
SYSTEMS REPORTING	9	8	10	12	14

TROLLEY BUS	1984	1985	1986	1987	1988
LABOR	66.0%	66.1%	62.4%	62.1%	59.4%
FRINGES	24.5%	26.4%	27.6%	26.7%	28.2%
SERVICES	0.4%	0.4%	0.6%	1.0%	0.6%
MATERIALS	6.3%	3.9%	6.2%	5.5%	5.5%
UTILITIES	2.8%	3.2%	2.6%	3.5%	4.2%
PURCHASED TRANSPORTATION	0.0%	0.2%	0.0%	0.0%	0.0%
MISCELLANEOUS	-0.1%	-0.2%	0.3%	1.1%	2.1%
TOTAL (MILLIONS)	$59.1	$62.3	$68.9	$65.2	$73.2
SYSTEMS REPORTING	5	5	5	5	5

TRANSIT OPERATING EXPENSES TRENDS
BY OBJECT CLASS FOR ALL SYSTEMS
SECTION 15 1984-1988

COMMUTER RAIL	1984	1985	1986	1987	1988
LABOR	24.6%	37.4%	39.1%	39.7%	38.4%
FRINGES	10.8%	20.1%	21.9%	24.0%	24.5%
SERVICES	2.4%	2.6%	5.7%	5.5%	5.3%
MATERIALS	7.1%	10.4%	10.8%	10.9%	9.1%
UTILITIES	4.7%	6.9%	7.0%	6.4%	5.8%
PURCHASED TRANSPORTATION	44.2%	11.7%	7.3%	9.5%	14.0%
MISCELLANEOUS	6.2%	10.9%	8.1%	4.1%	2.8%
TOTAL (MILLIONS)	$1,440.3	$1,588.8	$1,601.5	$1,706.7	$1,767.4
SYSTEMS REPORTING	18	21	18	18	14

DEMAND RESPONSE	1984	1985	1986	1987	1988
LABOR	25.1%	23.9%	22.2%	20.6%	19.0%
FRINGES	8.8%	8.6%	7.5%	6.9%	6.6%
SERVICES	3.8%	4.3%	4.3%	4.3%	3.4%
MATERIALS	7.4%	6.8%	5.8%	4.9%	4.5%
UTILITIES	0.7%	0.6%	0.5%	0.5%	0.5%
PURCHASED TRANSPORTATION	50.7%	52.8%	56.0%	59.0%	63.1%
MISCELLANEOUS	3.5%	3.1%	3.7%	3.6%	2.9%
TOTAL (MILLIONS)	$121.3	$146.7	$168.4	$196.6	$233.9
SYSTEMS REPORTING	237	243	245	257	280

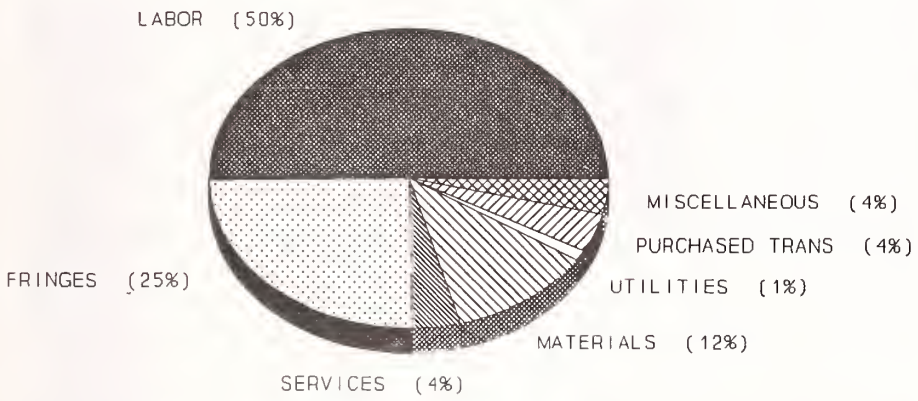
JOINT EXP.	1984	1985	1986	1987	1988
LABOR	39.0%	38.0%	36.2%	37.9%	39.8%
FRINGES	21.1%	21.4%	21.5%	24.8%	24.5%
SERVICES	13.2%	12.3%	12.5%	12.8%	13.8%
MATERIALS	9.2%	10.1%	9.8%	8.4%	6.8%
UTILITIES	6.9%	5.6%	4.6%	4.2%	3.2%
PURCHASED TRANSPORTATION	1.6%	0.0%	0.1%	0.1%	0.1%
MISCELLANEOUS	9.0%	12.6%	15.2%	11.9%	11.9%
TOTAL (MILLIONS)	$695.4	$771.2	$886.7	$959.2	$1,056.2
SYSTEMS REPORTING	104	102	88	79	85

MOTOR BUS OPERATING EXPENSES
BY OBJECT CLASS AND FLEET SIZE
SECTION 15 1988

- The $6.5 billion in total motor bus transit operating expenses incurred in 1988 (not including joint expenses) were distributed as follows:
  - -- The six largest motor bus systems incurred $2.40 billion or 37.0 percent of the total costs.
  - -- The 12 transit systems with 500 to 999 motor buses incurred $1.19 billion or 18.3 percent of total costs.
  - -- The 65 transit systems with 100 to 499 motor buses incurred $2.01 billion or 30.9 percent of total costs.
  - -- The 302 transit systems with less than 100 motor buses incurred $888.3 million or 13.7 percent of the total costs.
- Motor bus labor and fringe benefit expenses represented $4.87 billion in 1988, 75.2 percent of total operating expenses not including joint expenses. Materials expense represented the next largest expense area with between 10.3 and 14.4 percent of total operating costs.
- Motor bus systems with less than 250 vehicles used purchase-of-service agreements more extensively than the larger motor bus systems.
- Labor and fringe benefit expenses represented 82.0 percent of total operating costs for the largest transit systems and between 47.4 and 78.2 percent of operating expenses for other transit systems.

MOTOR BUS OPERATING EXPENSES

BY OBJECT CLASS



MOTOR BUS OPERATING EXPENSES
BY OBJECT CLASS AND FLEET SIZE
SECTION 15 1988

FLEET SIZE -->	<25	25-49	50-99	100-249	250-499	500-999	1000 AND OVER	ALL SYSTEMS
LABOR	35.8%	46.9%	45.7%	47.4%	49.5%	53.5%	52.4%	50.2%
FRINGES	11.6%	20.1%	19.5%	20.8%	24.7%	24.7%	29.6%	25.0%
SERVICES	6.0%	5.8%	5.1%	4.6%	5.0%	3.8%	2.9%	4.0%
MATERIALS	12.1%	14.4%	12.7%	12.6%	11.9%	12.0%	10.3%	11.6%
UTILITIES	1.3%	1.3%	1.1%	0.9%	1.1%	1.8%	0.6%	1.0%
PURCHASED TRANSPORTATION	25.3%	4.3%	7.7%	6.8%	3.4%	3.2%	1.4%	4.1%
MISCELLANEOUS	8.0%	7.1%	8.2%	6.9%	4.6%	1.0%	2.7%	4.0%
TOTAL (PERCENTAGE)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
TOTAL (MILLIONS)	$242.9	$281.5	$363.9	$913.7	$1,092.2	$1,188.5	$2,399.6	$6,482.3
SYSTEMS REPORTING	185	75	45	45	20	12	6	388


CHAPTER II

CHAPTER II - OPERATIONAL STATISTICS

OVERVIEW

This chapter contains aggregate statistics on transit operations. The service supply and service utilization information describes the three basic categories of operational statistics:

- Resource input statistics - transit system supply of vehicular and labor resources;
- Service output statistics - amount of service produced per resources consumed; and
- Service utilization statistics - extent to which the public utilizes the services generated.

Operational information for the charts and tables in this chapter comes from the Section 15 400 series forms. For the resource input category, vehicle fleet and employee statistics were selected. The service outputs category includes vehicle hours, vehicle miles, vehicle revenue hours, and vehicle revenue miles statistics. The third category, service utilization, includes unlinked passenger trips and passenger miles. More detailed statistics on transit system operational characteristics appear in Table 3.12 through Table 3.17 of the Annual Report. These tables include the statistics presented here, and contain other operational information as well, such as accident and roadcall statistics.

In the tables and charts in Chapter II, all operational information, with the exception of transit employee statistics and fleet age data, is in actual numbers. Employee statistics are in percentages except for the second total, which provides a count of the total employees for each mode. The fleet age table gives the total number of vehicles in each mode, the percentage of the fleet in each age category, and finally the average age of the fleet in years. As in the operating expense section, operational statistics are organized according to transit mode and fleet size, with special emphasis accorded the two major public transit modes--motor bus and rapid rail.

SERVICE SUPPLY AND SERVICE UTILIZATION STATISTICS

These statistics show the amount of service provided to the public and the public's use of these services. For this reason, it is important that the reader understand the nature of these statistics and some of the difficulties involved in collecting and interpreting them.

"Service supplied" statistics refer to four types of vehicles outputs: vehicles miles, vehicle revenue miles, vehicle hours, and vehicle revenue hours. Vehicle hours and miles represent the total times and distances traveled by vehicles, including the miles and hours traveled on scheduled routes and miles and hours required to get to and from these routes. Vehicle revenue miles and vehicle revenue hours, by contrast, are the times and distances traveled in revenue service only.

The difference between vehicle miles and vehicle revenue miles represents "deadhead" (non-revenue) miles. Interpretation and measurement of what constitutes deadhead mileage--and, accordingly, all four service supply measures--often differs from one transit agency to another. Efforts to render this information more comparable through the Section 15 validation process and through development of clearer definitions have produced greater consistency.

Two types of service utilization statistics are reported under the Section 15 program--unlinked passenger trips and passenger miles. Unlinked passenger trip statistics reflect the total number of trips made on a particular mode, regardless of the number of passengers carried. Each time a passenger transfers, he/she is counted as having taken another trip. This practice, however, makes it difficult to compare the number of passenger trips between the modes because, for example, when passenger transfer from one bus to another, the count would be two trips while on rail service such a transfer would be counted only as one trip.

Passenger mile statistics describe the total distance traveled by transit passengers, thereby relating total trips to the average distance traveled on each trip. Passenger miles on the other hand is comparable between modes because it counts

the total distance of the trip taken by a passenger and the transfer factor does not play a role.

Estimating this information has posed a difficult data-gather problem for some systems, particularly the smaller systems. In many instances the passenger-related data are collected through one of the several sampling techniques recommended by UMTA. Transit systems, however, may apply any sampling procedure they desire, provided that the technique yields estimates that satisfy precision and confidence requirements of 10 percent and 95 percent respectively.

PATTERNS AND TRENDS

Following are descriptions of some of the key operational patterns and statistics revealed in the tables and charts in this chapter.

Resource Input Statistics

- In 1988 there were over 61,843 transit vehicles operated in maximum service. These vehicles provided service in the following modes:
  - 67.3 percent provided motor bus service;
  - 13.2 percent provided rapid rail service;
  - 1.8 percent provided streetcar and trolley bus service;
  - 6.3 percent provided commuter rail service;
  - 10.2 percent provided demand responsive service; and
  - 1.2 percent provided other services such as ferry boat and inclined plane.
- Of the more than 200,000 reported equivalent employees in the public transportation industry, 44.3 percent of the employees are directly involved in vehicle operations.
- In 1988 NYCTA accounted for 60.6 percent of total U.S. national rapid rail vehicles. Chicago, the second largest system, accounted for 11.4 percent of the rapid rail vehicles. The other 10 systems accounted for 2,294 rapid rail vehicles, 28.0 percent of the total national fleet.

Service Output Statistics

- Motor bus supplied the greatest amount of transit service in 1988: 72.2 percent of total vehicle revenue hours and 63.5 percent of total vehicle revenue miles.
- Rapid rail, the second largest transit mode, accounted for 15.9 percent of total vehicle revenue hours and 21.5 percent of total vehicle revenue miles.
- Purchased transportation represented the major source of demand response services in 1988, accounting for 70.4 percent of demand response vehicle revenue hours and 70.1 percent of demand vehicle revenue miles.
- In 1988, transit systems in larger urbanized areas provided a greater proportion of the vehicle revenue miles of transit services:
  - Transit systems in urbanized areas with 2 million or more residents provided 62.4 percent of the transit vehicle revenue miles.
  - Transit systems in urbanized areas with between 1 and 2 million more residents provided 17.8 percent of the transit vehicle revenue miles.
  - Transit systems in urbanized areas with between 200,000 and 1 million residents provided 13.8 percent of the transit vehicle revenue miles.
  - Transit systems in urbanized areas with less than 200,000 residents provided 6.0 percent of

the transit vehicle revenue miles.

- In 1988 transit systems in urbanized areas with 2 million or more residents accounted for:

  - -- All passenger miles traveled on commuter rail.
  - -- 95.8 percent of the passenger miles traveled by rapid rail.
  - -- 79.4 percent of the passenger miles traveled by trolley bus.
  - -- 50.1 percent of the passenger miles traveled on streetcars.
  - -- 59.4 percent of the passenger miles traveled on motor bus.
  - -- 17.9 percent of the miles traveled on demand response transit.

Service Utilization Statistics

- The transit industry provided 67 million fewer (1 percent) passenger trips but 800 million (2.2 percent) more passenger miles in 1988 over 1987.

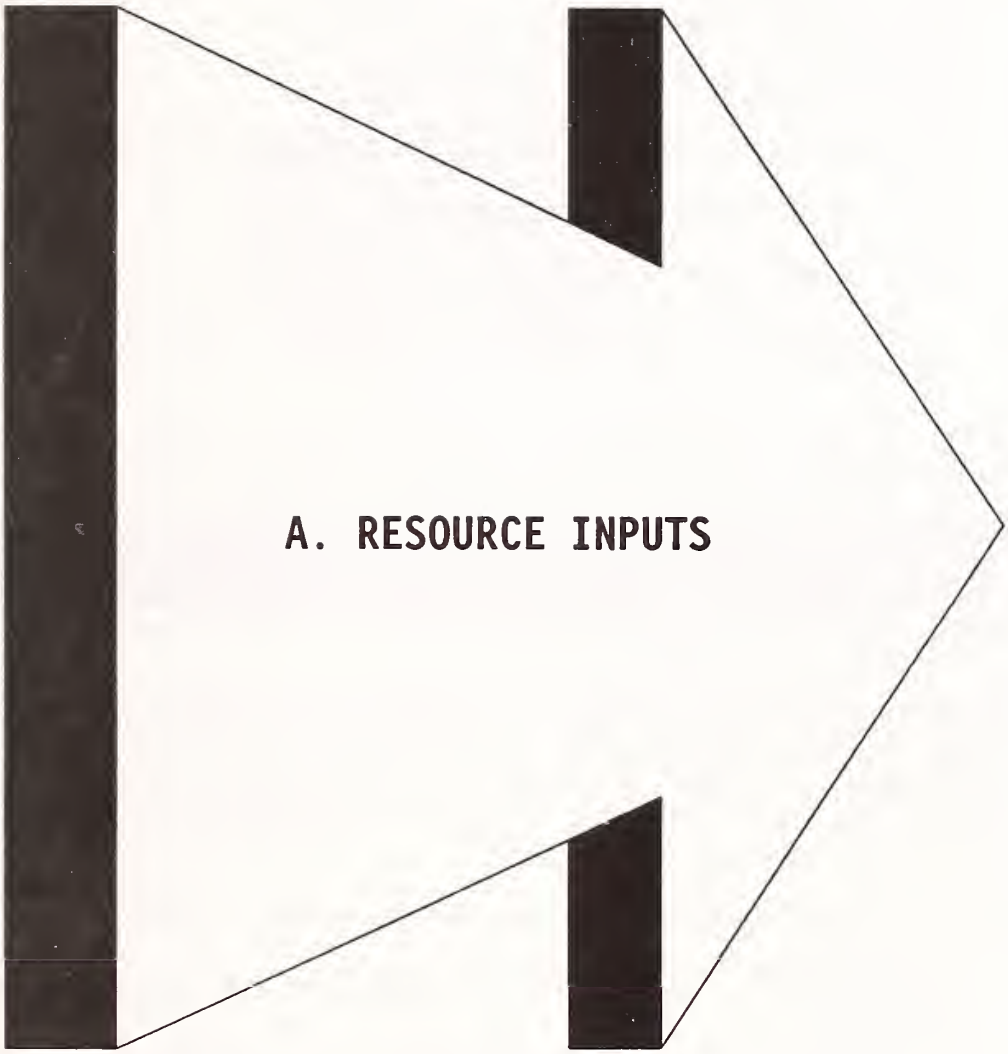
- Motor bus served the greatest number of passengers trips in 1988 (4.78 billion), accounting for 61.4 percent of total passenger trips and 47.9 percent of total passenger miles.

- Rapid rail served the second most passenger trips in 1988 (2.31 billion), accounting for 29.7 percent of total passenger trips and 30.6 percent of total passenger miles.

- All other modes of transit service accounted for 693.5 million passenger trips in 1988, accounting for 8.9 percent of total passenger trips and 21.5 percent of total passenger miles.

- Between 1984 and 1988, there has been an overall loss of 946.5 million passenger trips for all modes despite the fact of an increased level of rail service during this time period. However, there has been an increase of 910 million passenger miles.

II. TRANSIT INDUSTRY OPERATION EXHIBITS

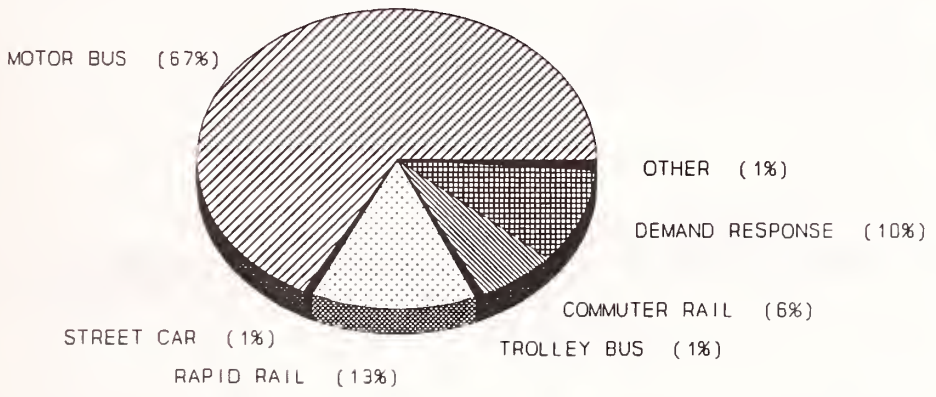

A. RESOURCE INPUTS

VEHICLES OPERATED ON TYPICAL WEEKDAY DURING PERIOD OF MAXIMUM SCHEDULED SERVICE BY MODE AND FLEET SIZE SECTION 15 1988

- In 1988 there were over 61,843 transit vehicles operated in maximum service. These vehicles provided service in the following modes:
  - -- 67.3 percent provided motor bus service;
  - -- 13.2 percent provided rapid rail service;
  - -- 1.8 percent provided streetcar and trolley bus service;
  - -- 6.3 percent provided commuter rail service;
  - -- 10.2 percent provided demand responsive service; and
  - -- 1.2 percent provided other services such as ferry boat and inclined plane.
- Transit systems operating modal fleets of 500 or more vehicles on a typical weekday accounted for 47.1 percent of the motor bus vehicles, 78.7 percent of the rapid rail vehicles and 62.3 percent of the commuter rail vehicles.
- Transit systems operating modal fleets of 100 or less vehicles on a typical weekday accounted for 21.8 percent of all transit vehicles and 19.2 percent of the motor bus service.
- In 1988, demand response vehicles, although comprising only 10.2 percent of urban public transportation vehicles, constituted nearly 31.7 percent of the vehicles in service for systems with revenue fleets of less than 100 vehicles and nearly 40.2 percent of the vehicles in service for systems with less than 25 vehicles.
- Of the 750 modal systems receiving Federal monies in 1988:
  - -- 13.9 percent of the vehicles operated in fleets of fewer than 50 vehicles
  - -- 7.8 percent of the vehicles operated in fleets of 50 to 99 vehicles
  - -- 32.2 percent of the vehicles operated in fleets of 100 to 499 vehicles
  - -- 46.0 percent of the vehicles operated in fleets of 500 or more vehicles.

VEHICLES OPERATED ON TYPICAL WEEKDAY

BY MODE



VEHICLES OPERATED ON TYPICAL WEEKDAY
DURING PERIOD OF MAXIMUM SCHEDULED SERVICE
BY MODE AND FLEET SIZE
SECTION 15 1988

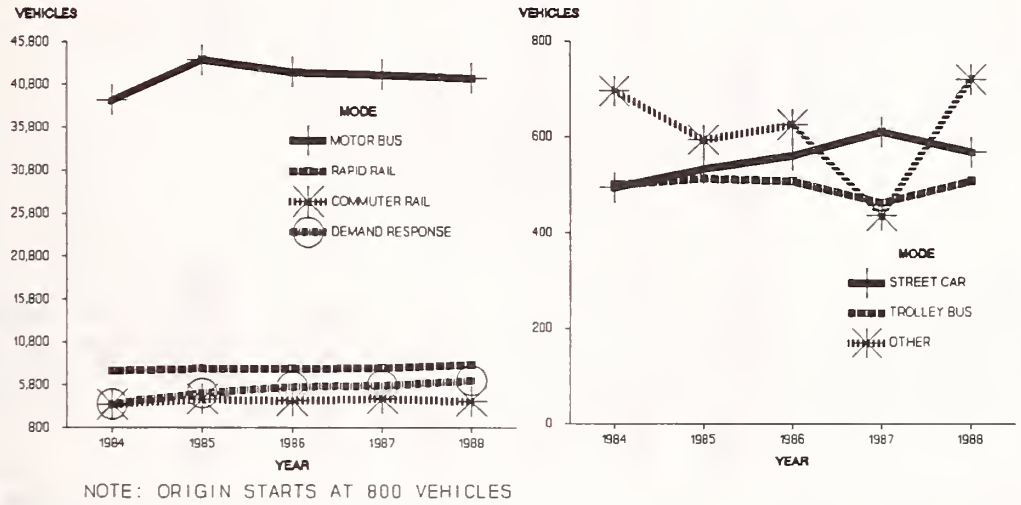
FLEET SIZE -->	<25	25-49	50-99	100-249	250-499	500-999	1000 AND OVER	ALL SYSTEMS
MOTOR BUS	2,219	2,635	3,126	7,068	6,954	8,391	11,223	41,615
RAPID RAIL	0	35	224	131	1,356	1,479	4,957	8,182
STREET CAR	150	53	80	287	0	0	0	570
TROLLEY BUS	0	25	119	101	266	0	0	511
COMMUTER RAIL	35	77	124	161	1,065	1,369	1,049	3,880
DEMAND RESPONSE	1,702	1,415	1,149	1,449	602	0	0	6,317
OTHER	120	158	0	444	0	0	0	722

VEHICLES OPERATED ON TYPICAL WEEKDAY
DURING PERIOD OF MAXIMUM SCHEDULED SERVICE TRENDS
ALL SYSTEMS
SECTION 15 1984-1988

- The transit industry experienced an increase of 6,613 vehicles operated in maximum service between 1984 and 1988, an average annual increase of 2.9 percent.

- Motor bus and demand response account for 81 percent of the increase in vehicles. Motor bus added 2,608 vehicles, an average annual increase of 1.6 percent year. Demand response added a similar number of vehicles to its fleet as Motor bus between 1984 and 1988, i.e., 2,767 vehicles. However, the effect of this addition was a near doubling of its fleet.

VEHICLES OPERATED ON TYPICAL WEEKDAY
ALL SYSTEMS



NOTE: ORIGIN STARTS AT 800 VEHICLES

VEHICLES OPERATED ON TYPICAL WEEKDAY
DURING PERIOD OF MAXIMUM SCHEDULED SERVICE TRENDS
ALL SYSTEMS
SECTION 15 1984-1988

	1984	1985	1986	1987	1988
MOTOR BUS	39,007	43,673	42,288	41,984	41,615
RAPID RAIL	7,432	7,673	7,705	7,731	8,182
STREET CAR	495	534	563	612	570
TROLLEY BUS	501	515	509	465	511
COMMUTER RAIL	3,502	4,113	3,917	4,170	3,880
DEMAND RESPONSE	3,550	4,803	5,607	5,716	6,317
OTHER	697	595	627	438	722

TRANSIT REVENUE VEHICLE FLEET AGE
BY MAJOR MODE
SUMMARY AGE DISTRIBUTION
SECTION 15 1988

- In 1988, the average age of the rapid rail fleet was 15.2 years, and more than 35.4 percent of the vehicles in the fleet were more than 20 years old. This represented an improvement, since 37.9 percent of the rapid rail fleet was more than 20 years old in 1987 and the average age of the rapid rail fleet was 23.9 years.

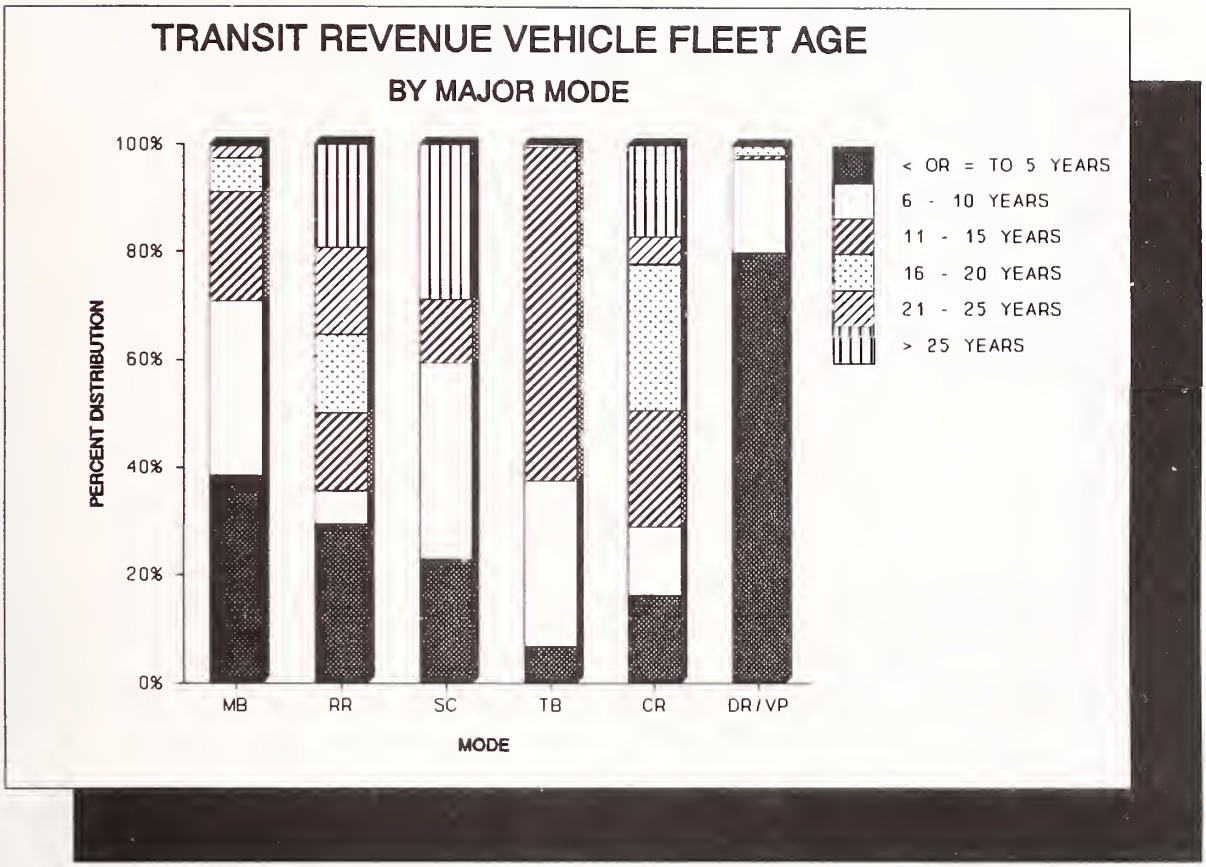
- In 1988 the average age of the trolley bus fleet was reduced from 12.5 years to 10.4 years. This occurred as the composition of the fleet went from 6.5 percent which was 10 years or less to 37.6 percent which was 10 years or less.

- With the exception of rapid rail, commuter rail cars, and trolley bus which have longer useful lives, the majority of transit vehicles in all modes were 10 years old or less in 1988. More specifically:

  -- 71.0 percent of the motor bus fleet (37,343) vehicles) were 10 years old or less.

  -- 59.5 percent of the streetcar fleet (546 vehicles) were 10 years old or less.

  -- 97.5 percent of the demand response and van pool fleet were (3,868 vehicles) 10 years old or less.



TRANSIT REVENUE VEHICLE FLEET AGE
BY MAJOR MODE
SUMMARY AGE DISTRIBUTION - SECTION 15 1988

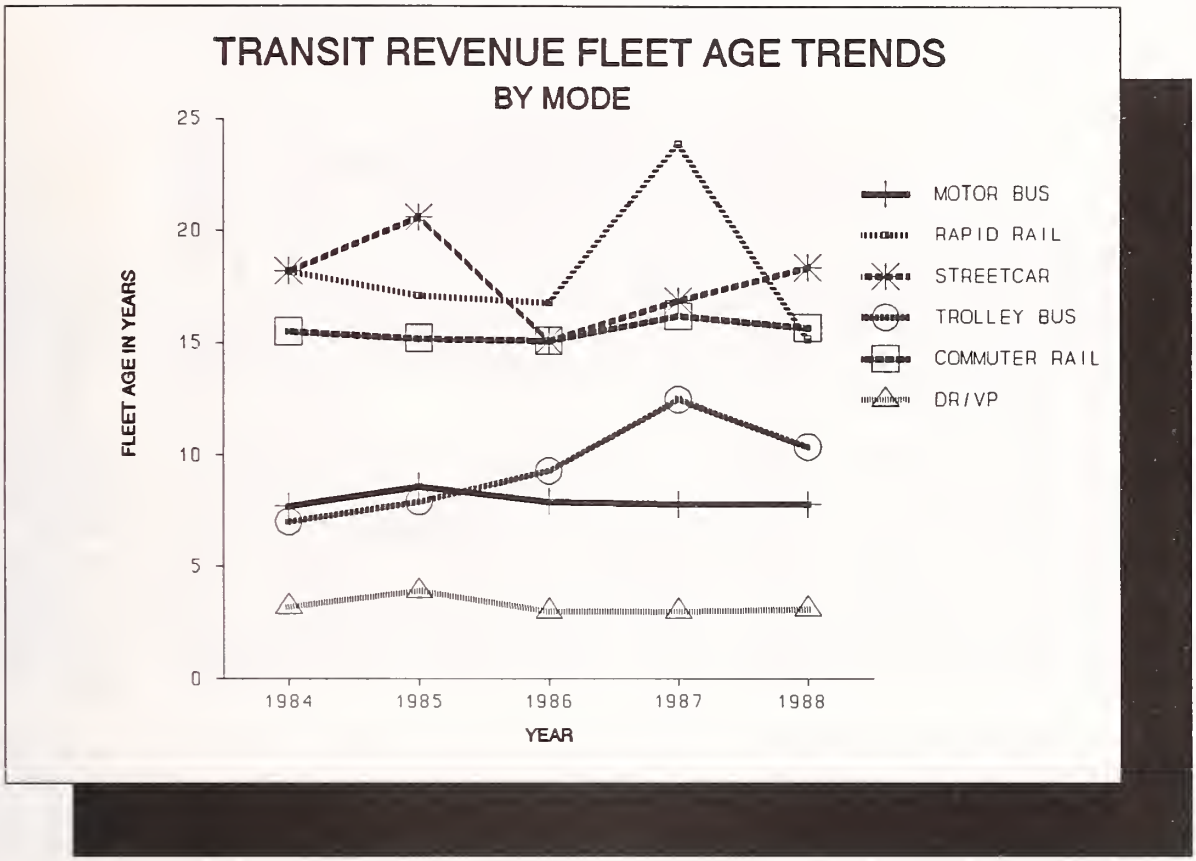
	FLEET SIZE	< OR = 5 YEARS	6-10 YEARS	11-15 YEARS	16-20 YEARS	21-25 YEARS	>25 YEARS	AVERAGE AGE
MOTOR BUS	52596	38.5%	32.5%	20.2%	6.3%	2.2%	0.3%	7.8
RAPIO RAIL	10419	29.5%	6.1%	14.6%	14.5%	16.1%	19.3%	15.2
STREETCAR	917	22.9%	36.6%	11.8%	0.0%	0.0%	28.7%	18.4
TROLLEY BUS	711	6.9%	30.7%	62.0%	0.4%	0.0%	0.0%	10.4
COMMUTER RAIL	5065	16.5%	12.6%	21.7%	27.1%	5.1%	17.0%	15.7
OEMAND RESPONSE/VAN POOL	3968	80.1%	17.4%	0.7%	1.8%	0.0%	0.0%	3.1

TRANSIT REVENUE FLEET AGE TRENDS
BY MODE
SECTION 15 1984-1988

- There were declines in the number of vehicles for all modes except for slight increases in rapid rail (69 vehicles) and streetcar (19 vehicles). There was a total net decrease of 874 vehicles. The majority of the fleet reduction was in demand response which experienced a drop of 576 vehicles and in motor bus which experienced a reduction of 258 vehicles in 1988 over 1987.

