FY 1986 TRIENNIAL PERFORMANCE AUDIT OF
SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT
PHASE I FINAL REPORT
APRIL 10, 1986

22399527

1800 Harrison Street
Suite 1500
Oakland, CA 94612-3432

Telephone 415 465 1000

Price Waterhouse

April 10, 1986

Ms. Sharon Neely
Manager, Transit Programs
Los Angeles County Transportation
Commission
403 West Eighth Street, Suite 500
Los Angeles, CA 90014

Dear Ms. Neely:

Enclosed herewith is the FY86 Triennial Performance Audit Phase I Final Report for the Southern California Rapid Transit District (SCRTD). The contents of the report reflect the work of Price Waterhouse and our subcontractor, Mundle & Associates, Inc. The document incorporates comments offered by LACTC and the operator relative to our earlier draft report.

The performance audit process has been constructive in our opinion, and we appreciate the cooperation from both SCRTD staff and LACTC. We believe that the report is complete and will prove useful to all concerned parties. It has been a pleasure to be of service in the review of transit performance in Los Angeles County.

Sincerely,

Fred U. Pshyk

Fred U. Pshyk

DWC/aer

Enclosure

cc: Ms. Priscilla F. Adler
Southern California Rapid Transit District

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

FY 1986 TRIENNIAL PERFORMANCE AUDIT

OF

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

PHASE I FINAL REPORT

APRIL 10, 1986

TABLE OF CONTENTS

IX. RECOMMENDATIONS

LIST OF EXHIBITS

EXECUTIVE SUMMARY

This Phase I Final Report documents the findings, conclusions and recommendations of the second TDA-mandated triennial performance audit of the Sourthern California Rapid Transit District (SCRTD) and covers the period FY83-FY85. The Los Angeles County Transportation Commission (LACTC) is responsible for conducting performance audits of all Los Angeles County transit operators receiving TDA funds. The objectives of this audit are linked to LACTC's ultimate goal of maintaining at least current service levels by improving the cost-effectiveness and delivery of transit service. Specifically, the FY86 performance audit objectives are to provide:

- a useful internal management tool for each operator
- specific implementation procedures for use by the operator
- each property is Board of Directors with a tool for evaluating the transit operations from a balanced perspective

In addition, LACTC should be able to use the performance audit results to satisfy state requirements, verify annually that the operators are making satisfactory progress in implementing the recommendations and improving effectiveness and efficiency, and verify that operator productivity is improving.

To meet these objectives, the performance audit includes a review of SCRTD's progress in implementing prior audit recommendations, a review of TPM/TDA data, functional review of performance, and prescriptive recommendations for improving service efficiency, effectiveness and economy. A brief summary of the performance audit results are provided below.

Overview of Operator

The SCRTD operates 184 regularly scheduled lines in Los Angeles and its surrounding counties. Fully twenty-six of these lines operate 24 hours per day, seven days per week. The SCRTD operates four service types: local, express, contract and special. In 1985, SCRTD operated an active fleet of more than 2,800 buses -- making it the largest bus-only operator in the United States.

Perhaps most significant among recent SCRTD accomplishments have been the productivity and efficiency improvements. The District has been able to respond to unprecedented increases in patronage through provision of higher service levels at a lower cost per passenger than was achieved in FY 1982-83, although cost per mile and hour are higher. Among the factors contributing to this achievement are:

- Route restructuring, the final phases which were implemented in 1983, accomplished more efficient deployment of buses and provided easier service identification through line renumbering.

- Schedule refinements, which included shortlining, interlining and increased limited service, allowed the District to meet the higher ridership demand stemming from the Proposition A fare reduction while minimizing the need for additional buses.

- Management improvements, including some management reorganization which was conducted to improve coordination and control, and automated information systems which were implemented to support management and control. the sophisticated information systems are embodied in TRANSMIS I and TRANSMIS II, which include the Payroll and Accounting System, Vehicle Maintenance System, Materials Management System, Planning and Scheduling System and a Human Resources Management Information System.

In addition to meeting regular service needs, the District met the extraordinary demands imposed by the Olympic Games held in Los Angeles in August of 1984. In order to meet the needs of residents and visitors attending the Games, SCRTD operated a system of local, express and park/ride buses serving the Olympic venues which was distinct from regular District services.

Progress on Prior Audit Recommendations

In FY83 performance audit of SCRTD resulted in nine specific recommendations relating to goals and objectives, general administration, transportation and maintenance. As a result of a prior recommendation, SCRTD redefined a system of department level goals and objectives which are included in the SRTP and

budget processes. The development of TRANSMIS I and II address the need for an integrated management information and performance monitoring systems as recommended in the FY83 audit. Administrative staffing, an area of concern in the prior audit, has been reviewed and internally justified by SCRTD.

The FY83 audit specified two recommendations focusing on improved manpower planning and reduced operator absenteeism. The District's positive actions in improved manpower planning have resulted in net cost savings of about $4.3 million annually through greater use of part-time drivers and reduction in the operator ratio. Over the FY86 audit period there has been no improvement in operator absenteeism, which is now estimated to cost about $16.3 million annually as compared to $12.5 million in FY83. The SCRTD is currently implementing a variety of actions to reduce the cost of this element.

The FY83 audit produced five Maintenance recommendations, all of which have been fully implemented or are in progress. As recommended, labor management improvements have been implemented with a cost savings of $1.4 million in overtime premiums and a significant reduction in industrial accidents. Maintenance absenteeism, however, remains unchanged from the FY83 level. SCRTD has implemented a materials management reorgnization which has improved effectiveness and control. Progress has been made in preparing maintenance task job times and standards, and some minor progress has been made in reducing the District's vehicle spare ratio. Perhaps the most significant accomplishment in Maintenance has been the successful implementation of the major drivetrain overhaul program.

Overall the District has been responsive to all prior audit recommendations, and has fully implemented or is making progress on implementation of each of the nine suggested improvements. The results have enhanced both effectiveness and efficiency, with an estimated annual net savings of $6.6 million.

TDA/TPM Indicator Review

SCRTD has initiated improvements to its data collection procedures over the FY86 audit period, hence improving compliance with TDA and TPM data reporting requirements. In FY85, the District began to use actual vehicle miles and hours as opposed to scheduled values, hence complying with the TPM definitions. SCRTD recalculated FY83 and FY84 statistics to better reflect the definition and resubmitted these to LACTC. Improvements in information systems and data reporting have enhanced data compilation and reporting capabilities to the benefit of compliance with TPM and TDA reporting requirements. By and large the District's data collection procedures are consistent with all of the established TDA and TPM statistics, with one exception -- peak vehicles. SCRTD reports annualized average peak vehicles as opposed to the TPM definition which requires peak day vehicles. The District should comply with the TPM requirements.

The TDA and TPM indicators denote improved effectiveness over the FY86 audit period and a decrease in systemwide efficiency. The improvements in effectiveness are the result of unprecedented increases in ridership, accounting for a 27 percent increase in passengers per hour over the audit period. The decline in efficiency is the result of operating cost increases which outpaced both service increases and inflation.

Functional Area Review

The functional area review focused on four primary areas -- goals and objectives, transportation operations, maintenance and general administration. Notable strengths and improvement opportunities in each area are addressed below.

On the whole the SCRTD has made significant progress in refining its goals and objectives over the audit period. The goals and objectives development process is directly tied to the budgeting process, and provides guidance in resource allocation decisions. Department level goals and objectives have increased in usefulness as a management tool.

The Scheduling and Transportation functions have generally registered favorable performance over the audit period, and have implemented or are implementing several major improvement strategies. In comparison with the FY83 audit, there have been improvements in operator utilization and planning, part-time driver utilization and management information availability (i.e., through TRANSMIS). Also, the rate of cost growth evidenced in this audit is lower, both absolutely and relative to inflation, than that recorded in the previous audit.

The FY86 audit also found several areas of needed improvement. First, operator absenteeism, a significant concern over the prior audit period, has not shown any improvement and now costs over $16.3 million annually. Second, workers compensation costs have nearly doubled over the audit period, and should be reviewed in greater detail. Finally, the Transportation Department has a comprehensive set of goals and objectives, but could strengthen the linkage of objectives between management layers to improve accountability and control.

The Maintenance function has demonstrated substantial improvement over the FY86 audit period. Goals and objectives have improved and targets are adjusted annually to reflect internal and external conditions. The growth in maintenance cost per mile has been controlled at the level of inflation, a significant improvement over the prior audit. Service reliability and vehicle availability have shown improvement, and better maintenance manpower management has resulted in reduced overtime and $1.4 million in annual savings. Futher, technology enhancements have been effectively used by SCRTD management to realize effectiveness and efficiency improvements. Even so, maintenance absenteeism remains unchanged over the audit period and continues to be an area of significant concern at a cost of $4.2 million annually.

The General Administration function accomplished several improvements in overall effectiveness in the FY86 audit period. Service planning successfully met the challenge imposed by the Proposition A fare reduction program by restructuring service to accomodate increased riders with available equipment. Budgeting and planning procedures have improved across the system, and several aggressive revenue enhancement programs were established. Even so, the rapidly increasing administrative labor cost per hour (about 61 percent over the audit period compared to 7 percent inflation) and increasing staff suggests that general administration should be monitored for potential efficiency opportunities.

Performance Audit Recommendations

The audit findings discussed above resulted in eight recommendations for improving SCRTD's performance. Each recommendation is discussed below.

1. SCRTD Should Follow the TPM Definition of Peak Vehicles in Reporting this Statistic to LACTC.

Over the FY86 audit period, SCRTD reported the average annual peak vehicles as opposed to the peak day vehicles required by TPM. SCRTD should adhere to LACTC's definition. SCRTD may consider asking the Commission to change the definition in the future, provided all parties find average annual peak vehicles to be a more useful statistic.

2. SCRTD Should Enhance the Goals and Objectives of the Scheduling and Transportation Departments.

While the department levels goals and objectives are comprehensive, there are opportunities to strengthen the use of objectives as a tool for improving preformance. First, the linkage of objectives between successive layers of management could be strengthened to reflect the common and unique responsibilities of each level. Second, cost control objectives could be established to support budget control.

3. SCRTD Should Take Steps to Reduce Operator Absenteeism and Establish a System of Management Controls and Monitoring.

Operator absenteeism and lost time is estimated to cost about $16.3 million annually. Bringing driver absenteeism down to the level experienced by similiar agencies (i.e., CTA, WMATA, NYCTA) would result in annual cost savings of about $3.8 million. While there has been no improvement in absence levels over the FY86 or

FY83 audit periods, SCRTD has implemented a wide range of absence reduction incentives in the current year. In support of these actions, operator absenteeism is recommended as an area to be included in the Phase II Performance Audit. This work would focus on identifying management controls and cost monitoring techniques.

4. SCRTD Should Continue with Current Maintenance Absenteeism Reduction Plans and Should Develop and Implement a Monitoring Program.

Maintenance absenteeism, an area of concern in the FY83 audit, continued at the same rate throughout the FY86 audit period at a cost of about $4.2 million annually. SCRTD has recently implemented a broad absence reduction incentive program, and could use some supporting improvements. First, absenteeism objectives and targets should be developed by Maintenance division. Second, absences should be evaluated to determine controllable and uncontrollable absence trends to help formulate management actions and programs. Finally, a cost monitoring program should be developed to allow improved management monitoring and control. These tasks should be addressed in Phase II Performance Audit. Potential savings are expected to fall between $500,000 and $1 million per year.

5. SCRTD Should Continue with Its Fare Collection Equipment Enhancement Program and Should Develop a Cost Monitoring Program.

Revenue collection and security at SCRTD is an area with planned improvements expected to significantly impact cost savings. The change from the current mechanical farebox to a high security,

electronic farebox is expected to increase net revenue by between $800,000 and $4.3 million annually. A cost monitoring methodology is recommended for development in Phase II of the audit.

6. SCRTD Should Aggressively Pursue Its Planned Cost Improvement Strategies and Should Develop Cost Estimating and Monitoring Programs.

SCRTD has been proactive in pursuing technology enhancements and procedural changes as a means of improving maintenance efficiency and effectiveness, even though no apparent problem exists. Specific planned improvements include South Park productivity (about $500,000 to $900,000 savings), brake life enhancements (about $250,000 to $900,000 savings) and an automated paint shop (about $500,000 to $700,000 savings). SCRTD should develop a cost monitoring program for each improvement to ensure realization of planned savings.

7. SCRTD Should Evaluate Workers' Compensation Costs to Isolate Areas for Potential Improvements.

As with the transit industry as a whole, rising workers' compensation costs are a matter of significant concern at SCRTD. The District's workers' compensation costs grew 87 percent between FY83 and FY85. Some State mandates regarding coverage and the administrator of SCRTD's program both changed over the period contributing to higher costs. Even so, it is recommended that this area be examined for potential cost improvement opportunities in Phase II, given the significant increase in costs.

8. SCRTD Should Monitor Administrative Staffing and Costs to Capture Potential Efficiencies, Should They Arise.

As noted earlier, total administrative costs have grown at four times the rate of inflation after adjusted for service hours. Administrative staffing has been on the rise as well over the audit period. While there are no clear indications that this represents a problem, it is suggested that SCRTD closely monitor the situation for potential future efficiencies.

I. INTRODUCTION

LACTC is the state-designated Regional Transportation Planning Agency (RTPA) and performs some functions of a Metropolitan Planning Organization (MPO) for the Los Angeles Region, as mandated in California's Transportation Development Act (TDA) of 1971, as amended in 1981. This draft Phase I final report documents the findings, conclusions, and recommendations of the first phase of the FY 1986 Performance Audit of the Southern California Rapid Transit District (SCRTD).

This introductory section briefly describes the audit objectives and Phase I scope, followed by a summary of report organization.

A. OBJECTIVES OF LACTC PERFORMANCE AUDIT PROGRAM

As specified by LACTC, the objectives of this audit are linked to the Commission's ultimate goal of maintaining at least current service levels by improving the cost-effectiveness and delivery of transit service. This dedication to excellence is embodied in the specific performance audit objectives and the Commission's Transit Performance Measurement (TPM) program.

1. FY86 Operator Performance Audits

This Performance Audit constitutes the second triennial audit of SCRTD. The audit covers the three-year period FY 1982-83 through FY 1984-85. As outlined by LACTC, the objectives of the FY 1986 Performance Audit were that:

- First and foremost, the performance audit report should provide a useful internal management tool for each operator.

- The recommendations made in the performance audit should provide specific implementation procedures for use by the operator.

- The Board of Directors of each property should be able to use the performance audit in evaluating the transit operation from a balanced perspective.

- LACTC should be able to use the performance audit results to:

  - Satisfy state requirements: verification of the five TDA performance indicators contained in Section 99246(c) and defined in Section 99247 of the Public Utilities Code.

  - Provide clear direction that enables the Commission to verify annually that the operator is making satisfactory progress in implementing the recommendations and improving effectiveness and efficiency.

  - Verify that operator productivity is improving.

LACTC also requires that in meeting the second and third objectives, the consultant should recommend specific low-cost methodologies that the operator may use to quantify cost savings anticipated and later realized as a result of implementation of the recommendations.

2. LACTC TPM PROGRAM

The Transit Performance Measurement program currently in use in Los Angeles County evolved from the Transit Coordination and Service Program (TCSP) developed by LACTC in FY 1980. The TCSP was developed in response to the California Assembly Bill 103 of

1979, with the primary purpose of developing a mechanism to allow service distribution among operators and/or service classifications to improve the efficiency and effectiveness of transit operators in Los Angeles County. The program was developed in close cooperation with LACTC staff and all transit operators in the County.

In the early 1980's, the TCSP was converted to a Transit Performance Measurement (TPM) program. This came about due to a realization, early on, that TCSP needed to be renamed because its provisions reflect transit performance measurement rather than transit coordination and service activities. Consequently, the name-change appropriately focussed the operator's attention on key indicators and provisions of the program.

While the details of the program are not outlined here, under the program the Commission monitors the performance of all fixed route transit operators receiving TDA, Section 5 and STAF subsidies through seven key performance indicators. Against established performance standards, LACTC evaluates operator performance based on these indicators.

B. SCOPE OF THE FY86 PHASE I PERFORMANCE AUDIT

The scope of SCRTD's Phase I performance audit encompassed the following steps:

1. Prior Audit Review

The initiating point of the audit was to review compliance with and progress toward the prior audit's recommendations, and to identify the related, demonstrable cost savings. Specifically, the following tasks were conducted:

- Review SCRTD's progress in complying with prior audit recommendations

- Identify cost savings resulting from implementation of prior audit recommendations.

2. Verification of Performance Indicators

A primary objective of the performance audit is to comply with TDA and TPM requirements for performance indicator verification. To meet this objective, the following tasks were conducted:

- Review and evaluate all non-financial data collection, compilation and reporting procedures for the eleven statistics included in TDA and TPM programs.

- Calculate and interpret the five systemwide performance indicators.

3. Functional Audit Review

The study included an investigation of SCRTD's performance goals and objectives as they relate to actual performance. The direct product of this review was the identification of strengths and weaknesses of SCRTD's functional areas.

The most important tasks were to determine the extent to which SCRTD has: 1) defined goals which reflect the basic mission of SCRTD (e.g., provide efficient and reliable service); 2) established means by which achievement of the goal can be measured; 3) established a target (i.e., objective or standard) which reflects the level of performance that must be achieved to be successful; 4) related that target to each of the functions (or departments) of the organization; and 5) determined the level of performance required of standard management tasks within that function in order to support the function's overall performance target.

4. Development of Recommendations

Following the analysis conducted in steps two and three, prescriptive recommendations in the areas of data collection and compilation techniques, as well as functional area improvements are formulated. These recommendations are accompanied with specific instructions on implementation, schedules and estimated cost savings.

C. REPORT ORGANIZATION

The remaining ten sections of this report are organized as follows:

- Section II - Background and description of SCRTD, including organization and management, operations and facilities, and recent accomplishments.
- Section III - Prior audit review findings, revisiting the FY 1983 Audit conclusions and recommendations, to assess SCRTD's progress on these recommendations.
- Section IV - TDA/TPM data review, which presents the TDA/TPM indicators, including conclusions and recommendations on data collection procedures.
- Section V - Goals and Objectives review, where functional area audit objectives are outlined.
- Section VI - Scheduling and operations review, which analyzes relevant performance indicator trends.

- Section VII - Maintenance review, which evaluates performance in this functional area.

- Section VIII - General Administration review, where findings and conclusions are detailed for administrative and financial functions.

- Section IX - Phase I performance audit evaluation and recommendations, where potential cost savings including a detailed implementation plan are outlined for each recommendation, and proposed work plans are developed on areas recommended for detailed audit reviews in Phase II.

II. BACKGROUND AND DESCRIPTION OF SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT (SCRTD)

A. HISTORY AND GOVERNANCE

The SCRTD is a public agency created in 1964 by the California State Legislature. The District was given two mandates:

1) Operate and improve the existing bus system

2) Design, construct and operate a rapid transit system to meet the needs of the people of Los Angeles

The district is governed by an eleven-member Board of Directors appointed by local elected officials. Five members are appointed by the Los Angeles County Board of Supervisors, two by the Mayor of the City of Los Angeles and four by a selection Committee representing the other 80 cities in the District.

B. ORGANIZATION AND MANAGEMENT

1. Organization Structure

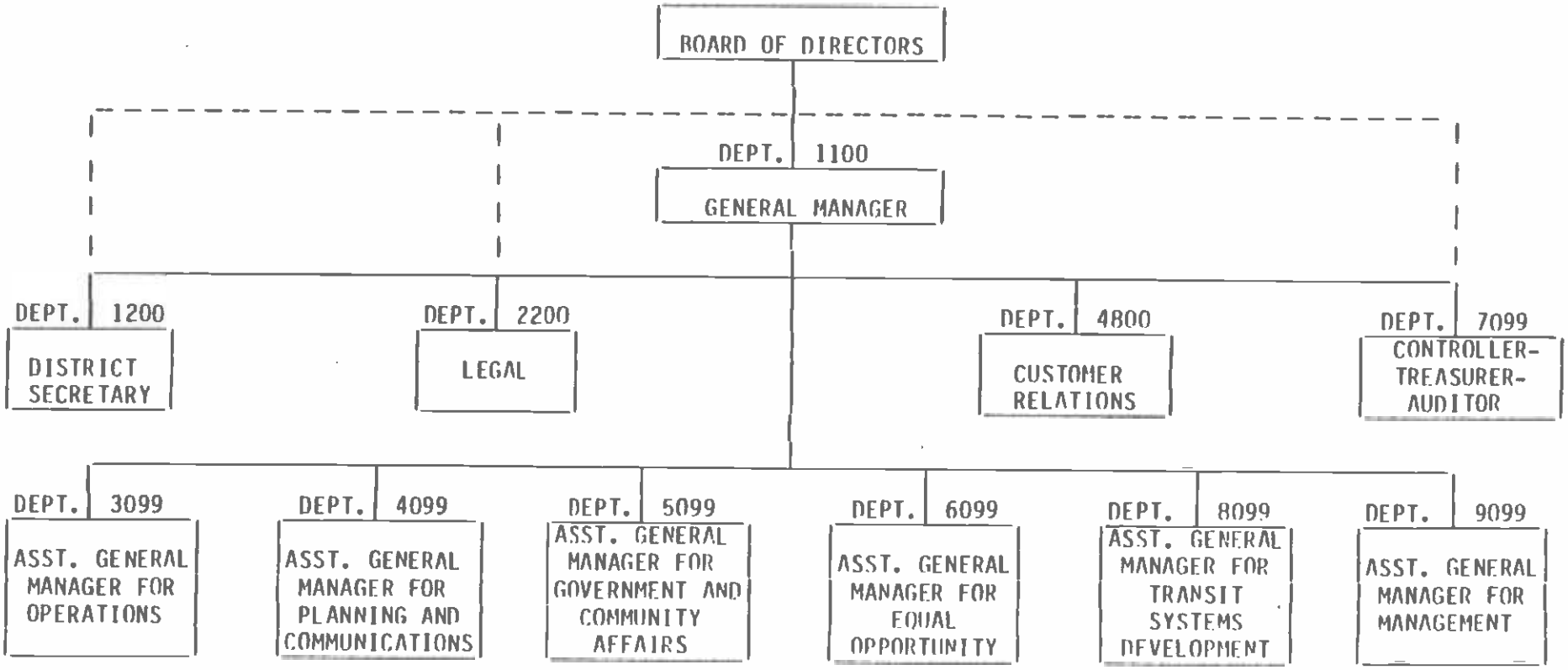
The organizational structure of the SCRTD is illustrated in Exhibit II-1. The General Manager reports directly to the Board of Directors. The General Manager has an executive staff of six Assistant General Managers. These individuals lead the follwoing functions:

- Operations
- Planning and Communications
- Government and Community Affairs
- Equal Opportunity
- Transit Systems Development
- Management

EXHIBIT II-1

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT
FISCAL YEAR 1985

DISTRICT ORGANIZATION CHART



In addition to the six Departments, the General Manager also has a Support Staff of four Departments including:

- o District Secretary
- o Legal
- o Customer Relations
- o Controller-Treasurer-Auditor

On some issues, the District Secretary, Legal and Controller-Treasurer-Auditor Departments may report directly to the Board of Directors.

2. Management Systems and Policies

RTD has a very complex policy and management structure. Its large size makes it virtually impossible to describe the entire program briefly. However, the key components of the Management Systems and Policies consist of the following:

- o Overall direction and policy for the District is set by the Board of Directors. The development of the District's goals and objectives and the annual budgets is done through board meetings, workshops and interaction with the staff.

- o The General Manager and the executive staff implement Board policies and directives. The General Manager and the executive staff analyze the issues at a more detailed level and evaluate the District's options.

- o Day-to-day activitives occur at all levels throughout the District.

The District-wide activities are supported by various Management Information System(s) which exist within the organization. The most visible of these is the TRANSMIS Program, a two-phase effort

to computerize various functions in the District. Significant improvements in several functional areas (e.g., accounting, maintenance, general ledger and inventory control) is helping the District maintain a higher standard of operational readiness.

Progress against stated goals, objectives and performance standards is monitored periodically and is reported in monthly and quarterly reports.

C. DESCRIPTION OF OPERATIONS AND FACILITIES

The District currently operates 184 regularly scheduled lines in Los Angeles and its surrounding counties. Twenty-six of these lines operate 24 hours a day, seven days a week.

The District operates four different types of service: local, express, contract, and special. Local service operates on surface streets, while express service operates on both surface streets and freeways. Intercounty contract services are those lines which travel into adjacent counties. The part of the service which runs outside of Los Angeles County is funded by the adjacent county. Other contract services are lines funded from special funding through a service contract and include the Westwood shuttle bus. Special services are those the District provides to special events such as the racetracks, the Hollywood Bowl, the Greek Theater and Dodger Stadium. Some special services are funded through service contracts and other special services operate as supplemental service to regular routes.

In 1985, RTD operated an active fleet of 2,807 buses and a total fleet of 2,952. The most widely used buses are: (937) GMC, RTS II, which seat 43 persons. The (415) Neoplan AN-440A which seat 43 and the (230) FLX870 which seat 46 are also frequently utilized. The average total fleet age is 6.8 years as of March 1986.

District staff maintains ongoing coordination with other transportation agencies in the region. Participation in regional transportation plans, studies and committees are outlined below.

Southern California Association of Governments (SCAG)

The SCRTD is a major participant in the overall regional planning work program. Major areas of participation include contribution to the development of the Regional Transportation Plan and the Transportation Improvement Program. The District also participates with SCAG and other agencies such as Caltrans and municipal operators in specific studies involving transit usage and improvements.

Additionally, the SCRTD is directly represented on two SCAG committees. SCAG's Transportation and Communications Committee (TCC) is a policy advisory group to the SCAG Executive Committee. Members of SCRTD's Board of Directors attain membership in SCAG's Transportation and Communication Committee if they are an elected official from a member city of SCAG. The District also participates actively on the SCAG Transit Advisory Committee (TAC), a technical advisory group composed of staff from all of the region's transit and paratransit operators, which is responsible to the Transportation and Communications Committee.

Los Angeles County Transportation Commission (LACTC)

The District participates actively at all levels of the following LACTC deliberations:

LACTC Organizational Level	District Involvement
Full Commission	Regular meeting attendance, no voting power

LACTC Organizational Level	District Involvement
Finance Review Committee	Meeting attendance, no voting power
Rapid Transit Committee	Meeting attendance, no voting power
Intergovernmental Relations (legislative affairs)	Meeting attendance, no voting power
Service Coordination Committee	Meeting attendance, no voting power
Technical Advisory Committee	Voting Membership
Transit Productivity Committee	Voting Membership
Bus Operations Subcommittee	Voting Membership
Elderly and Handicapped Transportation Advisory Council	Meeting attendance, no voting power
Highways and Freeways Subcommittee	Voting Membership

RTD receives funds for capital and operations through several sources. Monies are obtained from Federal, State and Local Capital Grants, and Local, State and Federal Cash Grants. These grants include the Proposition A funds and TDA funds. Revenue is largely received through passenger revenues.

D. RECENT ACCOMPLISHMENTS AND PRIORITIES

1. Major Initiatives Since Fiscal Year 1983

Perhaps most significant among recent District accomplishments are the productivity and efficiency improvements. The District has been able to respond to unprecedented increases in patronage through provision of additional service levels at a lower cost

per passenger than was achieved in FY 1982-83 (cost per mile and hour are higher). Among the factors contributing to this achievement are:

- Route Restructing - The final phases of the Sector Improvement Program were implemented in June and October of 1983. These changes have resulted in efficient deployment of buses on a reconfigured route system which is better suited to the needs of the District's patrons. Route restructuring has also aided in improved schedule adherence, and with the implementation of the Line Renumbering Program in October, 1983, better public identification of bus routing and service types has also resulted.

- Schedule Refinements - Increased use of scheduling techniques such as shortlining (terminating selected bus trips on a line at intermediate points in response to lower passenger demand at line extremities), and interlining (deploying buses coming out of service on one line to another line where service demands require additional buses) together with the increased number of lines offering Limited service have allowed for continued expansion of District services in response to Proposition A reduced fare ridership increases while minimizing the need for additional buses.

- Management Improvement - A management reorganization was completed at mid-year which should result in clearer definition of departmental responsibilities, and improved coordination of some functions, such as purchasing and inventory control, through centralization of responsibilities. Implementation of TRANSMIS I and TRANSMIS II is proceding expeditiously with full operation of the Payroll and Accounting System. Additional components in various stages of

installation include a Vehicle Maintenance System, Materials Management System, Planning and Scheduling System, and a Human Resources Management Information System.

A milestone was achieved in December, 1983 with the UMTA approval and distribution of the Final Environmental Impact Statement for the Metro Rail project. This represented the culmination of several years of planning and engineering devoted to the design of the first segment of the regional rail transit system adopted by the Los Angeles County voters with the passage of Proposition A. The District proceeded with the preparation of final plans and specifications, and initiated the real estate acquisition process.

The District met the extraordinary demands imposed by the Olympic Games held in Los Angeles in August of 1984. In order to meet the needs of residents and visitors attending the Games, the District operated a system of local, express and park/ride buses serving the Olympic venues which was distinct from regular District services.

2. Near-Term Management Priorities

There are eight issues which will be of central importance to SCRTD through FY 1986.

a. Joint Development

The District has established a joint development planning and implementation program in an effort to ensure private sector participation in the development of the Metro Rail system.

b. Light Rail Development

SCRTD plans to develop a detailed complementary bus plan to aid in the Long Beach/Los Angeles Rail Transit Project.

c. Bus Planning for Metro Rail Interface

The Milestone Preliminary Draft Report Addendum published public comments on the proposed supporting services plan and the results of SCRTD's study of the comments. The resulting bus plan will serve as the basis for the interface between Metro Rail and Bus Service.

d. Subcontracting to Private Carriers

SCRTD is continuing to explore the feasibility of subcontracting transit services to private firms while still maintaining the District's goal of providing an efficient and equitable transit system for the entire area.

e. User-Side Subsidies

The District is studying new areas for its user-side programs. In addition to expanding its current programs involving token sales to merchant associations and employer subsidized sale of employee passes, the District will study the areas of: the elimination of discount fares for school students; and transit/ transportation coupons for low income persons of Los Angeles County.

f. Timed Transfers

Experimentation of timed transfers is currently being prepared by SCRTD. The District's timed transfer technique is designed to increase ridership without increasing operating costs.

g. Freeway Transit Operations

SCRTD is involved in four freeway facility programs involving: Freeway Bus Shelter Program; The El Monte Busway Extension; Harbor Freeway (I-110) Transitway; and The Century Freeway Transitway. RTD is also studying the feasibility of converting the existing bus service operating on the El Monte Busway to a trunk shuttle mode of operation.

h. Methanol Fueled Bus Demonstration Project

RTD proposes to conduct a methanol fuel demonstration. This demonstration will involve the operation of up to 30 methanol fueled buses in revenue service for up to 24 months.

III. PRIOR AUDIT FINDINGS

The Los Angeles County Transportation Commission identified the need to review and evaluate the Southern California Rapid Transit District's (SCRTD) progress towards implementing recommendations developed by the FY83 Performance Audit. Of particular importance is the effectiveness of operator actions to date, and the achievement of cost savings. The review of prior audit recommendations and improving performance in targeted areas are discussed in this section.

A. SCOPE AND OBJECTIVES

The purpose of the Prior Audit Review is to document the SCRTD's actions in response to the FY83 Performance Audit Recommendations, and to assess the effects on performance of actions taken to date. The FY83 audit results are described below, followed by a discussion of specific objectives and activities of the review conducted during the FY86 Performance Audit.

1. Prior Audit Results

The FY83 Performance Audit of the SCRTD consisted of three main elements as follows:

- Phase I -- Review of TPM and TDA data collection procedures and performance indicators
- Phase II, Task 1 -- Evaluation of SCRTD effectiveness and efficiency in six basic functional areas
- Phase II, Task 2 -- Detailed investigation of the process followed by SCRTD in setting goals and objectives, and the SCRTD's performance monitoring system

It should be noted that since FY83, operators have been required by LACTC to develop and update annually action plans on the Phase II Audit recommendations.

2. Audit Review Objectives

The objectives of the review of operator progress with respect to FY83 Audit recommendations are to identify the following:

- Intent of recommendations and operators' interpretation of actions recommended
- Action implemented and continuing plans for productivity improvements
- Impact of actions, including cost savings realized and effectiveness in mitigating performance weaknesses
- Assessment of operator progress to date towards improvement in problem areas, and compliance with audit recommendations

To meet these objectives, four key interrelated activities were undertaken, as described below:

- Review FY83 Performance Audit reports and materials documenting the SCRTD's actions to improve performance
- Conduct interviews with SCRTD personnel on intent of recommendations and actions taken or currently planned
- Develop and review cost savings resulting from actions and
- Analyze impacts of actions based on operator data and assess effectiveness in improving performance

Documents reviewed, personnel interviewed and supplemental data sources in conducting the SCRTD's Prior Audit Review are listed in Appendix A. With the exception of the FY83 Performance Audit Program reports provided by LACTC, all materials were supplied by SCRTD.

B. PROGRESS IN COMPLYING WITH PRIOR AUDIT RECOMMENDATIONS

1. Overview of Prior Audit Recommendations

a. Management and Administration

The FY83 audit set forth three recommendations in areas of SCRTD management and administration. Recommendations were as follows:

- SCRTD should establish a refined system of department level goals and objectives;
- SCRTD should develop an integrated Management System to more effectively monitor performance; and
- SCRTD should examine its administrative staffing levels in general administration functional areas to ensure effective and efficient staffing.

b. Transportation Operations

The FY83 audit addressed several key aspects of the performance of SCRTD's Transportation Department. This department is responsible for daily provision of service, and has both the largest budget and largest workforce within RTD's organization. Accordingly, the audit focused on the effectiveness with which these resources are managed.

The prior audit presented findings in five areas:

- Cost per service hour for vehicle operations was found to be increasing above the rate of inflation over the FY83 audit period. These costs, which were measured from Section 15 data, included cost of the Transportation Department as well as the Scheduling Department, plus diesel fuel. During the FY86 audit period, RTD has reported a considerable improvement in this trend,

with cost growing below the rate of inflation (2.74 percent annual growth in cost versus 3.49 percent annual growth in inflation). This has been attributed by RTD to more extensive utilization of part-time drivers, a more favorable labor contract and a favorable fuel contract.

- Operator productivity and unscheduled labor cost were found to be virtually stable over the FY83 audit period. RTD has regularly tracked unscheduled overtime during the FY86 audit period, and has reported it to be flat through the final quarter of FY85. Overtime then grew, reflecting a reduction in extraboard operators.

- Driver absenteeism and other lost time were found to have declined slightly during the FY83 audit period; however it was noted as a cost improvement opportunity. Total absence cost was estimated to be between $7.5 and $12.5 million. A review of absence and lost time patterns during the FY86 audit indicates that no significant changes in absence rates have occurred, although SCRTD management has implemented programs to reward positive operator performance and discharged over 200 operators in the last year for inadequate performance, primarily in respect to attendance. Given expansions in service and higher wage and benefit rates, the total cost of absenteeism is now estimated to approach $16.3 million. Of this total, we estimate that a reasonable objective for cost reduction ranges from $1.3 to $3.8 million, based on rates experienced in the industry.

- Part-time driver utilization was observed in the FY83 audit to be consistently below the allowable limits set in RTD's contract with the United Transportation Union (UTU). In the 3 years in the FY86 audit period, however, RTD has expanded part-time ranks virtually to the allowable limit, and in fact gained more flexibility in their use through the labor negotiations concluded early this year.

- Transportation safety and service reliability were found in the FY83 audit to consistently register favorable performance. Both of these areas continue to be monitored closely by RTD and have continued to display positive trends. Safety improvements are a concern of RTD, however, given the recent growth in insurance cost. Service reliability is a growing concern given reductions in the operator workforce.

The FY83 audit recommended that RTD develop a new manpower planning process which regularly projects and refines operator

workforce levels. This process was to encompass maximum utilization of part-time drivers, development of an automated tool for projecting operator levels and training needs, and establish policies for granting requested leave and for nondriving use of operators.

Additionally, subsequent to the FY83 audit, LACTC and RTD identified the above recommendation and reduction of operator absenteeism to be high-priority issues. These issues are inextricably linked, and logically require a coordinated effort. Progress on both these issues in the FY86 audit period is further described later in the context of the single recommendation.

c. Revenue Vehicle Maintenance

The FY83 audit addressed several key aspects of the SCRTD's Maintenance Department. This department is responsible for revenue and non-revenue vehicle maintenance and repair, and has both the second largest budget and workforce within RTD's organization. Accordingly, the audit focused on the effectiveness and efficiency with which these resources are managed.

Five prior audit recommendations related to SCRTD's maintenance program effectivenss and efficiency. Particular concerns were presented in areas of labor efficiency, materials management and cost control, work standards and controls, fleet size and major rebuild scheduling and execution. The FY83 audit presented findings in ten areas:

- Maintenance management was guided by a sound foundation of goals and objectives which have been used by division-level managers to control cost, production and performance. The structure of goals, objectives and standards allow managers to make decisions on priorities which are consistent across the eleven divisions. This reliance on sound goals and objectives continues today and was in place over the FY86 audit period.

- While disaggregate data was prepared little summary information was available making trends and performance difficult to discern for managers responsible for controlling performance over the prior audit period. Not only was performance reported at a disaggregate level, but it ascended the hierarchy in a piecemeal fashion (i.e. related trends were not reported simultaneously). SCRTD was, in FY83, in the process of implementing an automated Vehicle Maintenance System (VMS) which was designed to address many of the information weaknesses. The VMS was implemented during the FY86 audit period and managers are now using the information to better control performance. The current system represents a vast improvement in information availability and reporting.

- SCRTD'S service reliability improved with mean miles between mechanical failures improving substantially between FY 1981 and FY 1982 by 62 percent. Cancelled runs due to vehicle unavailability dropped from 948 in FY 1980 to 7 in FY 1982. Preventive maintenance performance improved between FY80 and FY82 with the number of vehicles overdue for inspection dropping 63 percent. Service reliability continues at a reasonably high level of performance in the FY86 audit period, albeit mean miles between mechanical failures has dropped from the high of 3273 in FY82 to 2953 in FY85. This still represents a significant improvement over FY80 and FY81 levels.

- Vehicle availability improved with revenue vehicles out of service for repairs dropping from 190 vehicles in February 1980 to 87 vehicles in January 1982. In addition, average duration of downtime went from six weeks down to two weeks over the same period. In the FY86 audit period, vehicle availability has continued at a high level of performance even though approximately 700 vehicles had engine rebuilds over the last two years of the FY86 audit period.

- Maintenance costs increased substantially over the FY83 audit period, well in excess of the local CPI. Labor cost per mile increased 72 percent and materials cost 133 percent between June 1979 and June 1982 (the CPI increased 37 percent over the same period). The increase was due in part to an effort to improve vehicle reliability and increasing fleet complexity. During the FY86 audit period, cost growth appears to have stabilized and was equivalent to the local CPI over the audit period.

- Maintenance staffing increased substantially over the FY83 audit period, with work force growth at 40 percent and equipment growth at 13 percent. Manpower and

equipment trends fluctuated over the FY86 audit period, with FY85 staffing almost 23 percent higher than the FY82 level, and peak vehicles only 6 percent higher than FY82 levels.

- Labor utilization was noted to be of significant concern in the FY83 audit, with absenteeism, and industrial injuries offering the greatest opportunity for improvement. Absenteeism continued at a high rate during the FY86 audit period, although some mitigative strategies were established in early FY86. Maintenance absence is estimated to cost about $4.3 million annually, with a reasonable objective for cost reductions of $500,000 to $1 million. Industrial injuries have been a high priority area, and management has reduced industrial injuries per 100,000 employee hours from 18 in 1982 almost down to 9 in FY85.

- Materials management was noted to offer cost improvement opportunities, which SCRTD has pursued through implementation of an automated materials management system. The system was put in place during the FY86 audit period and cost implications and opportunities are currently being investigated by RTD. In addition, implementation of recommendations on parts room staffing during the FY86 audit period has resulted in improved parts issuance control.

- Progress was made on formalizing operating procedures, particularly at the supervisory level during the FY83 audit period. Procedures for scheduling and conducting work were informal throughout the FY83 audit period. Average time requirements by task were made available from VMS during the FY86 audit period and are used in work scheduling. SCRTD is considering the benefits of formalizing work standards.

- Fleet mix, size and age were all concerns in the FY83 audit. The SCRTD formalized plans for reducing the number of spare vehicles and changing the fleet mix during the FY86 audit period, although little has been accomplished to date due to Olympic requirements and used bus market surpluses. SCRTD lowered overall fleet age over the FY86 audit period, and has successfully met their greatest challenge -- the RTS II engine rebuilds. The maintenance department developed and implemented a major rebuild program to rebuild all 940 engines and completed about 700 RTS II rebuilds by the end of FY85.

2. Criteria for Evaluation of Operator Compliance

In evaluating operator compliance we applied the following criteria:

- Implementation Success -- extent to which SCRTD took appropriate follow-up actions, and successfully implemented programs to ensure that potential benefits would be realized.
- Plan Effectiveness -- effectiveness of actions in improving performance, as a result of both controllable factors and external constraints beyond the operator's sphere of influence.
- Net Cost Savings -- annualized net operating cost savings (in FY85 dollars) attributable to follow-up actions, where such savings are quantifiable.

3. Evaluation Results of Complying with Prior Audit Recommendations

Below, we have presented the results of our review of SCRTD's progress in implementing prior audit recommendations.

- PRIOR AUDIT RECOMMENDATION NO. 1 - SYSTEM OF DEPARTMENTAL GOALS AND OBJECTIVES SHOULD BE REFINED AND INTEGRATED TO STRENGTHEN THEIR ROLE IN GUIDING RESOURCE ALLOCATION DECISIONS.

  UNDERSTANDING OF THE PROBLEM: This recommendation in the prior audit was based on two key findings: The need to establish a linkage between measurable systemwide objectives and system goals and the need to update service goals and objectives to keep pace with the changing environment in which the service is provided. It was believed that a clearly defined set of goals, objectives, measures and standards can be an invaluable tool for managing a very complex system such as the District.

ACTIONS IMPLEMENTED:

Action	Status	Impact
o Goals, objectives, measures and standards included in SRTP and budget documents.	Completed	Improved management of resources; no direct cost implications have resulted from implementation.

ASSESSMENT: The District-wide and departmental goals, objectives, measures and standards have been established. These statements are found in the District's SRTP as well as the budget documents. A review of the most recent SRTP for FY86-90 indicates that the following categories of goals and objectives have been defined in detail:

- District-Wide Goals FY 1986-90: Seven systemwide goals have been established. These are documented in Exhibit III-1.
- Bus Operations Objectives: Eight bus operations objectives related to operating efficiency; service reliability; service accessibility; service reduction due to the ending of Proposition A Fare Reduction Program; regional accessibility; impacts of the new fare structure; experimentation of alternative service concepts; and the demonstration of energy conservation and air quality projects have been established. Under many of these objectives, quantifiable measures and standards have been developed. These are documented in Exhibit III-2.
- Facilities Construction Objectives: Five objectives under this category are listed in Exhibit III-2. The bulk of the emphasis here is on the construction of the Metro Rail Project.
- Cost Control Objectives: Ten cost related objectives are listed under this category in Exhibit III-2. In many cases quantifiable measures and standards have been established.
- Policy and Management Objectives: Seven objectives under this category are listed in Exhibit III-2. The objectives under this category include areas such as EEO and DBE/WBE plans; intergovernmental coordination;

EXHIBIT III-1

DISTRICT-WIDE GOALS
FY 1986-90

Goal 1: To operate a safe, clean, convenient and efficient mass transit system for the general public.

Goal 2: To develop and operate an integrated bus and rail transit system for the general public within the urbanized area while enhancing the quality of life and the development of the urbanized areas.

Goal 3: To improve the productivity of the transportation, maintenance, and management sectors of the District.

Goal 4: To use the SCRTD leadership position to serve as a catalyst for the physical, land use, and economic development of the metropolitan area in relation to transportation and access.

Goal 5: To support and reinforce the Centers Concept of land use development in the Los Angeles region.

Goal 6: To maximize the availability of accessible transit service within the District's service area.

Goal 7: To protect the public's investment in public transit.

EXHIBIT III-2

1.0 BUS OPERATIONS OBJECTIVES

1.1 To meet service demands and increase operating efficiency by:

1.1.1 Retaining revenue vehicle service hours within 1% of 7 million annual hours.

1.1.2 Maintaining a system-wide average of at least 60 boardings per revenue service hour.

1.1.3 Increasing by 10% the proportion of buses passing key time points, on time (0, 1, or 2 minutes late).

1.1.4 To reduce the number of pass-up complaints by 10%.

1.2 To maintain or improve service reliability by:

1.2.1 Providing a minimum 99% on-time pull-out rate;

1.2.2 Increasing the mean miles between mechanical failures to 3,000 miles;

1.2.3 Maintaining fleet size in accordance with the Board approved Fleet Mix Policy;

1.2.4 Maintain the active fleet spare ratio below 21%.

1.3 To maintain at least 95% accessible service reliability by:

1.3.1 Ensuring that all District departments incorporate the goals and objectives of the Accessible Service Program into the Tasks and Standards of the appropriate District personnel.

1.3.2 Ensuring that securement (devices) shall be workable and able to secure a wide variety of wheelchairs.

1.3.3 Ensuring that on accessible lines the accessible headways shall occur at intervals of one hour or less during service hours on that line.

EXHIBIT III-2
(Continued)

1.3.4 Ensuring that the combination of routes selected for accessible service will provide a diverse, balanced and geographically equitable system.

1.3.5 Ensuring that the lift equipped fleet shall be maintained and assigned to service so that lift equipment is available for at least 95% of the designated accessible trips.

1.4 To minimize service reductions due to the ending of the Proposition A Fare Reduction Program.

1.5 To maintain regional accessibility to the public transit system.

1.6 To assess the impacts of the new fare structure on ridership with sufficient specificity to enable the District to adjust service to meet demands.

1.7 To engage in experimentation of alternative service concepts including pulse point scheduling, timed transfer, subcontracting of service, service reallocation and deployment in order to enhance services offered.

1.8 To engage in or conduct experimental or demonstration projects related to energy conservation and air quality.

EXHIBIT III-2
(Continued)

2.0 FACILITIES CONSTRUCTION OBJECTIVES

2.1 To continue the preparation for and begin construction of the Metro Rail Project by:

2.1.1 Completing facilities design;

2.1.2 Completing systems design;

2.1.3 Completing necessary property acquisition;

2.1.4 Initiating construction of the MOS-1.

2.1.5 Developing an EIS/EIR for extensions of the MOS-1.

2.2 To complete construction of the Central Maintenance Facility.

2.3 To complete an EIS/EIR for the Universal City Station site.

2.4 To complete the renovations of the maintenance facility at Division 1.

2.5 To complete the design of the site work and service facility at Division 2.

EXHIBIT III-2
(Continued)

3.0 COST CONTROL OBJECTIVES

3.1 To increase budgetary control and review of expenditures by:

3.1.1 Implementing fully integrated capital and operating budget and accounting systems;

3.1.2 Completing the implementation of the management reporting elements of the TRANSMIS Projects;

3.1.3 Routing both purchase and personnel requisitions through the Office of Management and Budget.

3.2 To maintain a maximum operating cost per boarding of no more than $1.18.

3.3 To reduce bodily injury and property damage liability losses by reducing traffic accident frequency to no more than 4.5 per 100,000 miles.

3.4 To reduce Workers' Compensation costs by:

3.4.1. Reducing Transportation industrial accident frequency to no more than 7.0 per 100,000 hours;

3.4.2. Reducing Maintenance industrial accident frequency to no more than 9.0 per 100,000 hours.

3.5 To ensure, to the extent possible, that revenue/cost ratios are substantially equal for the following service classes: local service; limited service; express service; and contract service.

3.6 To minimize those schedule changes requiring Bus Operator assignment changes.

3.7 To implement a management plan for the transition from manual to automated systems.

3.8 To reduce unscheduled Bus Operator overtime by:

3.8.1 Maintaining a labor force consisting of the maximum number of contractually permissible part-time Operators.

3.8.2 Reducing the District ratio to less than 1.50 Operator Pay Hours per Revenue Vehicle Service Hour;

3.8.3 Implementing all appropriate recommendations resulting from Bus Operators' absenteeism studies.

3.9 To improve the ratio of buses per mechanic by 5%.

3.10 To attain a farebox recovery ratio of at least 38%.

EXHIBIT III-2
(Continued)

4.0 POLICY AND MANAGEMENT OBJECTIVES

4.1 To provide for minority participation in District programs and activities by continuing UMTA approved EEO and MBE/WBE plans and the Affirmative Action Career Development Project.

4.2 To improve efforts at intergovernmental coordination by:

4.2.1 Maintaining a regular series of inter-local coordination meetings with other public agencies;

4.2.2 Continuing the development and implementation of Benefit Assessment Districts;

4.2.3 Exercising a leadership role in developing, analyzing, and implementing future rail projects.

4.3 To continue to monitor performance quarterly as outlined in the established departmental and District-wide objectives.

4.4 To pursue a stable and diversified source of long-term funding for District operations.

4.5 To maintain the regional integrity of the transit system network.

4.6 To improve coordination with private sector agencies by:

4.6.1 Continuing the development and implementation of Benefit Assessment Districts;

4.6.2 Establishing a regular series of coordinating meetings with private sector representatives.

4.7 To maintain strong communication links with the general public and continue to improve community relations by informing the general public of transportation changes which affect service.

periodic performance monitoring program; coordination with private sector agencies; and communication with the general public.

In addition to the above, seven Five-Year District-Wide Objectives have also been developed and are presented in the FY86 SRTP document, shown in Exhibit III-3.

A review of the goals and objectives referenced above and those in the budget documents reveal that SCRTD has made a commendable effort in developing and implementing a comprehensive set of goals and objectives in response to the prior audit recommendation. This recommendation and its subsequent implementation was not expected to result in direct cost implications. It is expected that SCRTD's ability to manage its resources has improved as a result of these actions.

In the subsequent tasks of this audit, a more detailed analysis is conducted to determine to what extent SCRTD met its stated goals and objectives during the audit period.

- PRIOR AUDIT RECOMMENDATION NO. 2: AN INTEGRATED MANAGEMENT INFORMATION REPORTING SYSTEM SHOULD BE DEVELOPED TO MONITOR RTD PERFORMANCE IN A MANNER SUPPORTIVE OF BOARD, MANAGEMENT AND STAFF LEVEL DECISION-MAKING NEEDS.

UNDERSTANDING OF THE PROBLEM: This recommendation in the prior audit was based on two findings: The performance monitoring practices at the executive management and board level were limited in scope; and a regular, uniform program for monitoring departmental performance against objectives had not been established.

EXHIBIT III-3

FIVE YEAR DISTRICT-WIDE OBJECTIVES
FY 1986-90

Objective 1: Maximize cost control containment in District operations and programs.

Objective 2: Maximize ridership and passenger revenue while minimizing fare increases and service reductions within the constraints of available funding.

Objective 3: Attain a maximum fleet size of 120% of the peak fleet requirement (excluding energy contingency buses).

Objective 4: Maintain a system-wide level of at least 60 boardings per revenue bus hour.

Objective 5: Construct, implement, and operate Metro Rail service by 1991.

Objective 6: Operate Long Beach-Los Angeles Light Rail Transit service by 1990.

Objective 7: Implement an integrated fare structure for bus and rail at the inception of rail service.

ACTIONS IMPLEMENTED:

Action	Status	Impact
o Implementation of TRANSMIS I; Quarterly Budget and Performance Report instituted.	Completed	Improved management decision-making.
o Implementation of TRANSMIS II.	In progress	(Scheduled for completion by December 1986).

ASSESSMENT: The completion of TRANSMIS I has greatly enhanced SCRTD's ability to gather information in a systematic and consistent manner. Efforts to implement the other half of the MIS -- TRANSMIS II -- are currently underway. The implementation of TRANSMIS II is expected to be completed by December 1986. In addition, SCRTD has instituted the Quarterly Budget and Performance Report as well as improved the contents of other financial reports.

A review of the Quarterly Budget and Performance Report indicates that extensive information is now available to support management decision-making at various levels in the organization. Needless to say that completion of TRANSMIS II will further enhance and support management information needs.

The costs to implement TRANSMIS I and II were not driven by the prior audit finding. This action was taken independent of the audit recommendation.

o PRIOR AUDIT RECOMMENDATION NO. 3: SCRTD SHOULD EXAMINE STAFFING LEVELS IN GENERAL ADMINISTRATION FUNCTIONAL AREAS.

UNDERSTANDING OF THE PROBLEM: This recommendation in the prior audit was made to ensure that the staffing levels in the administrative areas were geared towards providing support functions as efficiently as possible.

ACTIONS IMPLEMENTED:

Action	Status	Impact
o General administration staffing evaluated during budget preparation.	Completed	Staffing positions justified.
o FY86: Consultant hired to evaluate records management improvement needs.	Underway	Improved records management and improved administration efficiency.

ASSESSMENT: SCRTD evaluated all general administrative staffing levels during the budget preparation stage.

SCRTD has concluded that administrative staffing growth, including all positions, was justified. Further, SCRTD's examination of the staffing levels indicates that the implementation of the FY83 audit recommendations, particularly those related to goals and objectives, and the information reporting system require additional management and supervisory staff.

In July 1985, SCRTD engaged a consultant to review its records management and retention practices. This review was also to focus on use of new technology. Short-term study

expectations include improved records management, reduced costs and improved administrative staff efficiency.

Administrative labor cost and staff size continue to grow rapidly in the FY86 audit period. The impact of this conclusion on the administrative staff size is further evaluated during the subsequent tasks in this audit (i.e., Section VIII).

- PRIOR AUDIT RECOMMENDATION NO. 4 - THE TRANSPORTATION DEPARTMENT SHOULD DEVELOP A MANPOWER PLANNING PROCESS WHICH REGULARLY PROJECTS AND REFINES MANPOWER LEVELS.

UNDERSTANDING OF THE PROBLEM: RTD acknowledges that minor problems existed which inhibited effective manpower planning. These included certain work-rule restrictions (e.g., ability of operators to migrate among divisions on a bi-weekly basis) and coordination among departments in planning for operator hiring. Also, shortly following the previous audit, concern was raised by certain of RTD management regarding staffing levels (more specifically, extraboard sizing policy) and the potential for cost savings should the staffing policy be modified.

Driver absenteeism and lost time, which affects operator staffing levels, is a continuing concern to RTD management. In fact, sick leave rates are monitored on a weekly basis for all transportation divisions (i.e., operating bases) and a division's performance against these rates is one component of the annual evaluation of transportation division managers. Additionally, RTD has implemented both incentives (the Operator Excellence Program) and extended disciplinary efforts (such as testing for substance abuse) to promote better attendance.

However, there has been little movement in absence and lost time rates since the close of the prior audit, as later discussed in Chapter VI. Additionally, certain of RTD management were found to be unaware of RTD's performance in this area relative to other large transit systems both nationwide and in California (i.e., RTD's absence and lost time rates are generally higher as shown in Chapter VI). RTD management does recognize, however, that opportunities for improvement exist, and are making performance improvements in this area a priority.

ACTIONS IMPLEMENTED:

Action	Status	Impact
o FY84: Initiated redesign of division dispatcher function.	5% Complete	Designed to permit better span of control over operators, including more control over factors contributing to absenteeism; cost was $583,000 (TOPIF funded).
o FY84: Integrated operator timekeeping function with payroll operation.	Completed	Cost $45,000 (TOPIF funded); no discernible impact.
o FY84: Initiated operator planning study.	90% Complete	Improved interdepartmental coordination and resulted in more cost-effective use of operators; study cost is $107,000 (TOPIF funded), savings from reduced operator ratio approximately $2,200,000 (See Appendix B).

Action	Status	Impact
o FY84: Initiated program to reduce transportation personal injury and liability losses.	Implemented	Program cost was $663,000 (TOPIF funded); no tangible impact to date upon operator injury as noted in a review of absence data.
o FY84-FY85: Improved part-time driver ratio.	Implemented	Savings of approximately $3,500,000. (See Appendix B).
o FY85: Initiated bus operator recognition program.	Implemented	Intended to reward positive performance among all divisions.
o FY85: Negotiated extended use of part-time drivers (30 hours per week, including weekends).	Being contested by UTU (Implemented March 86)	Intended to reduce absenteeism by making available more weekend days off to lower-seniority operators, as well as to reduce cost through more extensive use of part-time drivers.

ASSESSMENT: In respect to the manpower planning issues surfaced in the prior audit, RTD has been fully responsive and has achieved a net savings of approximately $4.3 million dollars (i.e., $5.7 million in savings versus $1.4 million in program-related costs). As noted above, this savings comes primarily from greater utilization of part-time operators and from reduction in the operator ratio. There has been no discernible impact from the other identified TOPIF-funded programs, although the programs have addressed important aspects of operator management.

In respect to operator absenteeism and lost time, there has been no tangible change from the findings in the FY83 audit. Service increases, higher wage rates and higher benefit rates which have been effected since the prior audit have

increased the cost of absenteeism and lost time to about $16.3 million annually from the FY83 audit's estimate of about $12.5 million. As noted earlier, however, a reasonable objective for reducing this total cost estimate ranges from $1.3 million to $3.8 million annually.

It is noted that RTD is currently implementing a wide range of actions which should improve its capability to manage absenteeism. In particular, the information systems being implemented are at least as comprehensive as any in the industry and should enable much better control than presently exists. Due to the current cost of absenteeism, however, it should continue to be considered as a priority for performance improvement. Savings and cost calculations are shown in Appendix B.

o PRIOR AUDIT RECOMMENDATION NO. 5 - RTD SHOULD DEVELOP AND IMPLEMENT A MAINTENANCE LABOR MANAGEMENT PROGRAM.

UNDERSTANDING OF THE PROBLEM: RTD acknowledges that labor absenteeism and industrial injuries have been somewhat high in Maintenance. However, attaining reductions in maintenance absenteeism through disciplinary measures is believed to be impeded by the labor contract and labor relations environment. Reduction of industrial injuries has been a high priority of the District.

ACTIONS IMPLEMENTED:

Action	Status	Impact
o FY84: Objectives regarding managerial control of the line personnel utilization were established in the FY85 annual budget.	100% Complete	Managers established formal objectives for absenteeism reduction.

Action	Status	Impact
o FY84: An RFP was issued for the TOPIF study on Maintenance Absenteeism in cooperation with LACTC. Phase I of the study was awarded and completed.	100% Complete	RTD sought outside assistance in finding solutions at a cost of $100,000 for Phase I of the study. The study provided little useful information beyond that known by the RTD.
o FY84: A consultant study was completed on mechanic overtime.	100% Complete	RTD sought outside assistance in finding overtime solutions at a cost of $36,000. Actual savings in overtime reduction was estimated at $1.4 million in FY85.
o FY85: Training began to help line supervisors exert more control over labor utilization.	50% Complete	Impact unclear to date.
o FY85: The TOPIF maintenance absenteeism study Phase II RFP was issued, but the study was aborted due to a dearth of useful information resulting from Phase I.	40% Complete	RTD and LACTC saved the $150,000 budgeted for Phase II based on the belief that little useful information would result from the study.
o FY85: RTD reviewed results of maintenance overtime study and developed reduction criteria.	100% complete	RTD prepared management plan for reducing maintenance overtime, and implemented same. Performance auditor estimates cost savings at $1.4 million in FY85, relative to FY84 levels.
o FY85: RTD implemented increased inspection, training discipline and occupational health programs to curb industrial accidents.	100% Complete	Industrial accidents per 100,000 work hours have been reduced substantially.