- The motor bus transit system fleet age averaged about 7.8 years between 1984 and 1988. The motor bus fleet has one of the youngest fleets of all fleets made up of full-size transit vehicles.

- Demand response and van pool vehicles have the shortest average life of all transit vehicles because of their construction. These vehicles were generally replaced every three to five years.



TRANSIT REVENUE FLEET AGE TRENDS
BY MODE
SECTION 15 1984-1988

	1984	1985	1986	1987	1988
MOTOR BUS	7.7	8.6	7.9	7.8	7.8
RAPID RAIL	18.2	17.1	16.8	23.9	15.2
STREETCAR	18.2	20.6	15.1	16.9	18.4
TROLLEY BUS	7.0	7.9	9.3	12.5	10.4
COMMUTER RAIL	15.5	15.2	15.1	16.2	15.7
DEMAND RESPONSE/VAN POOL	3.2	3.9	3.0	3.0	3.1

TRANSIT SYSTEM EMPLOYEES BY EMPLOYEE CLASSIFICATION AND MODE SECTION 15 1988

- Approximately 90 percent of transit employees working in the traditional urban transit modes (i.e., modes other than commuter rail services) were employed in the motor bus or rapid rail modes. In 1988, the motor bus mode employed 63.2 percent of public transit employees and the rapid rail mode employed 22.7 percent.

- Generally, the distribution of employees was similar among the three rail modes (rapid rail, streetcar, and commuter rail) and among the three non-rail modes (motor bus, trolley bus and demand response). For example, in general, rail services employ fewer operators than the non-rail services, since the rail modes often operate as vehicle trains rather than as single vehicles. Non vehicle maintenance (track, road beds, and facilities) employs far more people in rail service than in the non-rail services. Support personnel are more numerous in the rail than non-rail modes.

- The number of employees reflects, to some extent, both the size and complexity of a public transportation system. Overall, there was a reduction of 5,090.7 employee equivalents in 1988 over 1987. Based on the data reported in 1988 for Section 15 requirements, transit modes reported the following average number of employee equivalents:

  -- Motor bus - 368 employees.

  -- Rapid rail - 3,853 employees (New York City Transit Authority employees 28,225.5 employee equivalents or approximately sixty percent of all employee equivalents in the rapid rail industry).

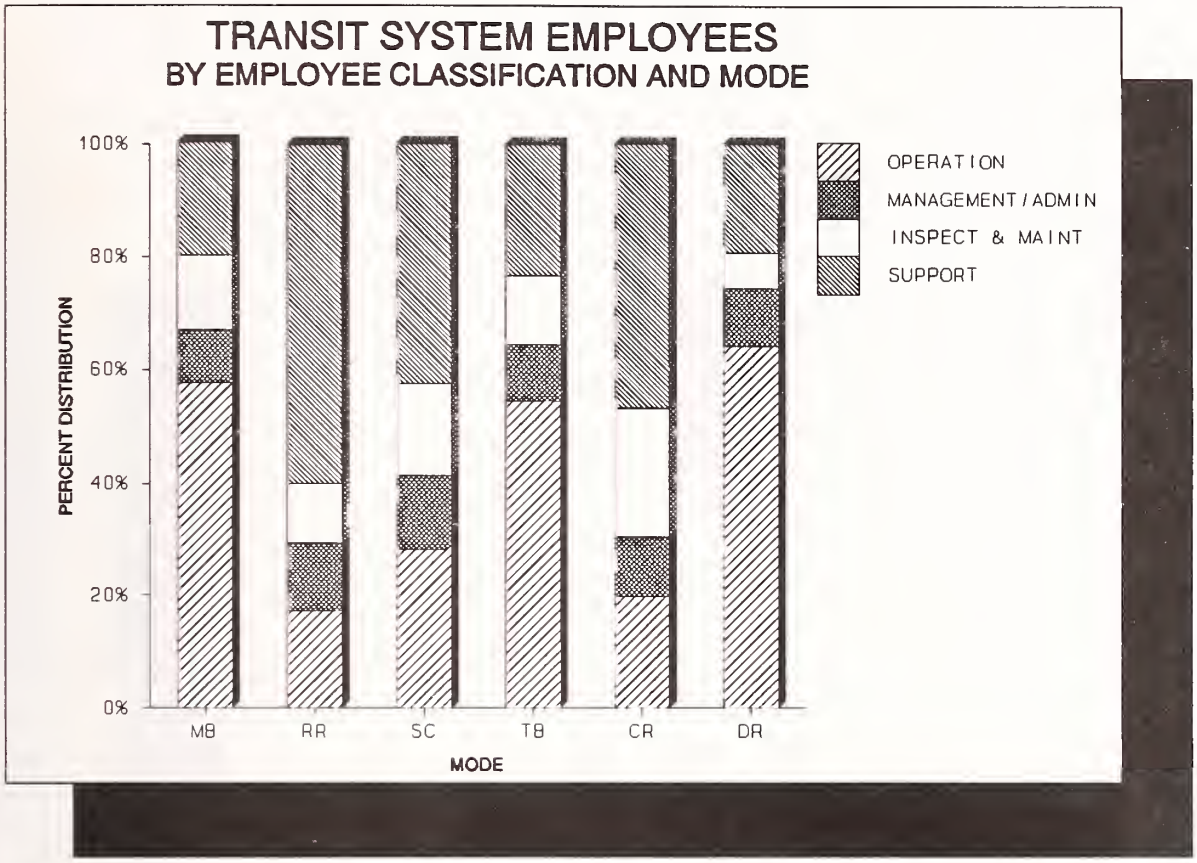
  -- Streetcar - 294 employees.

  -- Trolley bus - 408 employees.

  -- Commuter rail - 2,260 employees.

  -- Demand response - 18 employees.

- Of the more than 200,000 reported equivalent employees in the public transportation industry, 44.3 percent of the employees are directly involved in vehicle operations.



TRANSIT SYSTEM EMPLOYEES
BY EMPLOYEE CLASSIFICATION AND MODE
SECTION 15 1988

	MOTOR BUS	RAPID RAIL	STREET CAR	TROLLEY BUS	COMMUTER RAIL	DEMAND RESPONSE
REVENUE VEHICLE OPERATION	57.7%	17.3%	28.2%	54.5%	19.9%	64.3%
MANAGEMENT/ADMINISTRATION	9.3%	12.1%	13.2%	10.0%	10.6%	10.2%
REV VEH INSPECTION & MAINTENANCE	13.2%	10.6%	16.2%	12.2%	22.9%	6.3%
SUPPORT PERSONNEL	20.2%	59.9%	42.5%	23.3%	46.8%	19.4%
TOTAL (PERCENT)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
TOTAL EMPLOYEE EQUIVALENTS	128,951.8	46,235.3	3,826.5	2,038.6	20,335.6	2,642.7
SYSTEMS REPORTING	350	12	13	5	9	150


B. SERVICE OUTPUTS

VEHICLE REVENUE HOURS AND MILES
OF SERVICE SUPPLIED
ALL MODES
SECTION 15 1988

- Overall, the transit industry provided only 2 percent more vehicle revenue hours and 2.6 more vehicle revenue miles in 1988 over 1987.

- Motor bus supplied the greatest amount of transit service in 1988: 72.2 percent of total vehicle revenue hours and 63.5 percent of total vehicle revenue miles.

- Rapid rail, the second largest transit mode, accounted in 1988 for 15.9 percent of total vehicle revenue hours and 21.5 percent of total vehicle revenue miles.

- Purchased transportation represented the major source of demand response services in 1988, accounting for 70.4 percent of demand response vehicle revenue hours and 70.1 percent of demand vehicle revenue miles.

- Between 1987 and 1988 the number of motor bus transit systems reporting data for this exhibit increased by 2.4 percent from, 383 to 392. With this increase in the number of reporting systems, there was virtually no increase in the number of motor bus vehicle revenue hours and revenue vehicle miles.

- There were other changes noted between 1987 and 1988 in the number of systems reporting and the number of vehicle revenue hours of service provided by mode:

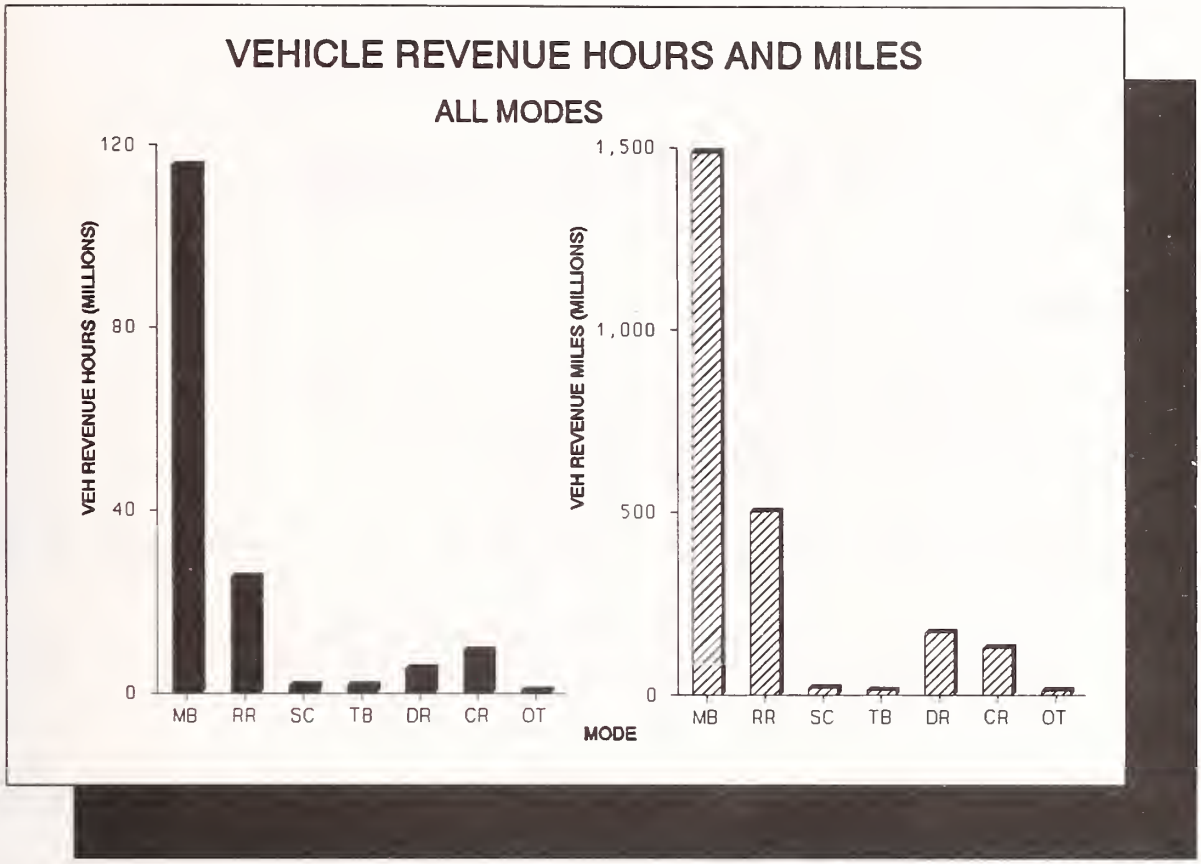
  -- There was no change in the number of rapid rail systems reporting; there was a 4.6 percent increase in the number of vehicle revenue hours of service and 6.1 percent increase in vehicle revenue miles.

  -- The number of streetcar systems reporting increased from 12 to 14 (17 percent); streetcar vehicle revenue hours of service increased by 10.3 percent and vehicle revenue miles increased by 11.3 percent.

  -- There was no change in the number of trolley bus systems reporting; and there was a 2.8 percent decrease in the number of vehicle revenue hours of service and a decrease of 1.6 percent of vehicle revenue miles.

  -- The number of commuter rail systems reporting stayed the same at 14 systems; the number of commuter rail vehicle revenue hours of service increased by 3.9 percent and vehicle revenue miles decreased by 1.6 percent.

  -- The number of demand response systems reporting increased from 254 to 282 (11 percent); there was a decrease of vehicle revenue hours of service of 17 percent and the number of demand response vehicle revenue miles of service increased by 15.9 percent.



VEHICLE REVENUE HOURS AND MILES
OF SERVICE SUPPLIED
SECTION 15 1988

HOURS AND MILES IN THOUSANDS

	MOTOR BUS	RAPID RAIL	STREET CAR	TROLLEY BUS	COMMUTER RAIL	DEMAND RESPONSE	OTHER	TOTAL
VEHICLE REVENUE HOURS								
DIRECTLY OPERATED	112,832.2	25,389.7	1,663.4	1,722.9	5,283.6	2,811.9	579.6	150,283.3
PURCHASED	2,585.1	0.0	0.7	0.0	207.5	6,675.5	91.1	9,559.9
TOTAL	115,417.3	25,389.7	1,664.1	1,722.9	5,491.1	9,487.4	670.7	159,843.2
VEHICLE REVENUE MILES								
DIRECTLY OPERATED	1,445,236.5	502,969.9	20,051.9	14,179.4	164,319.1	39,255.9	39,255.9	2,197,477.9
PURCHASED	41,739.5	0.0	3.5	0.0	8,241.0	91,831.4	1,413.4	143,228.8
TOTAL	1,486,976.0	502,969.9	20,055.4	14,179.4	172,560.1	131,087.3	12,878.6	2,340,706.7
SYSTEMS REPORTING	392	12	14	5	14	282	31	750

MOTOR BUS VEHICLE REVENUE HOURS AND MILES OF SERVICE SUPPLIED BY FLEET SIZE SECTION 15 1988

- In 1988, the 6 largest motor bus systems accounted for:

  -- 31.3 percent of motor bus vehicle revenue hours.
  -- 27.1 percent of motor bus vehicle revenue miles.
  -- 42.9 percent of motor bus passenger trips.
  -- 37.0 percent of motor bus passenger miles.

- In contrast, the 77 motor bus systems with fleets of between 100 and 999 vehicles supplied:

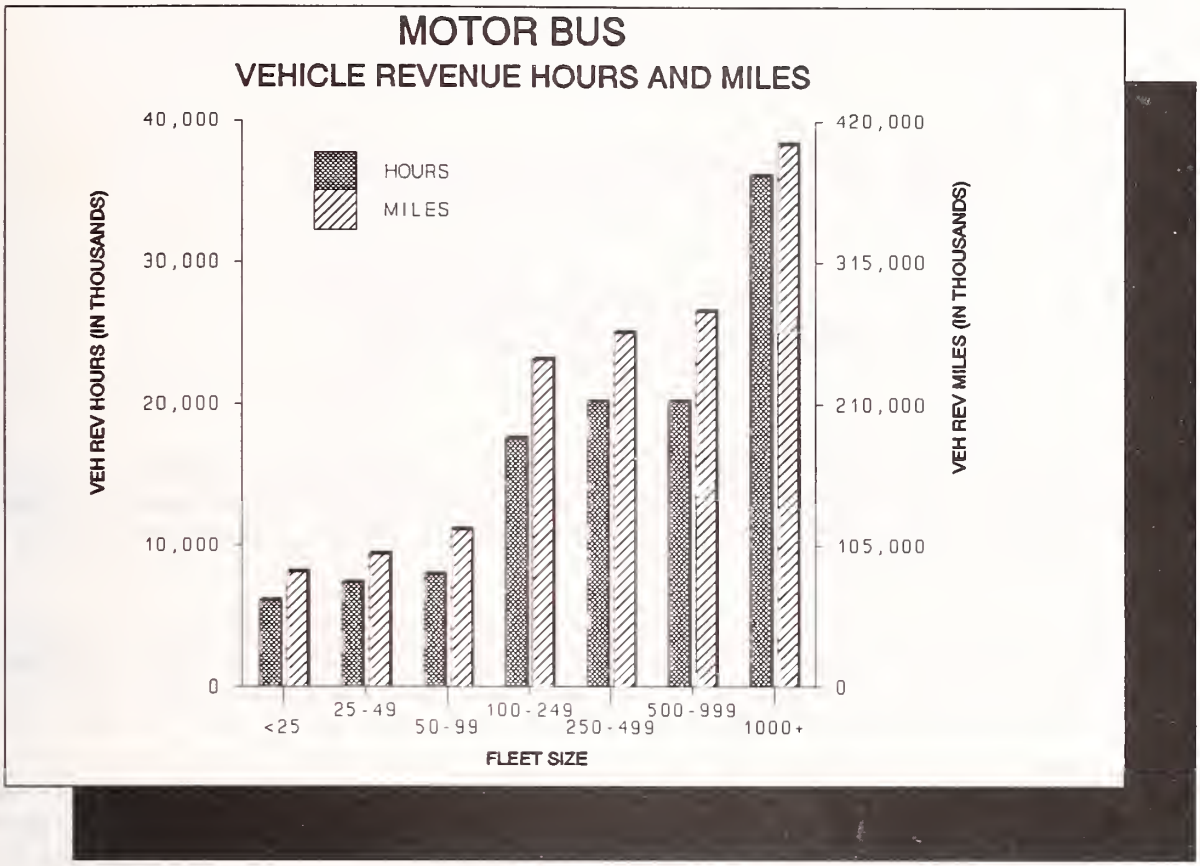
  -- 50.2 percent of motor bus vehicle revenue hours.
  -- 52.7 percent of motor bus vehicle revenue miles.
  -- 46.2 percent of motor bus passenger trips.
  -- 50.3 percent of motor bus passenger miles.

- About half the motor bus fleets (190 systems of 392) had less than 25 vehicles and supplied:

  -- 5.3 percent of motor bus vehicle revenue hours.
  -- 5.7 percent of motor bus vehicle revenue miles.
  -- 2.6 percent of motor bus passenger trips.
  -- 2.8 percent of motor bus passenger miles.

- In 1988, the average motor system speed for all motor bus systems in revenue service was 12.9 miles per hour. The systems reporting the fastest average speed were in 50-to-99 bus system group, with average speeds of 14.6 miles per hour and the systems with the slowest speeds were the 1,000-and-over motor bus systems, with an average speed of 11.2 miles per hour.

- Purchased transportation represented 12.5 percent of the total vehicle revenue hours for transit systems under 25 vehicles. It represented 2.0 and 9.1 percent of the vehicle revenue hours respectively, for transit systems with 25 to 49 and 50 to 99 vehicles. For all other transit system size groups purchased transportation represented between 0.8 and 1.3 percent of the vehicle revenue hours.



MOTOR BUS VEHICLE REVENUE HOURS AND MILES OF SERVICE SUPPLIED
BY FLEET SIZE
SECTION 15 1988

HOURS AND MILES IN THOUSANDS

FLEET SIZE -->	<25	25-49	50-99	100-249	250-499	500-999	1000 AND OVER	ALL SYSTEMS
VEHICLE REVENUE HOURS								
DIRECTLY OPERATED	5,325.4	7,220.8	7,228.1	17,426.2	20,008.4	19,929.7	35,693.6	112,832.2
PURCHASED	760.4	150.2	726.9	137.9	158.6	255.9	395.2	2,585.1
TOTAL	6,085.8	7,371.0	7,955.0	17,564.1	20,167.0	20,185.6	36,088.8	115,417.3
VEHICLE REVENUE MILES								
DIRECTLY OPERATED	72,677.3	95,889.3	104,888.8	240,352.8	259,776.5	274,120.7	397,531.0	1,445,236.5
PURCHASED	12,695.7	2,584.0	11,595.0	2,212.2	3,112.7	4,105.4	5,434.6	41,739.5
TOTAL	85,373.0	98,473.3	116,483.8	242,565.0	262,889.2	278,226.1	402,965.6	1,486,976.0
SYSTEMS REPORTING	190	74	45	45	20	12	6	392

VEHICLE REVENUE HOURS
BY MODE AND URBANIZED AREA SIZE
SECTION 15 1988

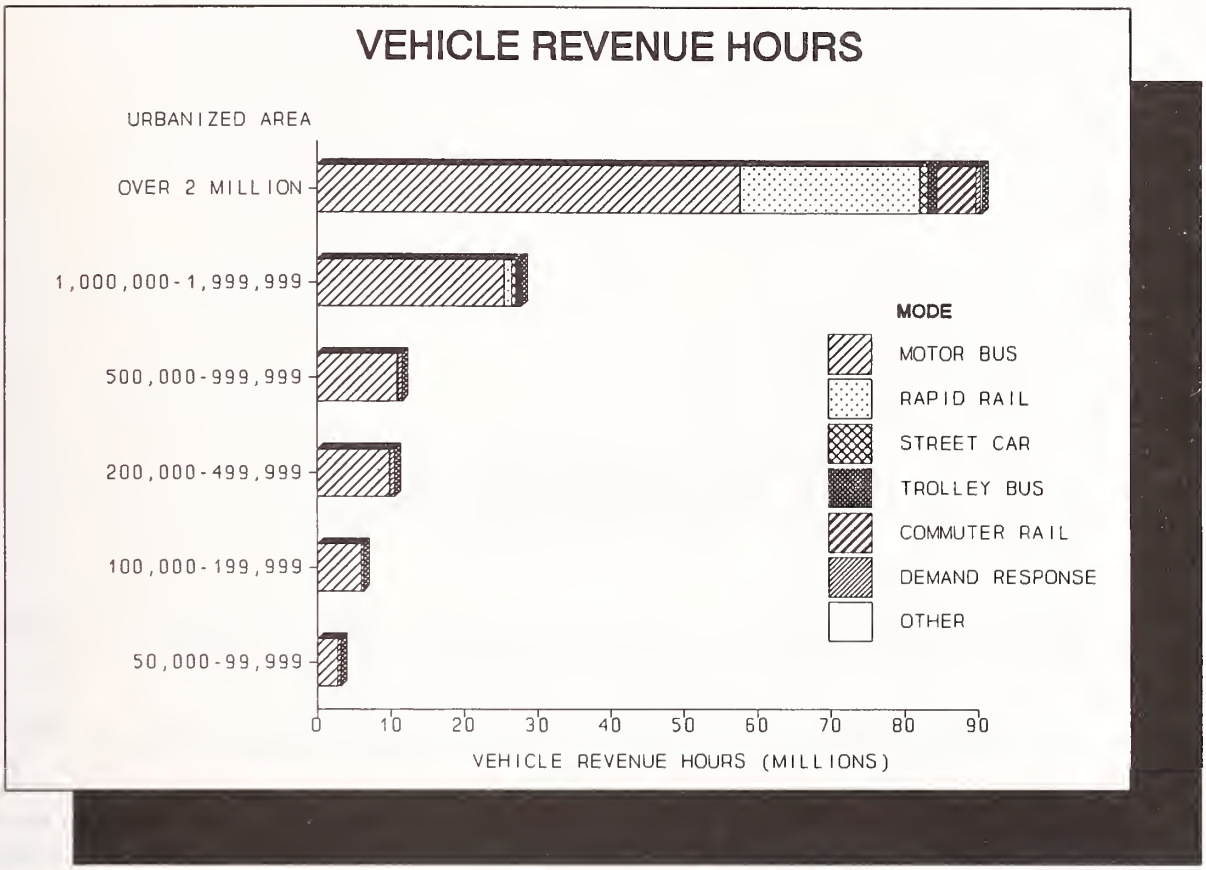
- Transit systems in urbanized areas with 2 million or more residents supplied 60.3 percent of all public transit vehicle revenue hours in 1988, and accounted for 73.3 percent of the unlinked transit passenger trips and 77.8 percent of passenger miles.

- Transit systems in urbanized areas with between 1 and 2 million residents supplied 18.6 percent of all public transit vehicle revenue hours in 1988, and accounted for 15.5 percent of the unlinked passenger trips and 12.8 percent of passenger miles.

- Transit systems in urbanized areas with between 200,000 and 1 million residents supplied 14.8 percent of all public transit vehicles revenue hours in 1988, and accounted for 8.5 percent of the unlinked passenger trips and 7.4 percent of passenger miles.

- Transit systems in urbanized areas with less than 200,000 inhabitants supplied 6.4 percent of all public transit vehicle revenue hours in 1988, and accounted for 2.7 percent of the unlinked passenger trips and 2.0 percent of passenger miles.

- Commuter rail services were only available in urbanized areas with 2 million or more residents. Rapid rail and streetcar services were usually only available in urbanized areas with 2 million or more residents; 3.9 percent of the rapid rail service and 34.1 percent of the streetcar service were available in urbanized areas with between one and two million residents. Only motor bus and demand response services were available in all urbanized area size groups.



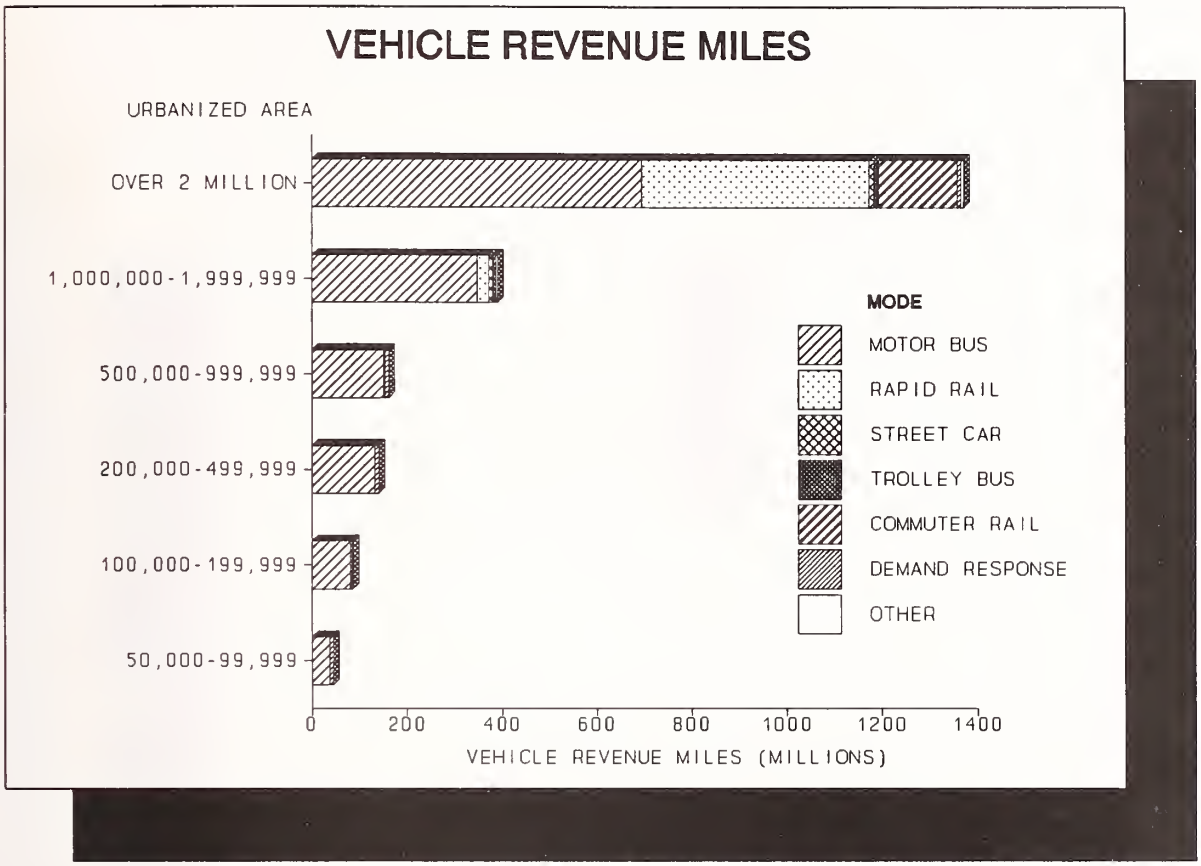
VEHICLE REVENUE HOURS (DIRECT)
BY MODE AND URBANIZED AREA SIZE
SECTION 15 1988

THOUSANDS OF HOURS

Population -->	50,000 TO 99,999	100,000 TO 199,999	200,000 TO 499,999	500,000 TO 999,999	1 MILLION TO 1,999,999	OVER 2 MILLION	TOTAL
MOTOR BUS	2,783.8	6,003.7	9,897.8	10,914.3	25,530.7	57,701.9	112,832.2
RAPID RAIL	0.0	0.0	0.0	0.0	981.6	24,408.1	25,389.7
STREET CAR	0.0	0.0	0.0	47.0	567.9	1,048.5	1,663.4
TROLLEY BUS	0.0	0.0	0.0	148.5	290.1	1,284.3	1,722.9
COMMUTER RAIL	0.0	0.0	0.0	0.0	0.0	5,283.6	5,283.6
DEMAND RESPONSE	458.4	324.7	670.7	487.9	261.2	609.0	2,811.9
OTHER	11.7	15.0	14.2	25.6	254.7	258.4	579.6
TOT VEH REV HOURS	3,253.9	6,343.4	10,582.7	11,623.3	27,886.2	90,593.8	150,283.3

VEHICLE REVENUE MILES
BY MODE AND URBANIZED AREA SIZE
SECTION 15 1988

- In 1988, transit systems in larger urbanized areas provided a greater proportion of the vehicle revenue miles of transit services:
  - -- Transit systems in urbanized areas with 2 million or more residents provided 62.4 percent of the transit vehicle revenue miles.
  - -- Transit systems in urbanized areas with between 1 and 2 million more residents provided 17.8 percent of the transit vehicle revenue miles.
  - -- Transit systems in urbanized areas with between 200,000 and 1 million residents provided 13.8 percent of the transit vehicle revenue miles.
  - -- Transit systems in urbanized areas with less than 200,000 residents provided 6.0 percent of the transit vehicle revenue miles.



VEHICLE REVENUE MILES (DIRECT)
BY MODE AND URBANIZED AREA SIZE
SECTION 15 1988

THOUSANDS OF MILES

Population -->	50,000 TO 99,999	100,000 TO 199,999	200,000 TO 499,999	500,000 TO 999,999	1 MILLION TO 1,999,999	OVER 2 MILLION	TOTAL
MOTOR BUS	38,148.1	80,717.9	132,118.2	151,759.5	347,755.2	694,737.6	1,445,236.5
RAPID RAIL	0.0	0.0	0.0	0.0	24,678.4	478,291.5	502,969.9
STREET CAR	0.0	0.0	0.0	936.2	8,490.6	10,625.1	20,051.9
TROLLEY BUS	0.0	0.0	0.0	1,588.9	2,716.2	9,874.3	14,179.4
COMMUTER RAIL	0.0	0.0	0.0	0.0	0.0	164,319.1	164,319.1
DEMAND RESPONSE	6,701.9	4,576.2	9,315.1	6,950.1	3,751.6	7,961.0	39,255.9
OTHER	310.7	1,097.6	267.0	751.5	3,363.3	5,675.1	11,465.2
TOT VEH REV MILES	45,160.7	86,391.7	141,700.3	161,986.2	390,755.3	1,371,483.7	2,197,477.9

C. SERVICE UTILIZATION

TRANSIT SERVICE UTILIZATION
ALL SYSTEMS BY MODE
SECTION 15 1988

- The transit industry provided 67 million fewer (1 percent) passenger trips but 800 million (2.2 percent) more passenger miles in 1988 over 1987.

- Motor bus served the greatest number of passengers trips in 1988 (4.78 billion), accounting for 61.4 percent of total passenger trips and 47.9 percent of total passenger miles.

- Rapid rail served the second most passenger trips in 1988 (2.31 billion), accounting for 29.7 percent of total passenger trips and 30.6 percent of total passenger miles.

- All other modes of transit service accounted for 693.5 million passenger trips in 1988, accounting for 8.9 percent of total passenger trips and 21.5 percent of total passenger miles.