Action	Status	Impact
o FY86: RTD started an internal task force in response to the failure of the TOPIF program to address maintenance absenteeism through incentive programs and inter-divisional competition.	40% Complete	Absenteeism reduction plans are in the process of development. Specific incentive programs were implemented in mid-FY86, with initial positive results.

ASSESSMENT: RTD has recognized labor utilization to be an area of significant concern and an opportunity for cost and effectiveness improvements. A series of progressive actions have been taken to realize improvements, albeit some improvements have been slow in coming (e.g., absence reduction). Two areas of success have been reductions in overtime and in industrial injuries. Maintenance overtime has been reduced by 40 percent betweeen FY84 and FY85. The actual "blue book" cost reduction is about $1.4 million in absolute dollar terms. The savings was achieved through a conscious effort by RTD management to cut costs.

Industrial injuries have also been on a decline as a result of management control programs. Actual performance was close to the goal of nine (9) industrial accidents per 100,000 hours in FY85. While some cost savings has resulted from this reduction, the cost implications are difficult to ascertain from data currently available.

Although some successes have been noted in labor management and utilization, absenteeism continues at a relatively high rate. Maintenance absenteeism is estimated to cost $4.3 million annually, with a reasonable objective for reduction of between $500,000 and $1 million. Management notes that the recent labor negotiations made significant gains for the system in areas related to wages, job classifications and

work rules, and implementation of a comprehensive absenteeism reduction program was not attempted due to the potential for harm to other negotiated changes. Given the current labor environment, management is planning to focus on incentives, rather than penalties, to encourage better attendance. Implementation of an incentive program began in January 1986. RTD has been responsive to the recommendation and continued efforts are needed in labor absenteeism reduction.

PRIOR AUDIT RECOMMENDATION NO. 6: RTD SHOULD DEVELOP STANDARD OPERATING PROCEDURES AND JOB STANDARDS AT MECHANIC AND SERVICER LEVELS.

UNDERSTANDING OF THE PROBLEM: RTD acknowledges that formalized maintenance operating procedures can benefit work program management through improved training, work planning and performance evaluation. The District asserts that the first step in establishing standards is to collect and analyze data on job task time requirements and variance. While this information is useful to management, maintenance management notes that the District's contract environment may not lend itself to work standards as a measurement of employee performance. However, this belief has not been tested or legally evaluated to date.

ACTIONS IMPLEMENTED:

Action	Status	Impact
o FY84: The Vehicle Management System (VMS) program was implemented.	100% Complete	The VMS program gives management increased knowledge of current worker productivity. This information is used to better plan and manage work and size maintenance staffing needs.

Action	Status	Impact
o FY85: Worked with consultants on Vehicle Management System enhancements throughout the year.	100% Completed	Management has used the work production records to gain a better understanding of maintenance work and time requirements. Aided in work scheduling in maintenance divisions.
o FY86: RTD utilized VMS to prepare tables of total and average time to conduct most primary maintenance tasks. Management is utilizing this information to plan and schedule production.	90% Complete	Management is utilizing more scientific efforts to plan, manage and control work production.

ASSESSMENT: RTD completed the first major task in establishing work standards -- the District implemented a system for capturing work time requirements and for monitoring work quality. The implementation of the Vehicle Management System required considerable time and effort to develop and implement. The information provided is a positive benefit to both work scheduling and quality control over maintenance activities. While the RTD has not prepared formal work procedures for controlling employee productivity, the District's staff is currently considering the potential applicability of formalized maintenance operating procedures.

While the RTD has not fully implemented the entire scope of the recommendation, the District was responsive to the intent of the recommendation. Sound management information has been obtained through development of the Vehicle Management System which can be used in job planning and quality control. Employee job standards have not been implemented; however, RTD did renegotiate the labor contract to gain other cost savings during the FY86 audit period relative to wages and work rules. Implementation of job standards during this period may have negatively impacted

the contract negotiations results. RTD is still considering implementation of standards in the future, recognizing that industrial engineering studies (e.g., time and motion) may be required to account for variances around average task times. This approach is planned for use in evaluating the RTD's preventive maintenance program.

- PRIOR AUDIT RECOMMENDATION NO. 7: RTD SHOULD ACCELERATE IMPLEMENTATION OF MATERIALS MANAGEMENT REORGANIZATION TO REDUCE INVENTORY COST AND TO GAIN BETTER CONTROL OVER SECURITY AND DISTRIBUTION.

UNDERSTANDING OF THE PROBLEM: RTD acknowledged the problems in inventory cost and parts disbursement control. Materials costs were growing at a rate well in excess of inflation, and the manual Cardex system was somewhat cumbersome. The Cardex system does accommodate avoidance of stock-outs and shortages, but does not allow management review of slow movers and obsolescence. In addition, parts room staff were reporting to the Maintenance department and did not include full time staffing of parts stores in the maintenance divisions, resulting in some security and efficiency concerns.

ACTIONS IMPLEMENTED:

Action	Status	Impact
o FY84: All stores personnel were transferred to the Contracts, Procurement and Material Department.	100% Complete	The change in reporting responsibility puts all materials ordering, stocking and issuance responsibilities under a single department, making performance easier to manage and control.
o FY84: Storeroom staff was increased to 24-hour coverage at all facilities.	100% Complete	The increased staffing came at a cost of about $450,000 per year. Savings in lost mechanic time and lost parts are unknown based on current data, but assumed to equal the additional staffing cost.

Action	Status	Impact
o FY84: An aggressive warranty claims program was implemented, producing significant parts and materials savings.	100% Complete (ongoing)	The warranty claims monitoring program cost about $121,000, and resulted in about $1,000,000 in approved warranty claims, or a net savings of $879,000.
o FY84: The Materials Management System was implemented as part of TRANSMIS I to reduce parts inventory cost.	100% Complete	Better management information and control over parts in stock.
o FY85: The Automatic Storage/Retrieval System (ASRS) was being implemented.	30% Complete	When complete, ASRS is expected to facilitate further reduction in materials cost.
o FY85: Disposal of obsolete equipment was conducted.	75% Complete	Elimination of some obsolete fleets should reduce inventory requirements.
o FY85: The Materials Management System and the Vehicle Management System were refined to improve automatic reordering at lower cost.	Ongoing	When complete, reordering procedures will be simplified.
o FY86: Stores personnel are receiving better training to improve usefulness of new materials management systems.	Ongoing	More accurate input of transactions will result in fewer delays for unavailable cost and may reduce parts on-hand.

ASSESSMENT: RTD has been responsive to the recommendation provided in the prior audit. A great deal of time, effort and expense has gone into modernization of RTD's materials management system -- resulting in several areas of clear improvement. Most notable of these improvements are better requisition and issuance controls at both central stores and divisions, higher recovery of warranty parts at a substantial cost savings ($800,000 to $900,000 net savings per year

- ongoing), improved ordering procedures and better information on parts use and consumption.

Progress has been accomplished, and parts costs have fluctuated considerably over the audit period, with a net result of no real growth in cost. That is, materials cost per vehicle mile is at the same level (i.e., $0.30) in FY85 as it was in FY82. This is a substantial improvement over the prior audit period. When evaluating cost growth it is important to recognize that costs reflect purchased parts, and that does not always translate to parts consumed. RTD is building a sound data base on the cost, availability and consumption of materials. As this data is collected and utilized, RTD can conduct a "risk and cost" analysis of parts needs and hence adjust inventory levels (i.e., reduce holding costs and wait time) at the RTD. Reductions in inventory cost may occur over the next two years based on information availability and current management plans. RTD is investigating this issue internally.

- PRIOR AUDIT RECOMMENDATION NO. 8: RTD SHOULD EVALUATE STRATEGIES TO REDUCE FLEET SIZE TO REALIZE POTENTIAL MAINTENANCE COST EFFICIENCIES.

UNDERSTANDING OF THE PROBLEM: RTD acknowledges that the fleet size should be reduced to realize operating cost, storage and inventory requirements savings. The high spare ratio (about 22.5 percent during the prior audit) was a result of acquiring complex equipment with substantial reliability problems. That spare ratio was actually increased somewhat to accommodate the increased demand stemming from Olympic service in the Los Angeles area. RTD is currently in the process of reducing the spare ratio to achieve a 20 percent spare fleet. In addition to an overall fleet reduction, RTD is attempting to improve fleet mix by selling/retiring specific vehicle types to reduce operating costs.

ACTIONS IMPLEMENTED:

Action	Status	Impact
o FY84: Bus retrofit programs, including AMG air conditioning retrofit and Grumman re-engineering were completed.	100% Complete	Improve reliability of these fleets, reducing need for spares.
o FY85: A major engine overhaul program for RTS II vehicles has been implemented.	64% Complete	Improved reliability, but also necessitates additional spares while rebuild underway.
o FY85: Additional retrofit programs underway (RTS II, AMG and Grumman fleets).	75% Complete	Improved operating reliability, reducing need for spares.
o FY85: 477 new buses (Neoplan and Carpenter) were purchased.	100% Complete	Higher spares in place.
o FY85: Sold or retired reserve fleet buses (242 of the 589 buses to be retired after the Olympics were sold).	41% Complete	Reduced spare ratio on hand.
o FY86: Continued to sell and dispose of reserve fleet.	Ongoing	Reduce spare fleet and operating cost.
o FY86: Complete RTS II drivetrain rebuild program.	75% Complete	Increase reliability and vehicle availability.

ASSESSMENT: RTD has been responsive to the recommendation, however, several external factors have impeded progress. First, the Olympic service requirements forced RTD to maintain a high spare ratio and even expand the fleet to cover service needs in that short period. Vehicle retirements were delayed, and costly repairs continued to insure adequate vehicle availability. Once the Olympics ended, RTD

began reducing the spare fleet. This process should be staged to gain an acceptable market price for the buses and to find interested buyers of the equipment. An apparent surplus of used buses on the resale market is impeding progress to some degree.

RTD has aggressively implemented actions within their control to facilitate improved vehicle availability with a reduced spare fleet. Engineering difficulties were experienced with the Carpenter, Neoplan and AMG buses, vehicle modifications and powertrain rebuilds have been implemented in a relatively short period while spares were available to cover downtime. The improved reliability of these vehicle fleets should off-set the impacts of spares reduction and do so at an improved cost.

- PRIOR AUDIT RECOMMENDATION NO. 9: RTD SHOULD DEVELOP A PROGRAM TO SCHEDULE MAJOR DRIVETRAIN OVERHAUL ACTIVITIES IN THE NEXT TWO TO THREE YEARS.

UNDERSTANDING OF THE PROBLEM: RTD acknowledges the intense challenge of rebuilding powertrains of close to 1,000 revenue vehicles in a two-year period. The RTS II fleet of 940 vehicles, all purchased in a single year, required major engine overhaul in FY85 and FY86 to continue street operations. RTD planned for the occurrence, and is in the process of completing a rigorous overhaul program (expected completion date is 6/86).

ACTIONS IMPLEMENTED:

Action	Status	Impact
o FY84: Equipment Maintenance developed plans for a multi-year engine overhaul program using private sector production strategies.	100% Complete	RTD was prepared to meet the rebuild challenge. Approximately 10% of the fleet was rebuilt.

Action	Status	Impact
o FY85: RTD implemented a major in-house rebuild program for RTS II and other coach types.	64% Complete	RTD had substantial success in increasing production of engine rebuilds. Improved vehicle reliability in service.
o FY86: RTD continues the engine overhaul program.	75% Complete	Production continues at a high level and improvements continue in coach reliability.

ASSESSMENT: RTD has been fully responsive to the recommendation. The Equipment Maintenance Department has responded to the overhaul demands and successfully addressed needs in an efficient and effective manner. During the prior audit, the maintenance central shop (i.e., South Park) increased engine overhaul throughput from a production capacity of 6 engines per week to 48 engines per week using private sector line production techniques. This high level of throughput was maintained throughout the overhaul program -- and, notably, overall maintenance overtime was reduced 40 percent over the first major year of rebuild (i.e., FY85). All rebuild work has been conducted inhouse with District labor.

C. SUMMARY OF EVALUATION RESULTS

SCRTD has made substantial progress in addressing the FY83 audit recommendations. All nine prior audit recommendations have either been fully addressed or are currently being addressed. Specifically, the implementation of the TRANSMIS system has greatly improved the District's ability to gather information used to support management decision-making. Reductions in maintenance overtime, implementation of the Vehicle Management System and major in-house drive-train rebuild program, and modernization of the materials management system further demonstrate SCRTD's responsiveness to the FY83 audit recommendations. Estimated net cost savings related to the FY83

audit recommendations total $6.58 million in annual savings. The improved operator ratio and part-time driver utilization accounted for $4.3 million, reduced mechanic overtime added $1.4 million and parts warranty savings were $900,000.

Absenteeism continues to be an area of concern, and SCRTD is implementing a wide range of actions directed at management of absenteeism. It is premature to ascertain what impact these actions may have on absence frequency. Further analysis of operator and maintenance absenteeism and lost time is included in Sections VI and VII of this report.

IV. TPM/TDA DATA REVIEW

In July 1981, the Los Angeles County Transportation Commission (LACTC) adopted a Transit Performance Measurement (TPM) program requiring transit operators receiving funds through the Commission to collect and report eleven non-financial operating statistics. The statistics are reported by six service classifications on an annual basis, five of which apply to fixed-route service. From this extensive data base, LACTC calculates seven performance indicators which are used to evaluate operator performance. Los Angeles County transit systems complete and submit TPM reporting forms annually with their Short Range Transit Plans (SRTPs).

In addition to the TPM program, transit operators have to satisfy the reporting requirements of the State of California's Transportation Development Act (TDA). Among its provisions, TDA requires the submittal of five systemwide performance indicators. All but two of the statistics used in the computation of these indicators are included in the TPM program. The statistics used to derive the indicators for fixed-route operators like SCRTD are listed in Exhibit IV-1.

The Transit Performance Measurement (TPM) Program was created with the objective of developing a funding allocation mechanism to allow service distribution among operators and/or service classifications to improve the efficiency and effectiveness of transit operators in Los Angeles County. The program was initially adopted in January 1981, and must be reviewed and readopted every two years.

LACTC staff annually evaluates all Los Angeles County operators' performance based on seven indicators. In the January 1983 version of the program, standards are established for three of

EXHIBIT IV-1

TPM AND TDA DATA REVIEW

Data Item		Reviewed For: TPM(1)	TDA(2)
A.	Total Vehicle Miles	X	
B.	In-Service Vehicle Miles	X	X
C.	Total Vehicle Hours	X	
D.	In-Service Vehicle Hours	X	X
E.	Peak Vehicles	X	
F.	Unlinked Passengers	X	X
G.	Passenger Revenue	X	
H.	Auxiliary Revenue	X	
I.	Local Subsidies	X	
J.	Total Operating Cost		X
K.	Full-Time Equivalent Employees		X

(1) Data were reported by five (5) service classifications: Local - Demand-Based; Local - Policy-Based; Local Intra-Community; Express Multiple Stop and Express Few Stop.

(2) The five service classificationsare grouped into three general categories:

(a) Local Fixed Route - encompasses Local Demand-Based, Local Policy-Based and Local Intra-Community.

(b) Express Bus - comprised of Express Multiple Stop and Express Few Stop.

(c) Demand Responsive - Dial-A-Ride

these seven indicators by service class -- operating cost per vehicle service hour; the sum of operating revenues, local subsidies and auxiliary revenue divided by operating cost; and LACTC-distributed subsidies per unlinked passenger. An operator that fails to comply with one or more of these standards has, in the past, been calculated a penalty in the form of a potential reduction in future subsidies, up to a maximum of five percent of that operator's formula share of local subsidies under the Discretionary Funding program. However, the calculated penalty is waived when the operator documents cost efficiencies equal to or exceeding the penalty, in the following year. The penalty could also be waived by LACTC, if the commission preceives a valid public purpose in the action. Consequently, the penalty, if applied, occurs two years after the year of violation.

The first year of transit performance evaluation was FY82, based on data reported for FY81. RTD has been determined to merit penalties in FY85 and FY86 based on performance in FY82 and FY83, respectively. The FY86 penalty was due to cost increases greater than the CPI (as defined by LACTC) in the Local and Express service categories.

TPM program guidelines were revised, as required, a second time in 1985 to include bonuses rather than penalties. In FY 1985, the first year in which the revised guidelines will be applied to data, RTD achieved three of the four applicable TPM standards. In fact RTD achieved three of four standards for allocation years FY85 and FY86.

A. OBJECTIVES AND SCOPE OF THE DATA REVIEW

The purposes of this data review are: (1) to verify the accuracy and reliability of the operator's reported TPM and TDA statistics and (2) to evaluate the five performance indicators required by the California Public Utilities Code. More specifically, the objectives are to:

- Document how data are collected, stored and reported
- Verify data collection and reporting procedures
- Identify potential procedural problems and recommend improvements
- Identify key trends in operator's systemwide performance

This section consists of two parts as follows:

- TPM and TDA Data Collection and Review - which is comprised of the procedure for collecting and documenting TPM and TDA information and the verification of each of the eleven statistics
- TDA Indicator Analysis - reviews the trends of TDA indicators over a seven year time frame

To facilitate an analysis of the data collection procedures, Exhibit IV-2 presents the definitions of the statistics used to calculate TPM/TDA indicators. In the text which follows, the RTD data collection processes are described and illustrated with flowcharts. The flowchart legend is presented in Exhibit IV-3.

It should be recognized here that the TPM/TDA performance monitoring program has evolved over a number of years. The data collection procedures have similarly been updated and enhanced by the District to meet the changing state and local requirements. It is further emphasized here that this chapter is not intended to evaluate LACTC's TPM program. The TPM program itself is under review locally.

B. TPM AND TDA DATA REVIEW

The purpose of this section is to verify the accuracy and reliability of SCRTD's reported TPM and TDA statistics. This section is organized to correspond to the sequence in which these statistics are reported on the TPM forms. It is important to note that all TPM statistics reflect weekday data alone by

TPM AND TDA DATA ELEMENT DEFINITIONS

		LACTC Definitions of Data Reporting Terminology[1]	TDA Performance Measure Definitions[2]
A.	Total Vehicle Miles	The total distance traveled by revenue vehicles, including both revenue miles and deadhead miles.	NA
B.	In-Service Vehicle Miles	Total miles traveled by revenue vehicle while in revenue service. Excludes miles traveled to and from storage facilities and other deadhead travel. Same as revenue vehicle miles.	Vehicle Service Miles means total number of miles that each vehicle is in revenue service.
C.	Total Vehicle Hours	The total hours of travel by revenue vehicles including scheduled hours consumed in passenger service and deadhead travel.	NA
D.	In-Service Vehicle Hours	The total number of schedule hours that a vehicle is in revenue service. Excludes hours consumed while traveling to and from storage facilities and during other deadhead travel.	Vehicle Service Hours means total number of hours that each transit vehicle isin revenue service, including layover.
E.	Peak Vehicles	Maximum number of individual revenue vehicles assigned to service during any one period of time.	NA
F.	Unlinked Passengers	The number of passengers who board public transportation vehicles. Passengers are counted each time they board a vehicle even though it may be on the same journey from origin to destination.	Total Passengers means the number of boarding passengers whether revenue producing or not, carried by the public transportation system.

TPM AND TDA DATA ELEMENT DEFINITIONS

	LACTC Definitions of Data Reporting Terminology[1]	TDA Performance Measure Definitions[2]
G. Passenger Revenue	a. Revenue earned from carrying passengers along regularly scheduled routes. Includes base fare, zone and express premiums, extra cost transfers, and park-and-ride revenue. b. Special transit fares: Revenues earned from subsidies received from agencies or organizations outside the City or agency providing transit service for: 1. Rides given in regular service but paid for by organization other than rider 2. Rides given along special routes for which revenue may be guaranteed Not general fare assistance. Special tarnsit fares must be apaplied to specific TPM service classifications.	NA
H. Auxiliary Revenue	Revenues earned from operations closely associated with transportation operations (e.g., advertising, station and vehicle concessions).	NA
I. Local Subsidies	Includes general operating assistance, local special fare assistance and other local sources.	
J. Operating Cost	Same as TDA.	All costs in operating expense object classes exclusive of depreciation and amortization and exclusive of all direct costs for providing charter service.

TPM AND TDA DATA ELEMENT DEFINITIONS

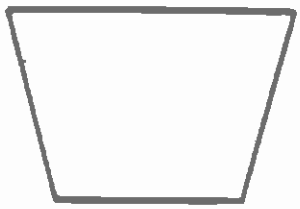
	LACTC Definitions of Data Reporting Terminology[1]	TDA Performance Measure Definitions[2]
K. Full-Time Equivalent Employees	NA	Number of employees employed in connection with the public transportation system, based on the assumption that 2,000 person-hours of work in one year constitute one employee.

NA Not Applicable

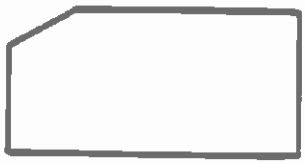
1 Technical Advisory Committee, Short Range Transit Plan Guidelines, October 10, 1981.

2 State of California, Public Utilities Code, Section 99247, Performance Measure Definitions, 1981.

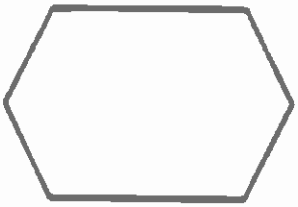
EXHIBIT IV-3
FLOWCHART LEGEND



MANUAL OPERATION

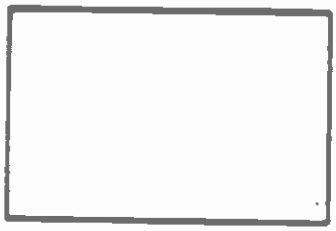


PUNCHED CARD

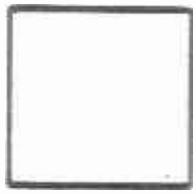


PREPARATION

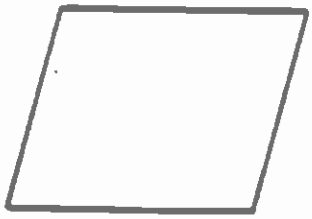
MANUAL INPUT



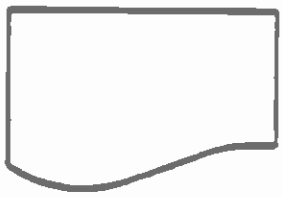
PROCESS



AUXILIARY OPERATION



INPUT/OUTPUT



DOCUMENT

definition. Conversely, the TDA statistics encompass all service periods, including weekends. The two statistics are neither interchangable nor comparable.

To enable an audit of the eleven statistics, it is essential to understand how SCRTD defined, collected, stored and reported these statistics. These activities are shared by three departments within RTD: Scheduling, Service Analysis Section and Planning. The Planning Department was primarily responsible for the preparation and compilation of TPM and TDA statistics. The Scheduling and Service analysis Sections contributed to the line-specific data. To obtain information for this data review, interviews were conducted with the personnel of these departments and in-house and published reports were reviewed. A list of documents and personnel interviewed is presented as Appendix A.

Statistics must be reported for each of the five fixed-route service classifications, as required by the TPM program. SCRTD operated a number of lines in each of the following five categories:

- Local Demand-Based Headways
- Local Policy-Based Headways
- Local Intra-Community
- Express Multiple Local Stops
- Express Few Local Stops

1. Total Vehicle Miles

a. TPM Collection Procedure

TPM reporting forms show the number of total, weekday, Saturday and Sunday vehicle miles by service class. The miles were the sum of individual line mile statistics. The line statistics represented a predetermined number of revenue and non-revenue

miles, based on measured distances. To calculate vehicle miles, RTD aggregated the number of miles operated on a day that a ride check was performed on a particular line. The statistics were then expanded to annual values.

The primary source for scheduled line mileage and other statistics was the Scheduled Service Operating Cost Factors by Line -- the 4-24 Report. For each service period, the Scheduling Department prepared this document. It identified each line's equipment requirements by: A.M. rush; day base; P.M. rush and Owl. It offers the interlining savings for both A.M. and P.M. Total and revenue vehicle hours and miles were also listed.

The 4-24 Report aids in the development of the Line Performance Trend data files (LPT). The Service Analysis Section selected 4-24 Report data and merged it with other data information -- specifically, the ride checks -- and created the LPT data files. The Planning Department then assumed the responsibility of developing assumptions and methods for converting the daily statistics into annual figures. The department also completed the TPM reporting forms and along with SCRTD's SRTP, submitted them to LACTC.

The detailed process by which total vehicle miles, hours and peak vehicles were determined, follows in Exhibit IV-4. This process is currently being utilized by SCRTD. With one exception, the process remains unchanged since the previous audit of 1982. The Herman File is no longer an output file; it has been eliminated.

The Scheduling Department was responsible for steps 1 through 5A. The key scheduling source was the Basic Operating Schedule (BOS) (Exhibit IV-5). This schedule, combined with the Trip Pattern File, produces total scheduled vehicle miles and places them, along with the revenue and non-revenue components, onto a Miles

EXHIBIT IV-4
SCRTD DATA REVIEW

TOTAL VEHICLE MILES, TOTAL VEHICLE HOURS, AND PEAK VEHICLES

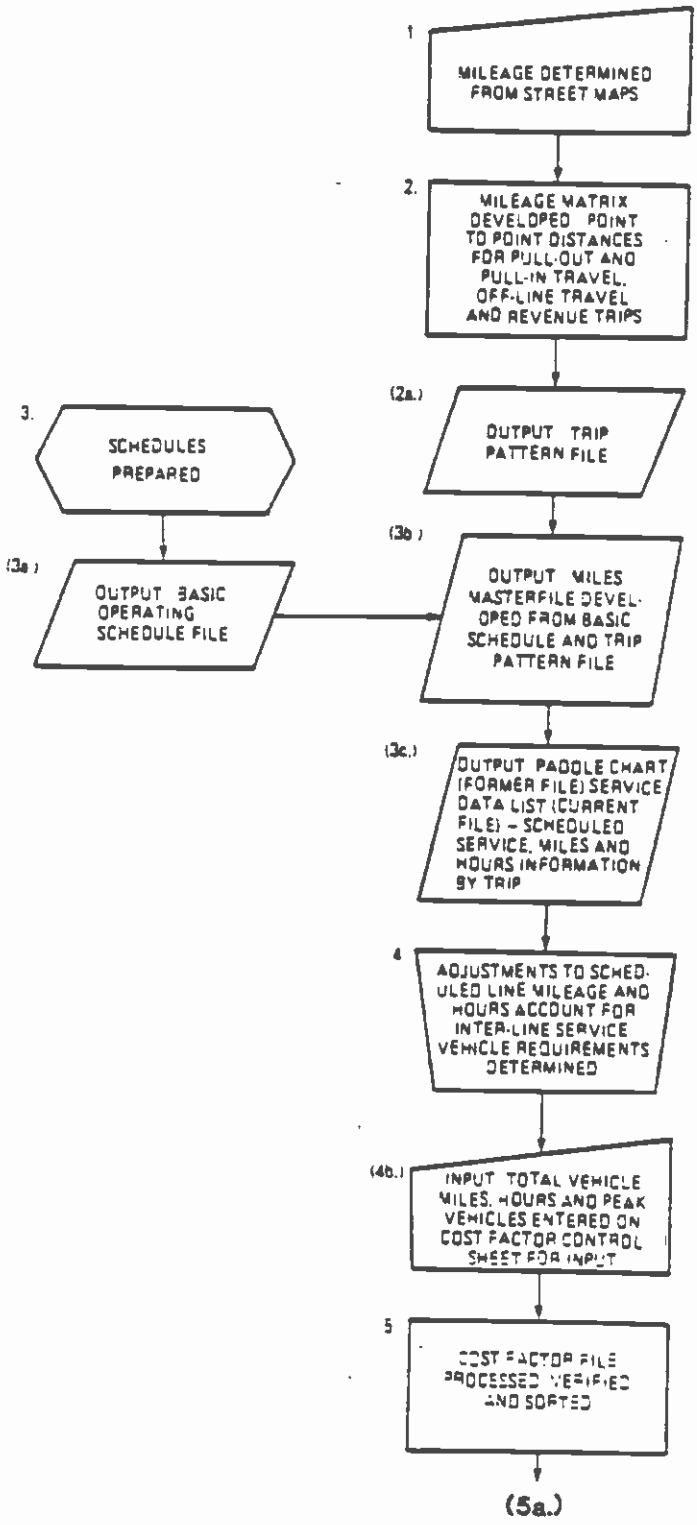
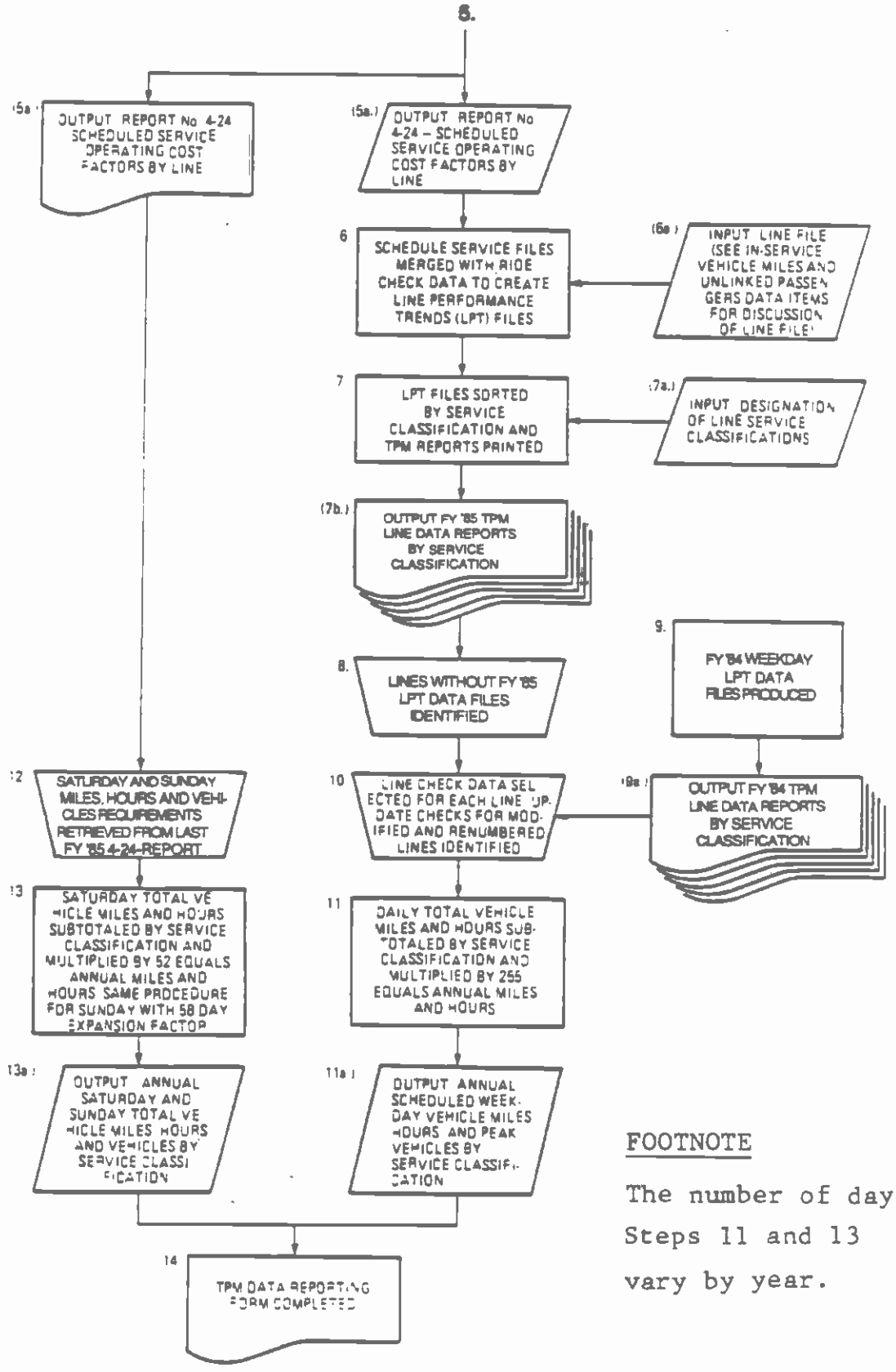


EXHIBIT IV-4
SCRTD DATA REVIEW

TOTAL VEHICLE MILES, TOTAL VEHICLE HOURS, AND PEAK VEHICLES (Continued)



FOOTNOTE

The number of days in Steps 11 and 13 vary by year.

EXHIBIT IV-5

SCHED. - 84 REV 2/85 — SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT — BASIC OPERATING SCHEDULE

FILE DATE 6-20-85 (HOD) — LINE 200 ALVARADO ST — DAILY EXCEPT SATURDAY & SUNDAY — SCHEDULE NUMBER 85092 IN EFFECT 06-30-85 — NORTHBOUND 01 — P. 2 — 01 02

CARD NO.	BUS RUN	PULL OUT TIME	BLOCK	RTE	FIGUEROA KING BLVD	JEFFERSON HUDSON VER	ALVARADO & PICO	ALVARADO & 6TH	HONDURAS LIBERTY	NEXT VEHICLE MOVEMENT LOCATION	TIME AVG.	TIME PULL IN	
													01 03 04 05 06 07
						6	11	8	10				
1440	2		K	200	839	845	855	903	913			925	
1460	3		K	200	850	856	905	913	923			935	
1461						6	9	8	10				
1500	4			200	900	906	915	923	933			945	
1520	5			200	910	916	925	933	943			955	
1540	6			200	920	926	935	943	953			1005	
1560	7			200	930	936	945	953	1003			1015	
1566	8			200	940	946	955	1003	1013			1025	
1580	9			200	950	956	1005	1013	1023			1035	
1600	1			200	1000	1006	1015	1023	1033			1045	
1620	2			200	1010	1016	1025	1033	1043			1055	
1640	3			200	1020	1026	1035	1043	1053			1105	
1654	4			200	1030	1036	1045	1053	1103			1115	
1660	5			200	1040	1046	1055	1103	1113			1125	
1680	6			200	1050	1056	1105	1113	1123			1135	
1700	7			200	1100	1106	1115	1123	1133			1145	
1720	8			200	1110	1116	1125	1133	1143			1155	
1740	9			200	1120	1126	1135	1143	1153			1205	
1745	1			200	1130	1136	1145	1153	1203			1215	
1760	2			200	1140	1146	1155	1203	1213			1225	
1780	3			200	1150	1156	1205	1213	1223			1235	
1800	4			200	1200	1206	1215	1223	1233			1245	

K - USE RADIO CHANNEL 5

08

Master File. Interlining was then accounted for. The worksheet adjustments for interlining were the Cost Factor Control Sheets which provided the necessary input for the computer preparation of the 4-24 Report. A sample page of a 4-24 Report is shown as Exhibit IV-6.

The remaining activities were specifically performed for satisfying TPM reporting requirements. Steps six, seven and nine were carried out by the Service Analysis Section. Weekday scheduled service statistics were merged with other data items obtained through the ride checks. The product of this merger was the LPT, which were sorted by service classification to produce TPM data reports.

In steps eight and ten through 14, the Planning Department assumed processing responsibilities. Lines without current fiscal year LPT data files were identified and updated. The lines were aggregated by LACTC classifications and the statistics were reported for each classification. These values were then annualized and the TPM data was recorded.

b. Analysis and Verification

Prior to FY 1985, SCRTD's TPM procedure did not follow the LACTC definition of Total Vehicle Miles. The previous procedures used scheduled revenue service data as opposed to actual revenue service data; the latter is required by LACTC (as well as UMTA Section 15 and the State Controller's Report). In FY 1985, RTD began to use actual data in constructing the TPM reports. Because SCRTD used scheduled rather than actual data, the statistics were initially overstated, albeit by a small margin. After complying with the LACTC definitions, RTD recalculated FY 1983-85 statistics to adhere to the definition and resubmitted the FY83 and FY84 numbers to LACTC. Also, as the District's computer capabilities improve, it is anticipated that additional adjustments in service, such as missed trips or bus failures

EXHIBIT IV-6

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

REPORT NO. 4-24

SCHEDULED SERVICE OPERATING COST FACTORS

EFFECTIVE: JUNE 30, 1985

DAILY EXCEPT SATURDAY AND SUNDAY

SCHOOL HOLIDAY, NON-RACE, NON-BOWL SCHEDULES

LINE	DIVISION	- GROSS EQUIPMENT REQUIREMENTS - AM RUSH	DAY BASE	PM RUSH	OWL	INTERLINE SAVINGS AM	PM	-VEHICLE HOURS- TOTAL	REVENUE	-VEHICLE MILES- TOTAL	REVENUE
1	7	21	15	24	4			348.8	335.0	3361.2	3129.8
2	7	31	17	26				356.5	328.2	4363.4	3803.9
4	6 7	37	31	37	3	2		567.2	534.6	6504.1	5792.6
10	7	22	15	25	1	2	2	282.8	267.5	2721.7	2481.3
14	2 7	31	17	33	1		1	370.8	347.9	4357.6	3892.3
16	1	20	14	24			1	262.8	238.3	2389.2	2076.1
18	1	26	17	29	1			321.5	301.0	3740.4	3364.1
20	2 6 7	73	57	75	3		1	911.2	866.7	9730.3	8987.6
26	1	12	9	14	1			175.4	167.5	1630.1	1441.6
28	7 10	40	20	37		4		395.1	365.5	4774.0	4087.6
30	1	39	25	40	2			467.4	437.4	5186.8	4439.8
33	6 10	39	19	36		10	7	408.4	383.4	5356.7	4776.1
38	10	16	9	13	1			184.6	173.4	2009.1	1674.7
40	5	43	26	44	2		3	492.1	441.4	5726.1	4690.7
42	5	8	6	9				123.2	112.7	1796.6	1520.9
45	2	29	17	30	1		1	342.8	311.7	4187.4	3363.8
48	2	8	5	11				116.7	109.9	1234.8	1052.7
51	2 18	23	13	26	1			290.9	269.1	3351.4	2914.6
53	18	16	11	19	1			231.2	222.7	2644.4	2446.3
55	10 12	18	12	19	2		1	238.6	222.0	3233.4	2781.7
56	10 18	11	6	13				148.9	141.8	1973.6	1799.9
60	10 12	48	21	48	1	1		524.5	463.3	7070.5	5654.3
65	1	8	5	7				89.3	84.9	1115.6	1036.8
66	2	23	9	20		3		215.9	198.9	2615.4	2215.7
68	10	21	15	23				274.9	257.9	3277.5	2835.6
70	9	27	16	29	2		2	334.9	306.9	4071.3	3466.4
76	9	14	10	15	1			185.1	172.1	2398.0	2114.6
78	9	24	13	28		1		278.0	245.3	4118.9	3291.6
81	3 18	23	13	27				300.1	285.2	3789.5	3423.2
83	3	17	11	19	2			205.1	191.9	2405.9	2123.9
84	3	11	7	13	1		2	145.6	137.6	1668.3	1478.5
90	15	15	6	18		2	2	143.8	127.9	2323.1	1887.4
92	15	19	12	21			1	220.3	209.3	3156.3	2835.6
94	15	22	12	23		4		263.4	241.0	4322.5	3632.9
96	15	14	7	15			1	158.9	143.1	2669.9	2273.2

enroute, will be included within the reported TPM and TDA operational data. This is a timely improvement given that non-financial UMTA Section 15 data is to undergo audit annually from this point forward.

Fare survey checks were done more frequently during FY 1983-85, which allowed adjustments for seasonality and operating changes. The fare surveys were done quarterly, with the following exceptions: in FY 1983, there was no third quarter survey and in FY 1984, there was no second quarter survey. Source documents were updated periodically, whenever significant service changes were introduced. (For example, 4-24 reports for FY 1984 and 1985 were produced for service changes effective on 6/17/84, 9/9/84, 12/25/84 and 4/14/85).

The annual weekday vehicle miles, for a sample of lines, were calculated to assess the impact of RTD's procedure for collecting total vehicle miles. The verification process was as follows:

1) Select a 10% sample of lines, by service classification.

2) Retrieve the daily vehicle mile statistics and multiply by 255 to obtain TPM procedure results.

3) Retrieve daily vehicle mile statistics for sample lines, from 4-24 reports for each service period in Fiscal Year 1985. Multiply by the appropriate number of weekdays, Saturdays and Sundays.

4) Divide sample total vehicle miles by classification total vehicle miles to gain the percentage difference.

5) Divide that percentage into the results of step 3.

6) Compare the results of the two procedures (Step 2 with Step 5).

The results of this verification are presented in Exhibit IV-7.

EXHIBIT IV-7

VERIFICATION OF TOTAL VEHICLE MILES

Service Classification	Number of lines in Sample	Vehicle Miles in Sample/ Vehicle Miles in Classification	Annual Weekday Total Vehicle Miles		
			TPM Procedure	Verification Procedure(1)	Difference
Local Demand	7	12%	5,417,679	5,372,640	-45,039 -0.83
Local Policy	4	17%	1,143,930	1,410,830	266,900 23.33
Local Community	2	58%	282,183	280,720	-1,463 -0.52
Express Multi Stop	4	15%	2,340,645	2,339,700	-945 -0.04
Express Few Stop	2	41%	743,529	746,200	2,671 0.36

(1) TPM statistics used were for fiscal year 1986 and were estimates. The TPM procedure statistics were from November 11, 1985 data which required the use of SRTP estimates of 1986 statistics.

As shown, the two procedures yield significantly different annual statistics for one service classification, Local Policy. This difference may primarily be due to the sampling procedure. The sample of only four lines may or may not be representative of the entire service classification. For all other service classifications though, two procedures yielded similar results for all practical purposes. Overall, it is concluded that the District uses consistent procedures and definitions for this statistic.

2. In-Service Vehicle Miles

a. TPM Collection Procedure

The number of in-service vehicle miles were the sum of individual line in-service mileage statistics. Weekday in-service miles were derived from ride check data which were performed by a checker traveling on board all bus trips scheduled for that line on a single day. The check recorded every time-point location served by the bus as well as several other factors. Actual miles traveled were calculated with the use of a mileage matrix. The Service Analysis Section processed this information and constructed Line Files. LPT data files were the product of Line Files and scheduled service statistics matched to the date of the ridecheck. The Planning Department then manually compiled in-service mileage reports for the TPM forms with the use of computer generated line data reports. Saturday and Sunday statistics were directly obtained from 4-24 Reports. The process for determining In-Service Vehicle Miles is presented in Exhibit IV-8.

b. TDA Collection Procedure

Based on the statistics provided in 4-24 Reports, the line statistics represent scheduled revenue miles expanded to annual values and a weighted daily average revenue hour value was computed for each line. The Planning Department then divided the

EXHIBIT IV-8
SCRTD DATA REVIEW

IN-SERVICE VEHICLE MILES

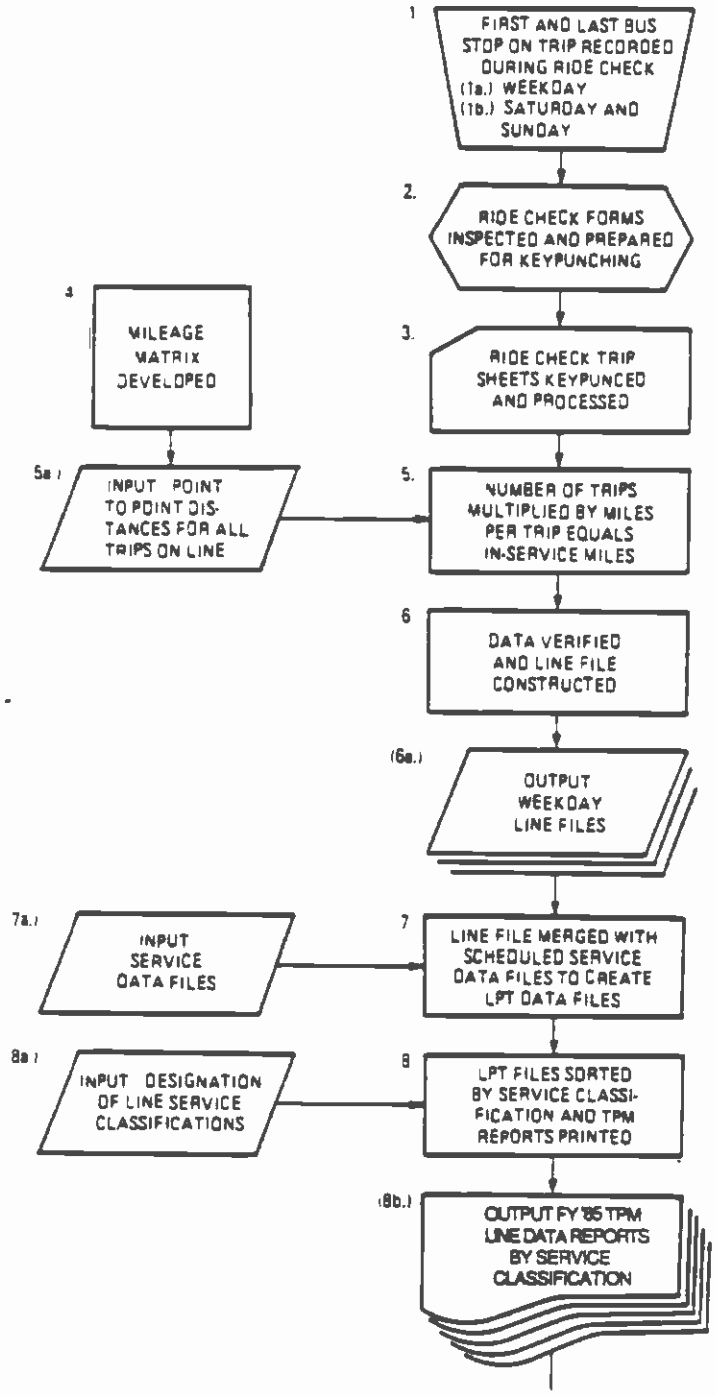
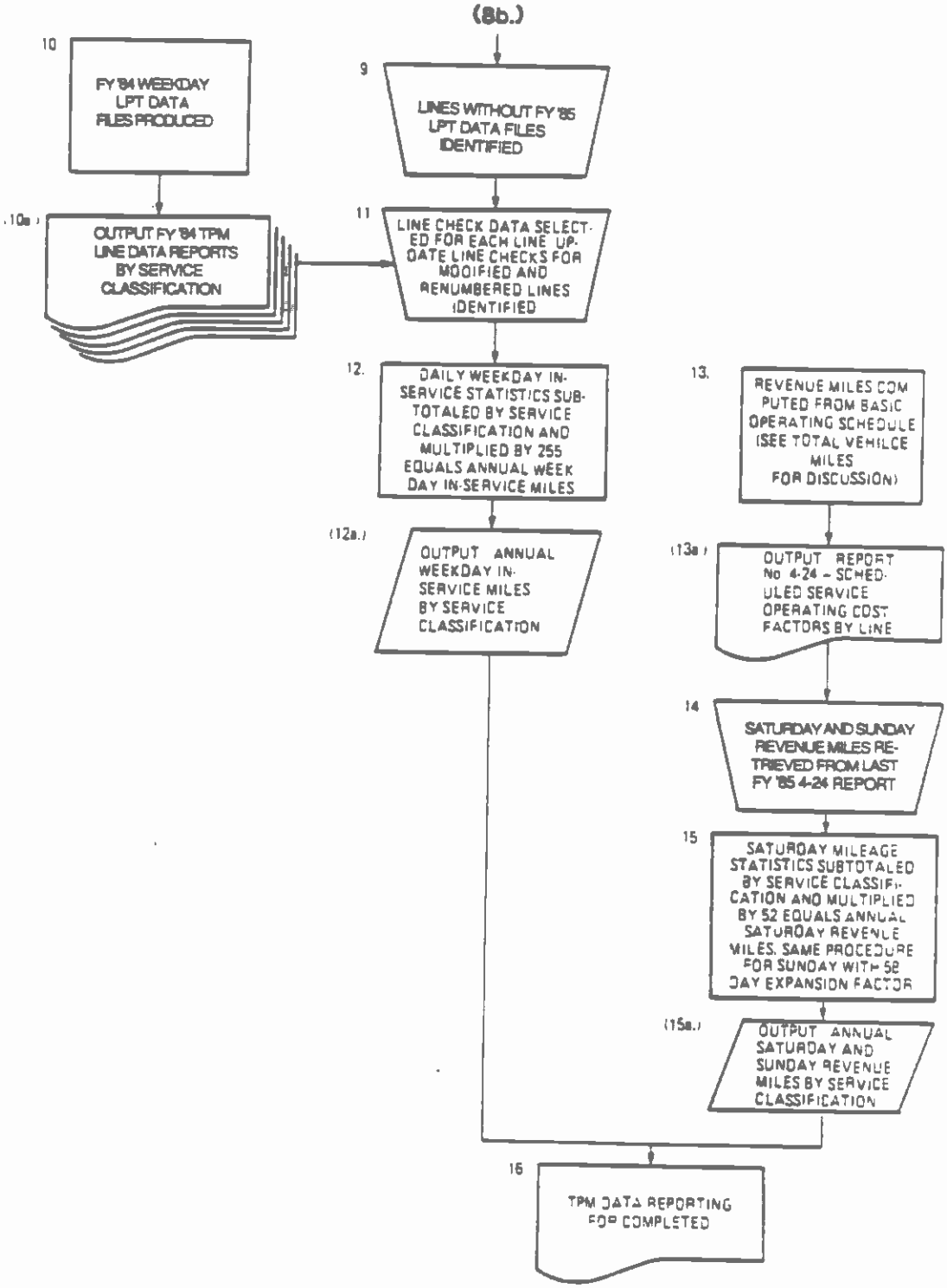


EXHIBIT IV-8
SCRTD DATA REVIEW

IN-SERVICE VEHICLE MILES
(Continued)



FOOTNOTE

The number of days in Steps 12 and 15 vary by year.

lines into local and express classifications. A ratio of local to express mileage was computed and applied to derive annual systemwide statistics to estimate local and express revenue miles.

c. Analysis and Verification

The definitions offered by TPM and TDA were very similar but SCRTD collected and processed data using two different methods. TPM data reflects the expansion of actual daily in-service data as recorded by a ride checker to annual values. A continuing concern is that some line mileage may have been missed due to interline operations.

The TDA mileage method involved expanding scheduled daily revenue miles to annual values. Revenue miles, as reported on the 4-24 Report included within line deadhead mileage. By TDA definition, all deadhead travel should be excluded.

To ensure consistency among the reported statistics in terms of both allocation to classification and total miles, a single method for collection and processing should be employed.

3. Total Vehicle Hours

a. TPM Collection Procedure

The number of total weekday vehicle hours was the summation of individual line time statistics. The line statistics represent a predetermined number of revenue and non-revenue hours that were scheduled for the day a ride check was conducted on the particular line. The statistics were then expanded to an annual value. The key source for scheduled vehicle hour statistics is the 4-24 Report, produced by the Scheduling Department. This process of documenting total vehicle hours was the same as that discussed in subsection 1. Total Vehicle Miles. The Service Analysis Section

produced TPM line data reports by service classification from the 4-24 Reports and statistics from its Line File. The Planning Department annualized the daily statistics and recorded them on the TPM report forms. The Saturday and Sunday vehicle hour statistics were factored to annual values using the appropriate number of Saturdays, Sundays and holidays. This process is depicted in Exhibit IV-4 in the prior subsection.

b. Analysis and Verification

As previously mentioned in subsection 1. Total Vehicle Miles, prior to FY 1985, the TPM procedure did not account for unscheduled operating changes which occur everyday. However, beginning with FY 1985, the actual service was being utilized rather than scheduled service. The seasonality adjustments were also the same as those in Total Vehicle Miles, where data was compiled from updated documents dependent upon service changes and the increased frequency of ride checks.

4. In-Service Vehicle Hours

a. TPM Collection Procedure

In-service hours reported for the TPM program were based on actual vehicle hours for weekdays only as opposed to scheduled vehicle hours.

b. TDA Collection Procedure

Individual line hour statistics were the basis for the number of revenue hours reported for TDA purposes. The line statistics present scheduled revenue hours, which were recorded on the 4-24 Report, expanded to annual values. A weighted daily average revenue hours value was computed for each line. Systemwide revenue hours were the summation of annual weekday, Saturday and Sunday statistics factored from the average daily values. This

process is continued under subsection 2. In-Service Vehicle Miles, where a ratio was applied to total systemwide revenue hours to estimate local and express revenue hours.

c. Analysis and Verification

TPM in-service vehicle hours were based on actual revenue hours. As previously stated, actual revenue hours accounted for operating changes and seasonality adjustments whereas scheduled revenue hours, which were the values used in the prior audit, did not. SCRTD now complies with the LACTC definition of in-service vehicle hours.

The differences in using scheduled as opposed to actual in-service hours, by classification, is depicted in Exhibit IV-9. By using scheduled hours, actual operating experiences for the entire system would have been overstated by 7.4 percent or more than 500,000 annual hours. Due to the use of scheduled hours, FY 1983 and FY 1984 vehicle service hours were both initially overstated by 7.2 percent. After complying with the LACTC definition in FY85, RTD recalculated FY 1983-85 statistics to be in accordance with the definition. It is anticipated that in the future, additional adjustments in service (e.g., missed trips and enroute bus failures) will be included within the TPM and TDA operational data.

5. Peak Vehicles

a. TPM Collection Procedure

The number of peak vehicles were the summation of individual line equipment requirements. Vehicle requirements were manually determined from scheduled bus run information and incorporated into the 4-24 Report. This vehicle count identified the number of buses required to operate an individual line's service by a particular time period -- A.M. peak, day base, P.M. peak and owl

EXHIBIT IV-9

TOTAL SCHEDULED VEHICLE HOURS VERSUS ACTUAL VEHICLE HOURS

	Total Scheduled Vehicle Hours	Total Actual In-Service Vehicle Hours	Difference	Percent Change
Local Demand	5,204,000	4,880,000	324,000	6.2%
Local Policy	891,000	829,000	62,000	7.0%
Local Community	65,000	58,000	7,000	10.8%
Express Multi-Stop	1,157,000	1,030,000	127,000	11.0%
Express Few Stop	101,000	74,000	27,000	26.7%
Total	7,418,000	6,871,000	547,000	7.4%

service. These statistics were reported as Gross Equipment. Interlining savings were also reported on the 4-24 Report. These savings were those realized by operating some trips on two or more lines with one vehicle.

Gross peak vehicle requirements were processed into the 4-24 Report and TPM line data reports. These line statistics were subtotaled and recorded in the TPM reporting form by the Planning Department. Exhibit IV-4 presents the process on documenting peak vehicles.

b. Analysis and Verification

Two basic problems arise with the data reported the TPM reports. First, the TPM procedure did not follow the LACTC definition of peak vehicles. Values were reported on an annualized average basis because they were considered to be a more representative value than peak day vehicle requirements requested under the TPM definition. Second, the determination of peak vehicle needs was not done for a specific point in time. Rather, peak vehicles were estimated on an annual basis dependent upon the estimated level of service. Many scheduling changes may occur during the year, which may go unnoticed by this procedure.

6. Unlinked Passengers

a. TPM Collection Procedure

Unlinked passengers were counted as total boardings apportioned among the six service classes. For the TPM form, they were the sum of annual boardings estimated for individual lines. The process for developing passenger statistics is presented as Exhibit IV-10.

EXHIBIT IV-10
SCRTD DATA REVIEW

UNLINKED PASSENGERS

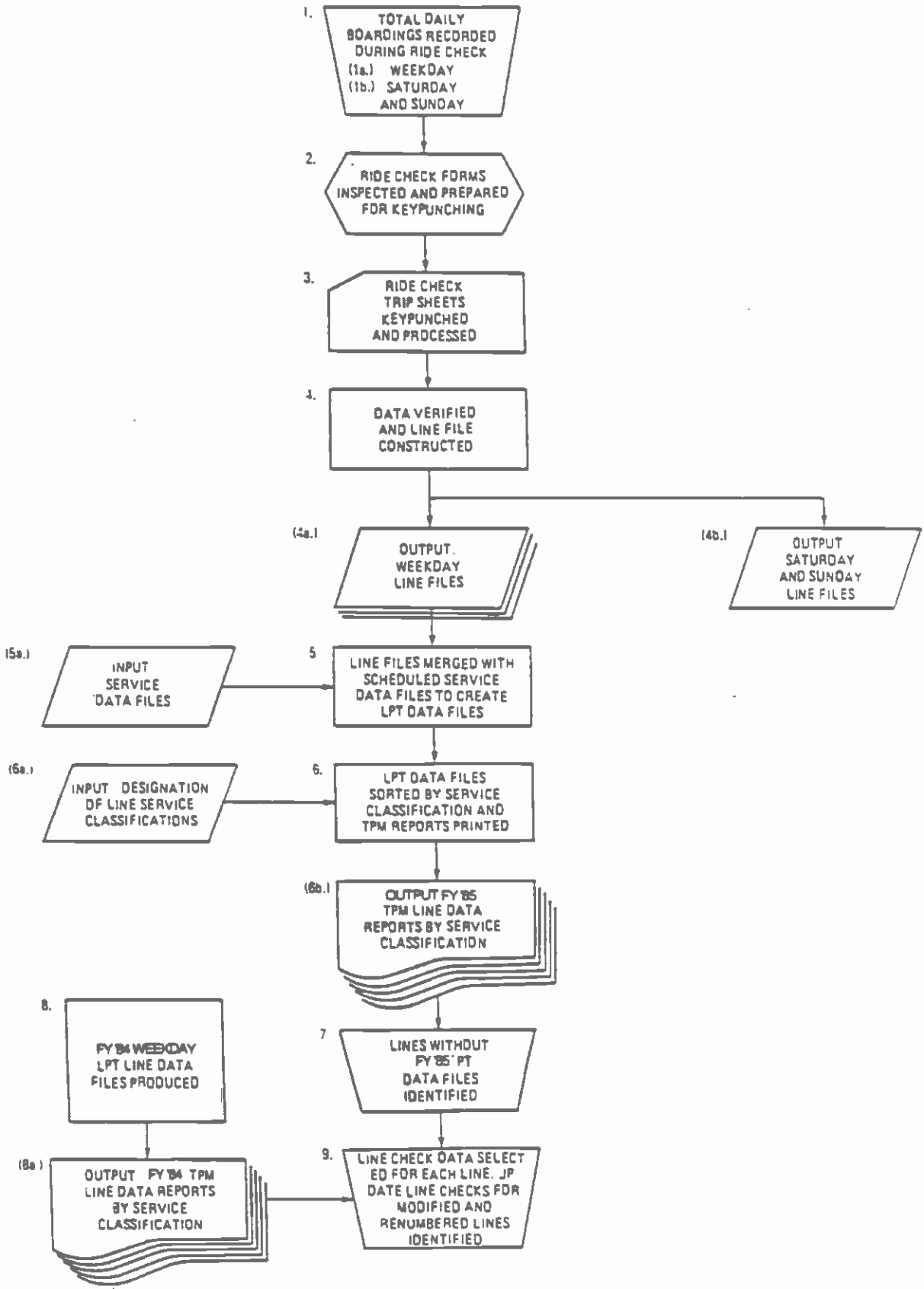
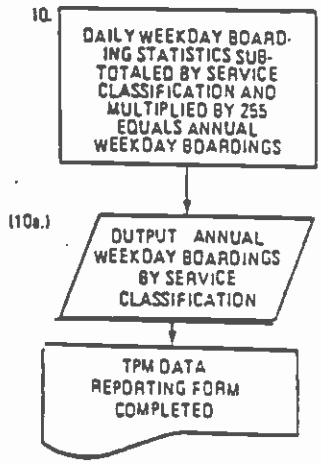


EXHIBIT IV-10
SCRTD DATA REVIEW

UNLINKED PASSENGERS
(Continued)



FOOTNOTE

The number of days in Step 10 varies by year.