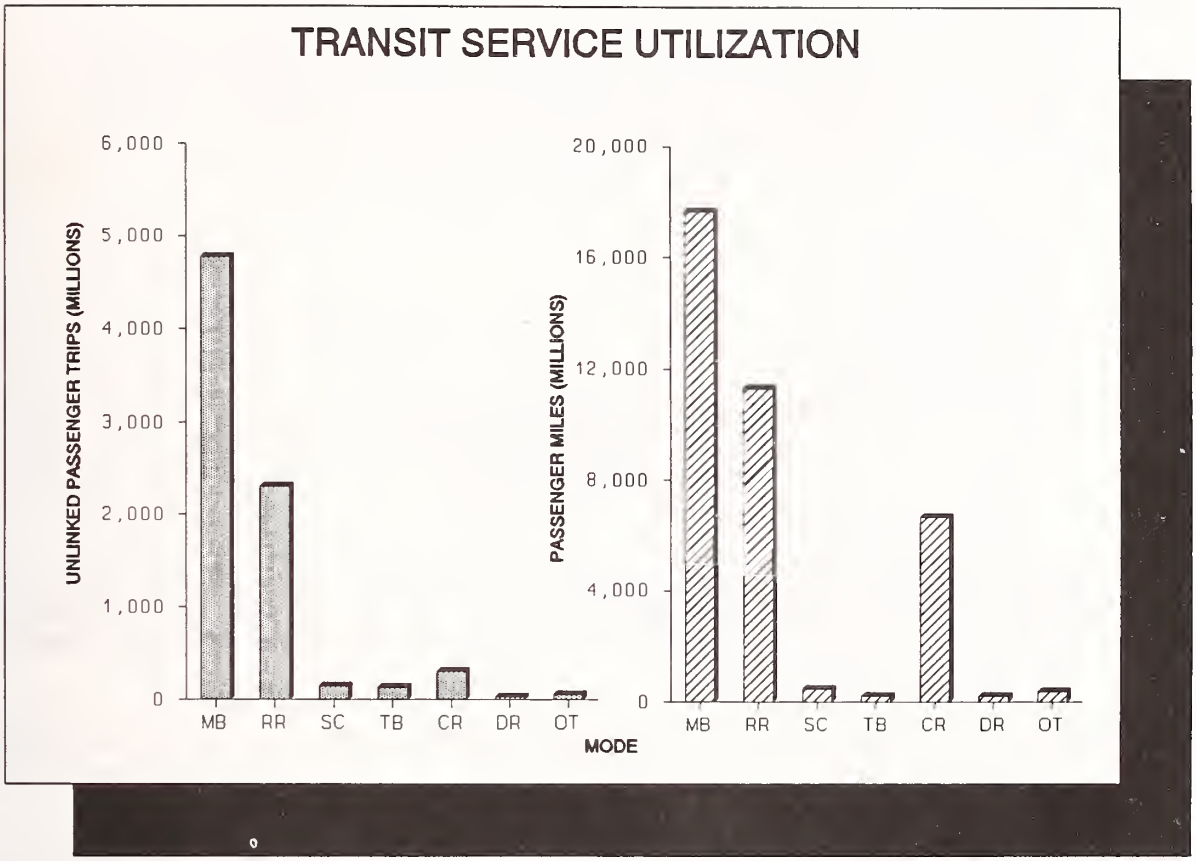
- Purchased transportation arrangements were the major source of demand response services. In 1988, they accounted for 69.3 percent of total demand response passenger trips and 63.2 percent of total demand response passenger miles.

- Of all transit riders in 1988, commuter rail patrons manifested the longest trip patterns, traveling, on average, 21.6 miles per trip. Thus, while commuter rail services provided 4.0 percent of public transit passenger trips, they accounted for 18.1 percent of public transit passenger miles.

- Unlinked passenger trips is a statistic that does not necessarily measure transit trips from origin to destination; it shows, rather, individual legs of trips. An exception may be transfers from one line to another in a rapid rail service where passengers pay a single fare and transfer between lines without leaving the system. Bus-to-bus or bus-to-rail transfers would still, however count as separate unlinked trips.

- Using the unlinked passenger trip and annual passenger mile data reported in 1988, average transit trip lengths were:

  -- Motor bus - 3.7 miles.
  -- Rapid rail - 4.9 miles.
  -- Streetcar - 3.1 miles.
  -- Trolley bus - 1.6 miles.
  -- Commuter rail - 21.6 miles.
  -- Demand response - 6.2 miles.
  -- Other modes - 6.0 miles.



TRANSIT SERVICE UTILIZATION
ALL SYSTEMS BY MODE
SECTION 15 1988

TRIPS AND MILES IN MILLIONS

MODE--->	MOTOR BUS	RAPID RAIL	STREET CAR	TROLLEY BUS	COMMUTER RAIL	DEMAND RESPONSE	OTHER	ALL SYSTEMS
UNLINKED PASSENGER TRIPS								
DIRECTLY OPERATED	4732.8	2,307.7	152.6	135.9	297.5	10.3	60.9	7,697.7
PURCHASED	46.8	0.0	0.0	0.0	10.7	23.3	2.3	83.2
TOTAL	4,779.6	2,307.7	152.6	135.9	308.2	33.6	63.2	7,780.9
ANNUAL PASSENGER MILES								
DIRECTLY OPERATED	17,388.2	11,299.6	475.8	211.2	6,357.5	76.1	359.2	36,167.6
PURCHASED	269.5	0.0	0.1	0.0	314.7	130.8	19.6	734.8
TOTAL	17,657.7	11,299.6	475.9	211.2	6,672.2	206.9	378.8	36,902.4
SYSTEMS REPORTING	392	12	14	5	14	282	31	750

TRANSIT INDUSTRY SERVICE UTILIZATION TRENDS
UNLINKED PASSENGER TRIPS
ALL SYSTEMS BY MODE
SECTION 15 1984-1988

- Between 1984 and 1988, there has been an overall loss of 946.5 million passenger trips for all modes despite the fact of an increased level of rail service during this time period. However, there has been an increase of 910 million passenger miles.

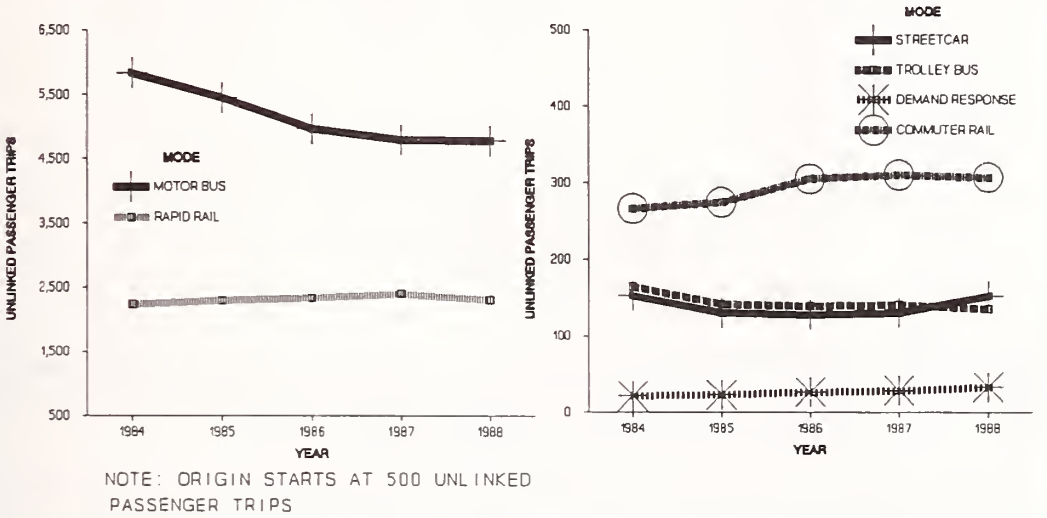
- Rapid rail, commuter rail, and demand response services have had steady growth of passenger trips (an average annual rate of 0.9 percent, 3.7 percent and 11.7 percent respectively).

- Motor bus systems have lost 1.05 billion trips during the 1984-88 period at an average annual rate of 4.8 percent. Most of this can be explained that as new rail lines are opened for service, many motor bus systems have reduced service in favor of the rail service.

- Trolley bus has had average annual rate loss of passenger trips of 4.7 percent.

- Streetcar, which has had a steady decrease of passenger trips between 1984-88, had a 16.2 percent increase in passenger trips in 1988 over 1987.

TRANSIT INDUSTRY SERVICE UTILIZATION TRENDS
UNLINKED PASSENGER TRIPS



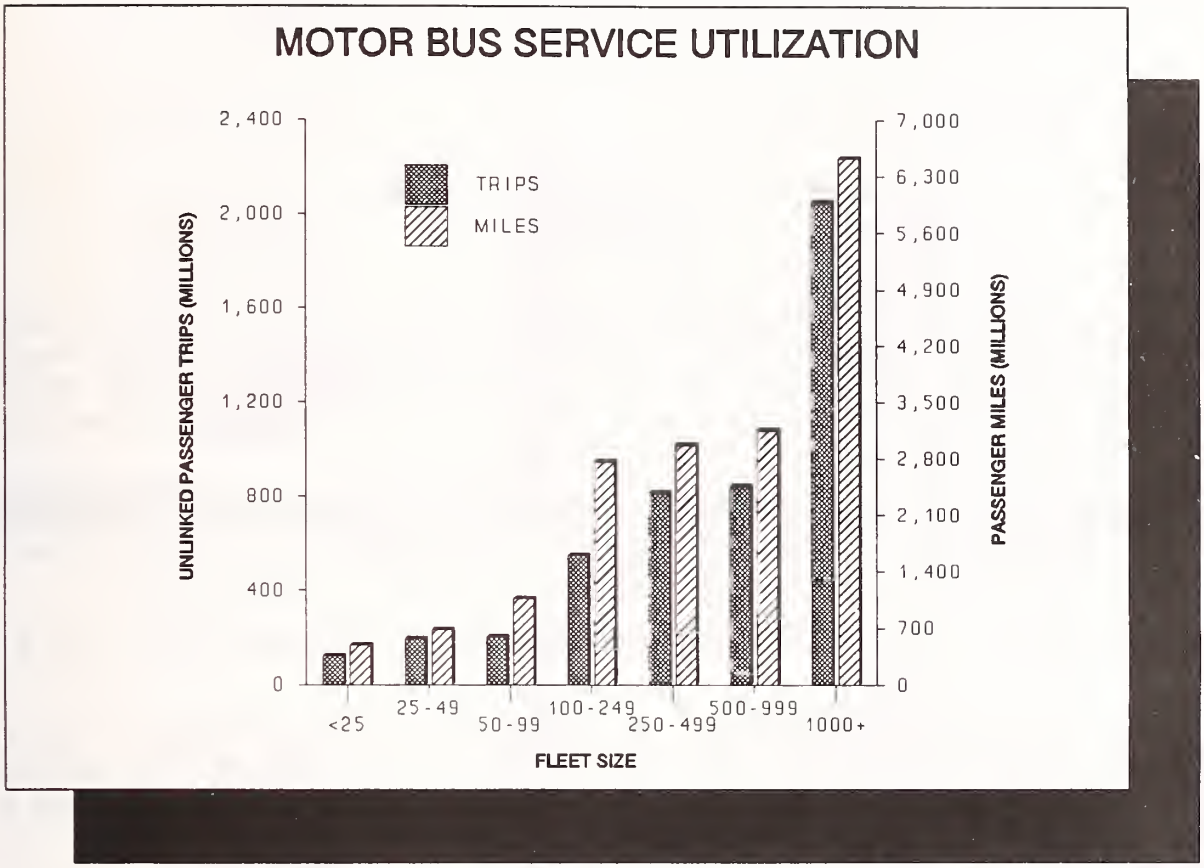
NOTE: ORIGIN STARTS AT 500 UNLINKED PASSENGER TRIPS

TRANSIT INDUSTRY SERVICE UTILIZATION TRENDS
UNLINKED PASSENGER TRIPS
ALL SYSTEMS BY MODE
SECTION 15 1984-1988

	1984	1985	1986	1987	1988
MOTOR BUS	5,826.9	5,438.7	4,959.8	4,794.3	4,779.6
RAPID RAIL	2,231.4	2,289.8	2,332.7	2,402.1	2,307.7
STREETCAR	152.7	130.7	128.5	131.3	152.6
TROLLEY BUS	164.8	141.6	139.2	140.8	135.9
DEMAND RESPONSE	21.6	23.8	27.3	28.8	33.6
COMMUTER RAIL	266.7	275.3	305.8	311.0	308.2

MOTOR BUS SERVICE UTILIZATION
BY SYSTEM SIZE
SECTION 15 1988

- In 1988, the 6 motor bus systems with 1,000 or more revenue vehicles accounted for 42.9 percent of motor bus passenger trips and 37.0 percent of motor bus passenger miles.
- The 77 motor bus systems with fleets of between 100 and 999 vehicles served 46.2 percent of motor bus passenger trips and 50.3 percent of motor bus passenger miles.
- About half the motor bus fleets (190 systems) had less than 25 vehicles and served 2.6 percent of motor bus passenger trips and 2.8 percent of motor bus passenger miles.
- Although purchased transportation carried only 1.0 percent of all unlinked passenger trips it carried 10.9 percent of the unlinked passenger trips on systems with less than 25 vehicles.
- The data reported suggest that the purchased transportation services tended to provide service to fewer passengers and that those passengers took trips about twice the distance of passengers using directly operated service.



MOTOR BUS SERVICE UTILIZATION
BY SYSTEM SIZE
SECTION 15 1988

TRIPS AND MILES IN MILLIONS

FLEET SIZE-->	<25	25-49	50-99	100-249	250-499	500-999	1000 AND OVER	ALL SYSTEMS
UNLINKED PASSENGER TRIPS								
DIRECTLY OPERATED	110.2	192.8	188.3	546.7	811.1	837.3	2,046.4	4,732.8
PURCHASED	13.5	1.9	16.6	2.2	3.5	5.0	4.1	46.8
TOTAL	123.7	194.7	204.9	548.9	814.6	842.3	2,050.5	4,779.6
ANNUAL PASSENGER MILES								
DIRECTLY OPERATED	404.5	664.7	993.5	2,742.1	2,958.9	3,124.0	6,500.6	17,388.2
PURCHASED	88.4	16.9	75.2	19.4	16.8	28.7	24.1	269.5
TOTAL	492.9	681.6	1,068.7	2,761.5	2,975.7	3,152.7	6,524.7	17,657.7
SYSTEMS REPORTING	190	74	45	45	20	12	6	392

RAPID RAIL SERVICE UTILIZATION
BY SYSTEM
SECTION 15 1988

- There was some overall growth in passenger miles (1 percent) in the rapid rail systems despite the fact that the New York CTA system, which dominates the statistics, had a 1.3 percent decrease in passenger miles. New York accounted for 60.0 percent of the rail passenger miles and 64.3 percent of the passenger trips.

- Baltimore, which is expanding its system, had a 63.8 percent increase in passenger miles in 1988 over 1987. Chicago and WMATA had strong increases of passengers miles of 10 percent and 7.9 percent respectively.

- SEPTA and Cleveland RTA each had decreases in passenger miles of 8.8 percent.

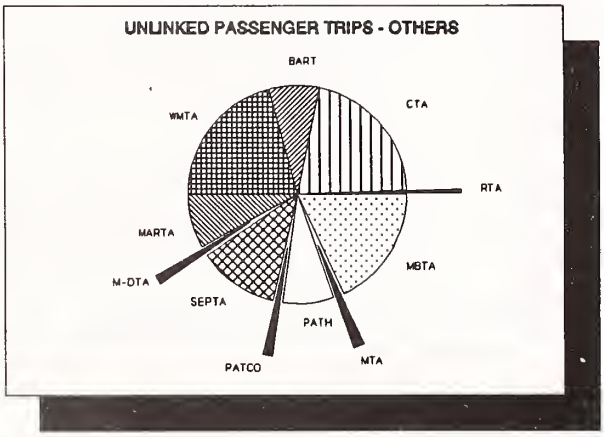
- There was significant growth in passenger trips in 1988 over 1987 at Chicago with 17.7, Baltimore with 13.0 percent and WMATA with 7.6 percent, while decreases in passenger trips in 1988 over 1987 were experienced at PATH (13.6 percent), Cleveland RTA (13 percent) and New York CTA (8.1 percent).

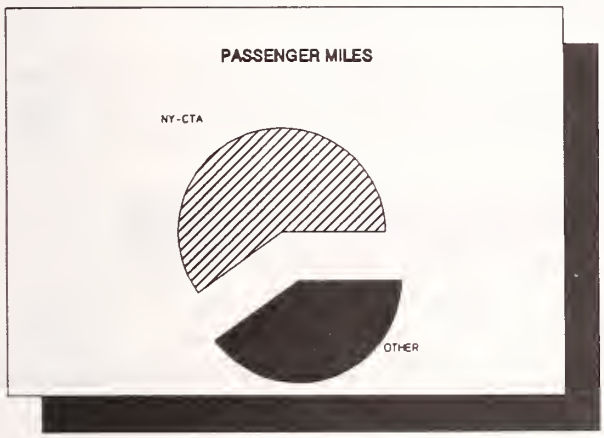
- In 1988 NYCTA accounted for 60.6 percent of total U.S. national rapid rail vehicles. Chicago, the second largest system, accounted for 11.4 percent of the rapid rail vehicles. The other 10 systems accounted for 2,294 rapid rail vehicles, 28.0 percent of the total national fleet.

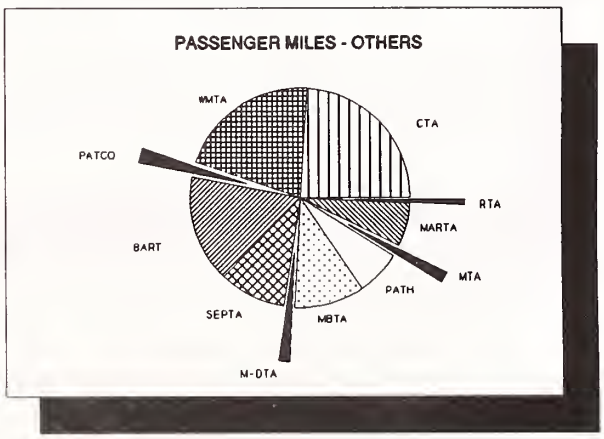
- BART system passengers, on average, traveled greater distances per trip (11.8 miles) than passengers on other rapid rail systems in 1988; PATCO system passengers had the second longest trip distances, averaging 8.8 miles per trip. Miami and Cleveland RTA trips also tended to be longer than average with trip lengths of 7.8 and 7.5 miles, respectively.

- The average trip length was between 3.0 miles and 5.4 miles. Thus, while BART was serving 2.7 percent of all unlinked rapid rail passengers trips, the BART system accounted for 6.4 percent of rapid rail passenger miles.

RAPID RAIL SERVICE UTILIZATION







RAPID RAIL SERVICE UTILIZATION
BY SYSTEM
SECTION 15 1988

	FLEET SIZE	(THOUSANDS) UNLINKED PASS TRIPS	PASSENGER MILES
New York CTA	4,957	1,483,209.5	6,775,151.8
Chicago-CTA	931	174,436.0	1,081,503.1
Washington Metro Area TA	548	172,614.8	940,165.9
San Francisco BART	346	61,160.0	722,583.1
Philadelphia - SEPTA	298	98,477.9	444,885.5
Boston - MBTA	400	151,468.6	460,464.5
New York - PATH	312	60,904.6	298,678.3
Atlanta - MARTA	131	65,908.0	292,850.1
Lindenwold - PATCO	90	11,102.5	97,399.0
Miami-Dade Cnty TA	74	10,406.2	81,584.6
Baltimore-MTA	60	13,424.0	69,465.3
Cleveland RTA	35	4614.5	34828.4
ALL SYSTEMS	8,182.0	2,307,726.6	11,299,559.6

UNLINKED PASSENGER TRIPS
BY MODE AND URBANIZED AREA SIZE
SECTION 15 1988

- Transit systems in urbanized areas with 2 million or more residents (i.e., systems that Federal operating assistance in 1988 represented 4.3 percent of their operating revenue) accounted for:

  -- 73.3 percent of passenger trips.
  -- 60.3 percent of all public transit vehicle revenue hours.

- Transit systems in urbanized areas with between 1 and 2 million inhabitants (i.e., systems that Federal operating assistance in 1988 represented 7.2 percent of their operating revenue) accounted for:

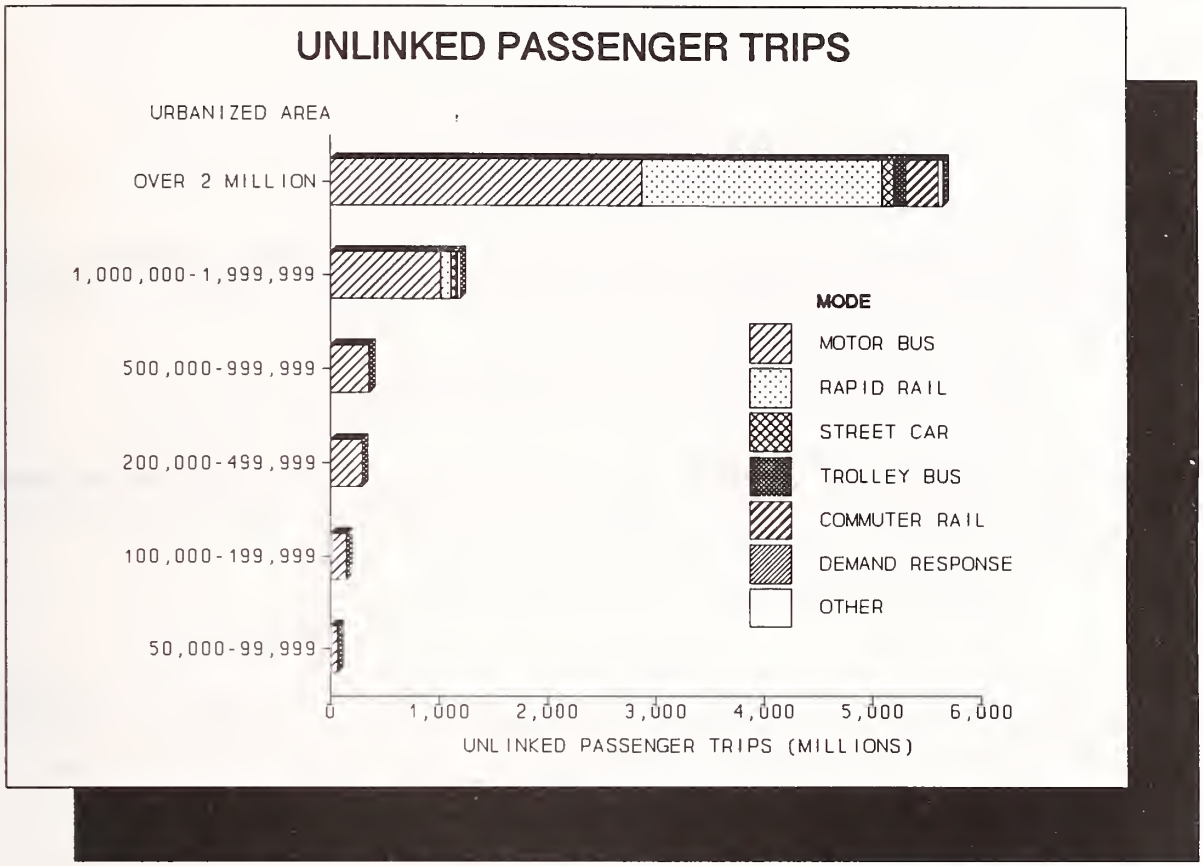
  -- 15.5 percent of passenger trips.
  -- 18.6 percent of all public transit vehicle revenue hours.

- Transit systems in urbanized areas with between 200,000 and 1 million inhabitants (i.e., systems that Federal operating assistance in 1988 represented 15.6 percent of their operating revenue) accounted for:

  -- 8.5 percent of passenger trips.
  -- 14.8 percent of all public transit vehicle revenue hours.

- Transit systems in urbanized areas with less than 200,000 thousand inhabitants (i.e., systems that Federal operating assistance in 1988 represented 22.5 percent of their operating revenue) accounted for:

  -- 2.7 percent of passenger trips.
  -- 6.4 percent of all public transit vehicle revenue hours.



UNLINKED PASSENGER TRIPS (DIRECT)
BY MODE AND URBANIZED AREA SIZE
SECTION 15 1988

MILLIONS OF TRIPS

Population -->	50,000 TO 99,999	100,000 TO 199,999	200,000 TO 499,999	500,000 TO 999,999	1 MILLION TO 1,999,999	OVER 2 MILLION	TOTAL
MOTOR BUS	62.6	143.1	287.4	354.6	1,015.2	2,869.9	4,732.8
RAPID RAIL	0.0	0.0	0.0	0.0	94.4	2,213.3	2,307.7
STREET CAR	0.0	0.0	0.0	3.6	43.0	106.0	152.6
TROLLEY BUS	0.0	0.0	0.0	4.5	17.6	113.8	135.9
COMMUTER RAIL	0.0	0.0	0.0	0.0	0.0	297.5	297.5
DEMAND RESPONSE	2.0	1.4	2.6	1.6	0.9	1.8	10.3
OTHER	0.1	1.0	0.4	0.3	22.5	36.7	60.9
TOTAL PASS TRIPS	64.6	145.5	290.4	364.7	1,193.5	5,639.1	7,697.7

PASSENGER MILES
BY MODE AND URBANIZED AREA SIZE
SECTION 15 1988

- Transit systems in urbanized areas with 2 million or more residents (i.e., systems that Federal operating assistance in 1988 represented 4.3 percent of their operating revenue) accounted for:

  -- 77.8 percent of public transit passenger miles.
  -- 60.3 percent of all public transit vehicle revenue hours.

- Transit systems in urbanized areas with between 1 and 2 million residents (i.e., systems that Federal operating assistance in 1988 represented 7.2 percent of their operating revenue) accounted for:

  -- 12.8 percent of public transit passenger miles
  -- 18.6 percent of all public transit vehicle revenue hours.

- Transit systems in urbanized areas with between 200,000 and 1,000,000 residents (i.e., systems that Federal operating assistance in 1988 that represented 15.6 percent of their operating revenue) accounted for:

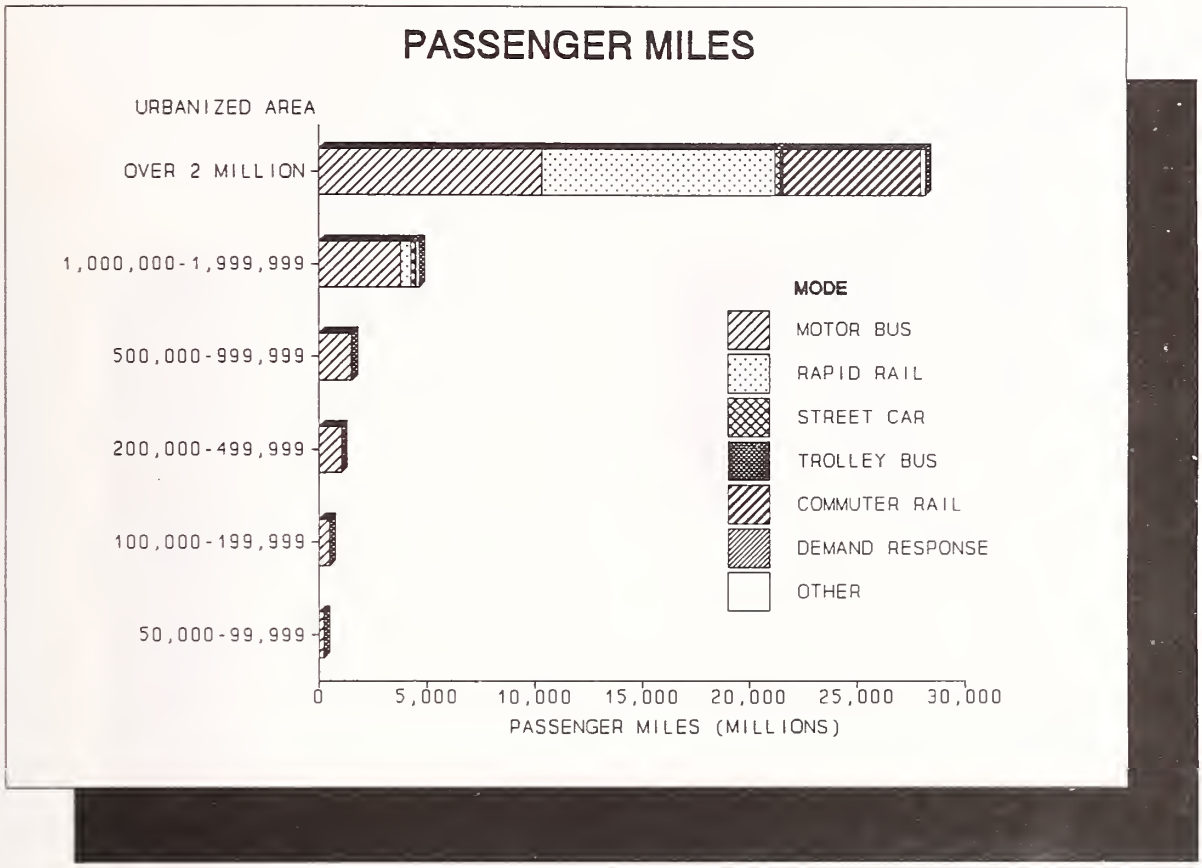
  -- 7.4 percent of public transit passenger miles.
  -- 14.8 percent of all public transit vehicle revenue hours.

- Transit systems in urbanized areas with less than 200,000 residents (i.e., systems that Federal operating assistance in 1988 represented 22.5 percent of their operating revenue) accounted for:

  -- 2.0 percent of public transit passenger miles.
  -- 6.4 percent of all public transit vehicle revenue hours.

- In 1988 transit systems in urbanized areas with 2 million or more residents accounted for:

  -- All passenger miles traveled on commuter rail.
  -- 95.8 percent of the passenger miles traveled by rapid rail.
  -- 79.4 percent of the passenger miles traveled by trolley bus.
  -- 50.1 percent of the passenger miles traveled on streetcars.
  -- 59.4 percent of the passenger miles traveled on motor bus.
  -- 17.9 percent of the miles traveled on demand response transit.



PASSENGER MILES (DIRECT)
BY MODE AND URBANIZED AREA SIZE
SECTION 15 1988

MILLIONS OF MILES

Population -->	50,000 TO 99,999	100,000 TO 199,999	200,000 TO 499,999	500,000 TO 999,999	1 MILLION TO 1,999,999	OVER 2 MILLION	TOTAL
MOTOR BUS	221.9	476.7	1,035.8	1,498.6	3,772.6	10,382.7	17,388.2
RAPID RAIL	0.0	0.0	0.0	0.0	478.7	10,820.8	11,299.6
STREET CAR	0.0	0.0	0.0	20.4	216.8	238.6	475.8
TROLLEY BUS	0.0	0.0	0.0	11.4	32.3	167.6	211.2
COMMUTER RAIL	0.0	0.0	0.0	0.0	C.0	6,357.5	6,357.5
DEMAND RESPONSE	15.5	9.4	19.9	12.4	5.2	13.6	76.1
OTHER	2.9	12.3	1.4	8.0	130.5	204.0	359.2
TOTAL PASS MILES	240.4	498.4	1,057.1	1,550.7	4,636.1	28,184.9	36,167.6

CHAPTER III

CHAPTER III - PERFORMANCE MEASURES

OVERVIEW

This chapter examines performance measures that are relevant to transit industry performance. Performance measures are derived indicators that typically relate service input factors to service output and utilization factors. As such, they are broad barometers of transit efficiency and effectiveness. It is important, however, to emphasize that performance measures offer only general insights into transit industry performance: to rely on performance measures alone for an understanding of industry efficiency and effectiveness can result in misleading conclusions.

This chapter is divided into two subsections. The first contains industry-wide measures and, where relevant, urbanized area measures for each mode.

The second subsection focuses exclusively on motor bus performance for fiscal year 1988 and examines that performance under the seven Section 15 fleet size categories. In 1984 the computations were done using a methodology designed to reduce the statistical impact of the large systems on the ratios. In 1985 to 1988 the method changed and is now designed to examine the motor bus industry as a whole without any smoothing statistical methods.

The motor bus focus is prompted by two interrelated factors. First and foremost, motor bus systems provide most of public transportation in the United States, supplying nearly 66 percent of all vehicle revenue miles of service and furnishing 61 percent of all public transportation passenger trips. Second, no other fixed-route public transit mode (see Table III-1) embraces enough systems to permit development of meaningful fleet-size performance statistics.[1]

PERFORMANCE MEASURES

Within each of the two subsections, two general types of performance measures are featured: 1) Benchmark Performance Measures and 2) Issue Oriented Measures. Benchmark Measures are fundamental indicators employed from year to year to gauge transit industry performance and provide the continuity needed to track key industry trends. Issue Oriented Measures, by contrast, are more topical and seek to respond to the major policy performance issues and concerns facing UMTA. Measures selected for this group may or may not change from year to year, depending on the issues that emerge.