Total boardings were recorded by the ride checkers on all scheduled trips for a particular day. A sample ride check form follows as Exhibit IV-11.

Passenger alightings were also recorded on the ride check form. The balance between total passengers and alightings was determined to account for the accuracy of the recorded data. A data technician in the Service Analysis Section must verify that all check sheets were returned for all scheduled trips. The weekly passenger boarding data were processed into Line Files which were processed into LPT files (previously presented in subsections 1. Total Vehicle Miles and 2. In-Service Vehicle Miles). The Planning Department processed the TPM data files (refer to subsections 1. Total Vehicle Miles and 2. In-Service Vehicle Miles) and completed TPM reporting forms.

b. TDA Collection Procedure

Passenger boardings were retrieved from systemwide ridership estimates, based on fare surveys and an in-house patronage model. Ridership was apportioned to local and express service on the basis of ratios developed from TPM ridership levels.

c. Analysis and Verification

Ride checks provided the raw line-specific weekday ridership data which were expanded to annual values. Several problems were evident in the prior audit of 1982 such as the timeliness of the data base; the ride check's inability to distinguish among day and seasonal variations in ridership levels; and the calculation of Saturday and Sunday ridership statistics. Changes in procedure in 1983 greatly reduced the significance of these problems. The age of the ride-check data has been decreased. Currently the average age of weekday line ride-checks is less than one year; down from approximately 18-20 months during 1982. The average age of weekend ride-checks has been reduced to just

EXHIBIT IV-11

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT
RIDING CHECK - TIME, FARES, AND PASSENGERS

PRINTED 851009 — PAGE 01 OF

LINE	SCHEDULE	DIRECTION	CARD NO.	SERVICE	DAY	YR MON DAY	RUN	VEHICLE
200	85193	03 SOUTHBOUND	NOV 4 1985 0000		FRI	85/11/01	05	7499

OBSERVER: A. RANGEL — WEATHER: CL (CL=CLEAR, CY=CLOUDY, RA=RAIN, FG=FOG) — SEATS: 51

CONTROL TIME — BASIC CCL — NARROW FARE 86X0

STOP	DEP DIV / DEP TERM STOPS	ARR TERM / ARR DIV	SCHED. TIME	ACTUAL TIME	BOARDING	ALIGHTING	ON BUS	CASH REG 0.85	CASH SENR 0.40	SENIOR PASS	STUDENT PASS	PASS & FREE	TRANSFER RECD	TICK/TOK RECD	ADDL REV TRANSFER 0.10
0010	MONTANA	LIBERTY	03	12543	10		10	2		3	1	3	1		1
0020	ALVARADO	SUNSET			16		26			5	1	2	8		2
0030	ALVARADO	SANTA YNEZ													
0040	ALVARADO	CLINTON													
0050	ALVARADO	HWO FWY			1		27	1							
0060	ALVARADO	TEMPLE			3	3	27	1				2			
0070	ALVARADO	BEVERLY	07	018	8	3	32			3		1	4		3
0080	ALVARADO	VALLEY													
0090	ALVARADO	3RD ST		OK	14	2	44	2		2	2	3	5		4
0100	ALVARADO	MARYLAND			2	1	45	1		1					
0110	ALVARADO	6TH ST	11	058	9	5	49			1	3	3	2		2
0120	ALVARADO	WILSHIRE			8	8	49		1	5		2			1
0130	ALVARADO	7TH ST			9	13	45	2		1	1	4	1		
0140	ALVARADO	8TH ST		7	6	4	47	2		4					2
0150	ALVARADO	9TH ST			1	4	44	1							1
0160	ALVARADO	OLYMPIC			2	7	39			1		1			
0170	ALVARADO	11TH ST			2	4	28					3			
0180	ALVARADO	12TH ST				2	31								
0190	ALVARADO	PICO	15	13	3	11	28						3		
0200	ALVARADO	HOOVER				2	26								
0210	HOOVER	VENICE			1	7	20						1		
0220	HOOVER	18TH ST													
0230	HOOVER	WASHINGTON			2	2	20			1		1			
0240	HOOVER	SM FRWY				3	17								
0250	HOOVER	24TH ST		7	1	3	15			1					
0260	HOOVER	ADAMS													
0270	HOOVER	28TH ST													
0280	HOOVER	30TH ST				2	13								
0290	HOOVER	32ND ST													
0300	JEFFERSON	HOOVER				1	12								
0310	JEFFERSON	ROYAL													
0320	FIGUEROA	JEFFERSON				3	9								
0330	FIGUEROA	35TH ST				1	8								
0340	FIGUEROA	EXPOSITION													
0350	FIGUEROA	STATE													
0360	FIGUEROA	39TH ST				2	6								
0370	M L KING	FIGUEROA	19	27		6	0								
0380	FLOWER	40TH PL													
	SUB-TOTAL														
	GRAND-TOTAL														

R/T: - 2? MINS. — NORMAL OPERATION.

over one year; down from approximately 24 months during 1982. RTD also now calculates Saturday and Sunday ridership levels in the same manner as weekday levels, which provides more consistent ridership values.

In an attempt to provide systemwide unlinked boarding estimates consistent with the TDA estimate, a procedure has been developed (and used to report FY 1983-84 and FY 1984-85 TPM unlinked boardings) which identifies the proportions of boardings between the six TPM service classes. The proportions are then calibrated to the systemwide TDA estimate. Given the improved (decreased) age of the ride-check data (previously mentioned), an improvement in the accuracy of the TPM estimate has been achieved by service class, while maintaining consistency with the TDA systemwide estimate. As opposed to the 1982 Audit finding, which found a difference between the reported TPM and TDA unlinked passenger estimate, TPM and TDA systemwide estimates of unlinked boardings are consistent beginning in FY 1983-84.

7. Passenger Revenue

a. TPM Collection Procedure

Passenger revenue statistics were the sum of revenues attributed to individual lines. The primary source for the computation of line-specific revenues was the ride check data sheets and the cash equivalent of fares. Exhibit IV-12 presents the process for determining and documenting passenger revenue. Once the passenger revenue statistics were extracted the methodology for processing the statistics followed the procedure outlined under subsection 6. Unlinked Passengers.

The Scheduling Department collected and prepared the ride check forms for the Service Analysis Section. Ride checkers record the fare paid by each patron, as shown by the sample ride check form

EXHIBIT IV-12
SCRTD DATA REVIEW

PASSENGER REVENUE

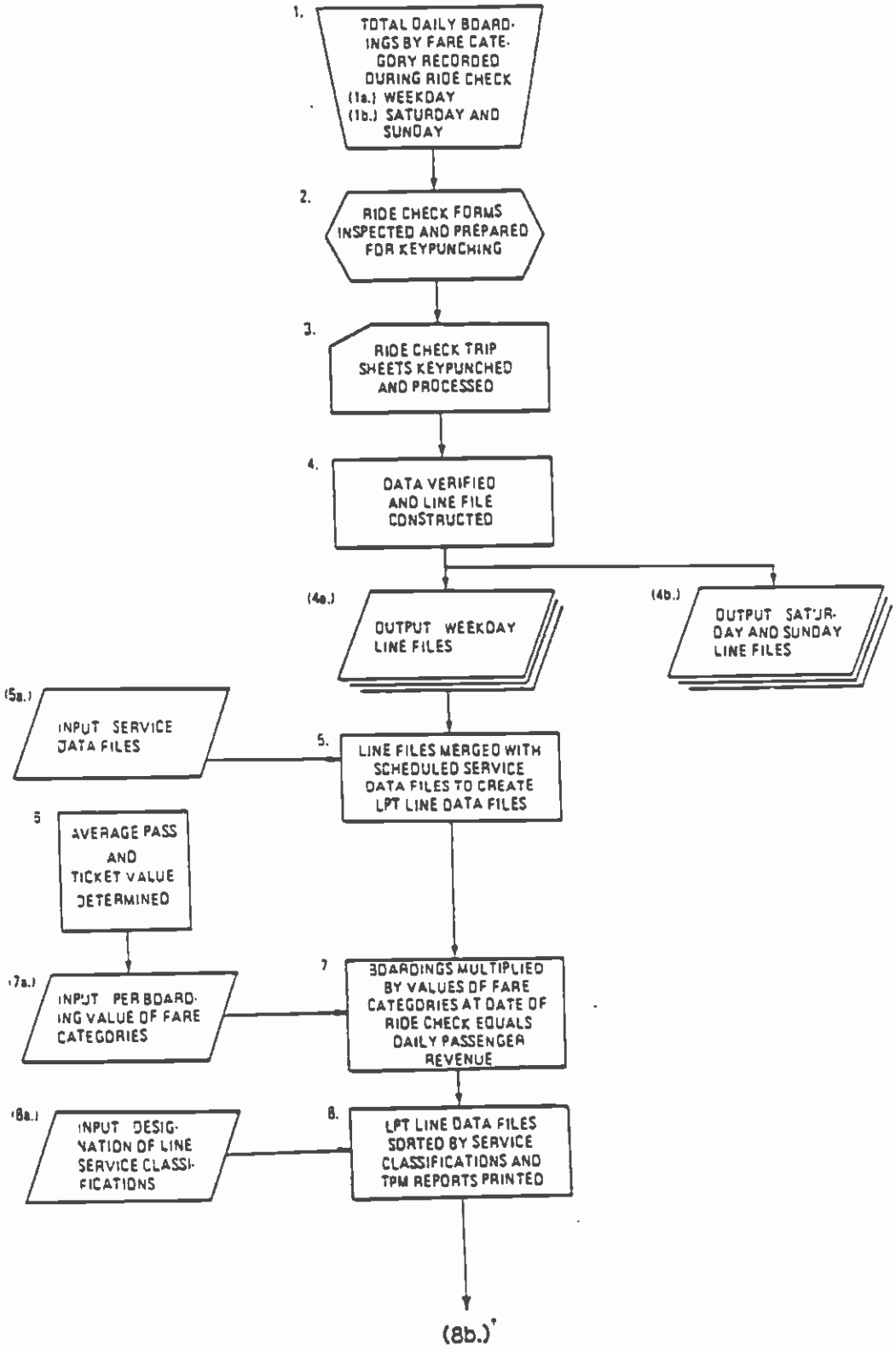
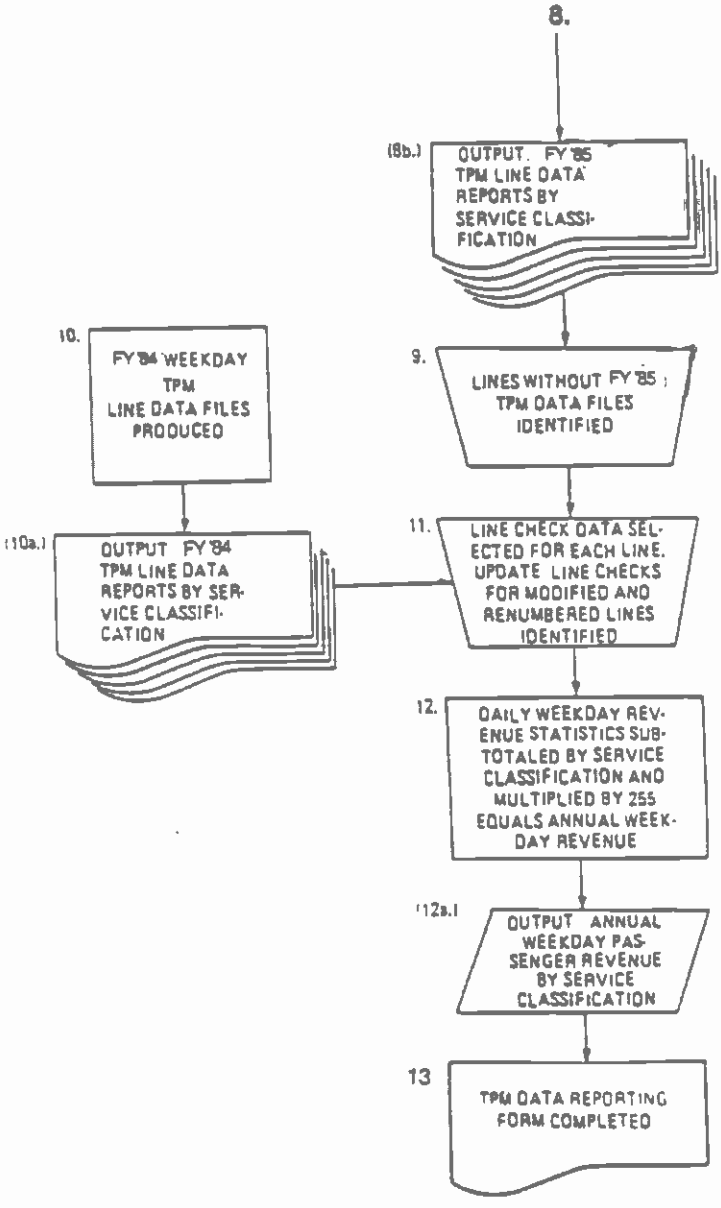


EXHIBIT IV-12
SCRTD DATA REVIEW

PASSENGER REVENUE
(Continued)



FOOTNOTE

The number of days in Step 12 varies by year.

in Exhibit IV-12. The Service Analysis Section determined the boarding value for each fare category which included: cash, pass, transfer, ticket and token, and additional fare categories. Passes pose the most complex configuration simply because of the wide variety of pass types available through SCRTD.

b. Analysis and Verification

Prior to FY 1983, the same problems which occurred with subsection 6. Unlinked Passengers also occurred with Passenger Revenue. These problems included timeliness and consistency of the data and different methodologies for the calculation of Saturday and Sunday values. As of FY 1983, these problems were resolved in the same manner as Unlinked Passengers. An increase in the frequency of ride checks allows for more accurate and up-to-date values. Seasonal and day-to-day variations were also more accurate. Finally, Saturday and Sunday values were determined under the same method to insure more consistent data.

8. Auxiliary Revenue

o Analysis and Verification

The TPM report combined auxiliary revenue with local subsidies to represent one value. The Section 15 Report and State Controller Report allocated values to each of the two categories ($2.7 million in auxiliary revenues were reported in FY 1985 on the Section 15 and State Controller Reports). In order to maintain reporting consistency throughout the various reporting forms, it would be advantageous for SCRTD to report both revenues in its TPM report, provided sufficient space is available.

9. Local Subsidies

o Analysis and Verification

Similar to auxiliary revenue, the TPM report did not separate local subsidies from auxiliary revenue as did the Section 15 and State Controller reports. Again, it would be beneficial to report these values in the same way as the other reports, provided sufficient space is available.

10. Operating Costs

o Analysis and Verification

Total Operating costs correspond to cost figures presented in Section 15 Report after adjustments for definitions. The Section 15 Report includes depreciation, rentals and leases and interest expenses whereas the TPM and TDA initial figures exclude depreciation only. When the figures are adjusted for the exclusions, the values are equal.

11. Full Time Equivalent Employees

o Analysis and Verification

Both the Section 15 and TPM Reports listed 8,789 full-time equivalent employees for FY 1985. Total employee hours worked during the year were tallied and divided by 2,000. Total employee hours included all overtime hours and part-time employee hours, as per the statistic definition.

* * * * *

In summary, it is noted here that the District has changed and/or modified the data collection procedures to keep up with the evolution of the TPM/TDA program. Particular improvement were

made with respect to reporting actual miles and hours rather than scheduled. By and large its data collection procedures are consistent with the established definitions with one notable exception -- peak vehicles. Furthermore, the District has improved its computer capabilities during the audit period. The implementation of TRANSMIS II will enhance the compilation and recordkeeping capabilities so as to ensure availability of reliable statistics for monitoring and management purposes.

C. TDA INDICATOR ANALYSIS

The requirements of the TDA triennial performance audit are the verification and evaluation of the following five performance indicators:

1. Operating cost per passenger
2. Operating cost per vehicle service hour
3. Passengers per vehicle service hour
4. Passengers per vehicle service mile
5. Vehicle service hour per employee

The statistics used to calculate these indicators are presented in Exhibit IV-13. The analysis of the indicators presented in this section identify performance trends over a seven-year period. This period covers four years studied in the prior audit and the three years covered in the current audit.

The performance indicator values for FY 1979-85 were calculated and are presented in Exhibit IV-14. The percent change from year to year and the Los Angeles Consumer Price Index (CPI) are presented in Exhibit IV-15.

EXHIBIT IV-13

SYSTEMWIDE PERFORMANCE INDICATOR STATISTICS

	1983	1984	1985
Operating Costs	$382,873,371	$414,125,308	$448,348,313
Unlinked Passengers	415,865,888	465,637,730	497,158,321
Vehicle Service Hours	6,761,892	7,062,580	7,041,642
Vehicle Service Miles	89,655,682	93,031,160	91,959,736
Full Time Employees	8,272	8,778	8,789

EXHIBIT IV-14

SCRTD TDA PERFORMANCE INDICATORS

	Fiscal Year						
	1979	1980	1981	1982	1983	1984	1985
Operating Cost/Passenger: system	$0.67	$0.76	$0.84	$0.98	$0.92	$0.89	$0.90
Operating Cost/vehicle service hour: system	$36.19	$40.65	$48.88	$54.54	$56.62	$58.64	$63.67
Passengers/vehicle service hour: system	53.79	53.33	58.27	55.84	61.50	65.93	70.60
Passengers/vehicle service mile: system	3.81	3.75	4.33	4.17	4.64	5.01	5.41
Vehicle service hour/ employee: system	829.00	855.37	840.90	813.66	817.44	804.58	801.19
C.P.I.	201.6	234.3	261.2	286.5	291.0	298.4	307.4

EXHIBIT IV-15

SCRTD TDA PERFORMANCE INDICATORS
PERCENT CHANGE

	Fiscal Year					
	1979-1980	1980-1981	1981-1982	1982-1983	1983-1984	1984-1985
Operating Cost/Passenger	13.43	10.52	16.67	-6.12	-3.26	1.12
Operating Cost/vehicle service hour	12.32	20.25	11.58	3.81	3.57	8.58
Passengers/vehicle service hour	-.86	9.26	-4.17	10.14	7.20	7.08
Passengers/vehicle service mile	-1.58	15.47	-3.70	11.27	7.97	7.98
Vehicle service hour/employee	3.18	1.69	-3.24	0.46	-1.57	-0.42
C.P.I.	16.2	11.5	9.7	1.6	2.5	3.0

1. Operating cost per passenger

This indicator relates operating cost to service consumption providing an overall view of the cost effectiveness. During the audit period of FY 1983-85, operating costs per passenger decreased slightly from $0.92 per passenger to $0.90 per passenger. This decrease can mainly be attributed to the institution of Proposition A fare reduction program. During FY 1983-85, passenger fares were decreased to $0.50, which ultimately led to an enormous increase in ridership, hence the decrease in operating cost per passenger. The graphic representation for the entire trend period is shown in Exhibit IV-16.

2. Operating costs per vehicle service hour

This indicator relates the overall cost of providing service to a unit of service output. During the seven-year period, operating costs per vehicle service hour increased a total of $27.48 or almost 76 percent. This seven-year trend is graphically illustrated in Exhibit IV-17. The solid line represents the actual values of the indicator, the triangles represent the previous years actual performance inflated by the CPI rate of inflation. As shown, costs have increased at a rate greater than the CPI in all years except FY 1983.

3. Passengers per vehicle service hour

This indicator relates total passenger boardings to a unit of service measured as vehicle service hours. This is a key characteristic for identifying trends in system effectiveness. During the current audit period, SCRTD's effectiveness increased 14.80 percent. The most dramatic change occurred between FY 1982 and 1983 when passengers per vehicle service hour increased 10.14 percent, the year in which fare reduction program went into

EXHIBIT IV-16
PERFORMANCE INDICATORS
TRENDS IN OPERATION COST PER PASSENGER

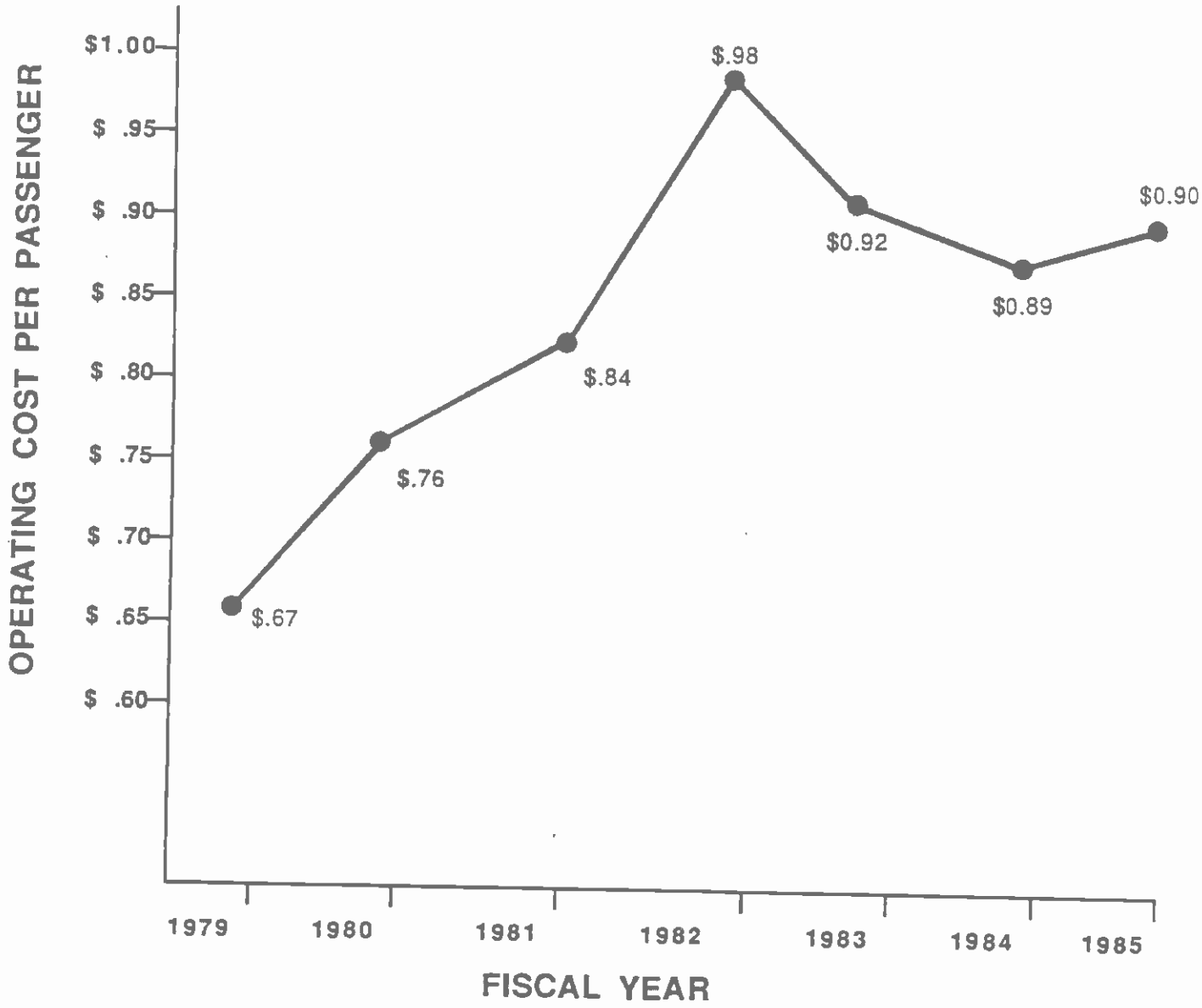
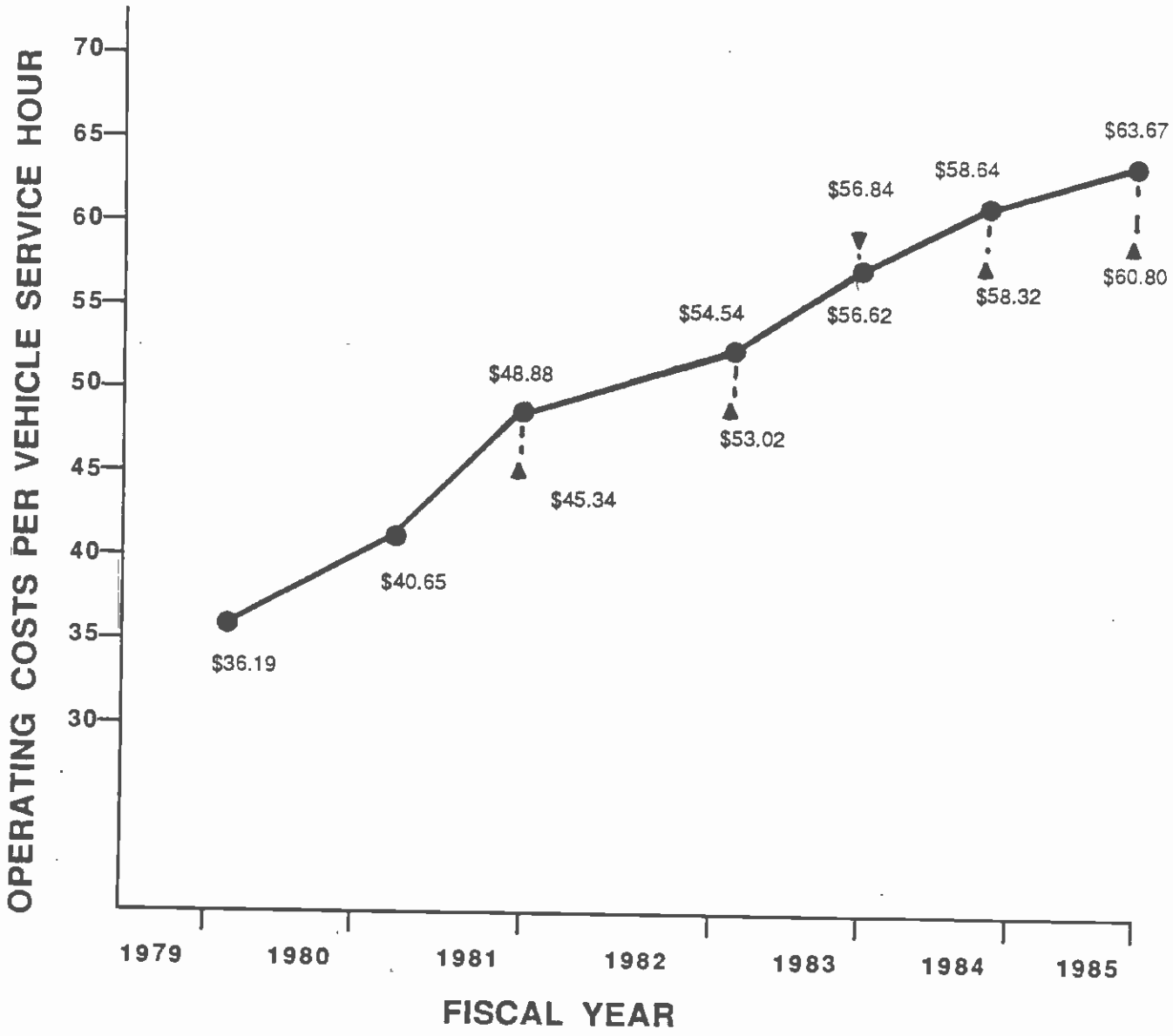


EXHIBIT IV-17
PERFORMANCE INDICATORS
TRENDS IN OPERATING COST PER VEHICLE SERVICE HOUR



• Actual Performance
▲ Target Performance

effect. In the early years of the analysis period, the number of passengers per vehicle service hour fluctuated in the 53-58 riders per hour range. Since then, the ridership has increased to 70 passengers per hour as illustrated in Exhibit IV-18.

4. Passengers per vehicle service mile

This ratio also measures service effectiveness with respect to output, in this case, vehicle service miles. The seven-year trend for this indicator is shown in Exhibit IV-19. During the audit period of FY 1983-85, performance had improved 16.59 percent and an overall increase of almost 42 percent occurred for the seven-year period. As mentioned before, an increase in RTD's effectiveness during 1982-83 period was primarily due to the Proposition A fare reduction program.