All of the measures in this chapter are measures of the performance of directly operated transit services, unless noted. As pointed out in Introduction to the Compendium, the exclusion of most purchased service costs represents a departure from past practices, a departure that allows a more accurate representation of transit service costs and operational characteristics for directly operated services.

TABLE III-1
PUBLIC TRANSPORTATION FIXED-ROUTE MODES
1988 SECTION 15 REPORTERS
BY
MODE AND FLEET SIZE

SIZE-->	UNDER 25	25-49	50-99	100-249	250-499	500-999	1000& OVER	ALL SYSTEMS
MOTOR BUS	190	74	45	45	20	12	6	392
RAPID RAIL	0	1	3	1	4	2	1	12
STREET CAR	9	2	1	2	0	0	0	14
TROLLEY BUS	0	1	2	1	1	0	0	5
COMMUTER RAIL	3	2	2	1	3	2	1	14

Benchmark Performance Measures

The Benchmark Measures fall into three performance categories:

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

- Service Effectiveness - The consumption of public transportation service in relation to the amount of service available. This attempts to answer the question, "How much public transportation service is consumed (or revenue received), at an established fare, in relation to the amount of service available?" Factors reflecting service quality and influencing the use of and perceptions about public transportation services by the public are important elements of service effectiveness.

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

These categories encompass the key elements of transit service performance and are commonly used to examine transit industry and system performance.

Within each of these general categories, several related measures are used to reflect transit performance. Like the general performance categories, these measures will be employed every year to allow analysts to follow key industry trends.

Issue-Oriented Measures

The 1988 Compendium features four groups of issue-oriented measures, each addressing a major area of policy and management concern. The four groups are:

- Labor Efficiency & Utilization - These measures address labor efficiency issues, focusing on the relationship between labor inputs and service outputs.

- Functional Efficiency - These measures focus on the cost of vehicle operations, vehicle maintenance, non-vehicle maintenance, and general administration in relation to service outputs including vehicle revenue hours and vehicle miles.

- Fleet Control Measures - These measures relate vehicle output to total active fleet vehicles, and focus on fleet utilization issues.

- Safety Measures - These

measures seek to gauge service safety by relating the number of accidents to vehicle miles and hours.[2]

For each group, efforts have been made to supply a "current" performance picture by using 1988 statistics. In addition, industry and modal performance over time is shown by citing performance indices from the previous 4 years.

PATTERNS AND TRENDS

Following are descriptions of some of the key patterns and trends highlighted in the tables and charts in this chapter.

Industry-Wide Benchmark Measures

- While the trolley bus and commuter rail modes were the only modes in which operating costs per vehicle revenue hour did not increase each year, the trend between 1984 and 1988 was that the transit modes experienced increases in their operating costs per vehicle revenue hour.

- The average annual percentage increases (+) and decreases (-) in operating costs per vehicle revenue hour between 1984 and 1988 are listed below by mode in ascending order:

  -- Commuter rail - 0.1 percent.

  -- Motor bus + 4.1 percent.

  -- Rapid rail + 4.3 percent.

  -- Trolley bus + 6.2 percent.

  -- Streetcar + 7.7 percent.

  -- Demand Response + 8.6 percent.

- In 1988 the largest urbanized areas had the highest operating expense per vehicle revenue hour, about 4.5 times greater than the urbanized areas with 50,000 to 99,999 residents, which had the lowest operating expense per vehicle revenue hour at $26.14.

- All areas experienced operating expense per vehicle revenue hour increases in 1988 over 1987, generally in the range of 3-7 percent with the exception of the urbanized areas with 50,000 to 99,999 residents which experienced a 6.2 percent reduction in operating costs per vehicle revenue hour.

- There was a general decline in unlinked passenger trips per vehicle revenue hour between 1984 and 1988. Only motor bus has consistently lost passenger trips per hour at an average annual rate of 5.7 percent during this period of time.

- On average, transit systems provided 51.2 unlinked passenger trips per vehicle revenue hour. Transit systems had 2 percent fewer trips per vehicle revenue hour in 1988 than 1987. However, urbanized areas with 100,000 to 199,999 residents had a 6.7 percent increase in passenger trips per vehicle revenue hour in 1988 than 1987.

- Overall, there was a 0.6 percent increase in farebox revenue per vehicle revenue hour in 1988 over 1987.

- With the exception of streetcar which reduced its costs per passenger trip by 2.5 percent in 1988 over 1987, all other modes had increases in costs per passenger trips in the 5 to 17 percent range.

- Farebox revenue contribution towards covering operating expenses has been relatively static during the 1984 to 1988 period, fluctuating between 40 percent to 42 percent. The state and local contribution has steadily increased from 43 percent in 1984 to 48 percent in 1988.

Federal contribution has steadily declined from 10 percent to 7 percent between 1984 and 1988.

Industry-Wide Issue Oriented Measures

- The labor expenses per hour of service were much higher for rail than non-rail modes of transit service.
- Fringe benefits expense added between 26 and 39 percent to the labor cost per revenue hour of service.
- Only commuter rail and demand response had a decrease in cost of labor and fringe benefit expense per revenue hour of 1 percent while the other modes had increases of 3 to 10 percent in 1988 over 1987.
- Demand response systems produced the most vehicle revenue hours per equivalent employee (1,064).
- Commuter rail had the highest vehicle operations expense per vehicle revenue hour ($126.46). The second highest mode was demand response ($47.87). This was a 13 percent increase for commuter rail over 1987 and a 15 percent increase for demand response.
- Motor bus, rapid rail, trolley bus, and streetcar each reported vehicle operations expense per vehicle revenue hour of between $33 and $48. Motor bus and rapid rail had increases in expenses per vehicle revenue hour of 0.5 percent and 2.6 percent respectively while streetcar and trolley bus had increases of 11.6 percent and 15.5 percent respectively in 1988 over 1987.
- From 1984 to 1988, maintenance expenses per vehicle hour increased annually for all modes.
  - -- Motor bus maintenance expenses per vehicle hour increased at an average annual rate of 3.8 percent.
  - -- Rapid rail maintenance expenses per vehicle hour increased at an average annual rate of 4.0 percent.
  - -- Streetcar maintenance expenses per vehicle hour increased at an average annual rate of 6.4 percent.
  - -- Trolley bus maintenance expenses per vehicle hour increased at an average annual rate of 7.7 percent.
  - -- Demand response maintenance expense per vehicle hour increased at an average annual rate of 1.4 percent.
  - -- Commuter rail maintenance expense per vehicle hour increased at an average annual rate of 33.7 percent.
- The ratio of the total active fleet vehicles and the vehicles in maximum scheduled service measures the relative size of a transit system's spare fleet. Four of the modes (motor bus, rapid rail, trolley bus, and commuter rail) reported a spare fleet of between 27 to 41 percent. Streetcar reported a spare fleet of 61 percent and demand response reported a spare fleet of about 143 percent in 1988.

Motor Bus Issue Oriented Measures

- Motor bus system operating expenses per revenue mile or hour (a resource efficiency indicator) typically increased (i.e. worsened) as fleet size increased.
- Average service effectiveness, as measured in unlinked passenger trips per revenue mile and hour, tended to increase (i.e. improve) with fleet size group. In 1988, passenger trips per vehicle revenue mile for the group of largest motor bus systems was over 3.4 times the average for the group of smallest motor bus systems.
- There was a decline in both trips per mile and trips per hour in the 2 percent to 6

percent range for the largest motor bus systems and those systems operating less than 50 vehicles in 1988 over 1987. The motor bus systems operating between 50 and 1000 vehicles had increases in both trips per mile and trips per hour in the 1 percent to 4 percent range in 1988 over 1987.

- Motor bus system operating expenses per passenger trip and passenger mile (both resource effectiveness indicators) tended to diminish (i.e. improve) as fleet size increased. Large systems exhibited significantly lower costs per passenger trip and passenger mile than smaller systems. In 1988, for example, the group of largest motor bus systems showed average per passenger trip expenses 18 percent lower than the next largest system group and nearly 47 percent lower than the smallest motor bus systems group.

- In general, the ratio of vehicle revenue hours of service per operating employee decreased with larger fleet size groups. Motor bus systems in the three largest system groups typically had 19 to 30 percent fewer vehicle revenue hours of service per employee in 1988 than the smallest transit systems.

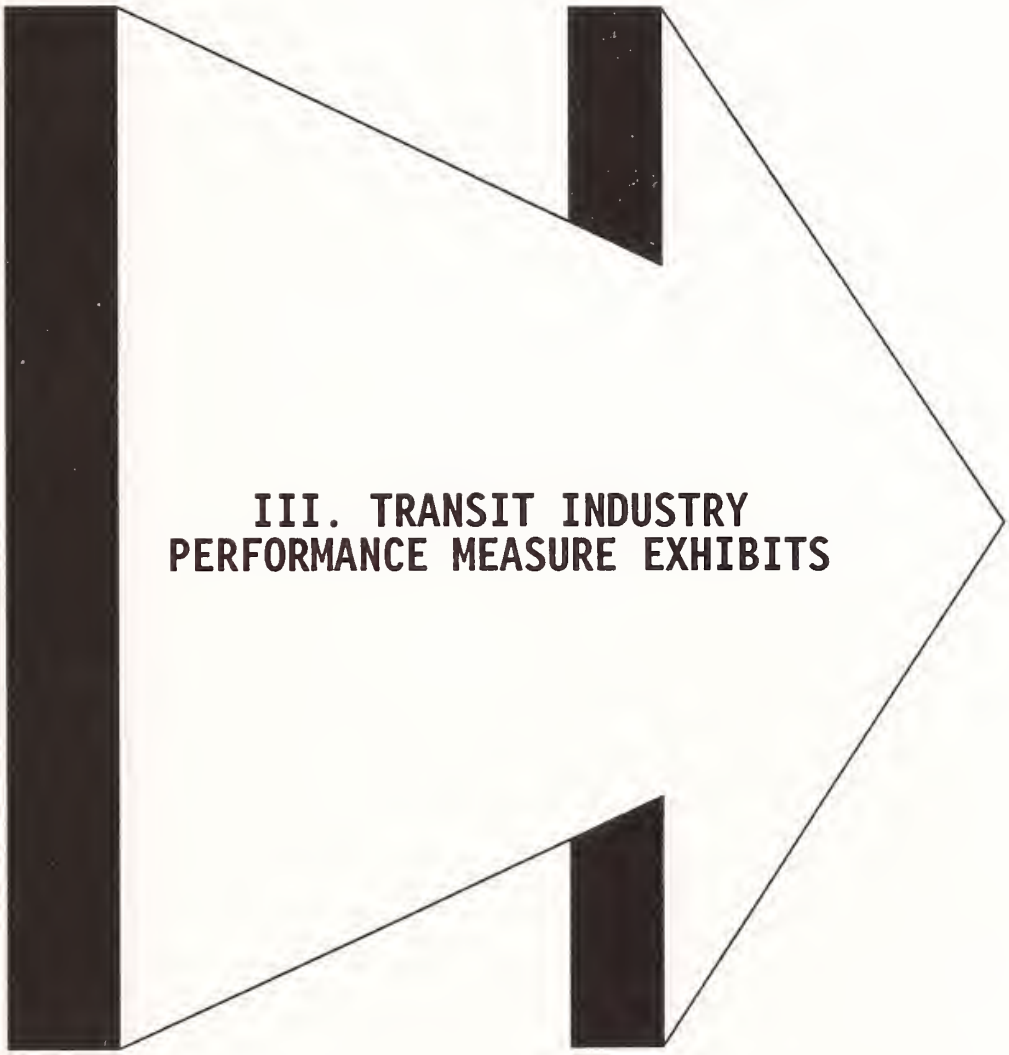
- All systems had maintenance costs per vehicle mile increases in 1988 over 1987 except those systems operating less than 25 vehicles and those operating between 250 to 499 vehicles which experienced decreases of about 3 percent. The largest systems had increases of maintenance costs per vehicle mile of nearly 7 percent.

- Motor bus systems with over 1,000 vehicles had the smallest average spare ratio (21 percent) and motor bus systems with less than 25 vehicles had the largest average spare ratio (38 percent). However, there was not much change in most systems in 1988 over 1987.

ENDNOTE:

1. Although 282 demand response systems reported under the Section 15 Program in 1988, they operated under very diverse service and contractual arrangements. This made it impossible to form valid fleet size groupings for examining the performance of these systems. Many of these systems, moreover, operated through purchase-of-service contracts, and their reports, therefore, did not fully reflect service costs.

2. The term "accident" here embraces collision accidents only, which is directly related to vehicle operations. Collision accidents refer to accidents, fatalities, or injuries that occurred as a consequence of the collision of the transit system's revenue vehicles with persons, objects, or other vehicles.



III. TRANSIT INDUSTRY PERFORMANCE MEASURE EXHIBITS


A. BENCHMARK
PERFORMANCE MEASURES

TRANSIT INDUSTRY COST EFFICIENCY TRENDS
OPERATING EXPENSE PER VEHICLE REVENUE HOUR
BY MODE
SECTION 15 1984-1988

- While the trolley bus and commuter rail modes were the only modes in which operating costs per vehicle revenue hour did not increase each year, the trend between 1984 and 1988 was that the transit modes experienced increases in their operating costs per vehicle revenue hour.

- The average annual percentage increases (+) and decreases (-) in operating costs per vehicle revenue hour between 1984 and 1988 are listed below by mode in ascending order:

  -- Commuter rail - 0.1 percent.

  -- Motor bus + 4.1 percent.

  -- Rapid rail + 4.3 percent.

  -- Trolley bus + 6.2 percent.

  -- Streetcar + 7.7 percent.

  -- Demand Response + 8.6 percent.

- Between 1987 and 1988, all modes had increases in operating expenses per vehicle revenue hour:

  -- Commuter rail + 0.4 percent.

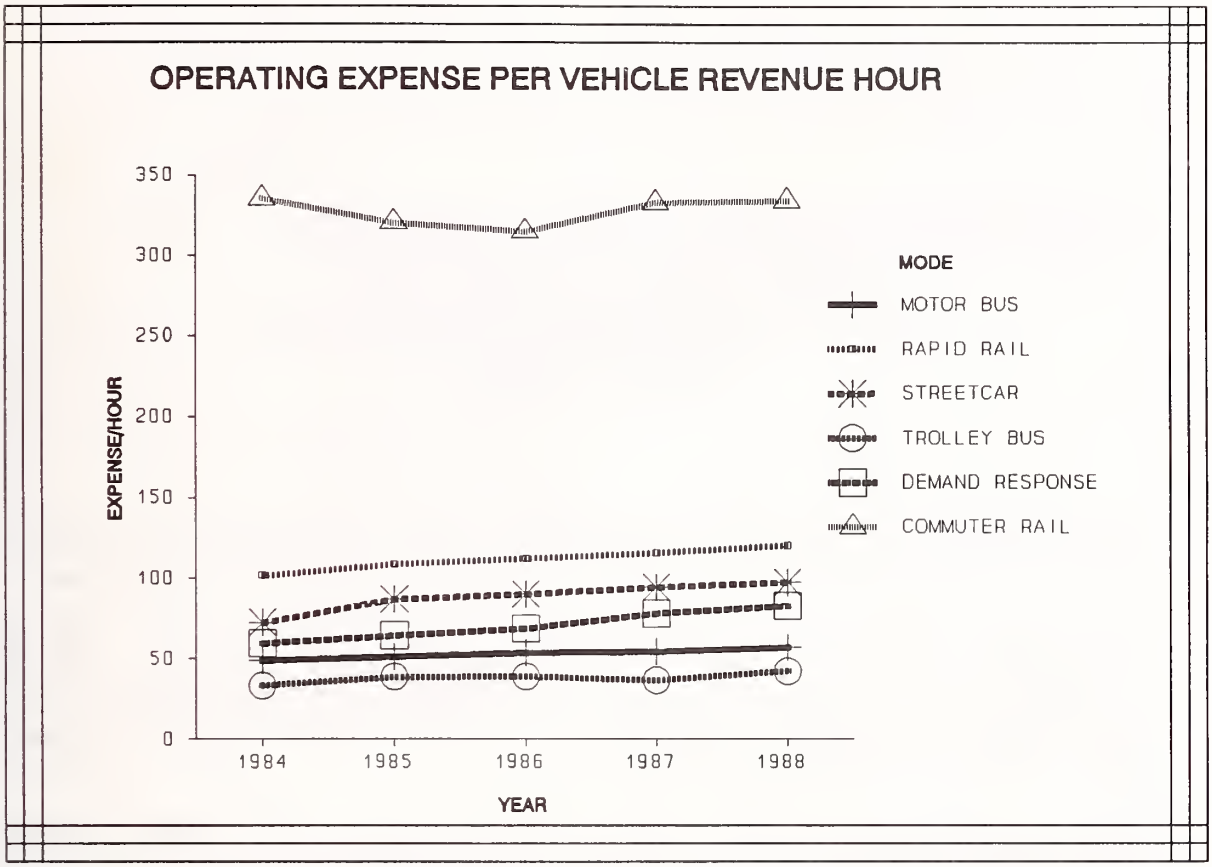
  -- Streetcar + 3.1 percent.

  -- Rapid rail + 3.9 percent.

  -- Motor bus + 4.9 percent.

  -- Demand response + 6.2 percent.

  -- Trolley bus + 15.4 percent.



TRANSIT INDUSTRY COST EFFICIENCY TRENDS
OPERATING EXPENSES PER VEHICLE REVENUE HOUR
BY MODE -- SECTION 15 1984-1988

	1984	1985	1986	1987	1988
MOTOR BUS	48.92	51.60	53.93	54.75	57.45
RAPID RAIL	101.95	108.90	112.34	115.99	120.56
STREETCAR	72.68	87.20	90.25	94.62	97.57
TROLLEY BUS	33.43	38.90	39.14	36.81	42.49
DEMAND RESPONSE	59.73	64.70	68.73	78.30	83.18
COMMUTER RAIL	335.58	320.70	315.20	333.15	334.51

(DOLLARS)

TRANSIT INDUSTRY COST EFFICIENCY
OPERATING EXPENSE PER VEHICLE REVENUE HOUR
BY URBANIZED AREA SIZE
SECTION 15 1988

- The indicator on the facing page measures the operating cost of transit services per vehicle hour of service, excluding deadhead travel time.

- The values for this indicator increased with urbanized area size. In 1988 the largest urbanized areas had the highest operating expense per vehicle revenue hour. This was about 4.5 times greater than the urbanized areas with 50,000 to 99,999 residents, which had the lowest operating expense per vehicle revenue hour at $26.14.

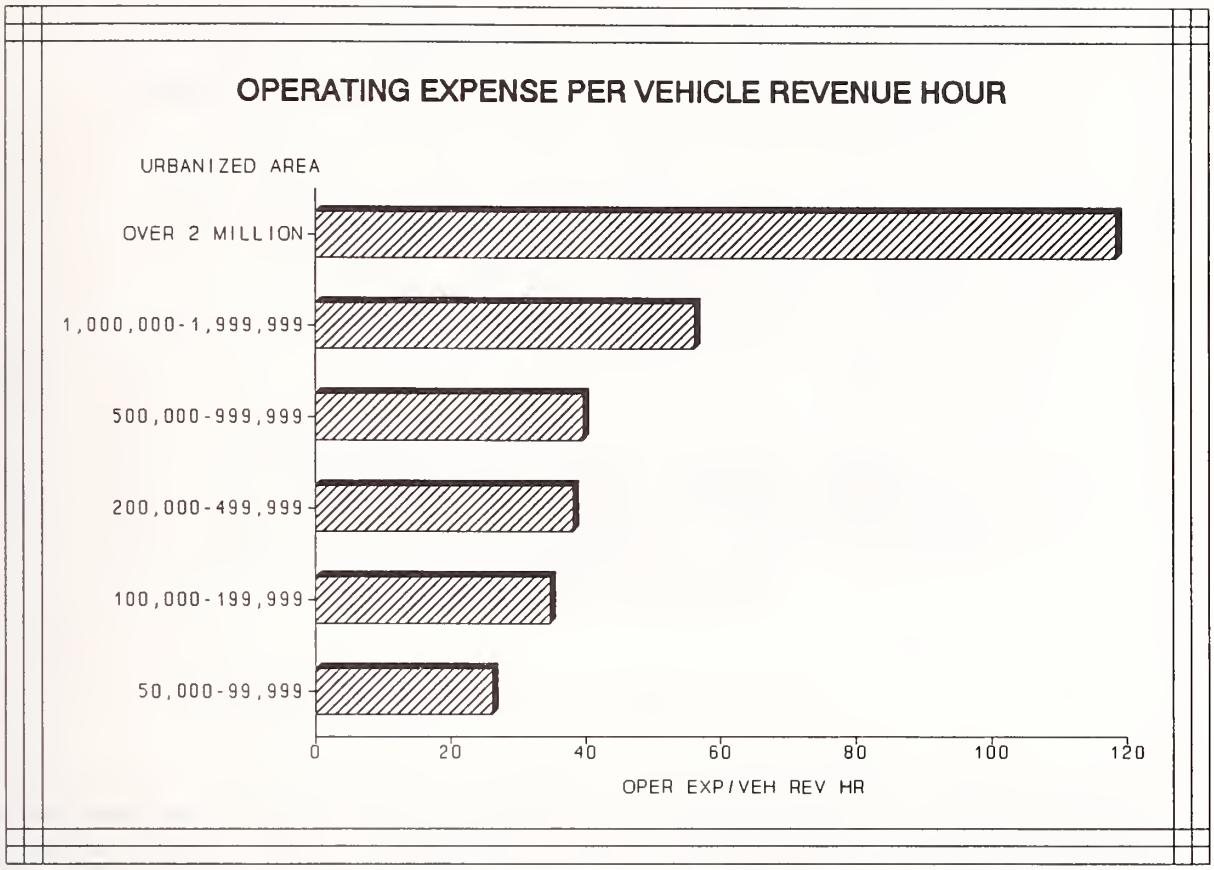
- More specifically, in 1988, the operating expenses per vehicle revenue hour for transit systems in the largest urbanized areas were:

  -- 210.8 percent more operating expense per vehicle revenue hour than systems in urbanized areas with 1 million to 1,999,999 residents.

  -- 280.9 percent more operating expense per vehicle revenue hour than systems in urbanized areas with 200,000 to 999,999 residents.

  -- 318.8 percent more operating expense per vehicle revenue hour than systems in urbanized areas with less than 200,000 residents.

- Most areas experienced operating expense per vehicle revenue hour increases in 1988 over 1987 in the range of 3 percent to 7 percent. However, the urbanized areas with 50,000 to 99,999 residents, experienced a 6.2 percent reduction in operating costs per vehicle revenue hour.



TRANSIT INDUSTRY COST EFFICIENCY
OPERATING EXPENSE PER VEHICLE REVENUE HOUR
BY URBANIZED AREA
SECTION 15 1988

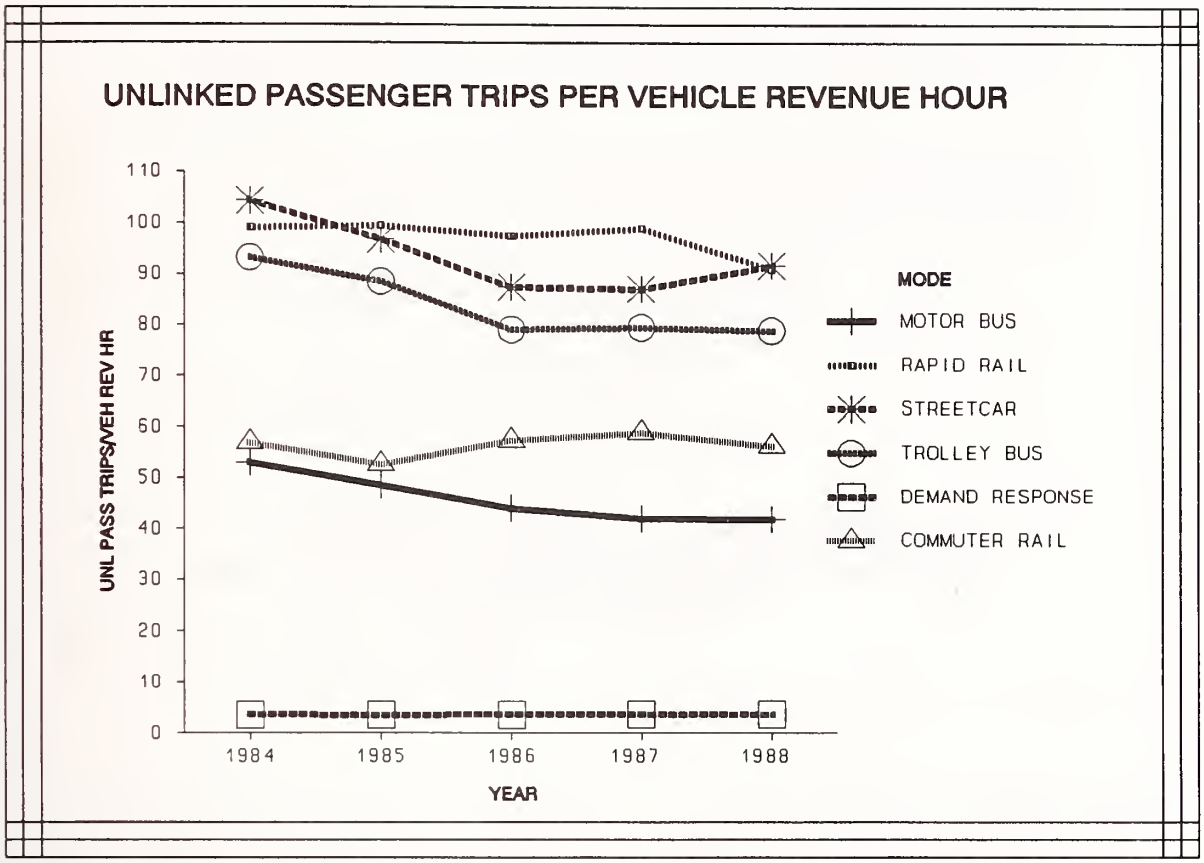
Population -->	50,000 TO 99,999	100,000 TO 199,999	200,000 TO 499,999	500,000 TO 999,999	1 MILLION TO 1,999,999	OVER 2 MILLION	TOTAL
OPER EXPENSE/VEH REV HOUR	26.14	34.69	38.09	39.65	56.13	118.32	86.33

(Dollars)

TRANSIT INDUSTRY SERVICE EFFECTIVENESS
UNLINKED PASSENGER TRIPS PER VEHICLE REVENUE HOUR
BY MODE
SECTION 15 1984-1988

- Demand response provided transit for specialized trips in the least dense travel markets. Consequently, it consistently had the lowest unlinked passenger trips per vehicle revenue hour in the 1984 to 1988 period with virtually no change.

- There was a general decline in unlinked passenger trips per vehicle revenue hour between 1984 and 1988. Only motor bus has consistently lost passenger trips per hour at an average annual rate of 5.7 percent during this period of time.



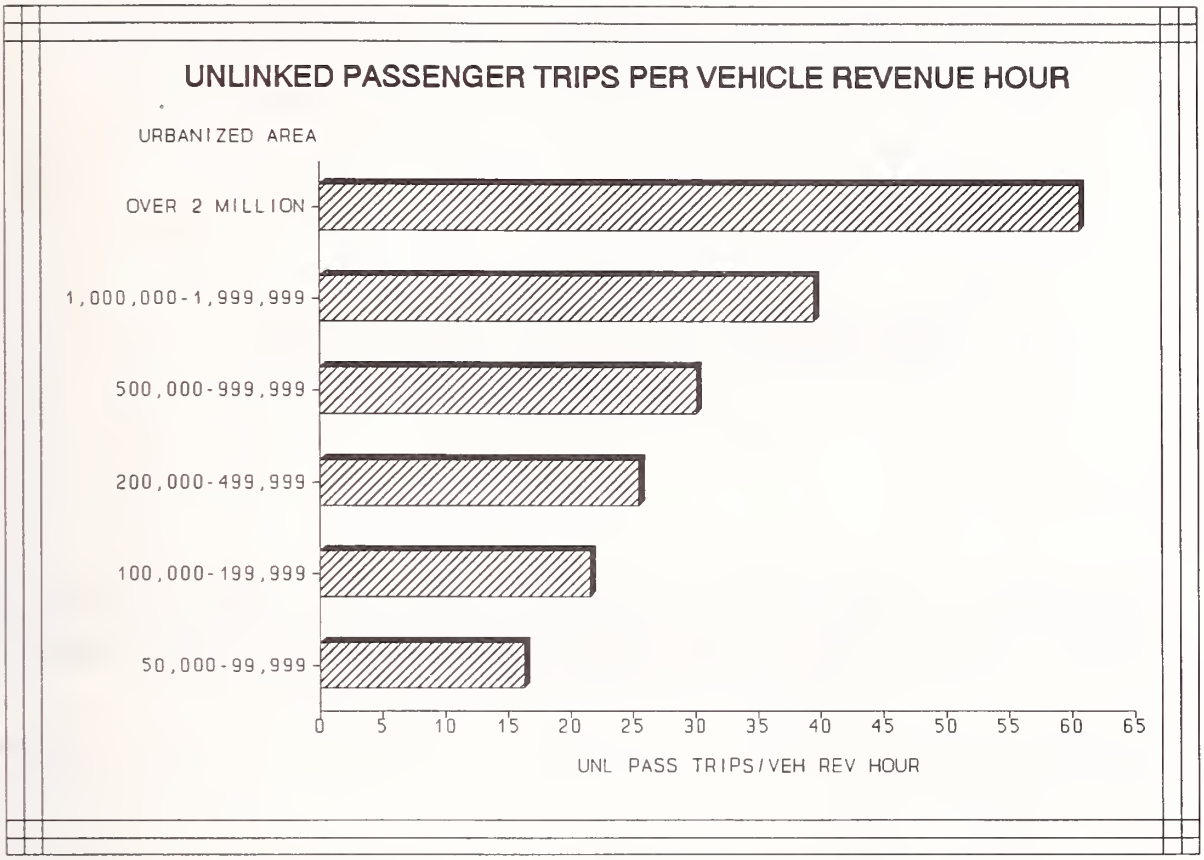
TRANSIT INDUSTRY SERVICE EFFECTIVENESS TRENDS
UNLINKED PASSENGER TRIPS/VEHICLE REVENUE HOUR BY MODE.
SECTION 15 1984-88

	1984	1985	1986	1987	1988
MOTOR BUS	53.0	48.6	44.1	42.0	41.9
RAPID RAIL	99.1	99.5	97.4	99.0	90.9
STREETCAR	104.3	96.8	87.4	87.1	91.7
TROLLEY BUS	93.2	88.5	79.1	79.5	78.9
DEMAND RESPONSE	3.6	3.6	3.6	3.7	3.7
COMMUTER RAIL	56.9	52.6	57.4	58.9	56.3

TRANSIT INDUSTRY SERVICE EFFECTIVENESS
UNLINKED PASSENGER TRIPS PER VEHICLE REVENUE HOUR
BY URBANIZED AREA SIZE
SECTION 15 1988

- On average, transit systems provided 51.2 unlinked passenger trips per vehicle revenue hour. Transit systems had 2 percent fewer trips per vehicle revenue hour in 1988 than 1987. However, urbanized areas with 100,000 to 199,999 residents had a 6.7 percent increase in passenger trips per vehicle revenue hour in 1988 than 1987.

- The smallest urbanized areas provided the fewest trips per hour. Additionally, the 16.3 trips per hour provided in 1988 is a 5 percent reduction over 1987.



TRANSIT INDUSTRY SERVICE EFFECTIVENESS
UNLINKED PASSENGER TRIP PER VEHICLE REVENUE HOUR
BY URBANIZED AREA
SECTION 15 1988

Population -->	50,000 TO 99,999	100,000 TO 199,999	200,000 TO 499,999	500,000 TO 999,999	1 MILLION TO 1,999,999	OVER 2 MILLION	TOTAL
UNL PASS TRIP/VEH REV HOURS	16.3	21.6	25.5	30.1	39.5	60.6	51.2

TRANSIT INDUSTRY SERVICE EFFECTIVENESS TRENDS
PASSENGER MILES PER VEHICLE REVENUE HOUR
BY MODE
SECTION 15 1984-1988

- From 1984 to 1988, transit industry service effectiveness trends, as measured in passenger miles per vehicle revenue hour, fluctuated for all modes. Demand response and streetcar showed some increase in this measure of service effectiveness. All other modes showed some decline.