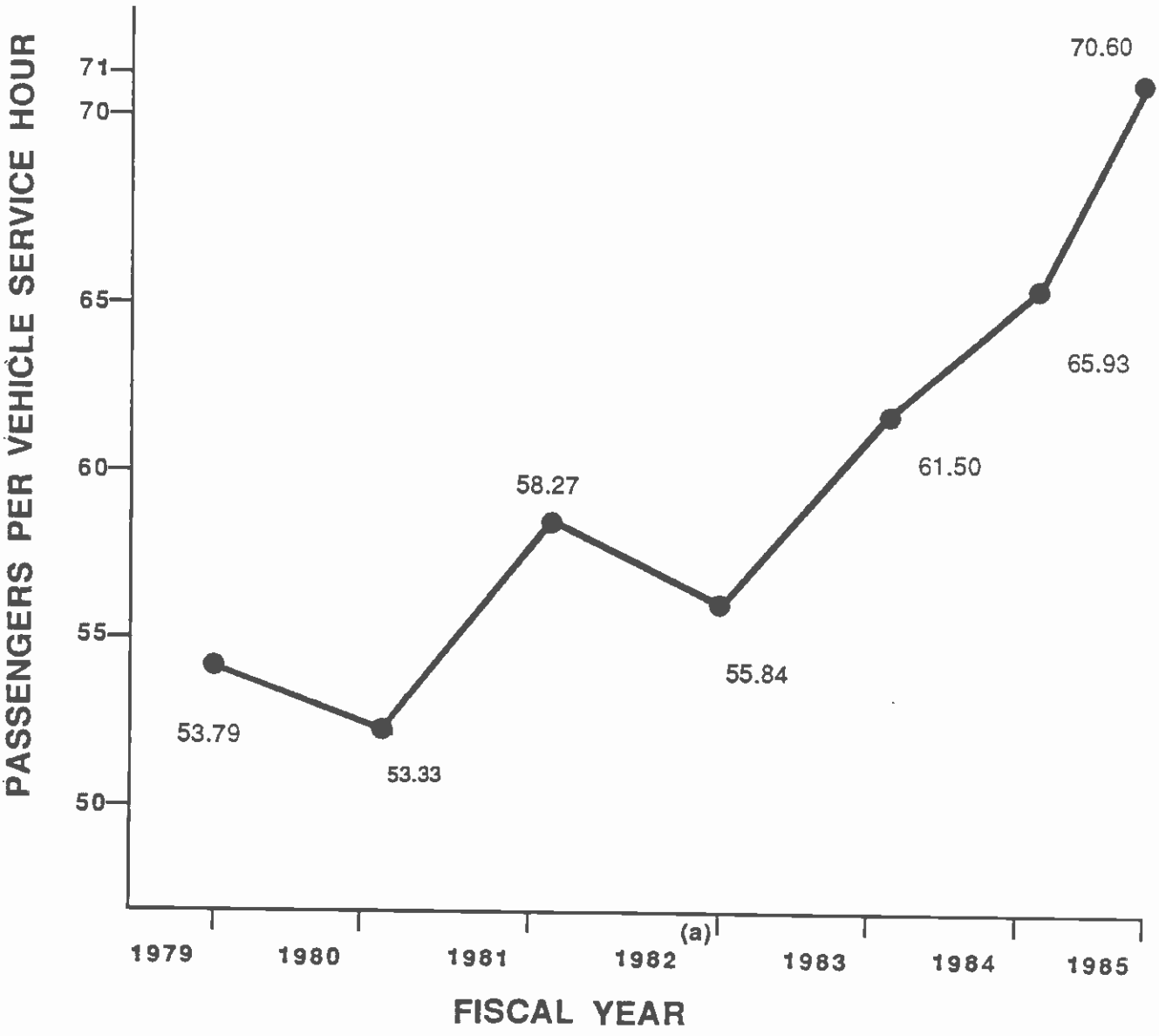
5. Vehicle service hour per employee

This indicator measures labor productivity with respect to units of service output. The trend analysis for this indicator is presented in Exhibit IV-20. During the FY86 audit period, SCRTD experienced over six percent increase in full time employees as compared to a 4.14 percent increase in vehicle service hours. RTD achieved 817 service hours per employee in FY 1983. This level declined to 801 hours per employee in FY 1985. Overall employee productivity, as measured by this indicator, has been declining steadily in the past five years. Given the overall pressure to improve the District's cost efficiency, this trend has been in the wrong direction.

* * * * *

In summary, it is noted here that three out of five TDA indicators which denote effectiveness of the District's operation exhibit improvements during the audit period. The remaining two

EXHIBIT IV-18
PERFORMANCE INDICATORS
TRENDS IN PASSENGERS PER VEHICLE SERVICE HOURS



(a) Estimated

EXHIBIT IV-19

PERFORMANCE INDICATORS
TRENDS IN PASSENGER PER VEHICLE SERVICE MILE

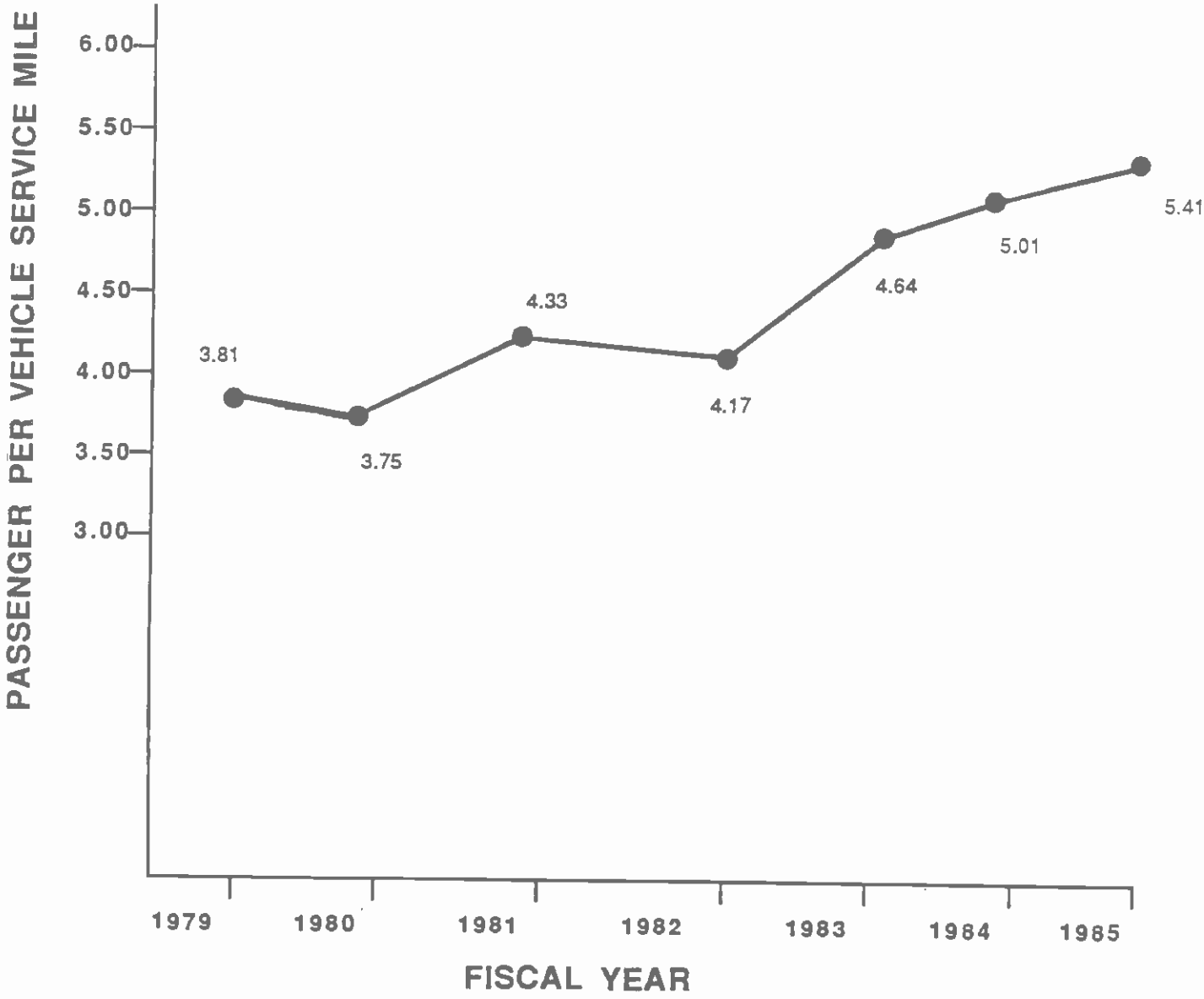
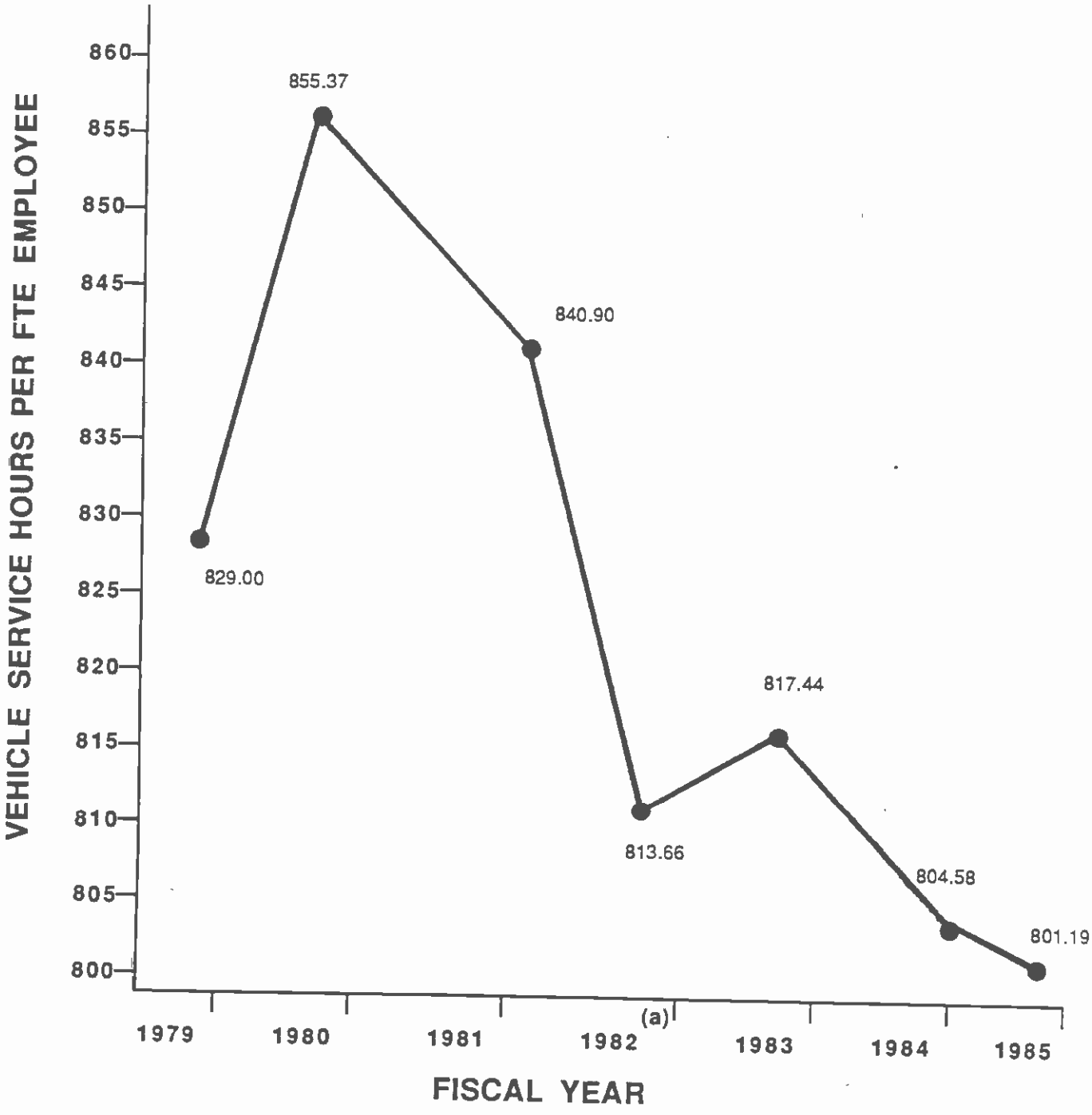


EXHIBIT IV-20
PERFORMANCE INDICATORS
TRENDS IN VEHICLE SERVICE HOURS PER FTE EMPLOYEE



(a) Estimated

indicators reflective of District's efficiency show decline. The District experienced increase in operating cost per service hour which exceeded the CPI in two out of three years covered during this audit period.

The improvements in the District's effectiveness are due to increased ridership. The Proposition A fare reduction program has resulted in a dramatic increase in passenger per vehicle service hour -- from 56 passengers per hour prior to the Proposition A fare reduction to 71 passengers during the last year of the FY86 audit period.

V. GOALS AND OBJECTIVES REVIEW FINDINGS

The purpose of this section is to examine the degree to which RTD management has established overall system goals and objectives and the extent to which these goals and objectives are being accomplished. While the goals statement establishes a framework for decision-making, it does not state the specific actions taken to accomplish each goal nor the priorities associated with any goal. This is the purpose of objectives. Objectives state measurable achievements designed to focus efforts in the direction of goal attainment. Objectives are designed to promote incremental progress and, as such, are updated annually.

Goals and objectives for the District are developed by the Office of Management and Budget (OMB) in cooperation with all the RTD departments. They are presented in several documents including, the Short-Range Transit Plan (SRTP), the Annual Budget, and the individual department documents.

The process of defining formal goals and objectives at the District is both top down and bottom up. Once the goals and objectives are defined, these become input to the annual budget development process. The departmental goals and objectives are critical in developing annual budgets. Once established, a summary of departmental goals and objectives is incorporated in the budget document itself. The SCRTD goals and objectives, as presented in the 1985 Annual Budget, follow as Exhibit V-1. This chapter presents a brief summary of the District's progress under each objective area.

Bus Operations

The District operated 7,109,000 revenue vehicle service hours in FY 1985. The RTD had budgeted a maximum of 7,326,000. The

EXHIBIT V-1

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT
FISCAL YEAR 1985 BUDGET

DISTRICT-WIDE GOALS

To operate a safe, clean, convenient and efficient mass transit system for the general public in the metropolitan area.

To develop and operate an integrated fixed-guideway transit system for the general public within the urbanized area while enhancing the quality of life and the development of the urbanized areas.

To improve the productivity of the transportation, maintenance, and management sectors of the District.

To use the SCRTD leadership position to serve as a catalyst for the physical, land use, and economic development of the metropolitan area in relation to transportation and access.

To support and reinforce the Centers Concept of land use development in the Los Angeles region.

EXHIBIT V-1
(Continued)

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT
FISCAL YEAR 1985 BUDGET

DISTRICT-WIDE OBJECTIVES

1.0 Bus Operations Objectives

1.1 To meet increasing service demands resulting from the Proposition A Fare Reduction Program by:

1.1.1 Reallocating fleet deployment from low occupancy lines to increasing demand corridors;
1.1.2 Increasing annualized revenue vehicle service hours by 2.3% to 7,326,000 annual hours authorized under the LACTC Memorandum of Understanding.

1.2 To minimize operating cost while maintaining service reliability by:

1.2.1 Maintaining a weighted average of 1.30 Operator/assignment ratio, within a range of 1.27 to 1.33, while providing a minimum 99% on-time pull-out rate;
1.2.2 Keeping the part-time Operator ratio at or near the maximum eligible rate of 15%.

1.3 To maximize revenue fleet availability by:

1.3.1 Increasing the ratio of hub miles between maintenance road calls to 3,000 miles;
1.3.2 Implementing a program to stabilize fleet size and mix.

1.4 To implement the Olympics Budget and Service Plan while maintaining the integrity of the regular bus service system.

1.5 To evaluate the Olympics service experience by November, 1984.

1.6 To improve schedule adherence for the riding public by:

1.6.1 Identifying baseline standards for ideal schedule performance and the relative impacts of the variation;
1.6.2 Determining current schedule adherence, as a basis for measuring improvement;
1.6.3 Devising and implementing a program for improving on-time performance.

1.7 To maintain at least 95% Accessible Service reliability.

EXHIBIT V-1
(Continued)

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT
FISCAL YEAR 1985 BUDGET

DISTRICT-WIDE OBJECTIVES

2.0 Facilities Construction Objectives

2.1 To complete final design and begin construction of the Metro Rail Project.

2.2 To complete the adoption of a rail network phasing plan in conjunction with LACTC.

2.3 To begin construction of the Central Maintenance Facility.

2.4 To identify and evaluate alternative sites for Division 6 and determine the best long term alternative for service, facilities and residents in the area.

3.0 Cost Control Objectives

3.1 To increase budgetary control and review of expenditures by:

3.1.1 Refining the financial control capability of TRANSMIS I;

3.1.2 Improving the timeliness and accuracy of variance reporting;

3.1.3 Fully integrating the capital and operating budget and accounting systems.

3.2 To maintain a maximum operating cost per boarding of $0.95.

3.3 To reduce personal injury and liability losses by:

3.3.1 Reducing traffic accident frequency to 4.5 per 100,000 miles;

3.3.2 Reducing Transportation industrial accident frequency to 7.0 per 100,000 hours;

3.3.3 Reducing Maintenance industrial accident frequency to 9.0 per 100,000 hours.

3.4 To improve the District's overall manpower and scheduling control and planning capability by completing and implementing Phase I of TRANSMIS II.

3.5 To implement manpower allocation capability at the Division Manager level.

3.6 To document productivity improvements and savings resulting from TRANSMIS applications.

EXHIBIT V-1
(Continued)

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT
FISCAL YEAR 1985 BUDGET

DISTRICT-WIDE OBJECTIVES

3.7 To minimize all service changes requiring Bus Operator assignment changes.

3.8 To develop a management plan for the transition from manual to automated systems.

3.9 To reduce unscheduled Operator overtime by:

3.9.1 Maintaining a labor force consisting of 15% part-time Operators;
3.9.2 Completing various studies related to Bus Operators' absenteeism and implementing appropriate recommendations.

4.0 Policy and Management Objectives

4.1 To prepare plans to minimize the impact of the post-Proposition A funding reduction on ridership, service levels and the general public during Fiscal Year 1986 by:

4.1.1 Developing long-term strategies for financing bus and rail systems under Proposition A requirements;
4.1.2 Developing a plan for post-Proposition A staffing levels;
4.1.3 Completing municipal service agreements covering the Cities' share of Proposition A funds.

4.2 To achieve mutually beneficial modifications for labor and management to all labor agreements expiring during this fiscal year.

4.3 To improve minority participation in District programs and activities by implementing UMTA approved EEO and MBE plans and the Affirmative Action Career Development Project.

4.4 To establish a regular series of inter-local coordination meetings with other public agencies.

4.5 To implement standardization of data elements for TRANSMIS applications.

4.6 To implement standardization of data for and use of personal computer generated reports.

District operated 217,000 hours below the maximum in order to minimize the service cuts expected to be required on July 1, 1985 as a result of the end of Proposition A Fare Reduction program and the subsequent fare increase. RTD expected to maintain an operator/assignment ratio within a range of 1.27 to 1.33, while providing a minimum 99 percent on time pull-out rate. Throughout FY 1985, RTD held an operator ratio average of 1.31 and maintained the 99 percent on-time pull-out rate minimum.

The ratio of part-time operators to full-time operators averaged 14.7 percent for the 1985 fiscal year. Since 15 percent is the maximum and cannot be exceeded by any single division, RTD achieved a rate considered to be the maximum practical rate under the current circumstances.

Facilities Construction

RTD continued its efforts to complete all construction objectives. No special effort was made in this audit to assess facilities construction progress during the audit period.

Cost Control

Again, RTD made progress towards achieving the stated objectives. The District intended to maintain a maximum operating cost per boarding of $0.95, and during FY 1985, that objective was achieved as operating cost per boarding averaged $0.92. Traffic accident frequency was 4.9 per 100,000 miles for FY 1985. Although it is above the objective of 4.5, the trend has been downward throughout the year as a result of the District's concerted effort to reduce accidents. Another cost control method met was the part-time operator ratio, which was kept at 14.7% of full-time drivers as stated above.

Policy and Management

Several objectives, geared towards the post Proposition A environment were met. Long-term strategies for financing bus and rail systems were developed. A plan for staffing levels was analyzed and used in developing the FY 1986 budget. Service agreements, covering the cities' share of Proposition A funds, were completed with several municipal agencies.

On the whole, RTD has made significant progress in refining its goals and objectives over the audit period. The consensus of the department managers is that the current process of developing goals and objectives is working and should be continued in the future.

VI. SCHEDULING AND TRANSPORTATION REVIEW AND CONCLUSIONS

The Scheduling and Transportation functions at SCRTD are individual departments within the Operations Division. In FY85, these departments accounted for approximately $156 million (35 percent) of SCRTD's operating budget. These two departments have direct responsibility for the scheduling and on-street operation of the District's bus service.

This section of the performance audit provides a review of objectives employed by the Scheduling and Transportation departments, an analysis of performance indicators and trends, and the performance audit conclusions.

A. REVIEW OF GOALS AND OBJECTIVES

This section presents a review of the objectives established within the Scheduling and Transportation departments; and how these are related to both higher and subordinate levels of management at SCRTD. The purpose of this review was to determine the extent to which the objectives reflected the mission of the respective departments, and served as a basis for action in guiding the departments' performance.

The objectives employed by the Scheduling and Transportation departments in FY85 are presented in Exhibit VI-1, along with the objectives for the Assistant General Manager (AGM) for Operations. The objectives employed within the three major units of the Transportation Department are presented in Exhibit VI-2.

Generally, both departments are supported by a comprehensive set of objectives, and management is active in reviewing progress against the objectives. Also, the objectives at the line management level (i.e., Scheduling and the major units within Transportation) effectively communicate the priorities for performance.

EXHIBIT VI-1

RELATIONSHIP OF OBJECTIVES AMONG AGM FOR OPERATIONS, TRANSPORTATION GENERAL AND SCHEDULING

FY1985

AGM FOR OPERATIONS

- Administer and manage District transit operations
- Coordinate interdepartmental issues
- Coordinate implementation of the Accessible Service Program
- Investigate or implement at least two operating efficiencies
- Ensure operational concerns are addressed/achieved for Ventura Blvd. signal pre-emption and data collection systems
- Implement the Olympics budget and service plan while maintaining the integrity of the bus system

TRANSPORTATION GENERAL

- Monitor division budgetary performance
- Maintain part-time operator ratio at 15%
- Allocate manpower among the divisions to ensure maximum effective use of bus operators
- Maintain a system-wide operator ratio of 1.30, within a range of 1.27 to 1.33
- Maintain effective first-time supervision of payroll clerks
- Coordinate implemenatation of TRANSMIS
- Promote division operating performance
- Provide Accessible Service per Board policy.

SCHEDULING

- Maintain productivity above 66 boardings per vehicle service hour
- Reduce an equivalent cost capacity of one extra peak bus per line regulation
- Obtain data for evaluation of Olympics service
- Provide support for TRANSMIS
- Maintain line utilization data average age at or below nine months
- Maintain average processing time between line check and data entry under 30 days
- Minimize changes to bus operator assignments

EXHIBIT VI-2

RELATIONSHIP AMONG OBJECTIVES WITHIN THE TRANSPORTATION DEPARTMENT

TRANSPORTATION GENERAL

- Administer and manage District transit operations
- Coordinate interdepartmental issues
- Coordinate implementation of the Accessible Service Program
- Investigate or implement at least two operating efficiencies
- Ensure operational concerns are addressed/achieved for Ventura Blvd. signal presumption and data collection systems
- Implement the Olympics budget and service plan while maintaining the integrity of the bus system

TRANSPORTATION OPERATING DIVISIONS

- Reduce traffic accident frequency to 4.5 per 100,000 miles
- Maintain operator absenteeism at no more than 7.2 percent at each Division
- Provide accessible transportation in accordance with District policy

TRANSPORTATION INSTRUCTION

- Ensure instruction needs are met within two months of need determination
- Support the District's objective of 4.5 accidents per 100,000 miles
- Provide retraining on accident prevention and safe operation where similar accident types constitute 5% or more of a division's total accidents
- To perform follow-up rides on changeable accidents within one week of occurance
- To support the Accessible Service Program's training and retraining needs

OPERATIONS CONTROL AND SERVICES

- Provide support and training for implementation of the computer-aided dispatching system
- Assist in achieving a traffic accident frequency of 4.5 per 100,000 miles
- Deploy and evaluate a supervisory foot patrol in the Central Business District
- To reduce passenger complaints resulting from pass-ups to 5.6 per 1 million boardings.

While the objectives used in Scheduling and Transportation reflect the major performance requirements at the line management level, there were two characteristics of the FY85 objectives which, if improved upon, would strengthen the use of objectives as a tool for improving performance:

- o The linkage of objectives between successive layers of management could be strengthened -- Above the line management level, objectives tend to be primarily a statement of general responsibilities as opposed to being an expression of priorities for performance. Since upper management and line managers do not have a common statement of priorities (e.g., performance objectives are not consistent through a chain of command), it is less likely that accountability will be enforced because upper management's performance is not dependent upon the performance of subordinate managers.

- o Cost objectives could be established to support budget control -- No cost-oriented objective, such as cost per in-service vehicle hour, is presently employed for transportation. Since the actual service levels operated by SCRTD may vary from the projection at the beginning of the fiscal year, and since Transportation expenses are governed by service levels, there is a logical need for a cost objective which is responsive to changes in service levels.

In summary, the objectives employed by Scheduling and Transportation adequately address the responsibilities of these two major functions, and have demonstrated refinement during the audit period. However, the value of these objectives as a management tool could be improved by strengthening the linkage of objectives between successive levels of management, including cost-based objectives and using the objective-setting process as an opportunity to tailor performance improvements based on existing conditions.

B. ANALYSIS OF PERFORMANCE INDICATORS AND TRENDS

This section presents an analysis of performance trends in four areas:

- o Cost per unit of service -- This section describes the cost efficiency of scheduling and transportation via three performance indicators:
  - Vehicle operations cost per in-service vehicle hour has been increasing above the rate of inflation, and most recently has been effected by extraordinary increases in fringe benefits cost.
  - Operator wage cost per in-service vehicle hour indicates that an improvement in efficiency occurred during the audit period, if the effect of changes in the operator wage rate are held constant. Due primarily to increases in the hourly wage rate, however, operator wage cost per in-service vehicle hour increased above the rate of inflation.
  - Operator benefits cost per in-service vehicle hour increased dramatically during the audit period, due almost entirely to increased workers compensation and medical insurance costs.
- o Scheduling and labor productivity -- This section describes the impact of Scheduling and Transportation

on operator pay hours via the three operations steps which define pay hours:

- Vehicle hours per in-service vehicle hour was observed to be almost constant during the audit period.

- Scheduled pay hours per in-service vehicle hour exhibited a slight degradation toward the end of the audit period.

- Total pay hours per in-service vehicle hour was observed to improve during the audit period, indicating an overall improvement in operator productivity.

o Absenteeism and lost time -- This section describes operator absenteeism and lost time in two ways:

- Relative to other large urban transit systems, SCRTD's operators have a higher absence rate, according to quarterly statistics collected by the American Public Transit Association.

- Absence rates have been almost constant during the audit period, but are higher than previously reported in terms of days lost per operator per year; total cost is estimated to be $16.3 million annually, a reasonable focus for reduction is estimated to be between $1.3 and $3.8 million.

o Safety -- SCRTD continues to have a positive safety record as measured by accident rates.

The detailed findings in each of these areas are described below:

1. Cost per Unit of Service

This section reviews the costs affected by the scheduling and transportation functions in respect to the level of service provided in the FY83-FY85 audit period. The operating costs reported in this section were taken from SCRTD's audited Section 15 reports. The selected service-level statistic -- in-service vehicle hours -- was reported in SCRTD's Short Range Plan as well as in the Section 15 submittal, and describes the amount of service actually available to boarding passengers. Accordingly, the ratios of cost to service levels described in this section reflect scheduling and operations efficiency in delivering transit service.

Three key performance indicators were selected to describe these functions' major cost characteristics:

- Vehicle operations cost per in-service vehicle hour is a comprehensive measure of scheduling and transportation cost, and indicates that cost growth has generally exceeded the rate of inflation, and has most recently been affected by a significant increase in fringe benefits cost

- Operator wage cost per in-service vehicle hour measures change in the largest component of vehicle operation cost, and indicates an improvement in efficiency during the audit period when the effect of increased wage rates is held constant

- Operator benefits cost per in-service vehicle hour measures change in the second-largest component of vehicle operations cost, and indicates a substantial

cost increase reflecting disproportionate changes in workers compensation and medical insurance costs

Each of these performance indicators are presented in Exhibit VI-3, and are described in more detail below. Changes in the Los Angeles Consumer Price Index (CPI) and the SCRTD Operator Wage Rate (top step only) are also provided in Exhibit VI-3 as bench marks for analyzing changes in the performance indicators.

a) Vehicle Operations Cost Per In-Service Vehicle Hour

This performance indicator is a broad measure of the resources expended to directly operate revenue vehicles, exclusive of any maintenance costs. As shown in Exhibit VI-4, it includes the costs of drivers, supervisory and administrative personnel in the transportation and scheduling departments, fringe benefits, fuel, and other miscellaneous expenses used to support vehicle operations.

During the audit period, vehicle operations costs increased by $4.96 per in-service vehicle hour, yielding a compounded annual growth rate of about 5.3 percent. This rate of growth was slightly above the rate of change in the operator wage rate (which has the strongest impact on total costs), and also exceeded the rate of growth in the region's CPI, which grew by only 2.4 percent per annum over the same period.

The cost trend in vehicle operations was strongly affected by increases in fringe benefits cost, as indicated in Exhibit VI-5. This graph identifies extraordinary cost growth by comparing the change in cost of major line items to the overall change in vehicle operations cost. A ratio of 1.0 indicates that a line item (e.g., operator wage cost) is changing at the same rate as overall costs. It is clear from this graph that increases in fringe benefits costs have been disproportionately high, particularly in FY85.

EXHIBIT VI-3

SCRTD SCHEDULING & OPERATIONS FUNCTIONS

COST PER UNIT OF SERVICE[a]

Indicator	FY82	FY83	FY84	FY85	Average Annual % Change
Vehicle Operations Cost[b] Per In-Service Vehicle Hour	$29.35	$30.89	$31.31	$34.30	5.34%
% change from previous year		5.26%	1.37%	9.55%	
Operator Wage Cost[b] Per In-Service Vehicle Hour	$14.63	$15.41	$16.10	$16.93	4.98%
% change from previous year		5.27%	4.44%	5.22%	
Operator Benefits Cost Per In-Service Vehicle Hour	$6.39	$7.17	$7.61	$8.92	11.74%
% change from previous year		12.10%	6.09%	17.21%	
Comparative Measures					
Los Angeles Consumer Price Index	281.6	293.47	302.31	313.42	2.37%
% change from previous year		1.6%	2.5%	3.0%	
SCRTD Operator Top Hourly Wage Rate[d]	$10.94	$11.57	$12.10	$12.73	5.18%
% change from previous year		5.76%	4.58%	5.21%	

(a) In-service vehicle hours as reported in SCRTD's Short Range Plan.