- The average annual increase and decrease for each of the modes between 1984 and 1988 was*:

  -- Commuter rail - 2.7 percent.

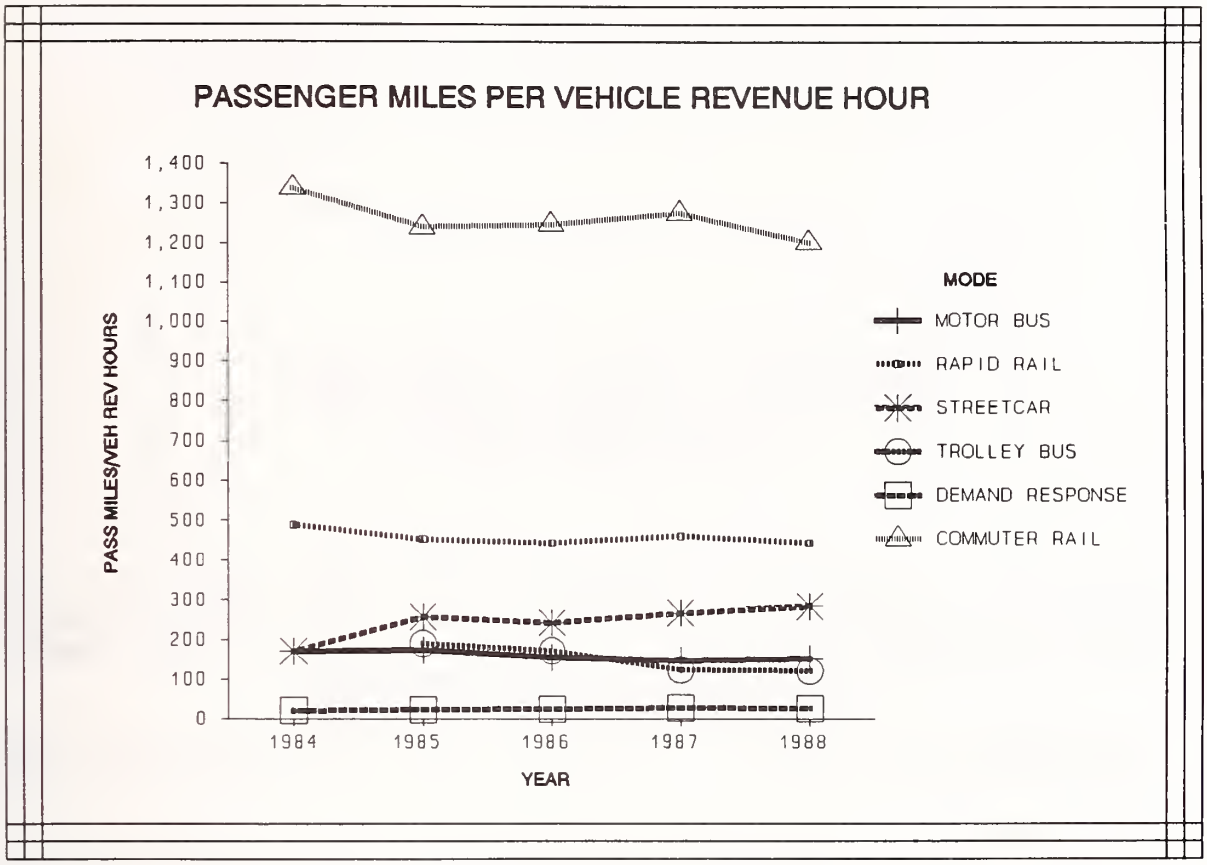
  -- Motor bus - 2.5 percent.

  -- Rapid rail - 2.3 percent.

  -- Demand response + 6.0 percent.

  -- Streetcar + 13.6 percent.

* Trolley bus miles data for 1984 are incomplete, making this ratio inconsistent with the other data in this analysis.



TRANSIT INDUSTRY SERVICE EFFECTIVENESS TRENDS
PASSENGER MILES PER VEHICLE REVENUE HOUR
BY MODE -- SECTION 15 1984-1988

	1984	1985	1986	1987	1988
MOTOR BUS	170.7	174.6	156.7	148.9	154.1
RAPID RAIL	488.9	453.0	444.5	461.3	445.0
STREETCAR	171.7	257.9	244.5	268.2	286.0
TROLLEY BUS	N/A	191.4	173.5	125.7	122.6
DEMAND RESPONSE	21.4	24.2	25.8	28.4	27.1
COMMUTER RAIL	1,337.5	1,239.9	1,247.3	1,276.1	1,203.3

Note: Trolley Bus Passenger Miles Data for 1984 are incomplete, making this ratio inconsistent with the other data in this analysis.

TRANSIT INDUSTRY SERVICE EFFECTIVENESS TRENDS
PASSENGER MILES PER VEHICLE REVENUE MILE
BY MODE
SECTION 15 1984-1988

- From 1984 to 1988, transit industry service effectiveness trends, as measured in passenger miles per vehicle revenue mile (average passenger load), fluctuated for all modes. Motor bus, rapid rail, and commuter rail were declining while the other modes were rising.

- The average annual increase or decrease for each of the modes between 1984 and 1988 was:

  -- Motor bus - 2.8 percent.

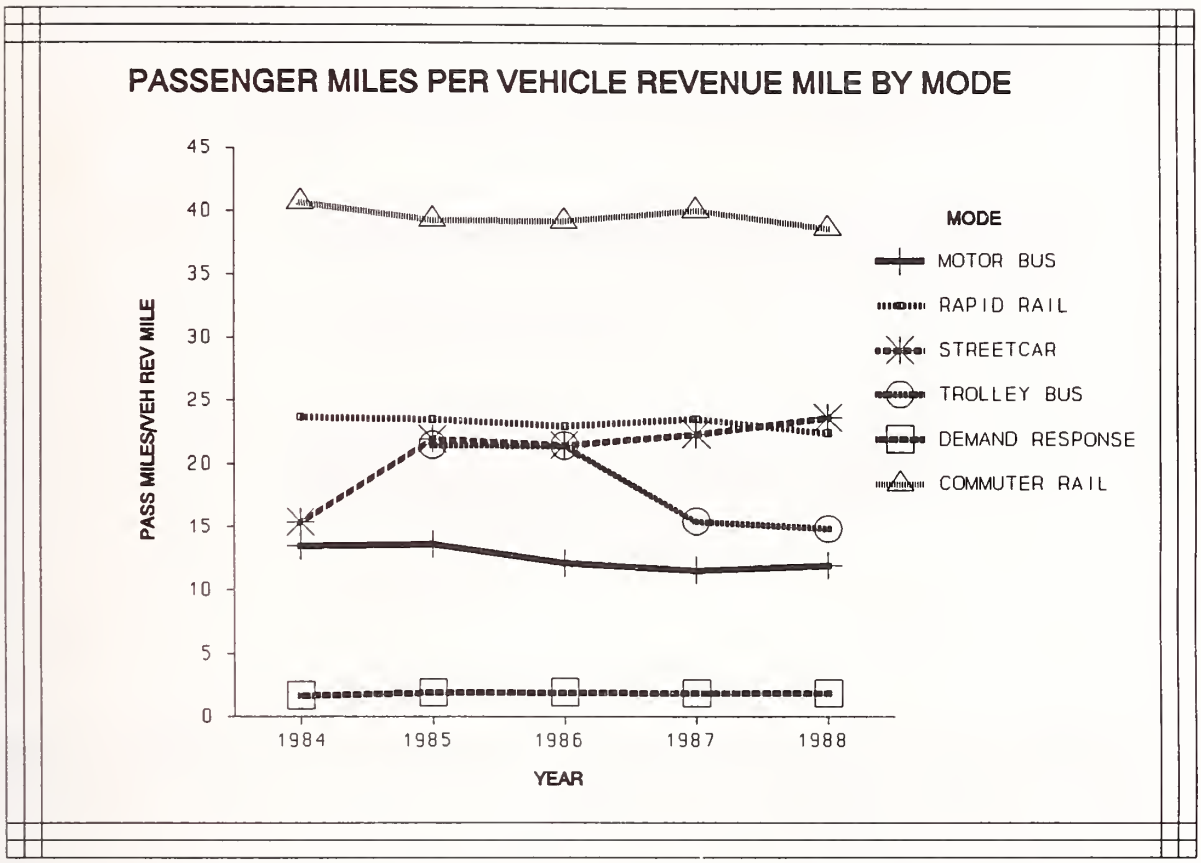
  -- Rapid rail - 1.3 percent.

  -- Commuter rail - 1.3 percent.

  -- Demand response + 3.1 percent.

  -- Trolley bus + 4.9 percent.

  -- Streetcar + 11.4 percent.



TRANSIT INDUSTRY SERVICE EFFECTIVENESS TRENDS
PASSENGER MILES PER VEHICLE REVENUE MILE
BY MODE -- SECTION 15 1984-1988

	1984	1985	1986	1987	1988
MOTOR BUS	13.5	13.7	12.2	11.6	12.0
RAPID RAIL	23.7	23.5	23.0	23.6	22.5
STREETCAR	15.4	22.0	21.5	22.4	23.7
TROLLEY BUS	N/A	21.5	21.5	15.5	14.9
DEMAND RESPONSE	1.7	2.0	2.0	1.9	1.9
COMMUTER RAIL	40.7	39.3	39.2	40.1	38.7

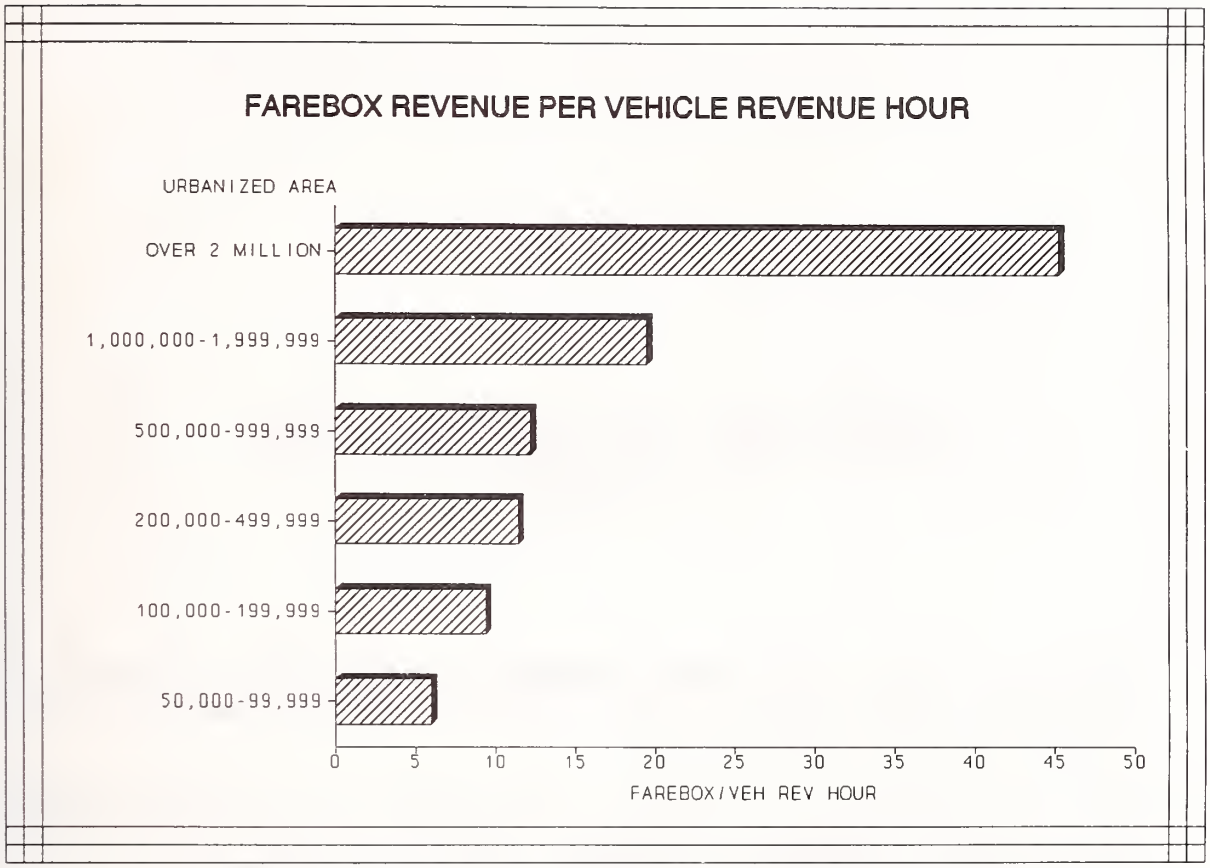
Note: Trolley Bus Passenger Miles Data for 1984 are incomplete, making this ratio inconsistent with other data in this analysis.

TRANSIT INDUSTRY SERVICE EFFECTIVENESS
FAREBOX REVENUE PER VEHICLE REVENUE HOUR
BY URBANIZED AREA SIZE
SECTION 15 1988

- Farebox revenue per vehicle revenue hour measures the amount of money taken in by transit systems per hour of service provided to the public (this excludes deadhead travel time).

- Since the larger transit systems carry more passengers and often have larger vehicles, they have higher farebox revenue per vehicle revenue hour of service. The largest systems receive almost 7.6 times the farebox revenue per vehicle revenue hour as the transit systems in the smallest urbanized areas.

- Overall, there was a 0.6 percent increase in farebox revenue per vehicle revenue hour in 1988 over 1987.



TRANSIT INDUSTRY SERVICE EFFECTIVENESS
FAREBOX REVENUE PER VEHICLE REVENUE HOUR
BY URBANIZED AREA
SECTION 15 1988

Population -->	50,000 TO 99,999	100,000 TO 199,999	200,000 TO 499,999	500,000 TO 999,999	1 MILLION TO 1,999,999	OVER 2 MILLION	TOTAL
FAREBOX REV/VEH REV HOUR	5.98	9.39	11.44	12.21	19.52	45.27	34.72

(Dollars)

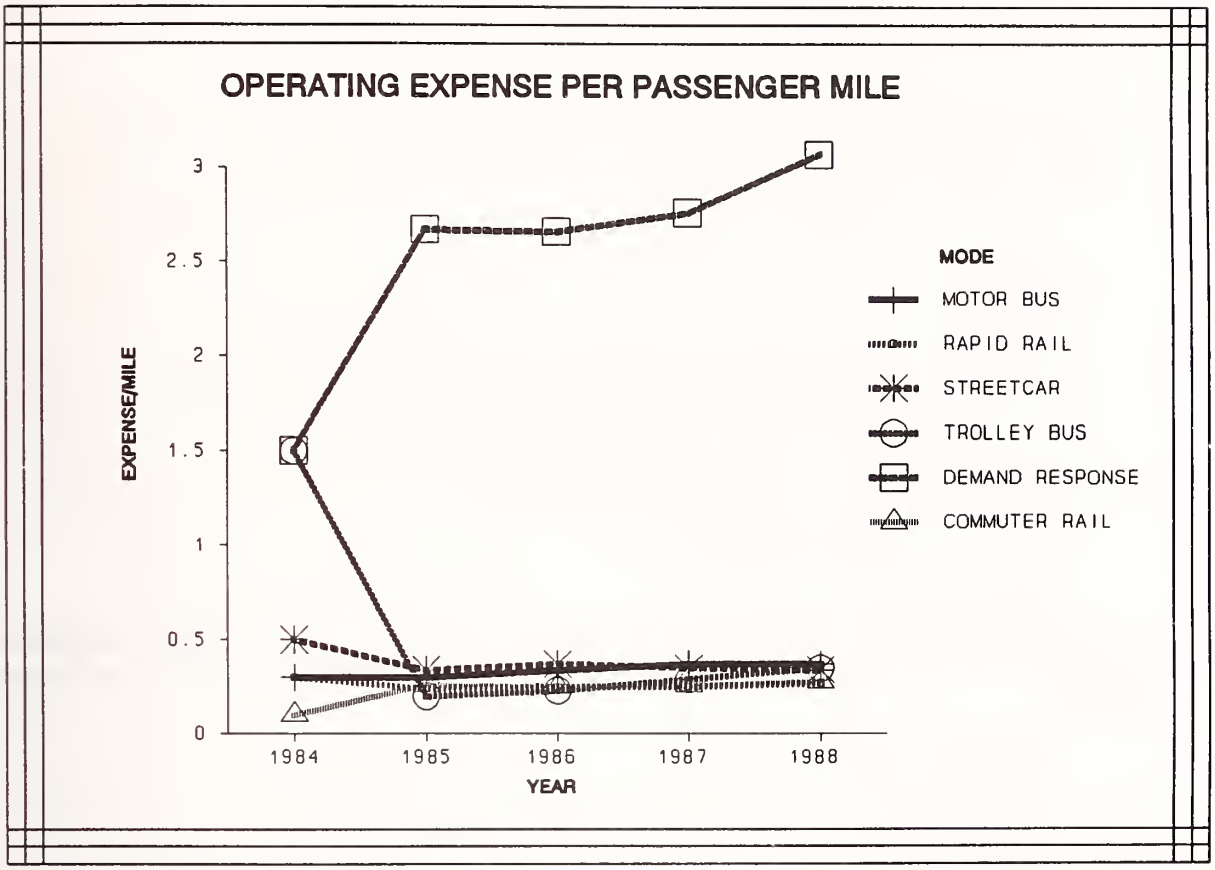
TRANSIT INDUSTRY COST EFFECTIVENESS TRENDS
OPERATING EXPENSE PER UNLINKED PASSENGER MILE
BY MODE
SECTION 15 1984-1988

- Because of the long distances traveled by the typical commuter rail passenger, commuter rail was one of the less expensive modes in terms of cost per passenger mile ($0.28).

- With the exception of streetcar, which reduced its costs per passenger mile by about 3 percent in 1988 over 1987, all other modes had increases in costs per passenger mile in the 1 to 18 percent range.

- The average annual percentage increase in operating costs per passenger mile between 1984 and 1988 are listed below by mode in ascending order:

--	Trolley bus	- 30.6 percent.
--	Streetcar	- 9.1 percent.
--	Rapid rail	- 2.5 percent.
--	Motor bus	+ 5.6 percent.
--	Demand response	+ 19.6 percent.
--	Commuter rail	+ 29.1 percent.



TRANSIT INDUSTRY COST EFFECTIVENESS TRENDS
OPERATING EXPENSE PER UNLINKED PASSENGER MILE
BY MODE
SECTION 15 1984-1988

	1984	1985	1986	1987	1988
MOTOR BUS	0.30	0.30	0.34	0.37	0.37
RAPID RAIL	0.30	0.24	0.25	0.25	0.27
STREETCAR	0.50	0.34	0.37	0.35	0.34
TROLLEY BUS	1.50	0.20	0.23	0.29	0.35
DEMAND RESPONSE	1.50	2.67	2.66	2.76	3.07
COMMUTER RAIL	0.10	0.26	0.25	0.26	0.28

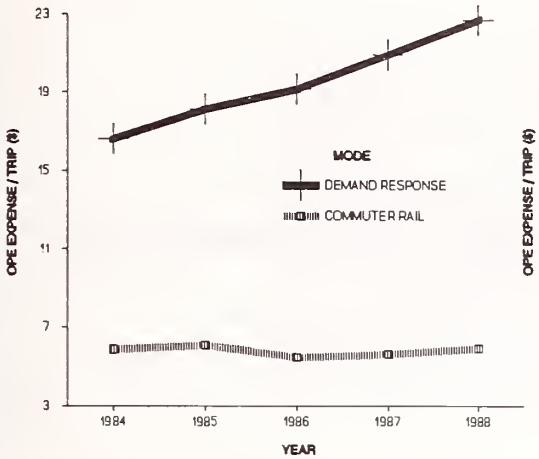
TRANSIT INDUSTRY COST EFFECTIVENESS
OPERATING EXPENSE PER UNLINKED PASSENGER TRIP
BY MODE
SECTION 15 1984-1988

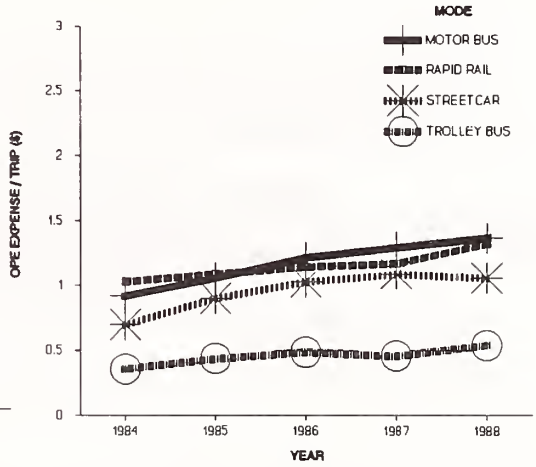
- The average annual percentage increases in operating costs per unlinked passenger trip between 1984 and 1988 are listed below by mode in ascending order:

--	Commuter rail	- 0.2 percent.
--	Rapid rail	+ 6.6 percent.
--	Demand response	+ 8.1 percent.
--	Motor bus	+ 10.5 percent.
--	Trolley bus	+ 10.6 percent.
--	Streetcar	+ 11.1 percent.

- With the exception of streetcar, which reduced its costs per passenger trip by 2.5 percent in 1988 over 1987, all other modes had increases in costs per passenger trips in the 5 to 17 percent range.

OPERATING EXPENSE PER UNLINKED PASSENGER TRIP





NOTE: ORIGIN STARTS AT $3 EXPENSE/TRIP

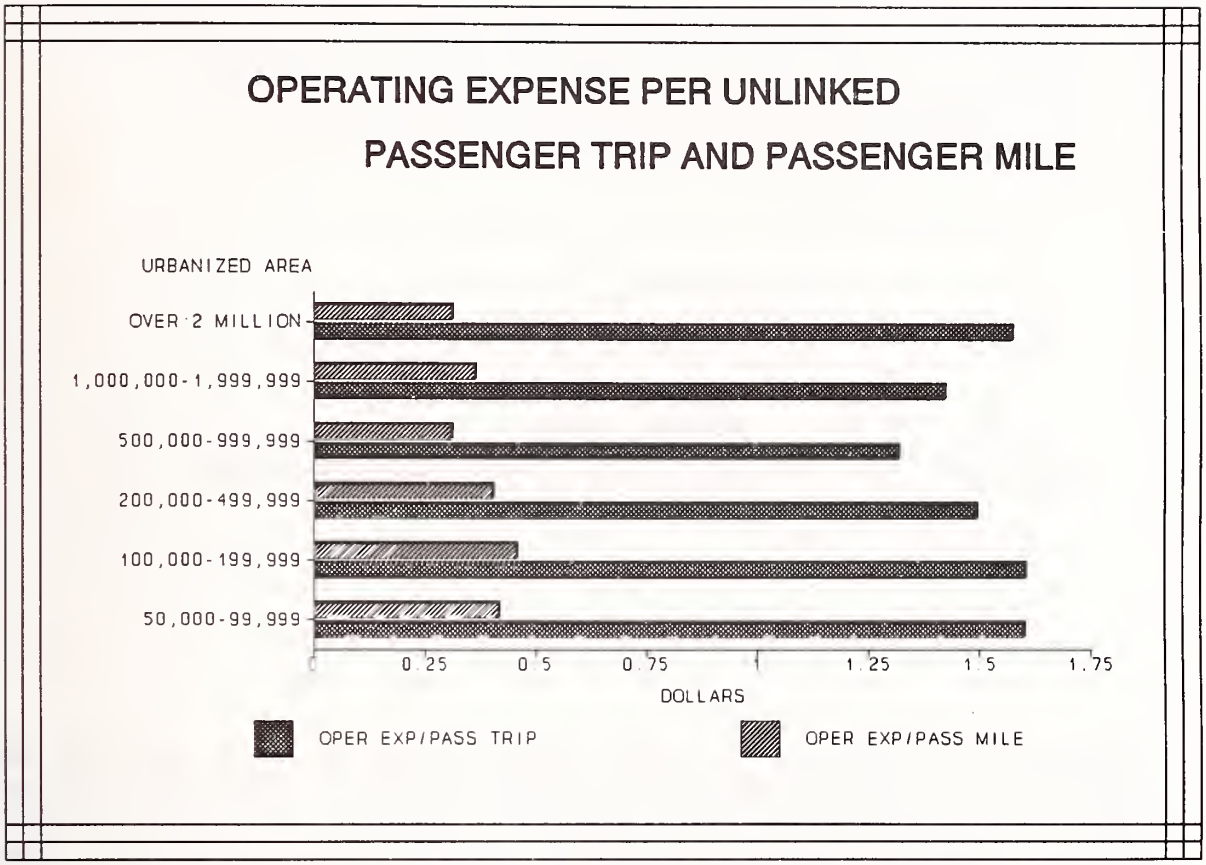
TRANSIT INDUSTRY COST EFFECTIVENESS TRENDS
OPERATING EXPENSE PER UNLINKED PASSENGER TRIP BY MODE
SECTION 15 1984-1988

	1984	1985	1986	1987	1988
MOTOR BUS	0.92	1.06	1.22	1.30	1.37
RAPID RAIL	1.03	1.09	1.15	1.17	1.33
STREETCAR	0.70	0.90	1.03	1.09	1.06
TROLLEY BUS	0.36	0.44	0.49	0.46	0.54
DEMAND RESPONSE	16.62	18.11	19.14	20.91	22.71
COMMUTER RAIL	5.89	6.09	5.49	5.66	5.94

(Dollars)

TRANSIT INDUSTRY COST EFFECTIVENESS
OPERATING EXPENSE PER UNLINKED PASSENGER TRIP AND PASSENGER MILE
BY URBANIZED AREA SIZE
SECTION 15 1988

- Operating expenses per unlinked passenger trip ranged from $1.32 in urbanized areas with 500,000 to 1 million residents to $1.60 in urbanized areas with between 100,000 and 199,999 residents.
- Operating expenses per passenger mile ranged from $0.31 in urbanized areas of 500,000 to 1 million residents and over 2 million residents to $0.46 in urbanized areas with between 100,000 to 199,999 residents.



TRANSIT INDUSTRY COST EFFECTIVENESS
OPERATING EXPENSE PER UNLINKED PASSENGER TRIP AND PASSENGER MILE
BY URBANIZED AREA
SECTION 15 1988

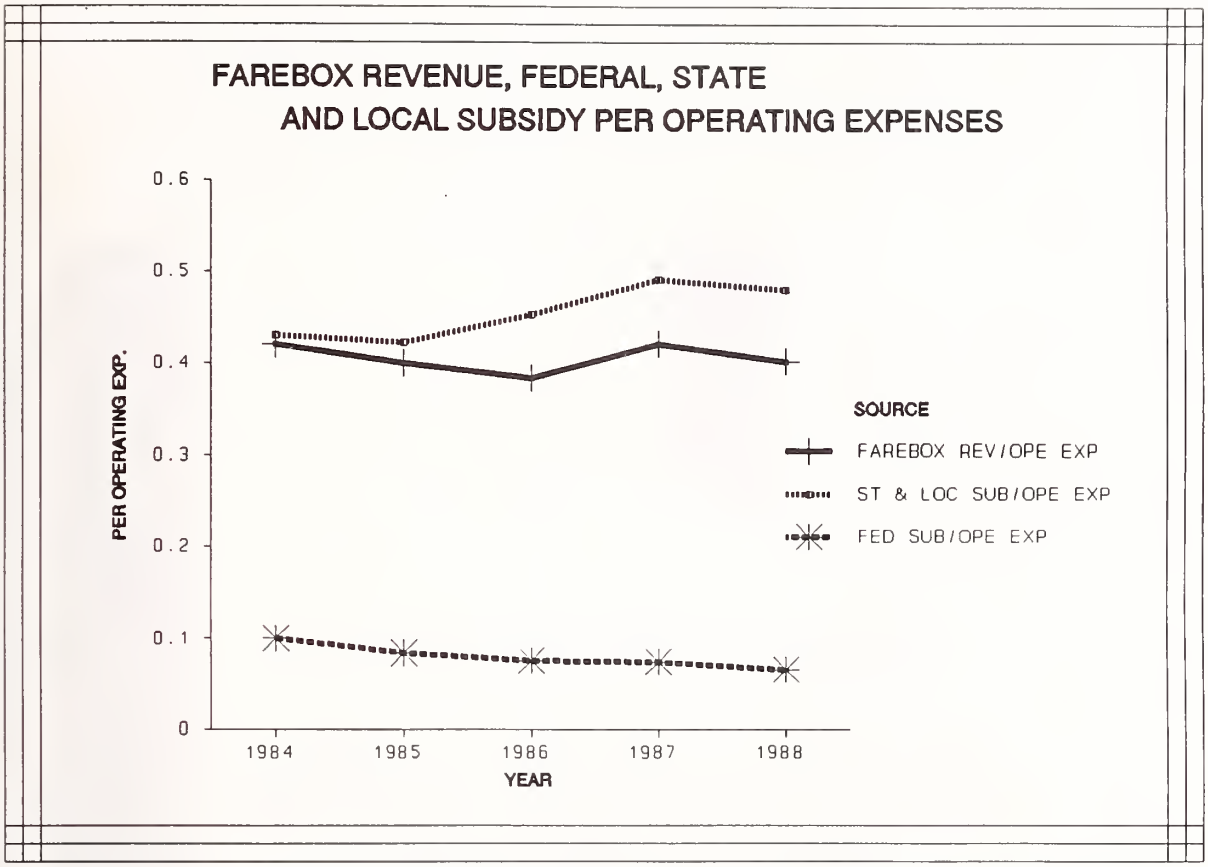
Population -->	50,000 TO 99,999	100,000 TO 199,999	200,000 TO 499,999	500,000 TO 999,999	1 MILLION TO 1,999,999	OVER 2 MILLION
OPER EXPENSES/PASS TRIPS	1.60	1.60	1.49	1.32	1.42	1.57
OPER EXPENSES/PASS MILE	0.42	0.46	0.40	0.31	0.36	0.31

(Dollars)

TRANSIT INDUSTRY COST EFFECTIVENESS
FAREBOX REVENUE,
FEDERAL, STATE AND LOCAL SUBSIDY PER OPERATING EXPENSES
SECTION 15 1984-1988

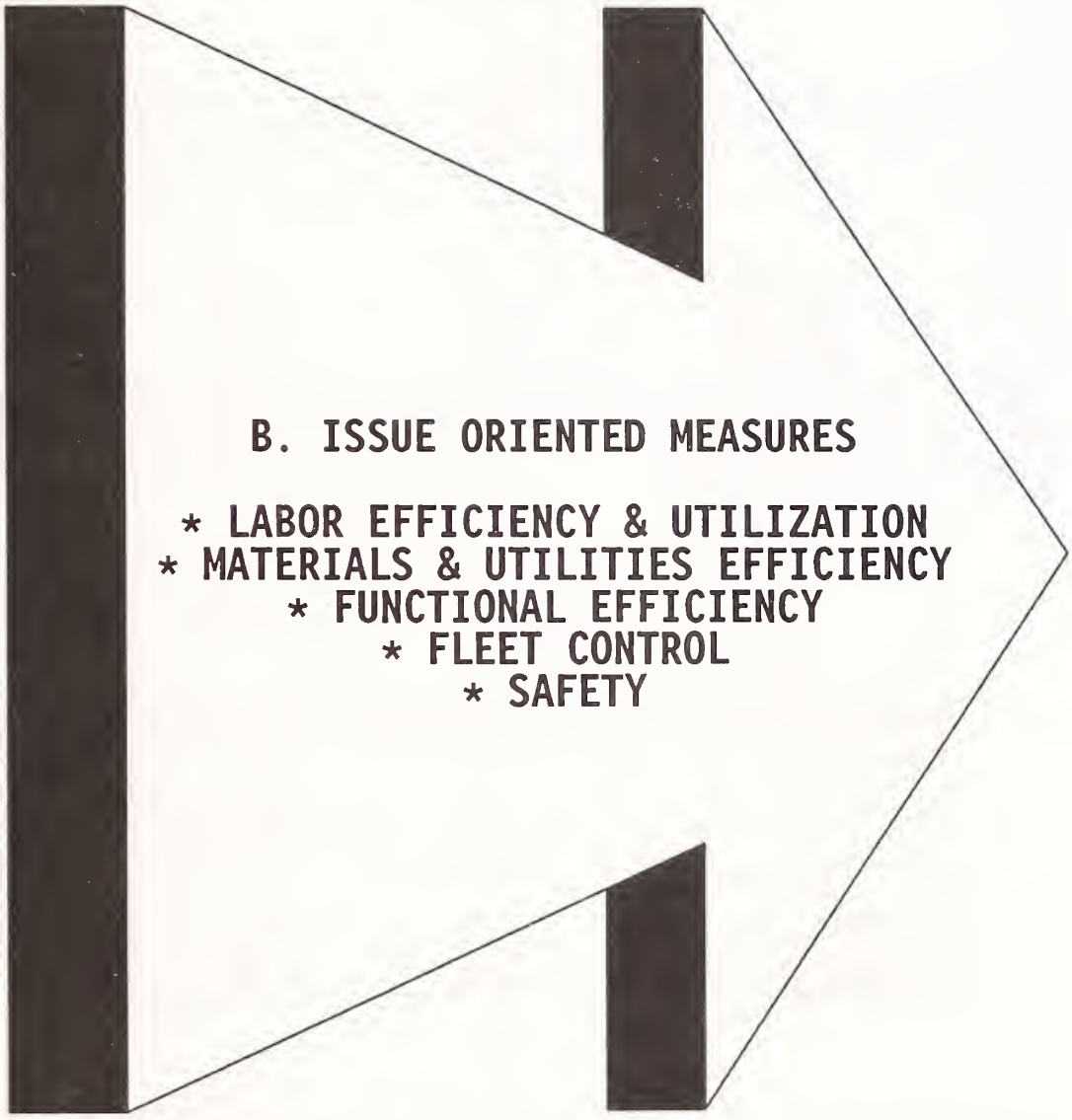
- The indicator of cost effectiveness shown on the facing page measures the proportion of transit system operating expense financed through passenger fares, State, local, and Federal sources of revenue. These indicators are some of the most important measures of transit system performance. They have long been used by transit managers as well as by local, State, and Federal transit administrators to evaluate the cost effectiveness of transit systems. Some States, such as California, even specify performance levels for this indicator in their eligibility requirements for operating funds.