(b) As reported in SCRTD Section 15 Reports, Form 301. Excludes Olympics costs.

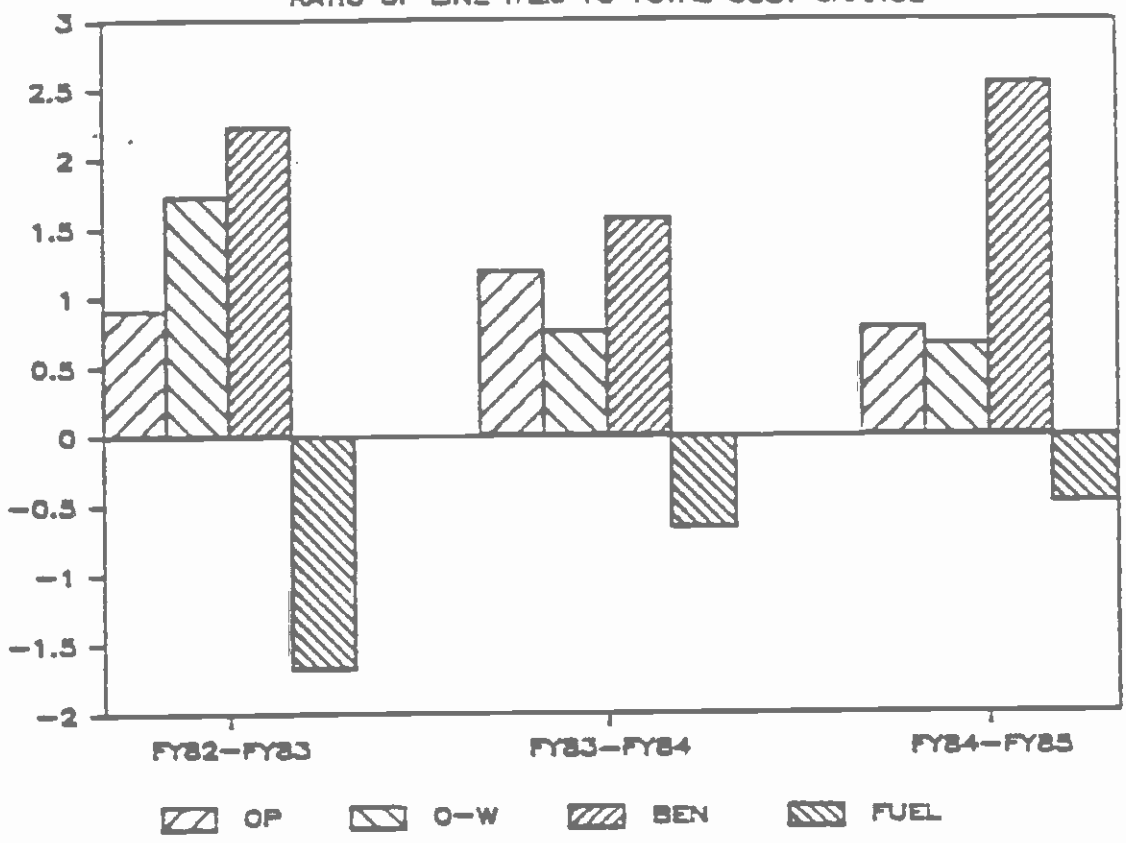
(c) Estimated from Section 15 Reports, Form 301, relative to operator wages.

(d) From SCRTD Bulletin, Labor Relations.

EXHIBIT VI-4

VEHICLE OPERATIONS COST

RATIO OF LINE ITEM TO TOTAL COST CHANGE



Key is:

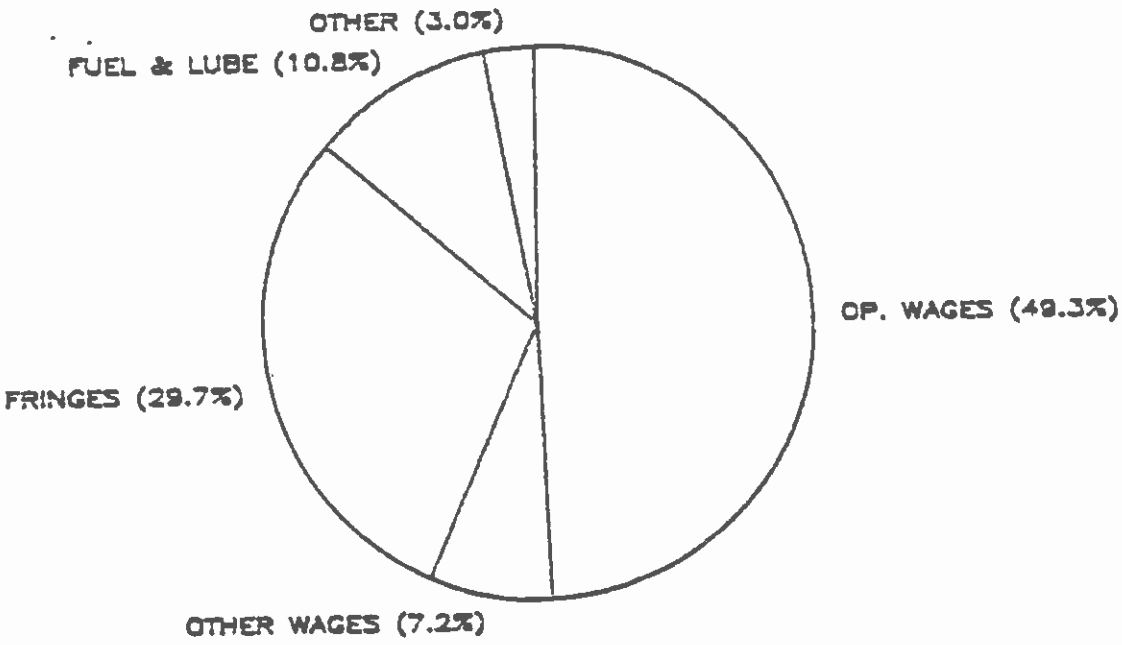
OP - Operator Wages
O-W - Other Salaries and Wages
BEN - Fringe Benefits
FUEL - Fuel & Lubricants

Source: Section 15 Reports

EXHIBIT VI-5

VEHICLE OPERATIONS COST

RELATIVE SHARES OF MAJOR LINE ITEMS



b) Operator Wage Cost Per In-Service Vehicle Hour

This performance indicator measures total operator wage cost per unit of service. Operator wage cost is the largest element of vehicle operations cost and total operating costs. Control over operator wage cost is essential to overall cost control.

As shown in Exhibit VI-3, growth in operator wage cost per in-service vehicle hour (5 percent annual rate) has been slightly below the growth in the top operator wage rate (5.2 percent annual rate), indicating an improvement in operator utilization. This is chiefly due to expanded use of part-time operators and to some extent was affected by reductions in the operator ratio (i.e., the ratio of operators to driving assignments) which occurred in late FY85.

Operator wage cost did, however, increase above the rate of general inflation, reflecting increases in the operator wage rate. It is important to note that the cost-of-living adjustment clause that contributed to these extra-inflationary wage rates was modified in the most recent labor agreement. The new agreement sets a four percent annual cap on the cost-of-living adjustment, although periodic raises to the base wage rate may result in wage rate increases which exceed general inflation.

c) Operator Benefits Cost Per In-Service Vehicle Hour

This performance indicator measures operator benefits cost per unit of service. Within vehicle operations cost, benefits are the second-largest line item (30 percent of total vehicle operations cost), and approximately 87 percent of this line item is attributable to operators. Benefits cost includes paid leave, social security and pension contributions made by SCRTD, workers compensation, medical and hospitalization insurance, uniforms, and life insurance.

RTD can be considered to have influence over some, but not all, of these costs. Social security contributions, for example, are legislatively mandated. Worker's compensation payments are also legislatively mandated, although RTD does have some discretion in setting aside reserves for future claims payments (RTD is self-insured for worker's compensation). Medical and hospitalization insurance, uniforms and life insurance costs reflect both the extent of coverage (determined through labor negotiations) and actual cost experience (which is largely out of RTD's control). Finally, paid leave is affected by absence rates, the accrual of sick leave and other special conditions affecting payment eligibility for lost time.

As indicated previously in Exhibit VI-3, operator benefits cost has increased by $2.53 per in-service vehicle hour during the audit period, yielding an annual increase of 11.7 percent. The most pronounced increase in this indicator occurred in FY 1985, when it rose by 17.2 percent. In all three years of the audit period, benefits cost increases significantly outpaced general inflation.

The most startling aspect of benefits cost growth in FY85 is that it exceeded wage cost growth in absolute terms. Total operator benefits cost increased by $9.1 million between Fiscal Years 1984 and 1985. Over this same period, operator wage cost increased by only $5.6 million. Since benefits costs are normally less than 50 percent of wage cost at SCRTD, this cost growth is truly unusual.

During the audit period, workers compensation cost and medical insurance cost (i.e., the hospital, medical and surgical plan) accounted for 99 percent of the cost growth in fringe benefits. While the factors contributing to these cost increases have not been completely isolated, workers compensation costs have grown the most in relative terms and have presented the most difficulty to SCRTD from both a budgeting and a control standpoint.

2. Scheduling and Labor Productivity

This section reviews the productivity with which bus operators are scheduled for and dispatched to driving assignments. Productivity is measured by the ratio of resource input to resource output. In the performance measures discussed below, resource input is defined in terms of operator pay hours and resource output is defined in terms of service actually placed on the street -- in-service vehicle hours.

The scheduling and transportation functions effect labor productivity via three general steps. First, the vehicle assignment (or blocking) process relates revenue trips to vehicle assignments. In this process, operator pay hours are affected by the difference between in-service vehicle hours (as measured by the duration of revenue trips) and total vehicle hours because the latter includes non-revenue time (e.g., vehicle travel between a garage and a route terminal). Second, vehicle assignments are divided or combined to form operator assignments. In this process, operator pay hours are affected by work rules and pay practices which govern the construction of operator assignments. Third, operators are dispatched daily to these assignments from the individual garages (or divisions) where they report. Due to the dynamics of daily scheduling of operators, operator pay hours are further affected by surpluses or shortages of labor.

The cumulative effect on productivity from the above three steps can be measured via three performance indicators, whereby productivity is defined according to the same base:

- Total vehicle hours per in-service vehicle hour measures the productivity of vehicle assignments, and was observed to be almost constant during the audit period.

- Scheduled operator pay hours per in-service vehicle hour measures the productivity of operator assignments, and was observed to degrade marginally during the audit period.

- Total operator pay hours per in-service vehicle hour measures the productivity of daily dispatching and management of the operator workforce, and was observed to improve during the audit period.

These performance indicators are summarized in Exhibit VI-6 for each of the three years in the audit period, and are discussed below.

a) Total Vehicle Hours Per In-Service Vehicle Hour

This performance measure describes the additional pay hours which occur as individual revenue trips are allocated to vehicle assignments. This process results in additional pay hours because it accounts for non-revenue vehicle trips, such as those between a division and a break-in point on the route for which the revenue trips are to be operated. This performance measure will always be greater than 1.0, and a declining trend in the ratio denotes improved performance (because relatively fewer resource inputs are required to achieve some level of output).

As evidenced in Exhibit VI-6, there has been little change in performance during the audit period. Due to the leverage that even small changes in this indicator have upon total operator cost, however, any decrease in performance will have a tangible effect on cost. The performance improvement registered in FY84, for example, could have resulted in a savings of about $0.2 million. Conversely, the decrease in performance occurring in FY85 could have resulted in additional costs of about $1.7 million.

EXHIBIT VI-6

SCRTD SCHEDULING & OPERATIONS FUNCTIONS

SCHEDULING AND LABOR PRODUCTIVITY

Indicator	FY83	FY84	FY85	FY83 - FY85 Percent Change
Total Vehicle Hours per In-Service Vehicle Hour	1.082	1.081	1.088	0.55%
% Change from previous year		(0.1)%	0.71%	
Scheduled Operator Pay Hours per In-Service Vehicle Hour	1.281	1.284	1.296	1.17%
% Change from revious year		0.19%	0.94%	
Total Operator Pay Hours per In-Service Vehicle Hours	1.601	1.555	1.543	(3.62%)
% Change from previous		(2.92)%	(0.73)%	

b) Scheduled Operator Pay Hours Per In-Service Vehicle Hour

This performance indicator describes the cumulative additional pay hours which occur when scheduled operator assignments are created by breaking and or combining vehicle assignments. This process, called runcutting, is governed by work rules and pay practices which are defined in the agreement between SCRTD and the UTU. Generally, the work rules constrain the duration of individual operator assignments and the elapsed time (or spread) within which an assignment must be completed. Pay practices include allowances and bonuses which are paid to compensate operators for particular work requirements (e.g., allowances for inspecting a vehicle prior to pull out). Collectively, the work rules, pay practices and characteristics of the vehicle assignments affect runcutting productivity and result in additional pay hours.

As shown in Exhibit VI-6, performance in all three years of the audit period has been relatively stable but displays a degrading trend. This is evidenced by the increase to 1.296 pay hours per in-service vehicle hour in FY85 versus 1.281 in FY83. While this increase appears slight in percentage terms, SCRTD could have saved as much as $3.6 million in FY85 if the pay hour ratio could have been held to the 1.281 value recorded in FY83.

c) Total Operator Pay Hours Per In-Service Vehicle Hour

This performance indicator describes the cumulative additional pay hours which occur with daily dispatching, the final step of the process which determines operator pay. The difference between these pay hours and scheduled pay hours (those resulting from the previous two steps) reflects the effectiveness of managing the operator workforce. Because operators may be absent

or required to participate in non-driving duties (e.g., instruction), the daily dispatching of operators always results in having greater or fewer operators available for work in respect to the number actually needed. Both situations result in additional pay hours. Reduction in pay hours generally means that the operator workforce is being more effectively managed.

As shown in Exhibit VI-6, performance has improved during the audit period, as evidenced by a declining trend in total operator pay hours per in-service vehicle hour. This reflects greater utilization of part-time operators in all three years of the current audit, as well as a reduction in the operator ratio (the ratio of full-time equivalent operators to operator assignments). Additionally, Transportation management has been more effective at ensuring a balanced supply of operators at all SCRTD divisions. This overall improvement in operator utilization can be interpreted as a net savings of approximately $4.3 million, when comparing the improved productivity rate in FY85 to that of FY83.

3. Absenteeism and Lost Time

Absenteeism and lost time among bus operators is a costly problem for many transit systems, and SCRTD is no exception. It is a problem when absences and lost time are high, and it is costly because this lost time must be paid for not only through paid leave time but also through the cost of maintaining a reserve workforce. The cost of paid leave and the cost of the reserve workforce are clearly extra costs which should be carefully managed.

This component of SCRTD's performance was cited for improvement in the FY 1980-1982 audit, and was observed not to have changed during the course of this audit. While SCRTD has implemented and is pursuing programs to reduce operator absenteeism, there has been no tangible improvement in performance to date. In fact, previous estimates of the extent and cost of absenteeism and lost

time have been understated due to a misunderstanding in interpreting SCRTD's statistics on this subject.

This section describes SCRTD's experience with operator absenteeism and lost time in two ways:

- o A comparison of SCRTD absence rates to other transit systems is included and is drawn from statistics regularly compiled by the American Public Transit Association (APTA). These statistics show that SCRTD's absence rates are higher than systems of comparable size, and with one exception are higher than those of other large west coast transit systems.

- o A summary of the extent and cost of SCRTD operator absenteeism and lost time is included and provides a comparison to statistics compiled in the prior audit, as well as new estiamtes based on more complete data. This summary indicates that absence rates have been stable, and that the extent and cost of absenteeism is greater than had been previously reported.

Each of these descriptions of absenteeism and lost time are presented below.

a) Comparison of SCRTD Absence Rates to Other Transit Systems

This comparison is based on statistics collected regularly by the American Public Transit Association (APTA), drawn from quarterly surveys conducted in July and October, 1984 and January and April, 1985. APTA surveys all of its member transit systems for data on typical weekday absenteeism for vehicle operators. Data from individual systems are tabulated according to a standard set of definitions, and should serve as a reasonable basis for comparison.

SCRTD's absence rates, as reported through the APTA survey, are compared in Exhibit VI-7 to the full-time bus operator absence rates of seven other transit systems:

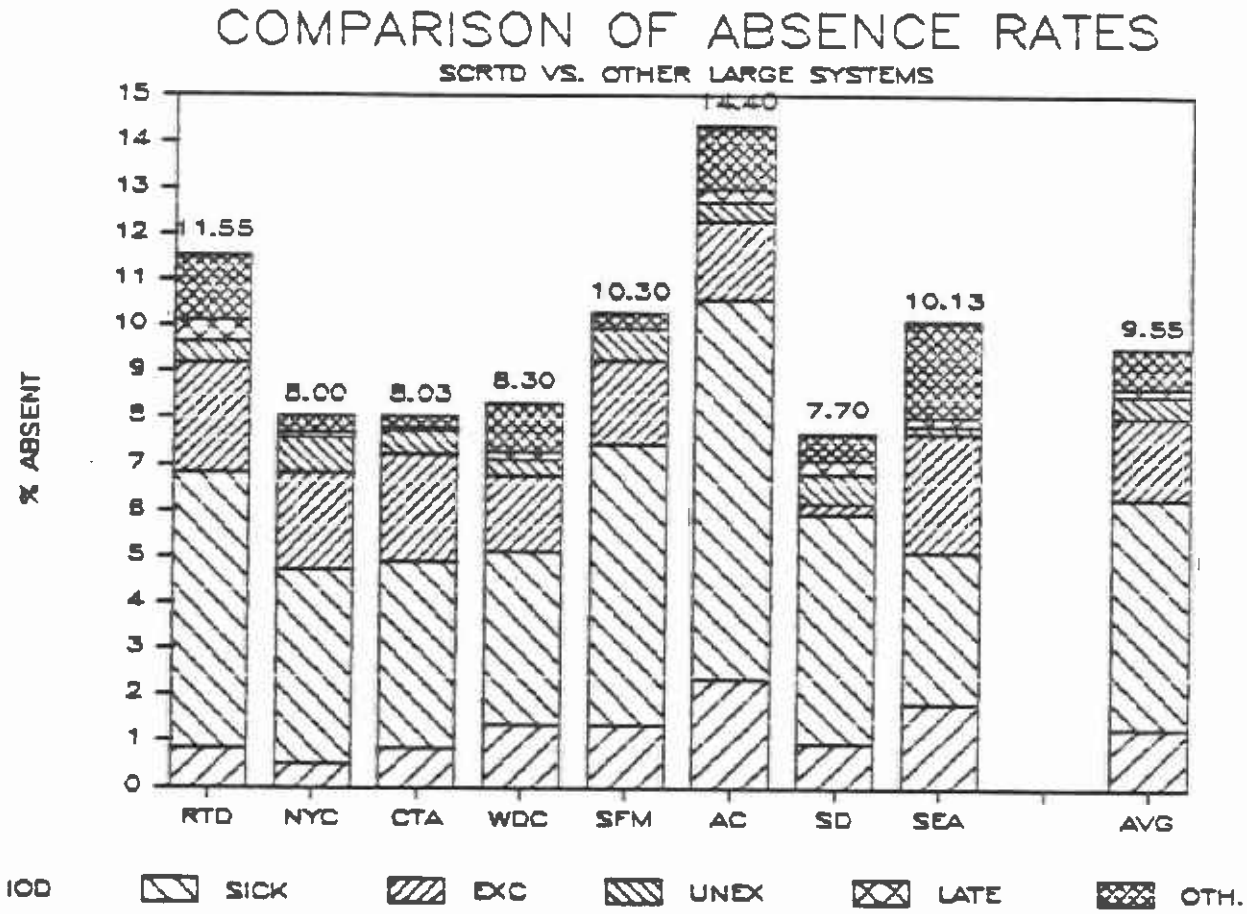
- New York City Transit Authority (NYCTA)
- Chicago Transit Authority (CTA)
- Washington (D.C.) Metropolitan Area Transit Authority (WMATA)
- San Francisco Municipal Railway (MUNI)
- Alameda-Contra Costa County Transit District (AC Transit)
- San Diego Transit Corporation (SDTC)
- Municipality of Metropolitan Seattle (Metro)

Of these seven systems, SCRTD has the second-highest overall absence rate, and the third-highest sick leave rate. Further, SCRTD's overall absence and sick leave rates are 40 percent and 50 percent higher, respectively, than the three large operators to which it is typically compared -- NYCTA, CTA, and WMATA.

b) Extent and Cost of SCRTD Operator Absence and Lost Time

This section presents two descriptions of SCRTD operator absence and lost time. First, an absence trend is presented wherein the rates are calculated in the same manner as in the prior (FY 1980-1983) audit. It was discovered during the course of this audit that these rates were understated by approximately 30 percent, however, because they omitted non-weekday absences. Second, an estimate of FY85 absence and lost time rates and cost

EXHIBIT VI-7



Key:

RTD	-	SCRTD
NYC	-	NYCTA
CTA	-	CTA
WDC	-	WMATA
SFM	-	MUNI
AC	-	AC TRANSIT
SD	-	San Diego TC (or SDTC)
SEA	-	Seattle
AVG	-	Peer Group Average

Source: Typical Weekday Absenteeism of Vehicle operators, APTA, 7/84, 10/84, 1/85, 4/85

Full-time bus operators only

is presented. These estimates were based on compilation of daily statistics from each of SCRTD's transportation divisions. These rates are higher than previously reported because they are based on comprehensive data, and are believed to be the most reliable estimate of operator absence and lost time rates.

A four-year trend in operator absences and lost time, calculated by the auditor in the same manner as in the previous audit, is presented in Exhibit VI-8. This indicates that absence and lost time rates have been relatively constant, albeit some minor degredation appears to have occurred in total lost time. It is important to note, however, that absence rates were expected by certain of RTD management to increase with a reduction in the Operator Ratio. Please also note that this exhibit is included only to provide a trend comparison with previously-summarized data, and is not consistent with our current estimate of absence and lost time rates cited in Exhibit VI-9 and discussed below. During compilation of these statistics for FY85, we learned that summary data compiled in the previous audit and as regularly compiled by SCRTD's Transportation Department understated the extent of absence and lost time rates. This was due to counting only weekday absences (these were the only absences included on SCRTD's weekly 3-5 report), and calculating absence rates based on the total operator payroll. To be accurate, the rates should be based on either weekday absences and weekday operators (i.e., excluding those on their day off), or total absences and the total operator payroll.

A current estimate of the extent and cost of operator absenteeism and lost time is provided in Exhibit VI-9. In all, SCRTD operators are unavailable for driving duties for approximately 36 days per person annually, exclusive of vacations, holidays and regular days off. This lost time is estimated to cost $16.3 million annually.

EXHIBIT VI-9

SCRTD OPERATOR ABSENTEEISM AND LOST TIME

	Annual Days Lost per Operator[a]	Total Cost (000's) Direct Wage Cost[b]	Relief Cost[c]	Extra Wage Cost[d]	Total	Reasonable Objective for Reduction Low Estimate	High Estimate
Sick leave	23.2	$ 8,358	$ 2,518	$ 686	$11,562	$ 973 [e]	$3,183 [f]
Miss/absent without pay	3.1	0	337	93	430	- [h]	- [h]
Other leave	3.1	1,117	337	93	1,547	- [h]	- [h]
Suspensions	1.3	0	141	38	179	- [h]	- [h]
Requested time off	5.2	1,873	564	154	2,591	300 [e]	598 [g]
Total Absences and Other Lost Time[d]	35.9	$11,348	$ 3,897	$1,064	$16,309	$1,273	$3,781

(a) Estimated from daily reports (Division Statement of Operating Personnel) from the period 1/27/85 through 6/29/85. Expressed in full-time equivalents for both full-time and part-time operators.

(b) Direct wage cost and wage-dependent fringe benefits cost for the time lost, based on operator levels and wage rates in effect in December 1985.

(c) Fixed benefits cost of all operators carried on the payroll to cover time lost by other operators.

(d) Derived from extra wage cost documented in Appendix III-A for the 1.27 operator ratio. Represents extra overtime and extra non-driving wage cost affected by variations in absence rates.

(e) Relative to national averages developed in a 1980 UMTA-sponsored study titled Operator Absenteeism and Worker's Compensation Trends.

(f) Relative to absence rates reported through APTA by the transit systems in New York, Chicago and Washington, D.C.

(g) Based on a reduction to 4 days per operator annually.

(h) Potential for cost reduction is believed to be negligible.

EXHIBIT VI-10

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

Collision Accidents Per 100,000 Vehicle Miles

Fiscal Year	Accident Rate
1982	8.22
1983	7.38
1984	7.62
1985	7.41

Source: Section 15 reports

Note that SCRTD monitors a subset of these rates which include chargeable accidents only (those subject to disciplinary action), and accordingly are lower than the rates shown here.

EXHIBIT VI-8

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

Summary of Bus Operator Absences and Lost Time Calculated Via Prior Audit Method[a]

Type of Absence or Lost Time[b]	Annual Days Lost Per Operator[e]			
	FY82[c]	FY83[d]	FY84[d]	FY85
Sick Leave	17.0	17.8	18.5	17.0
Request Off	7.4	5.8	4.3	4.0
Other Positions	3.2	3.0	3.8	4.0
Other Absences[b]	3.2	3.5	4.8	7.5
Total	30.8	30.1	31.4	32.5

(a) All statistics from the Transportation Department's 3-5 reports. These data are understated by approximately 30 percent due to omission of weekend absence data, and are included only to provide a trend comparison with previously summarized data in the FY85 audit.

(b) Includes military leave, missouts/absent without pay, suspensions, instruction and other leave.

(c) From FY80-FY83 audit; full-time and part-time operator data were converted to full-time equivalent rates.

(d) Compiled by SCRTD Office of Management and Budget.

(e) Expressed in full-time equivalents. On average, part-time operators are absent about 7 days annually.

NOTE THAT THESE DATA ARE NOT COMPARABLE TO DATA IN EXHIBIT VI-9. PLEASE REFER TO THE TEXT FOR EXPLANATION.

In an effort to define what proportion of this amount could resaonably be reduced, the auditor examined both national transit absence trends and the trends of three operators to which SCRTD frequently compares itself (i.e., CTA, NYCTA, WMATA). Opportunities for absence reduction focus only on sick leave (which includes absent due to illness and injury on duty) and requested days off (RDO), as shown in Exhibit VI-9. The low range of reasonable cost reduction opportunity (i.e., $1.3 million annual) requires that SCRTD lower its driver absence rates for sick leave (including IOD) and RDO's to the national transit averages, which are 21.4 and 4.6, respectively. (National averages based on an UMTA-published report entitled "Study of Operator Absenteeism and Worker Compensation Trends.") The higher estimate of a reasonable cost reduction objective, $3.8 million, requires SCRTD to lower its driver absence rates to those of its peers (i.e., CTA, NYCTA, WMATA). The District's peers, having a larger dollar stake in absenteeism, will perform better than the national average. To perform as well as the mean of these three operators, SCRTD would have to lower sick leave and days lost due to IOD from 6.9 percent to 5 percent and lower RDO's from 5.2 days per operator to 4 days. SCRTD could potentially achieve even greater savings (e.g., Seattle has even lower sick leave, and San Diego has only 7.7 percent total absenteeism), however, the aforementioned estimates appear to be reasonable targets for absence reduction.

4. Safety

SCRTD's traffic safety record was lauded in the previous audit, and performance during the current audit period was similarly positive. As shown in Exhibit VI-10, SCRTD has reduced its accident rates relative to those reported at the end of the previous audit period. During the current audit period, accident rates have been even with the exception of a slight rise in FY84.

It should be noted that these rates include both chargeable (i.e., subject to disciplinary action) and non-chargeable accidents and thus are higher than the chargeable accident rate monitored by SCRTD.

C. CONCLUSIONS

The Scheduling and Transportation functions at SCRTD have generally registered favorable performance over the audit period, and have implemented or are implementing several major strategies for improving operational efficiencies. In comparison to the previous audit (FY80-FY83), there have been improvements in operator utilization and planning, part-time operator utilization and management system (via TRANSMIS). Also, the rate of cost growth evidenced in this audit is lower, both absolutely and relative to inflation, than that recorded in the previous audit.

However, this audit observed three aspects of performance which should be considered for improvement -- operator attendance, workers compensation costs and establishment of objectives. Each of these performance improvement areas are discussed below.

1. Operator Absenteeism and Lost Time

SCRTD's operator absences and lost time result in costs of over $16.3 million annually and should be a priority for improvement. The amount of improvement should be targeted based on the estimated reasonable cost reduction objective of $1.3 to $3.8 million. As noted in the previous section, SCRTD's absence rates are higher than its industry peers. Also, despite being cited as a priority improvement area in the previous audit, operator absence rates have remained relatively stable, incurring only minor degradation.

Currently, SCRTD operators are absent from work for approximately 36 days annually per operator, exclusive of vacation, holidays and military leave. Sick leave accounts for 23.2 days of this total. In percentage terms, total lost time represents 16.2 percent of a standard 260 day work year, and sick leave represents about 8.9 percent (e.g., SCRTD's reported sick leave rate has been about 7 percent). These numbers are higher than previously reported in the audit. The reason for this increase is that SCRTD compiles summary absence statistics based on weekday absences, while calculating percentages relative to total operators (i.e., including those operators not working on weekdays). As a result, SCRTD's absence rates have been understated because they have excluded weekend absences, and thus the extent of absence cost is greater than previously believed.