- Farebox revenue contribution towards covering operating expenses has been relatively static during the 1984 to 1988 period, fluctuating between 40 percent to 42 percent. The state and local contribution has steadily increased from 43 percent in 1984 to 48 percent in 1988. Federal contribution has steadily declined from 10 percent to 7 percent between 1984 and 1988.



TRANSIT INDUSTRY EFFECTIVENESS
FAREBOX REVENUE, STATE & LOCAL SUBSIDY PER OPERATING EXPENSES
SECTION 15 1984-1988

	1984	1985	1986	1987	1988
FAREBOX REV/OPE EXP	0.42	0.40	0.38	0.42	0.40
ST & LOC SUB/OPE EXP	0.43	0.42	0.45	0.49	0.48
FED SUB/OPE EXP	0.10	0.08	0.08	0.07	0.07


B. ISSUE ORIENTED MEASURES
* LABOR EFFICIENCY & UTILIZATION
* MATERIALS & UTILITIES EFFICIENCY
* FUNCTIONAL EFFICIENCY
* FLEET CONTROL
* SAFETY

TRANSIT INDUSTRY LABOR EFFICIENCY
LABOR EXPENSE (WITH AND WITHOUT FRINGES)PER VEHICLE REVENUE HOUR
BY MODE
SECTION 15 1988

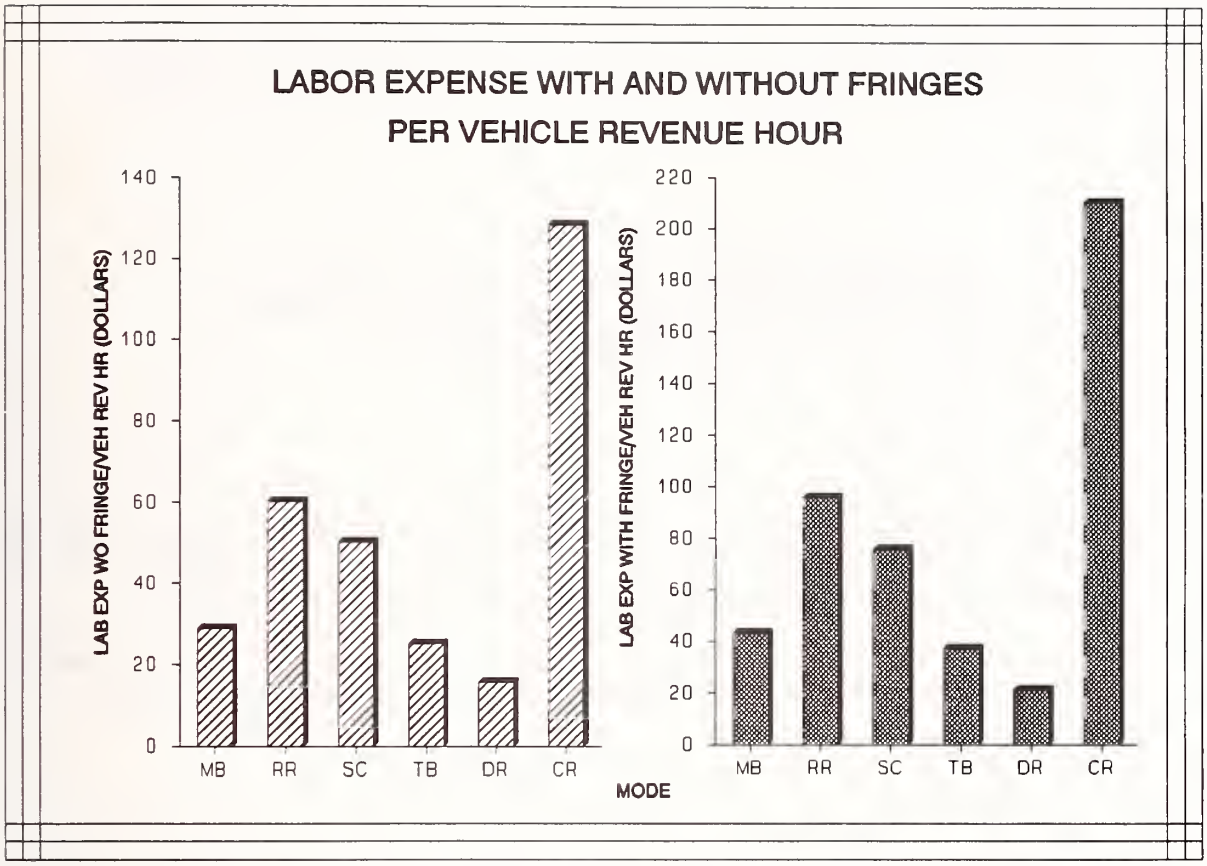
- Labor expense per vehicle revenue hour is a measure of transit system cost efficiency. The indicators include labor expenses with and without fringe benefit costs. Vehicle revenue hours are included in the indicators, since labor expenses are incurred largely based on the hours of service provided.

- The labor expenses per hour of service were much higher for rail than non-rail modes of transit service.

- Fringe benefits expense in 1988 added between 26 and 39 percent to the labor cost per revenue hour of service. More specifically, fringe benefit costs per revenue hour and as a percent of Total Labor Costs (including Fringes) are shown below:

MODE	COST OF FRINGE BENEFITS	PERCENT OF TOTAL LABOR COSTS
Motor Bus	$14.36	33.2%
Rapid Rail	$35.68	37.2%
Streetcar	$25.66	33.8%
Trolley Bus	$11.98	32.2%
Commuter Rail	$82.07	39.0%
Demand Response	$5.49	25.8%

- Only commuter rail and demand response had a decrease in cost of labor and fringe benefit expense per revenue hour of 1 percent while the other modes had increases of 3 to 10 percent in 1988 over 1987.



TRANSIT INDUSTRY COST EFFICIENCY
LABOR EXPENSE (WITH AND WITHOUT FRINGES)
PER VEHICLE REVENUE HOUR
BY MODE
SECTION 15 1988

	LABOR EXP WITHOUT FRINGE/ VEH REV HOUR	LABOR EXP WITH FRINGE/ VEH REV HOUR
MOTOR BUS	28.84	43.20
RAPID RAIL	60.16	95.84
STREET CAR	50.25	75.91
TROLLEY BUS	25.24	37.22
DEMAND RESPONSE	15.80	21.29
COMMUTER RAIL	128.43	210.49

(Dollars)

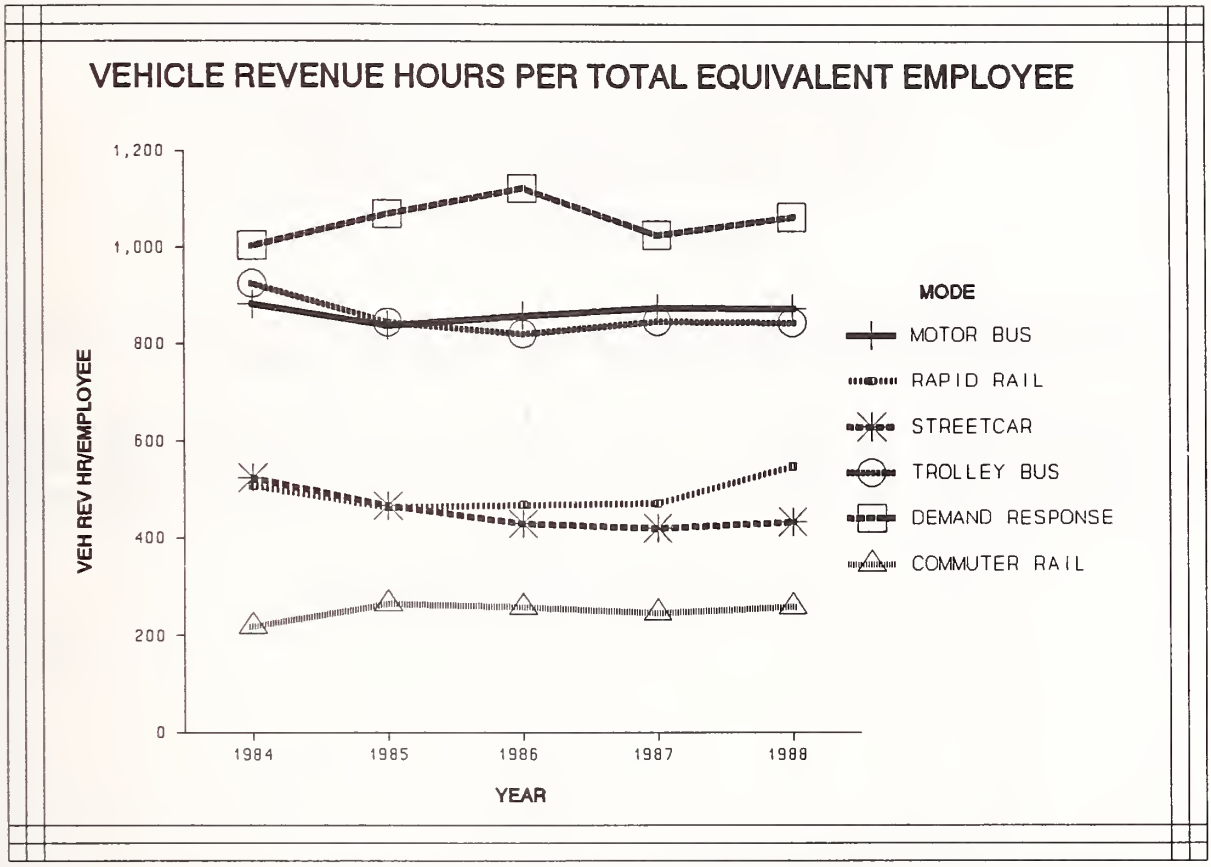
TRANSIT INDUSTRY LABOR EFFICIENCY TRENDS
VEHICLE REVENUE HOURS PER TOTAL EQUIVALENT EMPLOYEE
BY MODE
SECTION 15 1984-1988

- The value of the indicator on the facing page is influenced by both the number of employees and the hours of service. Demand response systems produced the most vehicle revenue hours per equivalent employee.

- Between 1984 and 1988 the number of vehicle revenue hours per equivalent employee increased (+) or decreased (-) at an average annual rate:

--	Streetcar	- 4.6 percent.
--	Trolley bus	- 2.2 percent.
--	Motor bus	- 0.2 percent.
--	Demand response	+ 1.4 percent.
--	Rapid rail	+ 2.0 percent.
--	Commuter rail	+ 4.3 percent.

- However, between 1987 and 1988, rapid rail systems experienced increases in the number of vehicle revenue hours per equivalent employee of 16 percent. Streetcar, demand response, and commuter rail systems had increases in the 3 percent to 5 percent range.



TRANSIT INDUSTRY LABOR EFFICIENCY TRENDS
VEHICLE REVENUE HOURS PER TOTAL EQUIVALENT EMPLOYEE
BY MODE
SECTION 15 1984-88

	1984	1985	1986	1987	1988
MOTOR BUS	882.2	838.6	858.4	875.4	875.0
RAPID RAIL	508.2	464.4	469.5	472.9	549.1
STREETCAR	525.0	467.5	430.3	420.8	434.7
TROLLEY BUS	925.1	845.1	821.5	847.5	845.1
DEMAND RESPONSE	1,004.3	1,069.6	1,123.2	1,026.5	1,064.0
COMMUTER RAIL	219.7	265.0	258.9	247.5	259.8

TRANSIT INDUSTRY LABOR EFFICIENCY TRENDS
VEHICLE HOURS PER EQUIVALENT OPERATOR
BY MODE
SECTION 15 1984-1988

- The indicator on the facing page measures the amount of time per year, on average, that vehicle operators operate transit vehicles.

- Between 1984 and 1988, each mode experienced some fluctuations in the annual number of vehicle hours per operator. The six modes for which data were available for 1984 through 1988 reported average annual increases of:

  -- Streetcar - 2.5 percent.

  -- Trolley bus + 0.1 percent.

  -- Demand response + 0.1 percent.

  -- Rapid rail + 0.5 percent.

  -- Motor bus + 0.5 percent.

  -- Commuter rail + 7.3 percent.

- The six modes can be ranked for the average number of vehicle hours per operator between 1984 and 1988 as follows (from highest to lowest):

  -- Rapid rail 2,796 hours per operator.

  -- Demand Response 1,922 hours per operator.

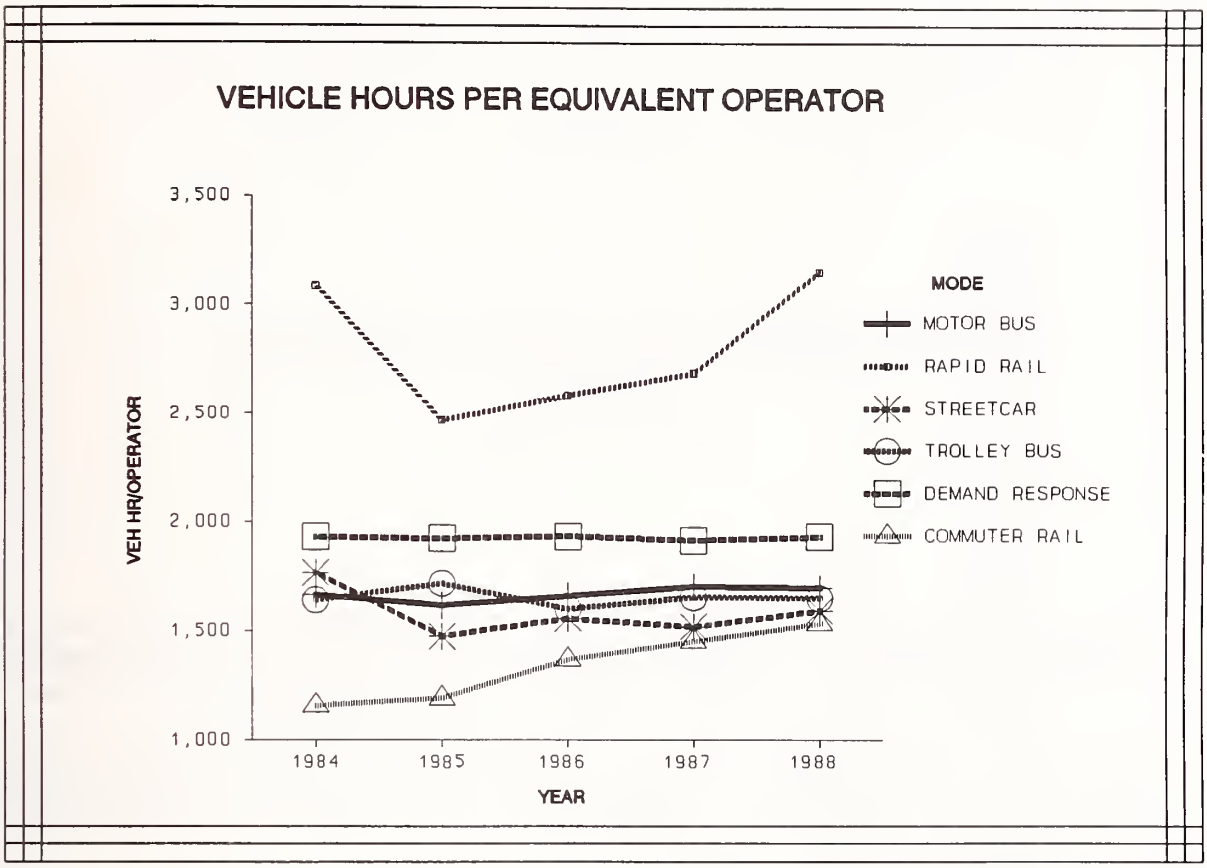
  -- Motor bus 1,668 hours per operator.

  -- Trolley Bus 1,653 hours per operator.

  -- Streetcar 1,582 hours per operator.

  -- Commuter rail 1,340 hours per operator.

- Based on the data reported, rapid rail vehicle operators had 208.7 percent higher average annual vehicle hours than commuter rail operators.



TRANSIT INDUSTRY LABOR EFFICIENCY TRENDS
VEHICLE HOURS PER EQUIVALENT OPERATOR
BY MODE
SECTION 15 1984-1988

	1984	1985	1986	1987	1988
MOTOR BUS	1,663.4	1,616.2	1,660.5	1,703.3	1,698.1
RAPID RAIL	3,086.2	2,470.4	2,583.0	2,687.8	3,153.1
STREETCAR	1,764.3	1,473.7	1,559.6	1,518.9	1,593.7
TROLLEY BUS	1,639.9	1,717.2	1,602.2	1,654.5	1,650.9
DEMAND RESPONSE	1,928.9	1,922.5	1,933.4	1,916.3	1,932.4
COMMUTER RAIL	1,154.9	1,190.3	1,368.7	1,452.5	1,533.7

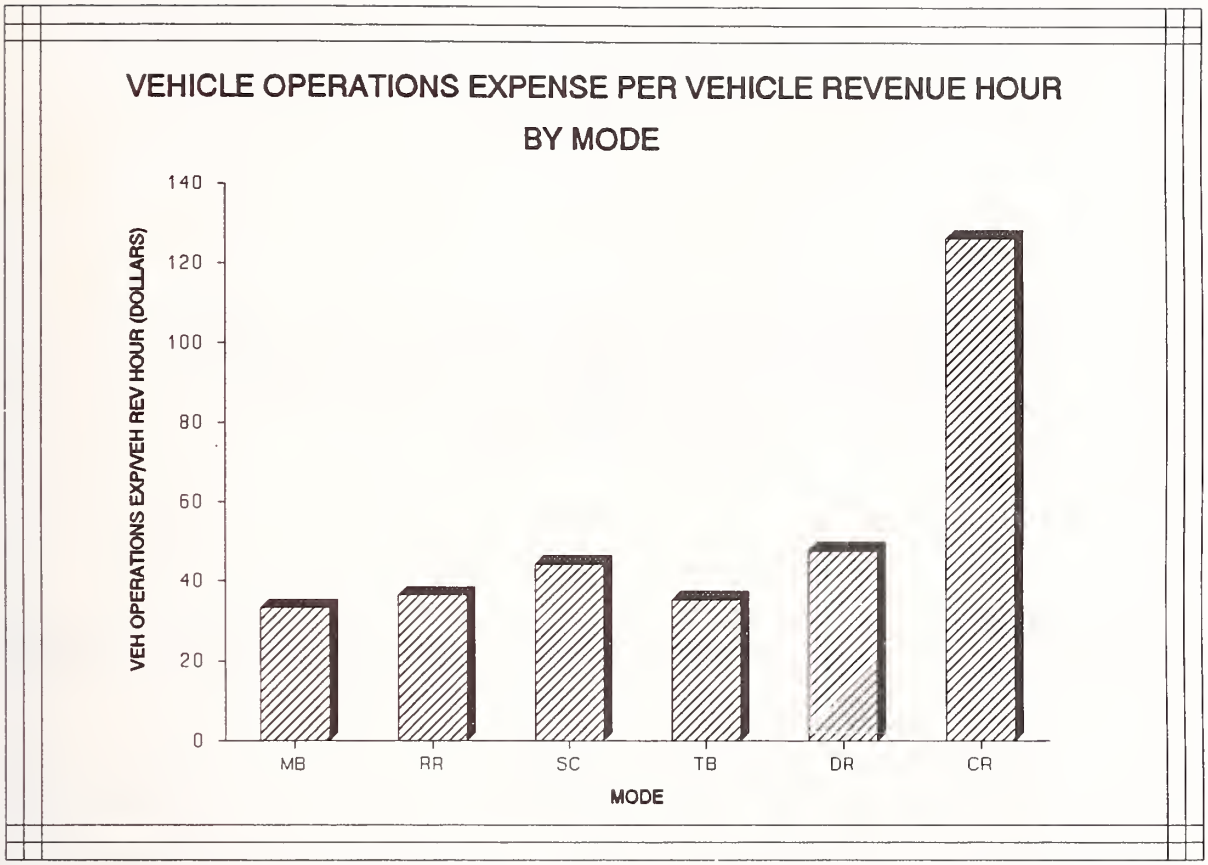
TRANSIT INDUSTRY VEHICLE OPERATIONS EFFICIENCY
VEHICLE OPERATIONS EXPENSE PER VEHICLE REVENUE HOUR
BY MODE
SECTION 15 1988

- The performance cost indicator shown on the facing page measures transit system efficiency for vehicle operations expenditures in relation to vehicle revenue hours of service, which excludes deadhead travel time.

- The vehicle operations function represents the greatest proportion of operating expenses for most modes (except rapid rail) because it is a labor intensive function, including all vehicle operators and operations supervisory personnel.

- Commuter rail had the highest vehicle operations expense per vehicle revenue hour ($126.46). The second highest mode was demand response ($47.87). This was a 13 percent increase for commuter rail in 1988 over 1987 and a 15 percent increase for demand response.

- Motor bus, rapid rail, trolley bus, and streetcar each reported vehicle operations expense per vehicle revenue hour of between $33 and $48. Motor bus and rapid rail had increases in expenses per vehicle revenue hour of 0.5 percent and 2.6 percent, respectively. Streetcar and trolley bus had increases of 11.6 percent and 15.5 percent, respectively, in 1988 over 1987.



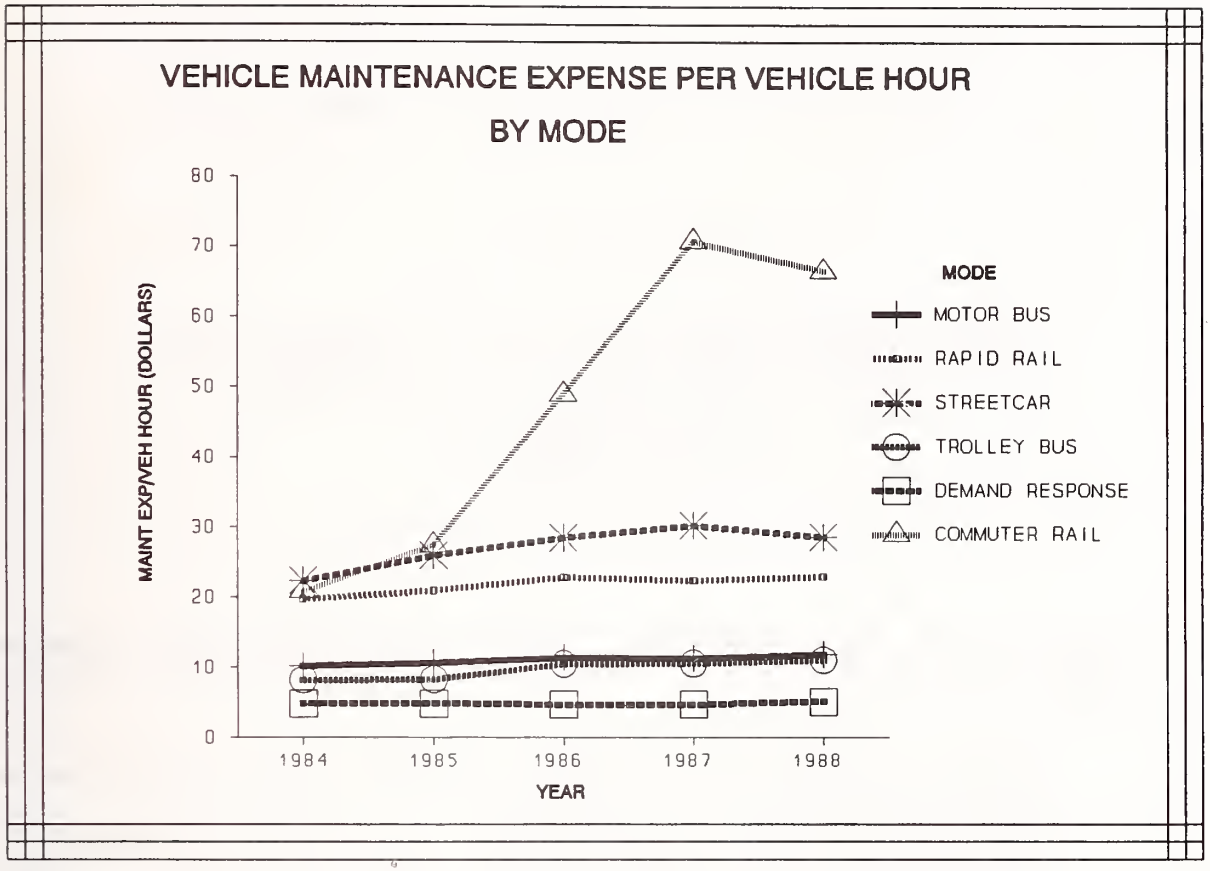
TRANSIT INDUSTRY COST EFFICIENCY
VEHICLE OPERATIONS EXPENSE PER VEHICLE REVENUE HOUR
BY MODE
SECTION 15 - 1988

	VEH OP EXP/ VEH REV HOUR
MOTOR BUS	33.31
RAPID RAIL	36.48
STREETCAR	44.46
TROLLEY BUS	35.42
DEMAND RESPONSE	47.87
COMMUTER RAIL	126.46

(Dollars)

TRANSIT INDUSTRY VEHICLE MAINTENANCE EFFICIENCY TRENDS
VEHICLE MAINTENANCE EXPENSE PER VEHICLE HOUR
BY MODE
SECTION 15 1984-1988

- From 1984 to 1988, maintenance expenses per vehicle hour increased annually for all modes.
  - -- Motor bus maintenance expenses per vehicle hour increased at an average annual rate of 3.8 percent.
  - -- Rapid rail maintenance expenses per vehicle hour increased at an average annual rate of 4.0 percent.
  - -- Streetcar maintenance expenses per vehicle hour increased at an average annual rate of 6.4 percent.
  - -- Trolley bus maintenance expenses per vehicle hour increased at an average annual rate of 7.7 percent.
  - -- Demand response maintenance expense per vehicle hour increased at an average annual rate of 1.4 percent.
  - -- Commuter rail maintenance expense per vehicle hour increased at an average annual rate of 33.7 percent.
- The rail vehicles, which are more complex and generally older (except for trolley bus) than motor bus and demand response vehicles, had significantly higher maintenance expense per vehicle hour.



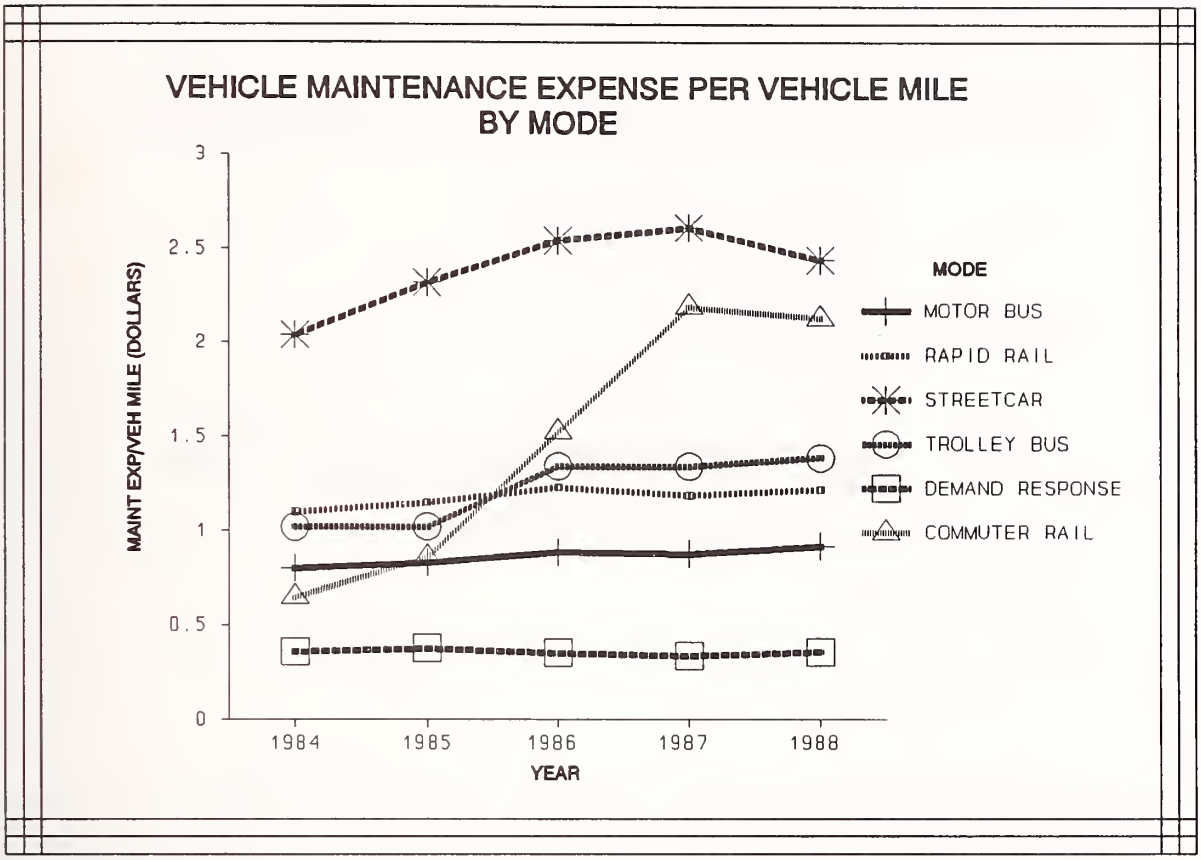
TRANSIT INDUSTRY VEHICLE MAINTENANCE EFFICIENCY TRENDS
VEHICLE MAINTENANCE EXPENSE PER VEHICLE HOUR
BY MODE
SECTION 15 1984-1988

	1984	1985	1986	1987	1988
MOTOR BUS	10.20	10.62	11.40	11.32	11.83
RAPID RAIL	19.69	20.95	22.92	22.43	23.00
STREETCAR	22.37	26.01	28.53	30.31	28.62
TROLLEY BUS	8.21	8.30	10.48	10.56	11.04
DEMAND RESPONSE	4.83	4.83	4.71	4.72	5.10
COMMUTER RAIL	20.82	27.43	48.97	70.75	66.56

(Dollars)

TRANSIT INDUSTRY VEHICLE MAINTENANCE EFFICIENCY TRENDS
VEHICLE MAINTENANCE EXPENSE PER VEHICLE MILE
BY MODE
SECTION 15 1984-1988

- From 1984 to 1988, maintenance expenses per vehicle mile increased annually for all modes except for demand response which decreased at an annual rate of 0.5 percent.
  - -- Motor bus maintenance expenses per vehicle mile increased at an average annual rate of 3.5 percent.
  - -- Rapid rail maintenance expenses per vehicle mile increased at an average annual rate of 2.6 percent.
  - -- Streetcar maintenance expenses per vehicle mile increased at an average annual rate of 4.5 percent.
  - -- Trolley bus maintenance expenses per vehicle mile increased at an average annual rate of 8.0 percent.
  - -- Commuter rail maintenance expenses per vehicle mile increased at an average annual rate of 34.6 percent.



TRANSIT INDUSTRY VEHICLE MAINTENANCE EFFICIENCY TRENDS
VEHICLE MAINTENANCE EXPENSE PER VEHICLE MILE
BY MODE
SECTION 15 1984-1988

	1984	1985	1986	1987	1988
MOTOR BUS	0.80	0.83	0.89	0.88	0.92
RAPID RAIL	1.10	1.15	1.23	1.19	1.22
STREETCAR	2.04	2.32	2.54	2.61	2.44
TROLLEY BUS	1.02	1.02	1.34	1.34	1.39
DEMAND RESPONSE	0.36	0.38	0.36	0.34	0.36
COMMUTER RAIL	0.65	0.86	1.53	2.19	2.13

(Dollars)

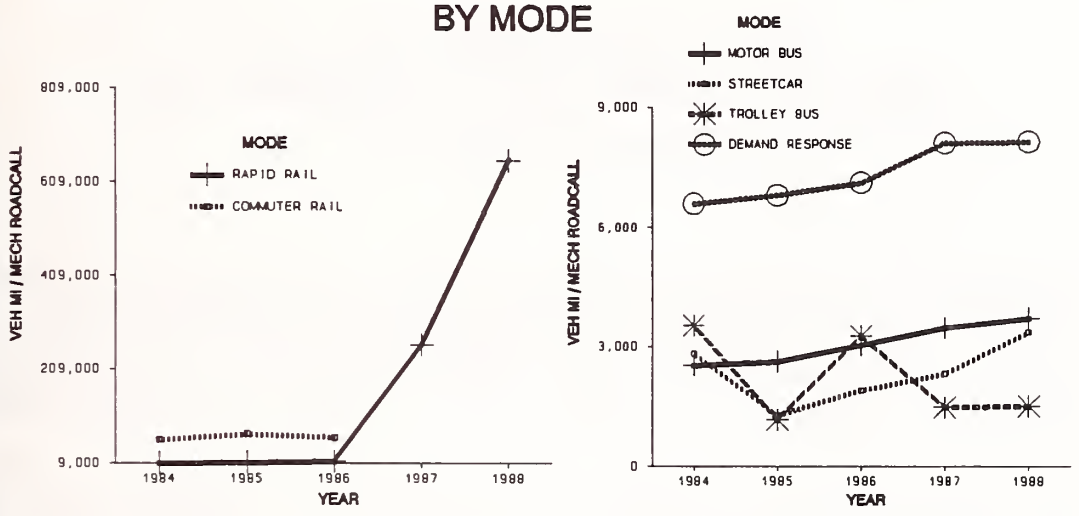
TRANSIT INDUSTRY VEHICLE MAINTENANCE EFFICIENCY TRENDS
VEHICLE MILES PER MECHANICAL ROADCALL
BY MODE
SECTION 15 1984-1988

- Vehicle miles per mechanical roadcall is a ratio used in the transit industry to monitor vehicle maintenance performance. Although Section 15 provides a definition for roadcalls, many transit systems continue to count roadcalls using definitions different from those specified by UMTA. Therefore, comparisons between systems and between modes are not reliable indicators of the frequency of vehicle breakdowns. Comparisons over time for any system, shown in Section 3 of the Annual Report, would indicate trends for that system.

- Commuter rail in 1988 and 1987 was the only mode that reported no mechanical roadcalls.

VEHICLE MILES PER MECHANICAL ROADCALL

BY MODE



NOTE: ORIGIN STARTS AT 9,000

VEH MI/MECH ROADCALL

TRANSIT INDUSTRY VEHICLE MAINTENANCE EFFICIENCY TRENDS
VEHICLE MILES PER MECHANICAL ROADCALL
BY MODE
SECTION 15 1984-1988

	1984	1985	1986	1987	1988
MOTOR BUS	2,533.8	2,638.4	3,048.8	3,479.9	3,722.4
RAPID RAIL	9,580.6	11,095.0	13,007.5	261,313.6	654,164.5
STREETCAR	2,820.1	1,280.2	1,914.7	2,335.7	3,370.2
TROLLEY BUS	3,531.6	1,171.7	3,280.6	1,490.9	1,515.5
DEMAND RESPONSE	6,602.6	6,816.1	7,133.9	8,130.4*	8,163.4*
COMMUTER RAIL	58,925.3	71,492.5	63,535.9		

*NOTE: Table 2's show zero Roadcalls for Commuter Rail

TRANSIT INDUSTRY VEHICLE SPARE RATIO
TOTAL ACTIVE VEHICLES TO VEHICLES IN MAXIMUM SERVICE
BY MODE
SECTION 15 1984-1988

- The ratio of the total active fleet vehicles and the vehicles in maximum scheduled service measures the relative size of a transit system's spare fleet. Four of the modes (motor bus, rapid rail, trolley bus, and commuter rail) reported a spare fleet of between 27 to 41 percent. Streetcar reported a spare fleet of 61 percent, and demand response reported a spare fleet of about 143 percent in 1988.

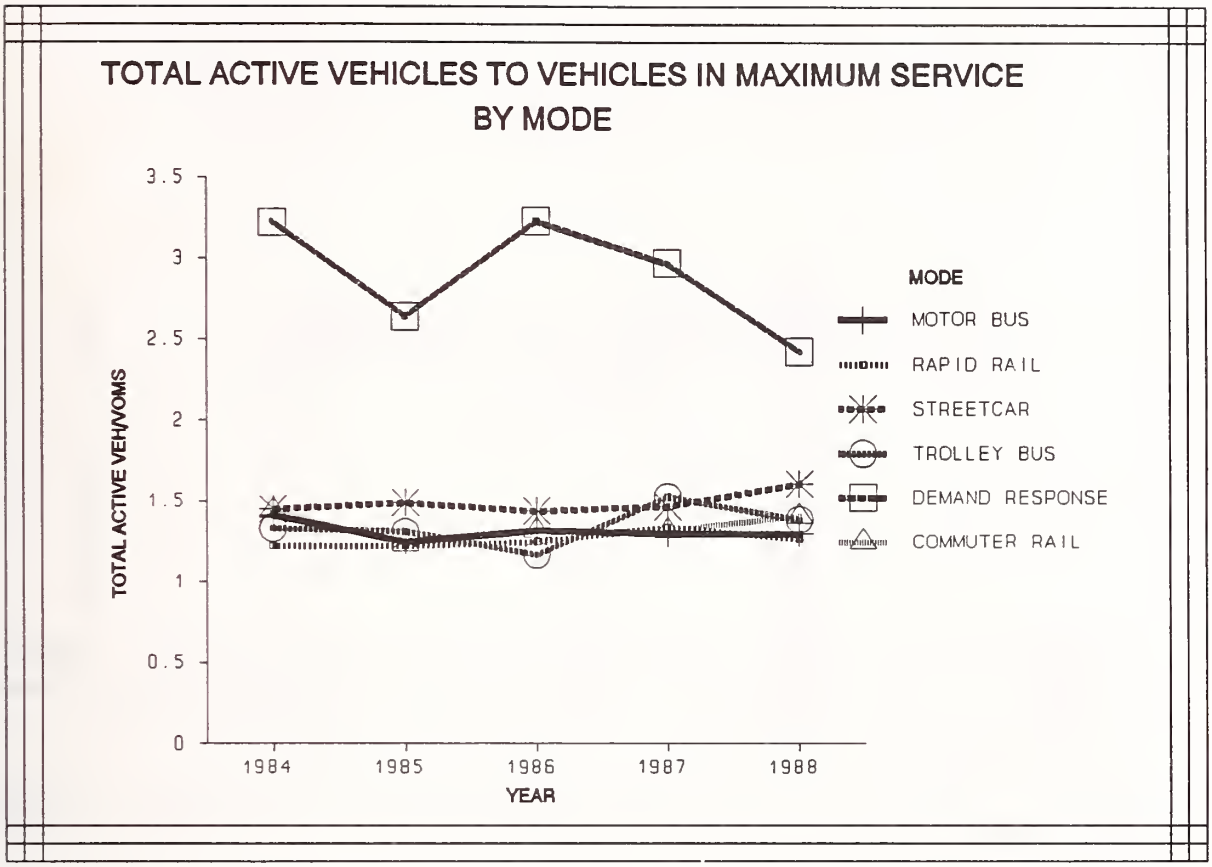
- With the exception of commuter rail and streetcar systems, there was a decrease in the size of the spare fleet percent in 1988 over 1987. Motor bus remained the same.

  -- Rapid Rail - 5.3 percent.
  -- Trolley Bus - 9.2 percent.
  -- Demand Response - 19.2 percent.

- Commuter rail and streetcar spare fleet increased by 7 percent and 9 percent respectively in 1988 over 1987.

- Between 1984 and 1988 the average annual rate of change in the spare fleet was as follows:

  -- Demand Response - 6.8 percent.
  -- Motor Bus - 2.0 percent.
  -- Commuter Rail - 0.6 percent.
  -- Rapid Rail + 1.0 percent.
  -- Trolley Bus + 1.2 percent.
  -- Streetcar + 2.7 percent.



TRANSIT INDUSTRY VEHICLE SPARE RATIO
TOTAL ACTIVE VEHICLES TO VEHICLES IN MAXIMUM SERVICE
BY MODE
SECTION 1984-1988

	1984	1985	1986	1987	1988
MOTOR BUS	1.41	1.25	1.32	1.30	1.30
RAPID RAIL	1.22	1.22	1.25	1.34	1.27
STREETCAR	1.45	1.49	1.44	1.47	1.61
TROLLEY BUS	1.33	1.31	1.17	1.53	1.39
DEMAND RESPONSE	3.22	2.64	3.23	2.97	2.43
COMMUTER RAIL	1.44	1.23	1.32	1.32	1.41

TRANSIT INDUSTRY SAFETY PERFORMANCE
VEHICLE MILES AND HOURS PER COLLISION ACCIDENT
BY MODE
SECTION 15 1988

- The performance measure presented on the facing page measures accident frequency (not severity) since it shows the miles and hours between collision accidents. Higher values represent better performance.

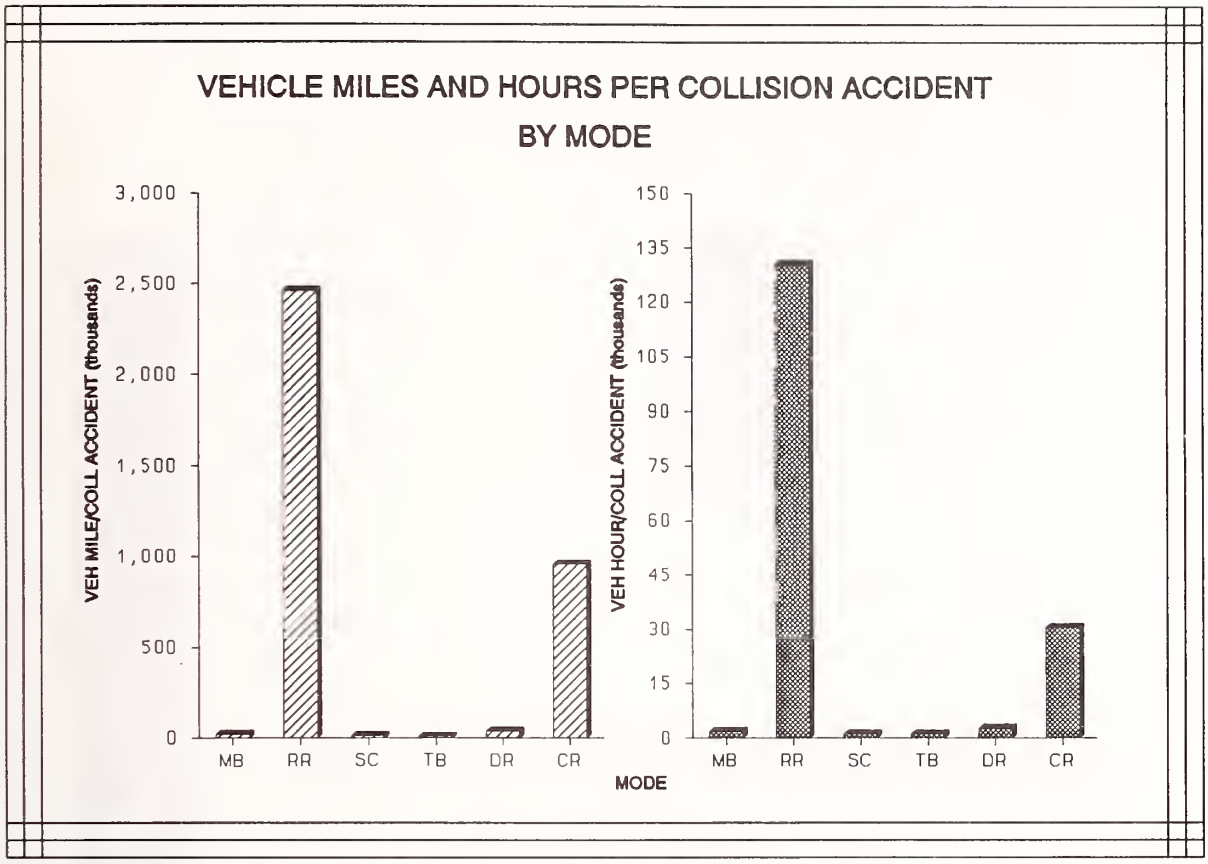
- Safety performance, as measured in vehicle miles and hours per collision accident, varied directly with traffic congestion and exposure. In 1988, for example:

  -- Rapid rail recorded a significantly greater number of vehicle miles and hours between collision accidents than other modes.

  -- Commuter rail ranks second to rapid rail in both miles and hours between collision accident.

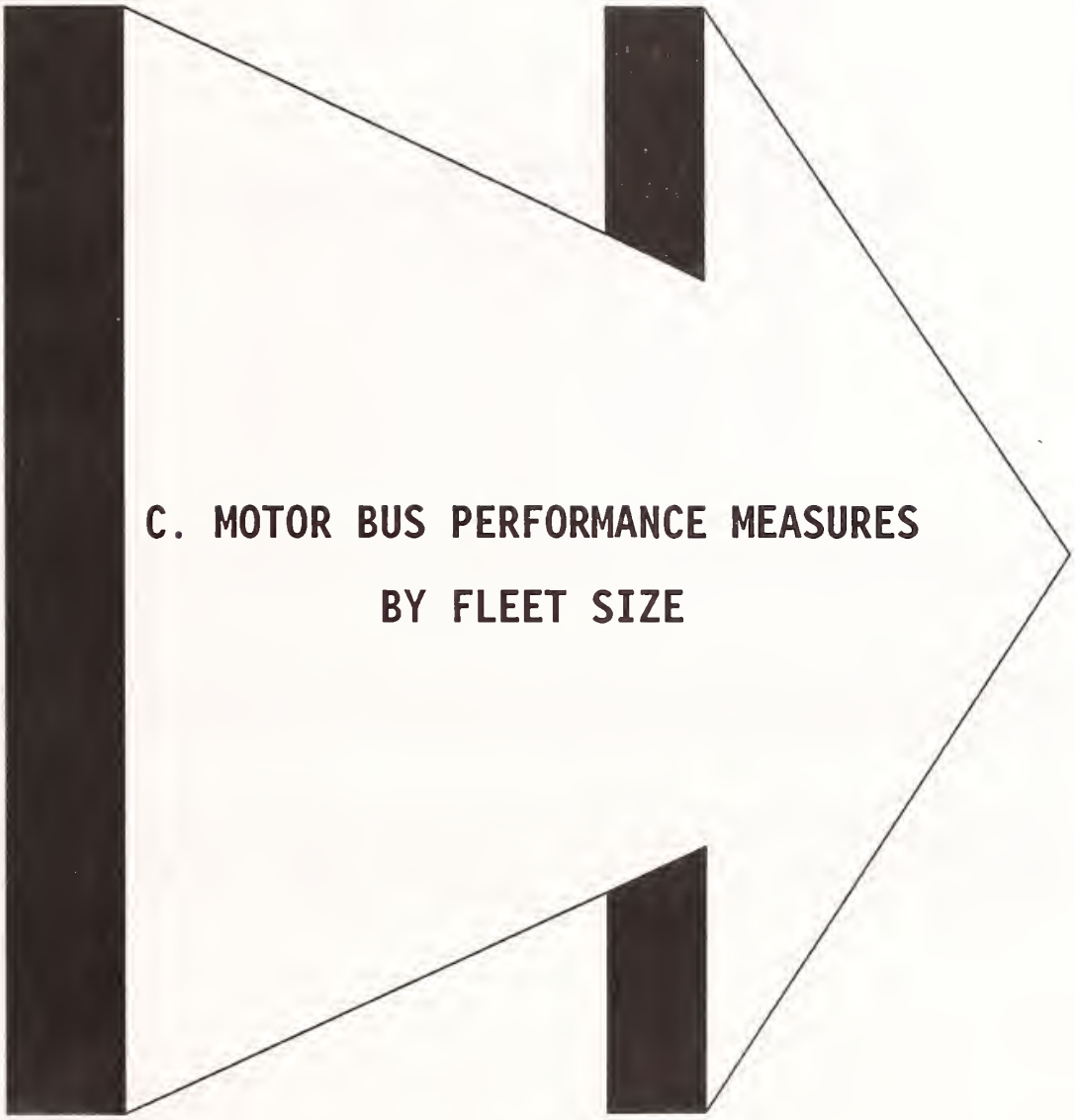
  -- Streetcar and trolley bus systems generated fewer vehicle miles and hours between accident than other modes.

- With the exception of demand response systems and motor bus, every mode decreased the miles and hours between accidents in 1988 over 1987.



TRANSIT INDUSTRY SAFETY PERFORMANCE
ANNUAL VEHICLE MILES AND HOURS
PER COLLISION ACCIDENT BY MODE
BY MODE
SECTION 15 1988

	VEH MILE/ COLL ACCIDENT	VEH HOUR/ COLL ACCIDENT
MOTOR BUS	23,617.3	1,833.9
RAPID RAIL	2,464,019.5	130,513.3
STREETCAR	14,797.4	1,259.1
TROLLEY BUS	10,369.1	1,304.4
DEMAND RESPONSE	39,460.1	2,753.5
COMMUTER RAIL	961,281.1	30,696.3



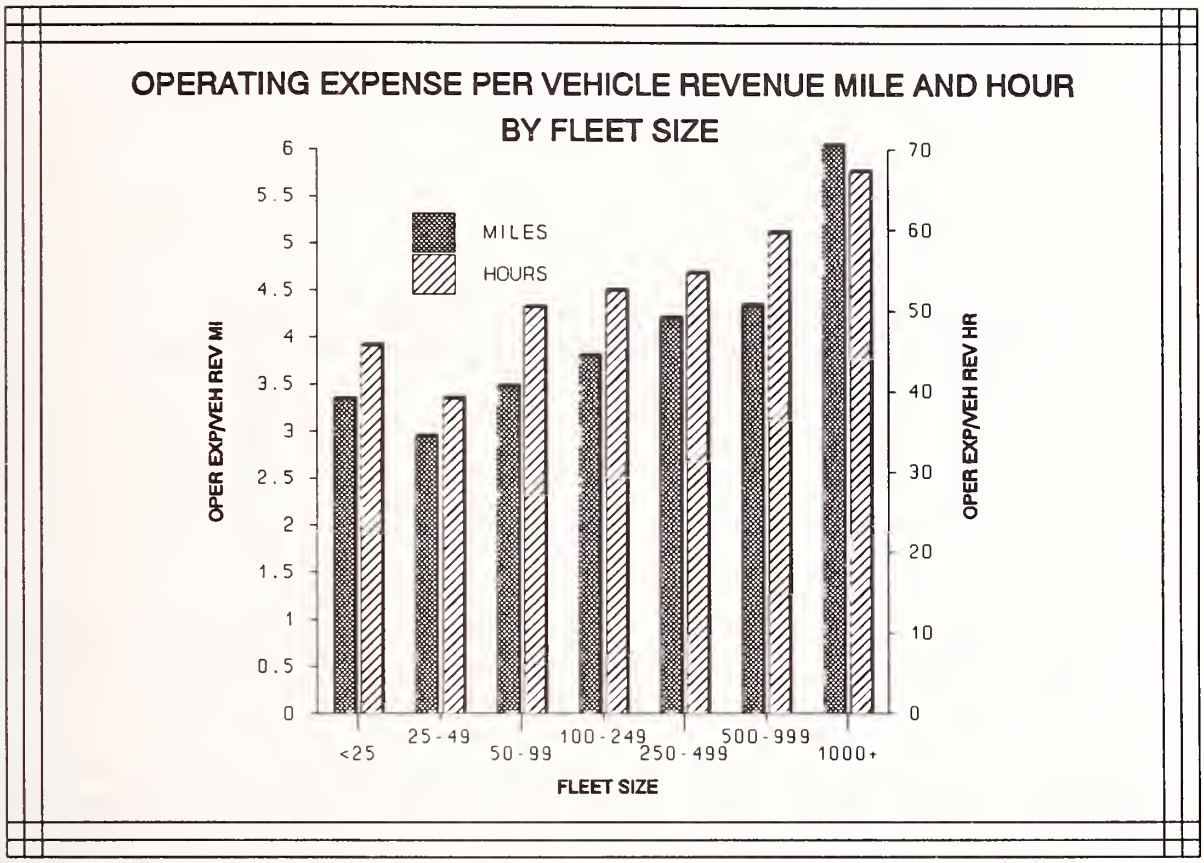
C. MOTOR BUS PERFORMANCE MEASURES BY FLEET SIZE

MOTOR BUS COST EFFICIENCY
OPERATING EXPENSE PER VEHICLE REVENUE MILE AND HOUR
BY FLEET SIZE
SECTION 15 1988

- Motor bus system operating expenses per revenue mile or hour (a resource efficiency indicator) typically increased as fleet size increased.

- In 1988, the group of largest motor bus systems--those systems with the highest service demands and labor requirements--showed average per hour and mile expenses approximately twice as high as the motor bus systems with fleets of 25 to 49 vehicles.

- The motor bus systems operating 50 to 99 vehicles and those operating more than 500 vehicles had increases in operating expense per revenue mile or hour by 6 percent to 10 percent in 1988 over 1987. The other systems had increases in the 1 percent to 3 percent range.



MOTOR BUS COST EFFICIENCY
OPERATING EXPENSE PER VEHICLE REVENUE MILE AND HOUR
BY FLEET SIZE
SECTION 15 - 1988

	<25	25-49	50-99	100-249	250-499	500-999	1,000 AND ABOVE
OPER EXP/VEH REV MILE	3.34	2.94	3.47	3.80	4.20	4.34	6.04
OPER EXP/VEH REV HOUR	45.61	38.98	50.35	52.43	54.59	59.63	67.23

(Dollars)

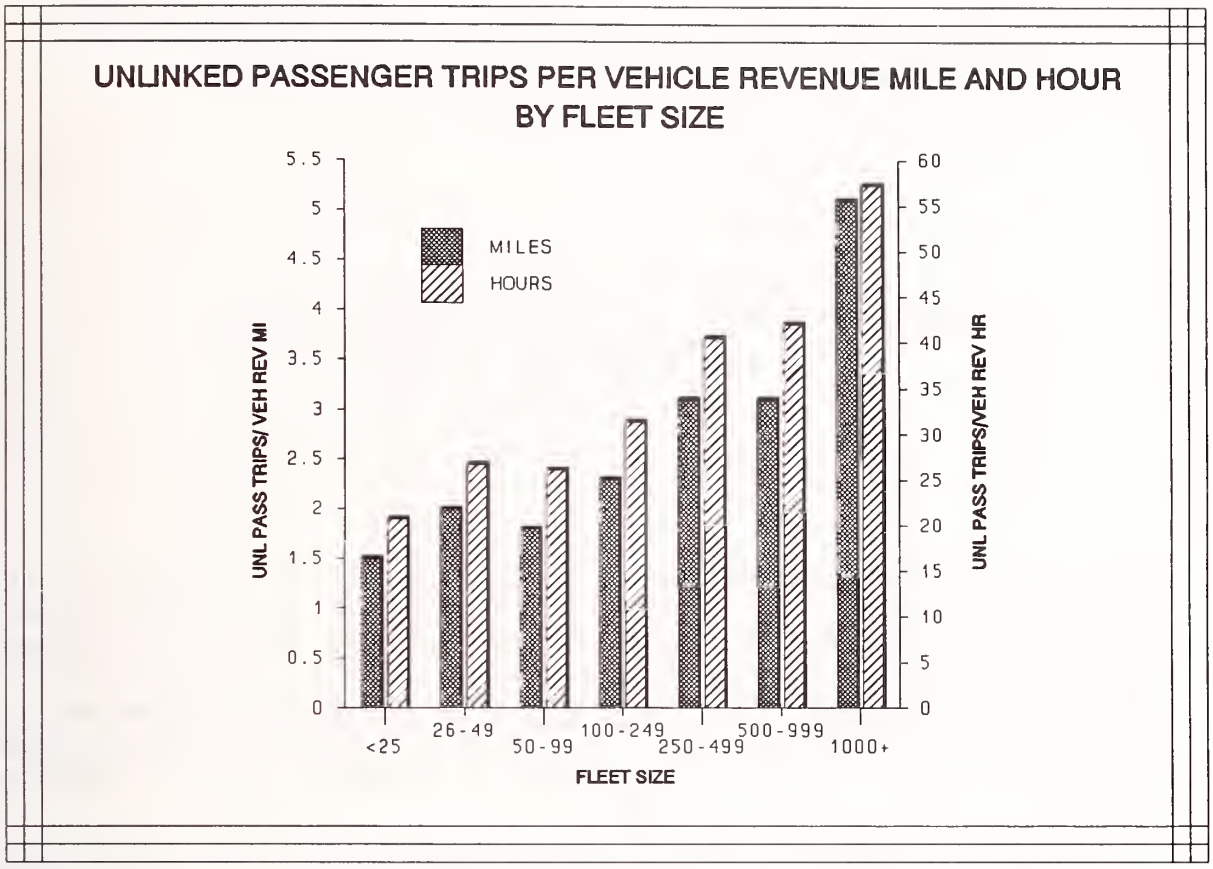
MOTOR BUS SERVICE EFFECTIVENESS
UNLINKED PASSENGER TRIPS PER VEHICLE REVENUE MILE AND HOUR
BY FLEET SIZE
SECTION 15 1988

- The indicators shown on the facing page measure motor bus transit system service effectiveness. The indicators consider service use (i.e. ridership) in relation to service availability.

- Average service effectiveness, as measured in unlinked passenger trips per revenue mile and hour, tended to increase (i.e. improve) with fleet size group. In 1988, passenger trips per vehicle revenue mile for the group of largest motor bus systems was over 3.4 times the average for the group of smallest motor bus systems.

- The average unlinked passenger trips per vehicle revenue hour for the group of largest motor bus systems were nearly three times the average for the group of smallest motor bus systems.

- There was a decline in both trips per mile and trips per hour in the 2 percent to 6 percent range for the largest motor bus systems and those systems operating less than 50 vehicles in 1988 over 1987. The motor bus systems operating between 50 and 1000 vehicles had increases in both trips per mile and trips per hour in the 1 percent to 4 percent range in 1988 over 1987.



MOTOR BUS SERVICE EFFECTIVENESS
UNLINKED PASSENGER TRIPS PER VEHICLE REVENUE MILE AND HOUR
BY FLEET SIZE
SECTION 15 1988

FLEET SIZE -->	<25	26-49	50-99	100-249	250-499	500-999	1,000 AND ABOVE
UNL PASS TRIP/VEH REV MILE	1.5	2.0	1.8	2.3	3.1	3.1	5.1
UNL PASS TRIP/VEH REV HOUR	20.7	26.7	26.1	31.4	40.5	42.0	57.3

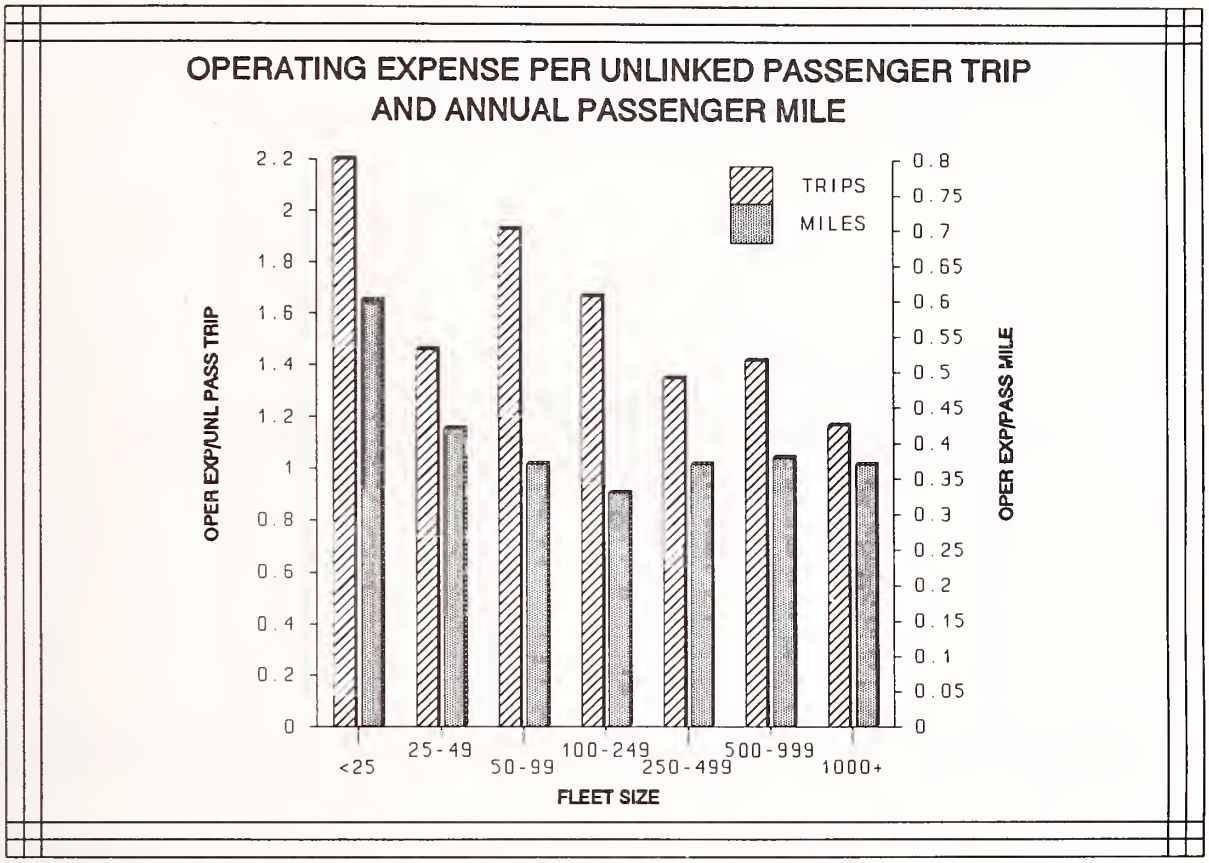
MOTOR BUS COST EFFECTIVENESS
OPERATING EXPENSE PER UNLINKED PASSENGER TRIPS
AND ANNUAL PASSENGER MILES
BY FLEET SIZE
SECTION 15 1988

- Motor bus system operating expenses per passenger trip and passenger mile (both resource effectiveness indicators) tended to diminish (i.e. improve) as fleet size increased. Large systems exhibited significantly lower costs per passenger trip and passenger mile than smaller systems. In 1988, for example, the group of largest motor bus systems showed average per passenger trip expenses 18 percent lower than the next largest system group and nearly 47 percent lower than the smallest motor bus systems group.

- The operating expenses per motor bus passenger trip in 1988 ranged from $1.17 for the largest systems to $2.20 for the smallest systems. The operating expenses per annual passenger mile ranged from $0.33 for the systems operating 100 to 249 vehicles to $0.60 for systems of less than 25 vehicles.

- Motor bus systems operating less than 25 vehicles and those operating 50 to 249 vehicles were the systems which experienced a reduction (6 percent and 14 percent respectively) in expenses per passenger mile in 1988 over 1987. The other systems experienced increases in expenses per passenger mile in the 2 percent to 10 percent range in 1988 over 1987.

- All motor bus systems had increased operating expenses on a per trip basis in 1988 over 1987.

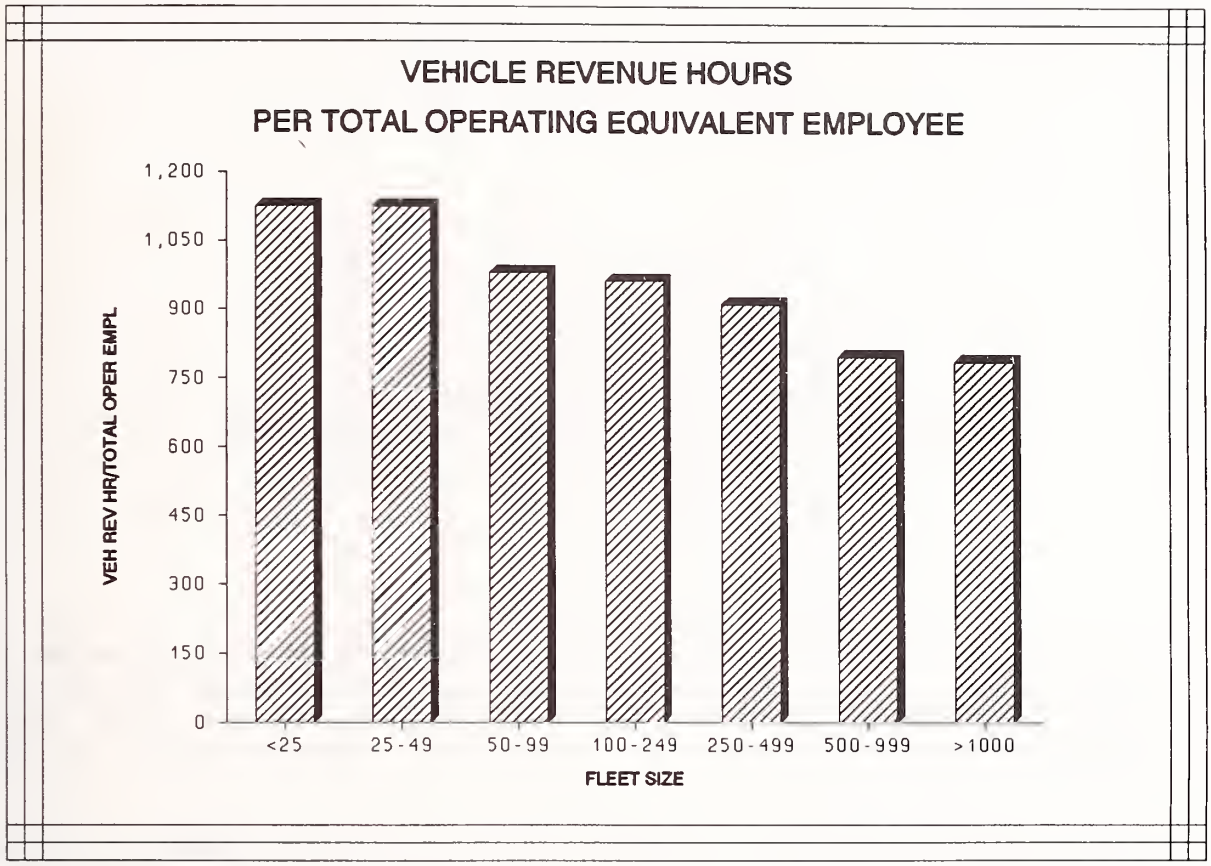


MOTOR BUS COST EFFECTIVENESS
DOLLARS OF OPERATING EXPENSE PER UNLINKED PASSENGER TRIP
AND ANNUAL PASSENGER MILE
BY FLEET SIZE
SECTION 15 1988

FLEET SIZE -->	<25	25-49	50-99	100-249	250-499	500-999	1,000 AND ABOVE
OPER EXP/UNL PASS TRIP	2.20	1.46	1.93	1.67	1.35	1.42	1.17
OPER EXP/ANN PASS MILE	0.60	0.42	0.37	0.33	0.37	0.38	0.37

MOTOR BUS LABOR EFFICIENCY
VEHICLE REVENUE HOURS PER TOTAL OPERATING EQUIVALENT EMPLOYEE
BY FLEET SIZE
SECTION 15 1988

- The measure on the facing page provides information on the number of vehicle revenue hours of service provided per operating employee utilized. Employees that work on capital improvements are not included.
- In general, the ratio of vehicle revenue hours of service per operating employee decreased with larger fleet size groups. Motor bus systems in the three largest system groups typically had 19 to 30 percent fewer vehicle revenue hours of service per employee in 1988 than the smallest transit systems.
- In general, there were only slight increases (1 to 3 percent) in vehicle revenue hours per operating employee in 1988 over 1987. However, motor bus systems operating 50 to 499 vehicles experienced a decrease of vehicle revenue hours per operating employee of about 5 percent.



MOTOR BUS LABOR EFFICIENCY
VEHICLE REVENUE HOURS PER TOTAL OPERATING EQUIVALENT EMPLOYEE
BY MODE
SECTION 15 1988

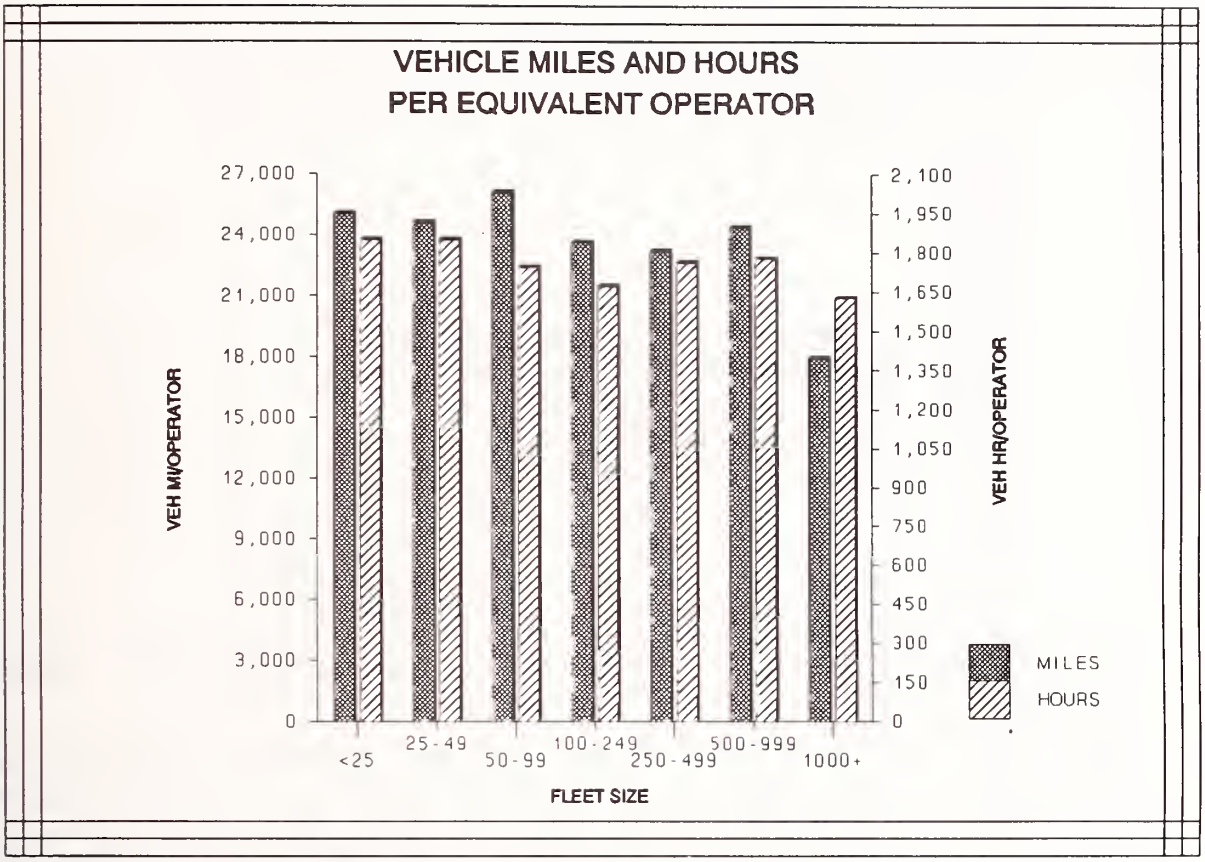
	<25	25-49	50-99	100-249	250-499	500-999	1000 AND OVER
VEH REV HRS/ TOTAL OPER EMPL	1,125.7	1,123.5	979.8	961.9	910.9	797.1	787.4

MOTOR BUS LABOR EFFICIENCY
VEHICLE MILES AND HOURS PER EQUIVALENT OPERATOR
BY FLEET SIZE
SECTION 15 1988

- The measures on the facing page provide information on the utilization of vehicle operators. They measure the average number of miles and hours of motor bus operation per operator, including deadhead travel time. Many factors influence this measure, in particular transit system service schedule, labor agreements, and management practices.

- Revenue vehicle operators of smaller motor bus systems tended to drive more annual vehicle miles and hours than operators of larger motor bus systems. For example, operators of motor bus systems with fleet sizes of less than 25 vehicles drove 39.4 percent more annual miles and 13.5 percent more hours in 1988 than did operators of the largest motor bus systems.

- All systems had increases of vehicle miles and hours per operator in 1988 over 1987 of about 14 percent on a system wide basis. Systems operating 500 to 999 vehicles had the greatest increases (25 percent) for both vehicle miles and hours per operator.

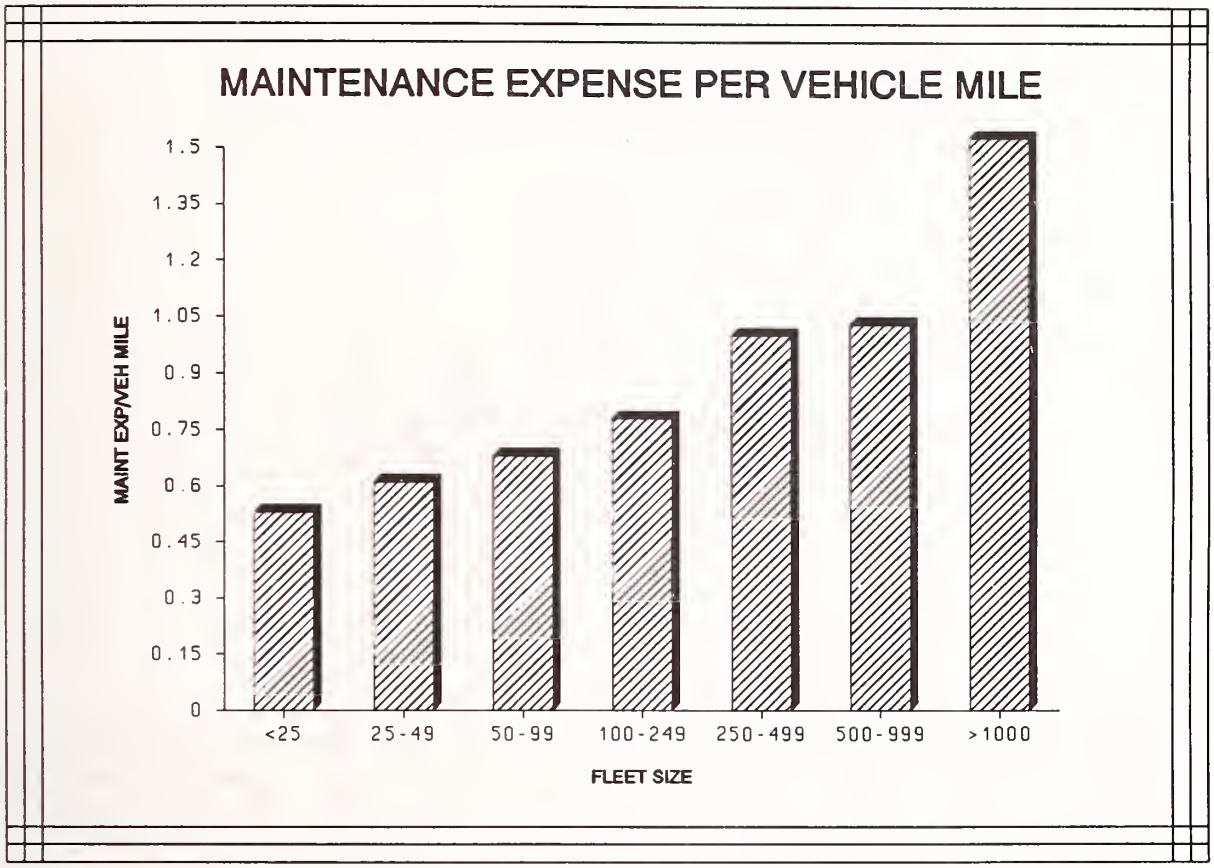


MOTOR BUS LABOR EFFICIENCY
VEHICLE MILES AND HOURS PER EQUIVALENT OPERATOR
BY MODE
SECTION 15 - 1988

	<25	25-49	50-99	100-249	250-499	500-999	1,000 AND OVER
VEHICLE MILES/OPERATOR	25,031.5	24,587.5	26,103.6	23,622.6	23,208.0	24,368.9	17,959.2
VEHICLE HOURS/OPERATOR	1,847.3	1,847.8	1,741.9	1,670.6	1,760.8	1,776.6	1,627.2

MOTOR BUS MAINTENANCE EFFICIENCY
MAINTENANCE EXPENSE PER VEHICLE MILE
BY FLEET SIZE
SECTION 15 1988

- The performance indicator on the facing page measures transit system resource efficiency.
- Among motor bus fleet size groups in 1988, maintenance expenses per vehicle mile indicated that larger motor bus systems had generally higher maintenance costs in relation to service outputs than smaller systems. However, this could be misleading because the data available does not capture the expenses for those systems which contract for the maintenance of their vehicles.
- Motor bus systems operating the largest number of vehicles had maintenance expenses per vehicle mile about 2.9 times motor bus systems operating with less than 25 vehicles.
- Most systems had increases in maintenance costs per vehicle mile in 1988 over 1987. However, those systems operating less than 25 vehicles and those operating between 250 to 499 vehicles experienced decreases of about 3 percent. The largest systems had increases of maintenance costs per vehicle mile of nearly 7 percent.



MOTOR BUS MAINTENANCE EFFICIENCY
MAINTENANCE EXPENSE PER VEHICLE MILE
BY FLEET SIZE
SECTION 15 1988

FLEET SIZE -->	<25	25-49	50-99	100-249	250-499	500-999	1000 AND OVER
MAINT EXP/VEH MILES	0.53	0.61	0.68	0.78	1.00	1.03	1.53

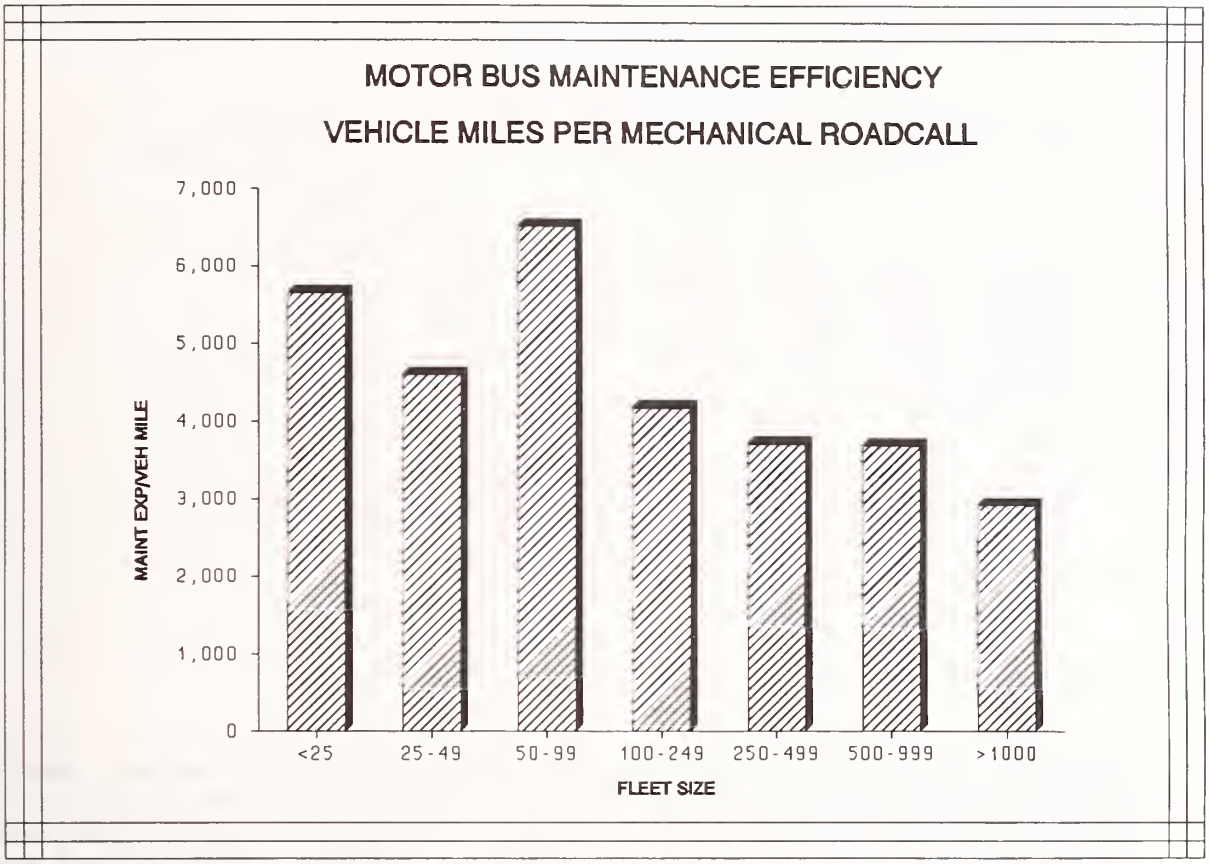
(Dollars)

MOTOR BUS MAINTENANCE EFFICIENCY
VEHICLE MILES PER MECHANICAL ROADCALL
BY FLEET SIZE
SECTION 15 1988

- The indicator on the facing page is generally used as a measure of maintenance effectiveness. The values of the indicator are influenced by many factors: fleet age, maintenance expenditures, mechanic skills, terrain, and climate. Although Section 15 provides a definition for roadcalls, to insure consistent reporting, there have been some problems attaining consistency. Many transit systems continue to count roadcalls using definitions different from those specified by UMTA.

- Motor bus transit systems operating larger numbers of vehicles generally had fewer vehicle miles between roadcalls than systems operating smaller number of vehicles.

- Every system group, except those systems operating with less than 25 vehicles and those operating between 100 to 249 vehicles, increased the number of miles between roadcalls in 1988 over 1987.



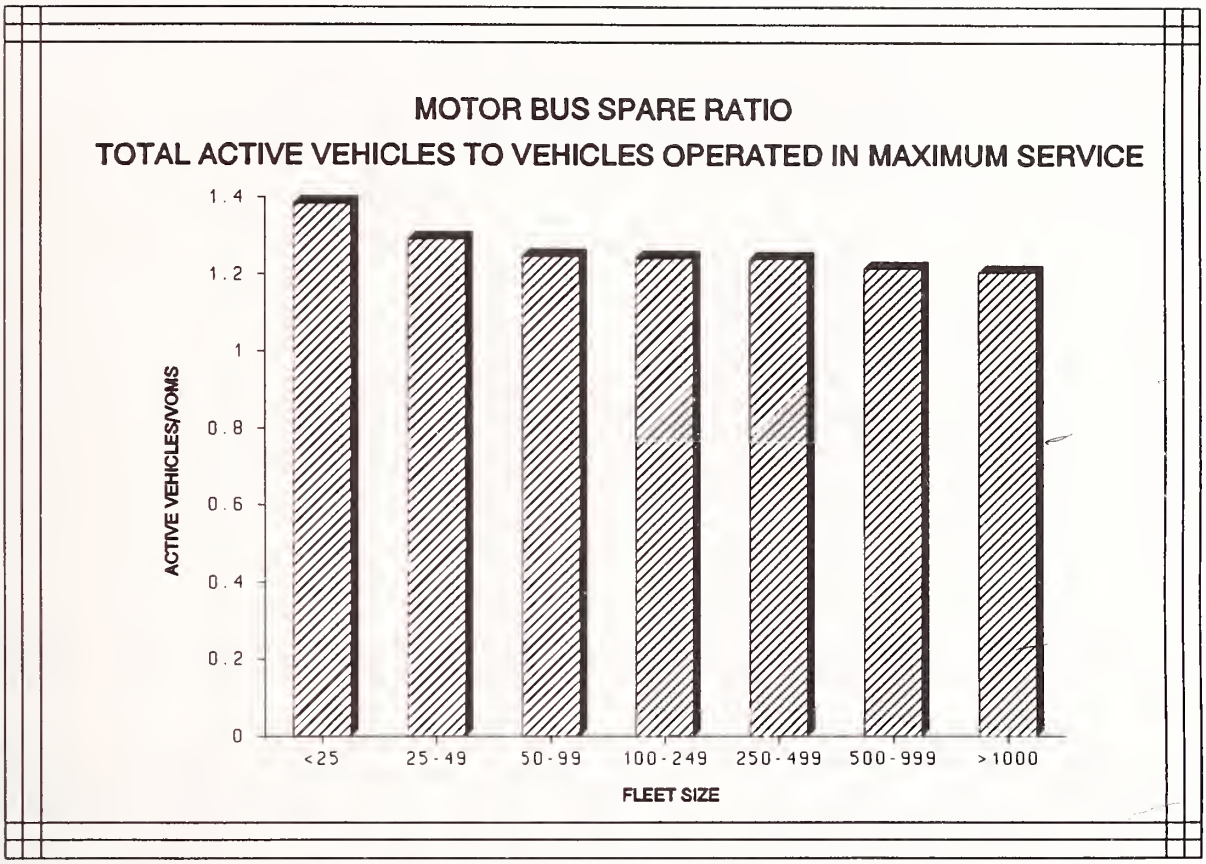
MOTOR BUS MAINTENANCE EFFICIENCY
VEHICLE MILES PER MECHANICAL ROADCALL
BY FLEET SIZE
SECTION 15 1988

FLEET SIZE -->	<25	25-49	50-99	100-249	250-499	500-999	1,000 AND OVER
VEH MILES/ MECH ROADCALL	5,650.5	4,603.3	6,514.2	4,176.2	3,713.3	3,692.0	2,923.5

MOTOR BUS SPARE RATIO
TOTAL ACTIVE VEHICLES TO VEHICLES OPERATED IN MAXIMUM SERVICE
BY FLEET SIZE
SECTION 15 1988

- The ratio of vehicles in the total active fleet to the maximum service indicated relatively little variation in spare ratios among fleet size groups with between 25 and 999 vehicles. Each of these five groups have spare ratios of between 22 and 31 percent. However, there was not much change in most systems in 1988 over 1987.

- Motor bus systems with over 1,000 vehicles had the smallest average spare ratio (21 percent). Motor bus systems with less than 25 vehicles had the largest average spare ratio (38 percent). However, there was not much change in most systems in 1988 over 1987.

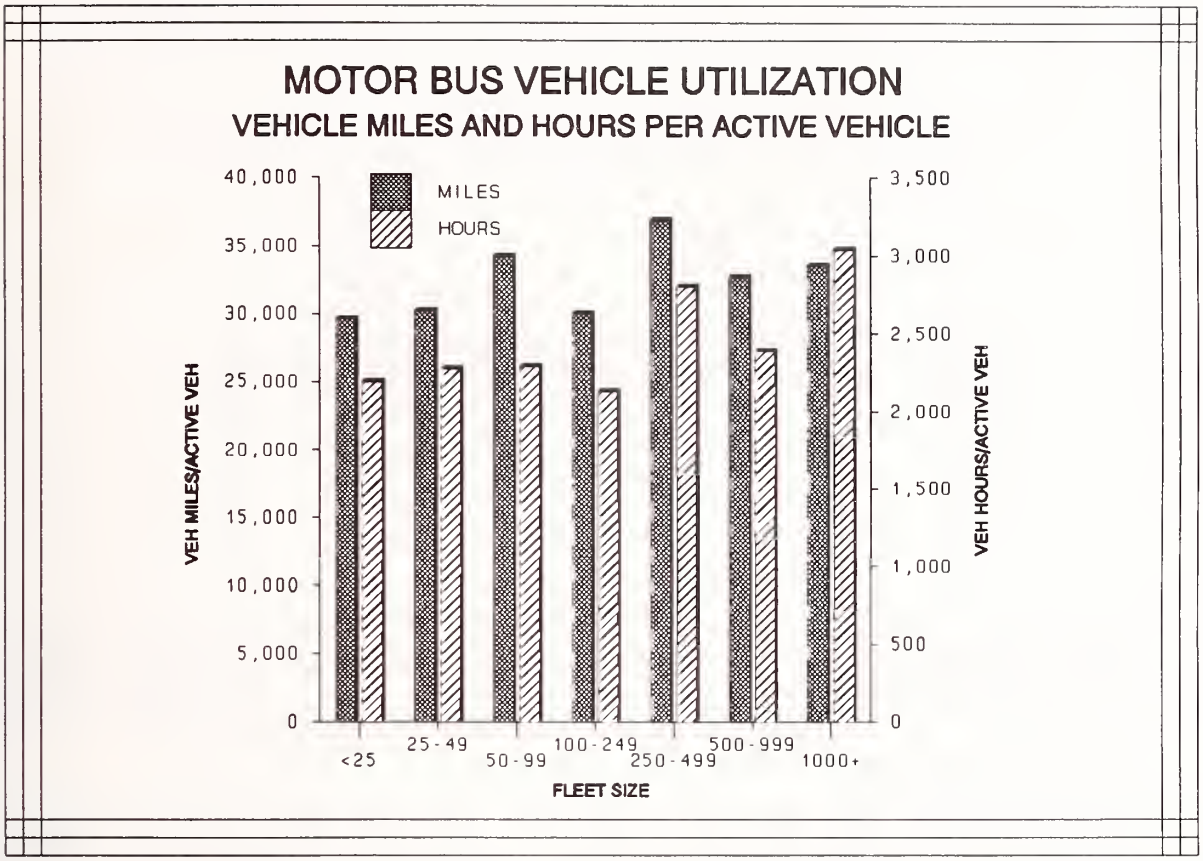


MOTOR BUS SPARE RATIO
TOTAL ACTIVE VEHICLES TO VEHICLES OPERATED IN MAXIMUM SERVICE
BY FLEET SIZE
SECTION 15 1988

FLEET SIZE -->	<25	25-49	50-99	100-249	250-499	500-999	1000 AND OVER
ACTIVE VEH/VOMS	1.38	1.29	1.25	1.24	1.24	1.22	1.21

MOTOR BUS VEHICLE UTILIZATION
VEHICLE MILES AND HOURS PER ACTIVE VEHICLE
BY FLEET SIZE
SECTION 15 1988

- The ratios on the facing page measure annual vehicle utilization in terms of both the hours and miles of service provided.
- No clear pattern of variation existed among motor bus fleet size average statistics for miles or hours of service per active vehicle. On average motor bus systems seem to have operated their vehicles between 29,000 and 37,000 miles per year. Average measures for vehicle hours per active vehicle suggest slower operating speeds by the largest systems.
- The largest systems experienced slight changes in vehicle miles and vehicle hours per active vehicle in 1988 over 1987.
- Systems operating between 100 to 249 vehicles experienced a reduction in vehicle miles and vehicles hours per active vehicle of 8 percent in 1988 over 1987. However, systems operating with less than 25 vehicles, 50 to 99 vehicles, and 250 to 499 vehicles had increases of 8 percent in vehicle miles and vehicle hours per active vehicle in 1988 over 1987.



MOTOR BUS VEHICLE UTILIZATION
VEHICLE MILES AND HOURS PER ACTIVE VEHICLE
BY FLEET SIZE
SECTION 15 1988

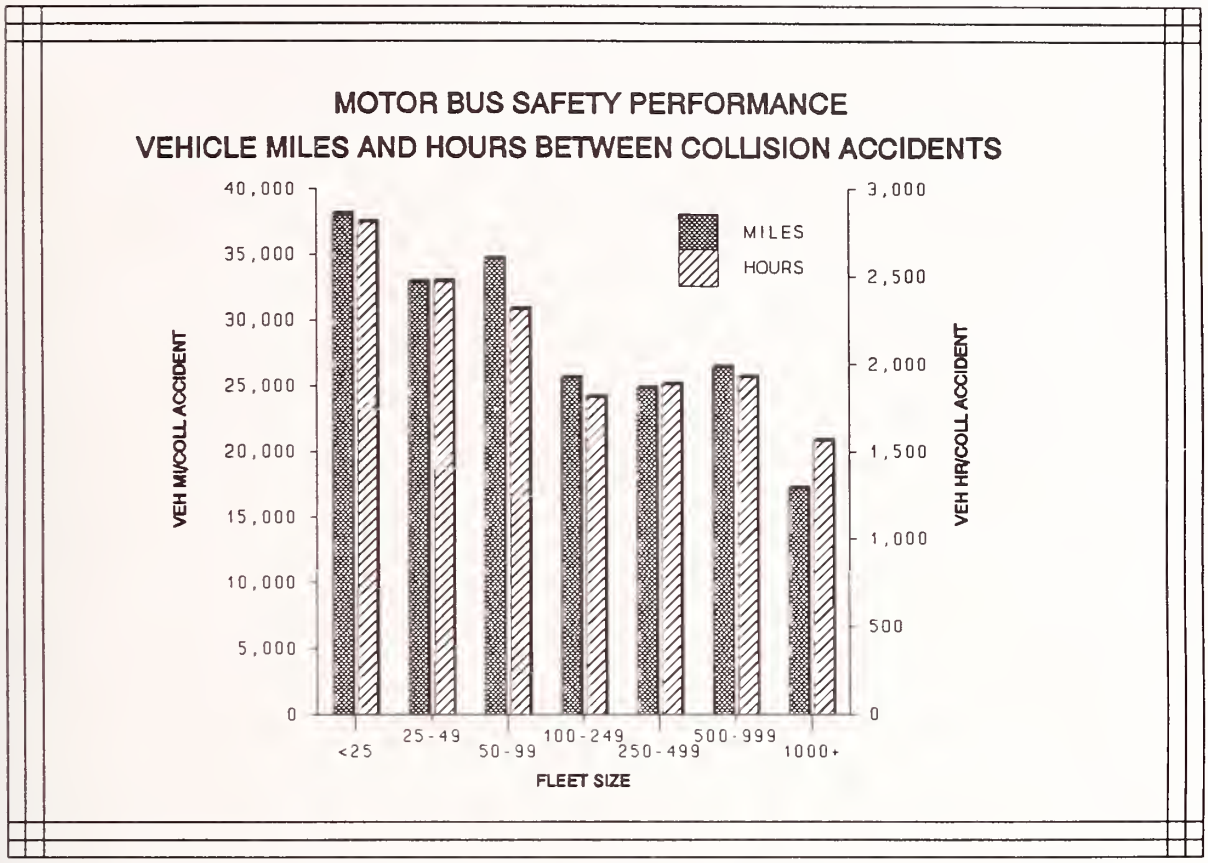
	<25	25-49	50-99	100-249	250-499	500-999	1000 AND OVER
VEH MILES/ACTIVE VEH	29,650.0	30,224.3	34,279.7	30,048.2	36,937.9	32,759.5	33,594.0
VEH HOURS/ACTIVE VEH	2,188.1	2,271.4	2,287.5	2,125.0	2,802.5	2,388.2	3,043.8

MOTOR BUS SAFETY PERFORMANCE
VEHICLE MILES AND HOURS BETWEEN COLLISION ACCIDENTS
BY FLEET SIZE
SECTION 15 1988

- The measure shown on the facing page is generally used to evaluate transit system safety performance, since it provides information on the vehicle miles and hours between collision accidents (i.e. collision accident frequency). This measure does not provide information on the severity, costs or likelihood of collision accidents.

- Average vehicle hours and miles per collision accident tend to decrease as motor bus fleet size group increases, suggesting a correlation between traffic exposure and safety performance. Motor bus services in the largest system groups typically operate in more congested service areas and thus are likely to have a higher incidence of accidents in relation to service supplied.

- Most motor bus groupings increased vehicle miles and hours between collision accidents in 1988 over 1987. However, systems operating 250-499 vehicles had decreases in vehicle miles and vehicle hours between collision accidents by 9 percent. Also, systems operating with less than 25 vehicles had decreases in vehicle hours and vehicle miles per collision accident by 2 percent.



MOTOR BUS SAFETY PERFORMANCE
VEHICLE MILES AND HOURS BETWEEN COLLISION ACCIDENTS
BY FLEET SIZE
SECTION 15 1988

FLEET SIZE -->	<25	25-49	50-99	100-249	250-499	500-999	1,000 AND OVER
VEH MI/COLL ACDT	38,077.2	32,895.5	34,679.9	25,633.1	24,811.1	26,433.8	17,240.4
VEH HR/COLL ACDT	2,810.1	2,472.1	2,314.2	1,812.7	1,882.5	1,927.1	1,562.1

* U.S. G.P.O.:1991-523-699:40326