SCRTD has historically focused on absenteeism from a behavioral perspective and has retained a consulting firm to review and recommend an employee incentive-based program for improving attendance. Improvement opportunities exist in controlling absenteeism through higher level management committment and better information about factors hindering improved attendance.

2. Workers Compensation Costs

During the audit period, SCRTD's Workers Compensation costs nearly doubled, to approximately $19 million from $10 million. In FY85, increases in Workers Compensation costs surpassed the increase in operator wage cost, which dramatically underscores its rate of growth since all fringe benefits normally total less than 50 percent of wage cost. While the responsibility for containing these costs is not directly a responsibility of managers in the Transportation Department, it should nonetheless be a major concern of SCRTD as a whole. Accordingly, this area provides potential opportunities for improvement.

3. Establishment of Objectives

Although the Transportation Department has a comprehensive set of objectives, the use of these objectives as a management tool for encouraging performance improvements could be enhanced by employing these steps:

- o Include the highest-priority objectives for operating division performance in the objectives for the Director of Transportation and the AGM for Operations -- SCRTD's success depends heavily on the successful management of the 12 operating divisions in the Transportation Department. Since both the Director of Transportation and the AGM for Operations have responsibility for these divisions, their management success should in part be measured by the success of the operating divi- This is most directly accomplished by establishing a limited and consistent set of performance objectives for all three levels of management which communicates the performance priorities. Key measures such as absenteeism, accidents and service cancellations are good examples of the types of performance objectives which are relevant to each level of management.

- o Establish performance objectives which are specific to each of the operating divisions -- SCRTD has indicated that it had already planned to implement this strategy, and we endorse its application. It is essential that division managers be evaluated in respect to their work environment, rather than to a department-wide set of standards as is now the case.

These two steps would improve accountability for and meaning of performance objectives, and would lend additional management control.

VII. MAINTENANCE REVIEW FINDINGS AND CONCLUSIONS

The Maintenance department is responsible for the upkeep and disposition of SCRTD's 2,900-plus revenue vehicles and its non-revenue fleet of about 700 vehicles. The Maintenance department, excluding fuel and lubricants for revenue vehicles, accounted for expenditures in excess of $92 million in FY85 or approximately 19 percent of SCRTD's total operating budget.

This section of the performance audit provides a review of objectives utilized by the Maintenance department, an analysis of performance indicators and trends in the maintenance function, and performance audit conclusions.

A. REVIEW OF GOALS AND OBJECTIVES

The performance audit included a review of the objectives established within the Maintenance department, and how these relate to both higher and subordinate levels of SCRTD management. The purpose of this review is to determine the extent to which the objectives reflect the mission of the department, and served as a basis for providing priorities and guiding management actions toward establishing performance.

The district-wide goals related to the Maintenance management function, shown in Exhibit VII-1, provide top-level guidance to Maintenance decision makers and link the department's function to the agency's mission. The more detailed district objectives related to vehicle maintenance, presented in Exhibit VII-2, provide more direct guidance in three program areas -- bus operations, facilities construction and cost control. The objectives are comprehensive, in that they address the primary

EXHIBIT VII-1

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT
FIVE-YEAR GOALS AND OBJECTIVES
(FY 1986 - 1990)
MAINTENANCE MANAGEMENT FUNCTION

Five-Year District-Wide Goals (FY 1986-90)	Five-Year District-Wide Objectives (FY 1986-90)
o To operate a safe, clean, convenience and efficient mass transit system for the general public.	o Maximize cost control containment in District operations and program.
o To improve the productivity of the transportation, maintenance and management sectors of the District.	o Attain a maximum fleet size of 120 percent of the peak fleet requirement (excluding energy contingency bases).
o To protect the public's investment in public transit.	

Source: SCRTD Five-Year Short-Range Transit Plan (FY 1986-90); March 1985.

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT
ONE-YEAR OBJECTIVES (FY 1985-86)
MAINTENANCE MANAGEMENT FUNCTION

ONE-YEAR DISTRICT WIDE OBJECTIVES (FY 1985-86)

BUS OPERATIONS

- To maintain or improve service reliability by:
  - Providing a minimum 99 percent on-time pull-out rate
  - Increasing the mean miles between mechanical failures to 3,000 miles
  - Maintaining fleet size in accordance with the Board approved Fleet Mix Policy
  - Maintaining the active fleet spare ratio below 21 percent
- To maintain at least 95 percent accessible service reliability by:
  - Ensuring that securement (devices) shall be workable and able to secure a wide variety of wheelchairs
  - Ensuring that the lift equipped fleet shall be maintained and assigned to service so that lift equipment is available for at least 95% of the designated accessible trips

FACILITIES CONSTRUCTION

- To complete construction of the Central Maintenance Facility
- To complete renovations of the maintenance facility at Division 1
- To complete the design of the site work and service facility at Division 2.

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT
ONE-YEAR OBJECTIVES (FY 1985-86)
MAINTENANCE MANAGEMENT FUNCTION

ONE-YEAR
DISTRICT WIDE OBJECTIVES
(FY 1985-86)

COST CONTROL

- To reduce bodily injury and property damage liability losses by reducing traffic accident frequency to no more than 4.5 per 100,000 miles.
- To reduce workers' compensation costs by reducing maintenance industrial accident frequency to no more than 9.0 per 100,000 hours.
- To improve the ratio of buses per mechanic by 5 percent.

SOURCE: SCRTD Five-Year Short-Range Transit Plan (FY 1986-90); March 1985.

focus areas of revenue vehicle maintenance activities, and management actively monitors performance against the objectives.

Internally, the Maintenance department has a more detailed set of goals, objectives and standards which serve to direct resource allocation decisions within specific functional and divisional responsibility areas on a monthly, weekly and daily basis. These objectives specify production and program targets, which when met, serve to fulfill the district-wide objectives. For example, SCRTD has a comprehensive preventive maintenance program comprised of three tiers of inspection which, when properly implemented, serve to reduce accident frequencies and roadcalls. Similarly, the South Park vehicle rehabilitation, painting and engine rebuild objectives are agressively established to result in high vehicle availability for pull-out while allowing a reduction in the spare ratio.

Overall the Maintenance department objectives are complete, are well communicated, receive continuous monitoring and are used to establish priorities in routine resource allocation decisions. The objectives are revised periodically to reflect performance capabilities, and generally expect some improvement. For example, in the first year of this audit (i.e., FY83), Maintenance objectives included achieving 90 percent reliability on wheelchair lifts and 3,500 miles between mechanical failures on buses. The most recent objectives (i.e., FY86) in these categories include 95 percent lift reliability and 3,000 miles between mechanical failures. Actual performance levels approach the objectives in both time periods.

While the overall structure and use of goals and objectives is exemplary, there are two apparent improvement opportunities relative to performance as guided by goals and objectives. First, absenteeism reduction, identified as a significant cost control concern in both this and the prior audit, does not appear to be supported by an adequate system of objectives to control

performance and instill accountability. Given the potential bottom-line cost savings, it would behoove SCRTD to develop absenteeism control objectives by employee class (e.g., service attendant, mechanic, clerical support and supervision) and by operating division. Over the FY 1983 audit period an objective of 12 absences per employee per year was in place, but has since been dropped.

Second, non-revenue vehicle maintenance goals and objectives do not have an obvious link to district-wide objectives. Given that this fleet totals about 700 vehicles (including over 500 automobiles), it would appear that the operation of this fleet is of some significance to the agency and should be considered in goal formulation.

B. ANALYSIS OF PERFORMANCE INDICATORS AND TRENDS

This section presents an analysis of performance indicator trends in six areas:

- Cost per unit of service, which describes the trend of labor and materials expenditures per vehicle mile, relative to the local Consumer Price Index (CPI).

- Service reliability, which reviews SCRTD's record of in-service mechanical failures and their causes.

- Vehicle availability, which examines the ratio of spare vehicles, typical vehicle uses and engine rebuild results.

- Maintenance staffing, which reviews staff utilization in terms of service attendants and mechanics per vehicle, and overtime utilization.

- o Maintenance absenteeism, which discusses the magnitude and cost of Maintenance absenteeism.

- o Technology utilization, which examines SCRTD's results from prior technology changes and future plans.

The detailed findings in each of these areas follows:

1. Cost per Unit of Service

The total maintenance function cost per vehicle mile has kept pace with inflation over the audit period, as shown in Exhibit VII-3. The cumulative cost growth between FY82 and FY85 was 6.9 percent, while the local CPI was 7.1 percent. This represents a significant improvement over the prior audit period, when cost growth far outpaced inflation. The total maintenance cost, for the purposes of this indicator, includes both vehicle and non-vehicle maintenance (two separate departments at SCRTD) and fuel, lubricants, tires and tubes cost for revenue vehicles (sometimes included as a Transportation expense).

The contributing factors to cost growth varied significantly. Labor costs per vehicle mile increased more than 20 percent over the audit period (three times the local CPI), but has shown substantial slowing in cost growth. In FY85, labor cost growth actually increased at a rate below inflation. Labor cost control has come about through increased management control over productivity, a conscious reduction in Maintenance overtime and greater reliance on reduced cost labor. The last point refers to servicer attendants. SCRTD had negotiated a change in servicer classification and wage which allows the District to pay new servicer hires a lower wage than current employees, averaging about $2.60 per hour in direct wage savings alone. Through attrition, the majority of servicers fall into the latter category.

EXHIBIT VII-3

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

MAINTENANCE COST PER VEHICLE MILE [1]

	FY 1982 [2]	FY 1983	FY 1984	FY 1985
Labor Cost per Vehicle Mile	$0.72	$0.78	$0.84	$0.85
% change from previous year		11.4%	7.7%	1.2%
Materials and Service Cost per Vehicle Mile (excluding fuel and lubricants)	$0.30	$0.29	$0.32	$0.30
% change from previous year		(3.3%	10.3%	(6.3)%
Fuel and Lubricants Cost per Vehicle Mile	$0.31	$0.27	$0.26	$0.25
% change from previous year		(12.9)%	(3.7)%	(3.9)%
Total Maintenance Cost per Vehicle Mile	$1.31	$1.34	$1.42	$1.40
% change from previous year		2.3%	6.0%	(1.3)%
Los Angeles SMSA CPI-W				
% change from previous year		1.6%	2.5%	3.0%

1. Source: UMTA Section 15 Reports. Includes vehicle and non-vehicle maintenance costs. Revenue vehicle fuel and lubricants costs, and tire and tubes costs are included in the maintenance function indicators.

The unit of cost of maintenance materials and services have varied, with a net effect of no cost growth over the audit period. The fuel and lubricants cost, due to market factors, have fallen considerably in the past three years.

2. Service Reliability

Service reliability, measured in terms of vehicle miles between mechanical failures, is improving at the present time. Reliability dropped significantly between FY82 and FY83, with a sizeable reversal in this trend between FY84 and FY85 (see Exhibit VII-4). In FY 1985, SCRTD narrowly missed its goal of 3,000 miles between mechanical failures, closing the year with 2,953 miles between failures.

Several factors contributed to this performance, the most significant being the engine rebuild requirement at SCRTD. As discussed in the FY83 performance audit, SCRTD's 940 RTS II coaches and other vehicles were reaching the upper-end of mileage limits before rebuild in FY83 and FY84. As a bus engine approaches the end of its useful life span, reliability deteriorates. Significant increases in roadcalls due to engine problems occurred during this span. At the end of FY84 and throughout FY85, SCRTD rebuilt about 75 percent of the engines in question and roadcalls due to engine problems subsequently decreased. The result has been an improvement in service reliability.

3. Vehicle Availability

Vehicle availability appears to have been adequate over the current audit period. This finding is not based on a comprehensive review of missed or late pull-outs due to vehicle availability but through interviews in Maintenance and Transportation.

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

MECHANICAL ROADCALLS BY CATEGORY

TYPE OF FAILURE	FY1982	FY1983	FY1984	FY1985
ENGINE				
Cooling system	3,297	4,775	5,068	4,641
Throttle	368	583	639	672
Exhaust system	90	104	93	154
Fuel system	645	1,027	1,097	1,882
Low oil	937	1,220	1,361	1,173
No start	121	192	316	233
Oil pressure	76	110	88	94
Slow bus	224	459	501	672
Smoke	201	164	142	145
Stall	616	826	995	892
Starter	431	353	472	371
Engine percent of total	25%	27%	27%	30%
TRANSMISSION				
Differential	37	50	59	111
Drive line	32	39	48	83
Noisy	32	63	65	51
No shift	1,035	1,116	1,122	980
Oil leak	974	1,058	1,332	1,088
Slip/low	886	1,402	2,029	1,853
Engage	116	608	759	610
Transmission percent of total	11%	12%	13%	13%
ELECTRICAL				
Battery	2,750	3,300	2,890	2,492
Generator/light	204	229	351	440
Horn	86	95	99	92
Interior light	109	163	178	114
Passenger signal	318	146	153	101
Exit light	401	394	253	N/R
Switch/fuse	2,400	2,426	2,486	1,890
Turn signal	61	407	346	243
Electrical percent of total	23%	19%	17%	15%
DOORS				
Emergency	30	19	41	30
Engine	46	41	39	42
Front	631	577	499	832

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

MECHANICAL ROADCALLS BY CATEGORY

TYPE OF FAILURE	FY1982	FY1983	FY1984	FY1985
DOORS (cont.)				
Interior/lock	49	96	109	102
Rear	1,951	2,208	2,334	2,163
Sensitive edge	10	28	29	21
Slow	30	13	32	34
Doors percent of total	0%	0%	0%	0%
RADIO				
Radio	115	190	212	144
BRAKES				
Lock	559	390	336	251
Emergency/hand	30	46	61	47
Noisy	90	211	154	102
Pull/grab	698	723	646	548
Slack	1,054	1,314	1,808	1,301
Hot	121	524	894	610
Brakes percent of total	9%	9%	10%	8%
TIRES				
Tire	361	1,451	1,653	1,467
Tire percent of total	1%	4%	4%	4%
STEERING				
Freeplay	86	76	87	94
Hard	101	74	93	101
Power steering/B.O.	23	149	153	179
Steering percent of total	1%	1%	1%	1%
UNDERCARRIAGE				
Air/bags	405	681	909	835
Chassis	64	55	49	81
Noise	36	60	62	84
Shocks	17	17	28	31
Suspension	117	148	168	250
Kneel	6	57	51	29
Water/leaks	40	433	595	407
Undercarriage percent of total	2%	4%	5%	5%

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

MECHANICAL ROADCALLS BY CATEGORY

TYPE OF FAILURE	FY1982	FY1983	FY1984	FY1985
WINDOW/GLASS				
Stuck	8	10	8	7
Swinging	66	80	64	52
Window/Glass percent of total	0%	0%	0%	0%
AIR CONDITIONING/HEATING				
A/C start	33	143	83	159
Air conditioning	830	846	1,082	1,051
Defrost	56	98	54	73
A/C - H/C	254	366	364	534
Air System percent of total	4%	4%	4%	5%
FAREBOX				
Vault	53	13	13	25
% change from previous year		(75.5)%	0.0%	92.3%
Hot work	84	30	35	60
% change from previous year		(64.3)%	16.7%	71.4%
Farebox percent of total	0%	0%	0%	0%
AIR SYSTEM				
Leak	544	879	1,067	1,086
No air	186	190	283	207
Slow buildup	78	112	108	164
Air system percent of total	3%	3%	4%	4%
WIPERS				
Blade/arm	155	210	116	66
Hot work	158	356	204	114
Wipers percent of total	1%	2%	1%	0%
MISCELLANEOUS				
Operator seat	99	104	108	116
Fire	28	25	17	25
Floor	14	9	6	11
Grab rail	8	16	9	10
Headsign/AC	292	369	352	336

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

MECHANICAL ROADCALLS BY CATEGORY

TYPE OF FAILURE	FY1982	FY1983	FY1984	FY1985
MISCELLANEOUS				
Mirrors	257	254	175	90
No fuel	1,011	1,509	1,656	1,013
Seats	32	31	37	34
Speedometer	6	4	4	4
Wheelchair	378	450	389	446
Miscellaneous percent of total	10%	7%	6%	6%
TOTAL ALL CATEGORIES(1)	27,747	36,994	40,218	36,545
% change from previous year		33.3%	8.7%	(9.1)%
MILES BETWEEN MECHANICAL FAILURES	3,273	2,712	2,668	2,953

FOOTNOTE

1. Total for FY 1985 does not include exit light (electrical) faults, for which data was not available.

SOURCE: Internal RTD report titled "Mechanical Roadcalls by Category" for detailed information. Section 15 Reports used to determine miles between mechancial failures.

N/R: Not reported

Another measure of vehicle availability is the percentage of active vehicles beyond the peak vehicle requirement, or spare ratio. In the FY83 performance audit, the spare ratio was 22.5 percent and was noted as being too high (UMTA allows a spare ratio of up to 20 percent for vehicle purchase funding purposes). The high spare ratio was justified in part due to reliability problems with SCRTD's complex fleet and due to the increased vehicle demands for Olympic service. Given these implications, the high spare ratio (relative to UMTA allowances) appears to be justified over most of the FY86 audit period.

At the end of FY 1985, the spare ratio was reduced to 22 percent and a phased-plan for reduction to 20 percent is inplace. The immediate reduction of fleet size is stymied, to some extent, by continued engineering and reliability problems (particularly with the two newest fleets -- Neoplans and Carpenters) and a glut of surplus buses on the open market.

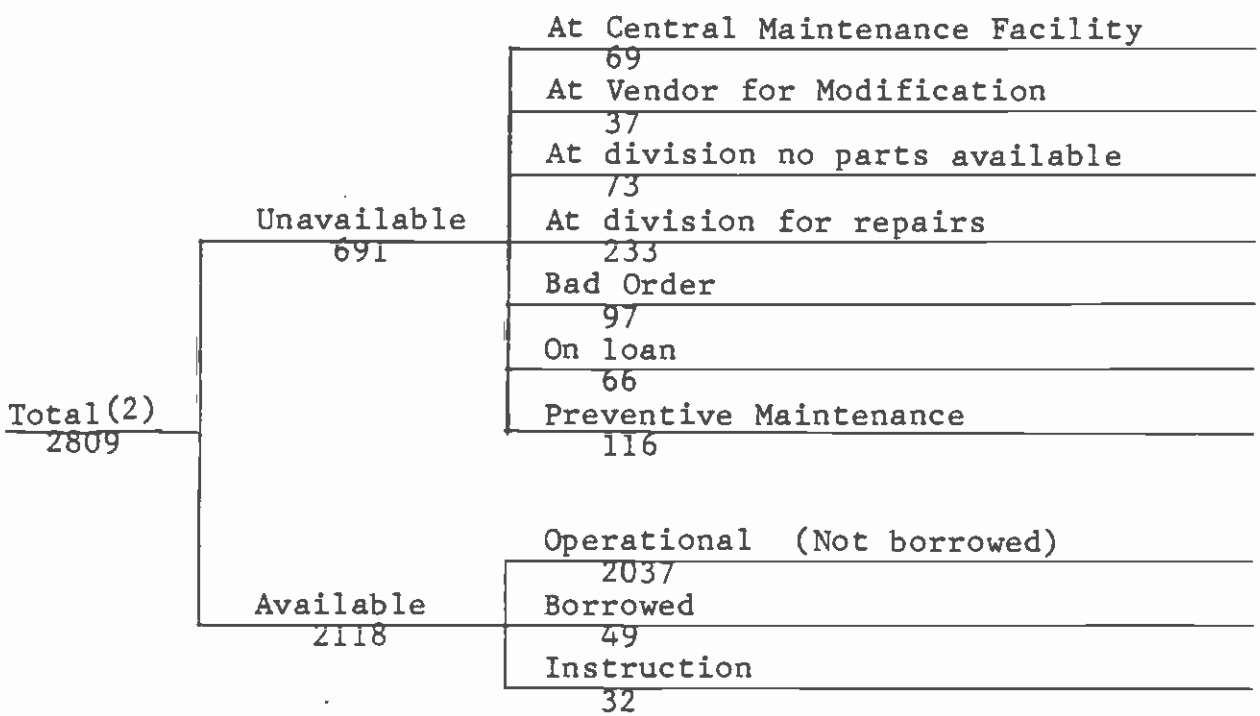
When reviewing spare ratios, it is important to understand that spare vehicles are not always vehicles parked at the garage ready for revenue service. Spares encompass vehicles undergoing engineering changes, major rebuild and repair, preventive maintenance, and vehicles needed to cover breakdowns in service. A typical distribution of vehicles and their deployment is shown in Exhibit VII-5. This type of information is monitored by Maintenance management by division every day, separately for morning and afternoon peaks.

The effectiveness of the South shop has been an important factor contributing to SCRTD's vehicle availability performance. The heavy maintenance facility has generally met or exceeded engine remanufacture, engine change-outs, transmission overhauls and heavy wreck repair goals throughout FY85 and to date in FY86. The productivity and throughput of the shop has increased steadily, with management continuing to engineer improvements with the assistance of a consulting firm.

EXHIBIT VII-5

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

SAMPLE OF COACH AVAILABILITY(1)



FOOTNOTES:

1. Based on available data for Wednesday, December 4, 1985.

2. The total includes 2760 vehicles assigned to divisions, plus 49 borrowed vehicles.

SOURCE: "Vehicle Maintenance System, Bus Availability Summary". Internal RTD Report.

Another factor impacting vehicle availability is average vehicle age. RTD's total fleet has aged over the audit period, even with the influx of some new vehicle and the retirement and/or sale of others. The average vehicle age of the fleet owned by RTD for each audit year follows:

- FY82: 5.0 years
- FY83: 6.3 years
- FY84: 8.7 years
- FY85: 6.0 years
- FY86 (March): 6.8 years

The distribution of vehicle ages as of January 1, 1985, shown on Exhibit VII-6, indicates some improvement in the distribution of vehicle ages over the prior audit period.

4. Maintenance Staffing

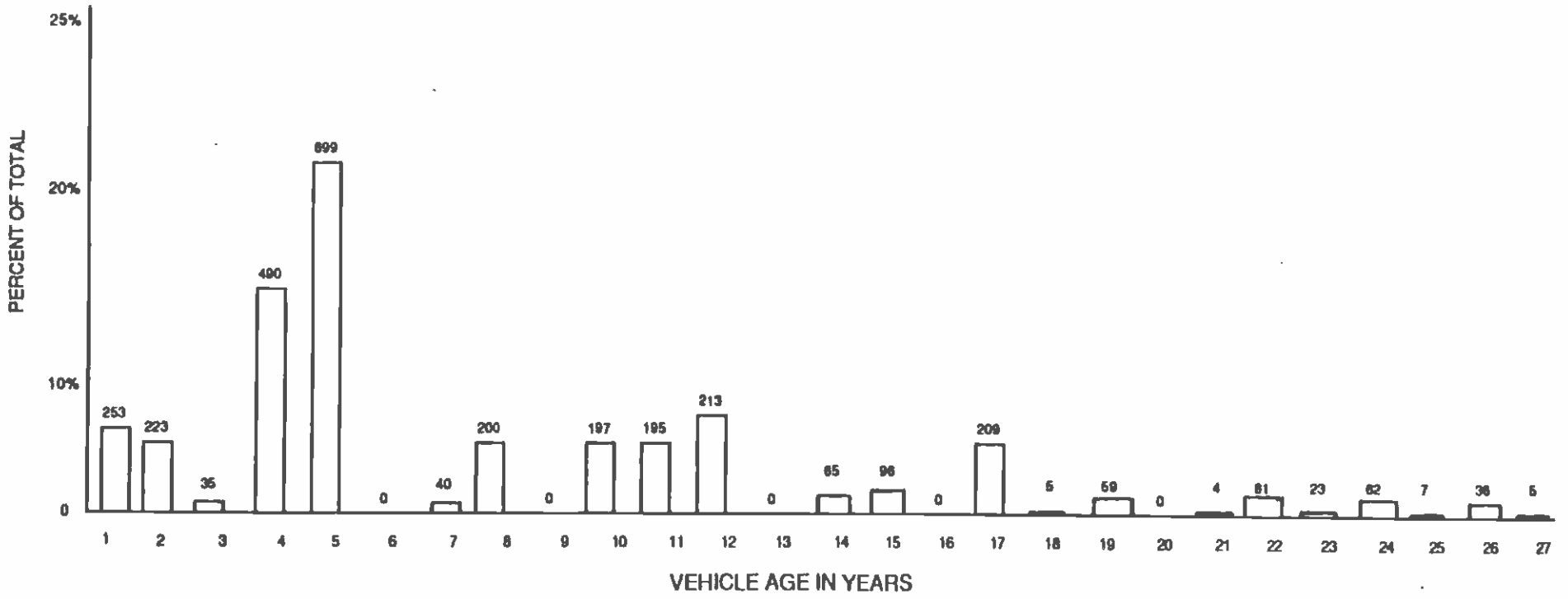
Maintenance staffing has fluctuated in both directions over the FY86 audit period, with a net result of slightly lower labor productivity in FY85, measured as peak vehicles per maintenance employee. Maintenance staffing in FY85 is almost 23 percent higher than FY82 staffing in all categories, while peak vehicles have increased by only 6 percent, or 111 vehicles. Staffing levels and worker productivity, as shown in Exhibit VII-7, are impacted by both peak vehicle requirements and overtime. Peak vehicles increased steadily in FY84 and FY85, after a moderate decrease in FY83. Increasing vehicle sophistication, aging of the vehicle fleet and more complex administrative and support requirements, coupled with a desire to improve vehicle reliability, contribute to the productivity trend.

Overtime impacts the staffing levels reported as they are expressed as full-time equivalent employees and not as the actual number of individuals employed. The impact of overtime on staffing equivalents is clearly illustrated on Exhibit VII-8,

EXHIBIT VII-6

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

DISTRIBUTION OF BUS FLEET AGE (JANUARY 1, 1985)



SOURCE: Coaches Owned by SCRTD, January 1, 1985 "Active Fleet Inventory"

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

MAINTENANCE STAFFING LEVELS

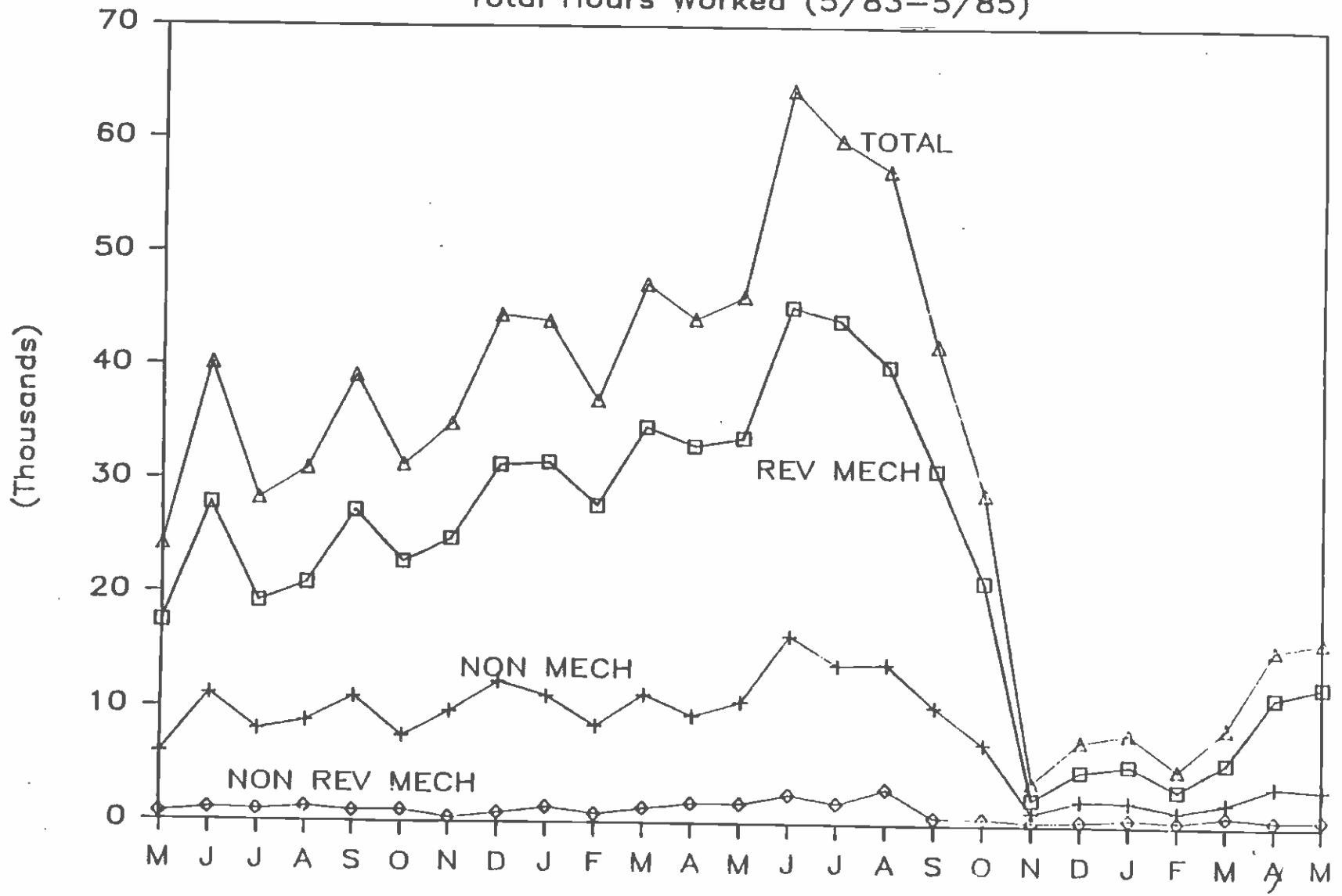
STAFFING LEVELS	FY 1982	FY 1983	FY 1984	FY 1985	Percent Chang FY82 - FY85
Supervision	157	189	215	227	44.6%
Support Services	207	188	237	269	30.0%
Mechanics	1,167	1,389	1,397	1,448	24.1%
Servicer Attendants	439	465	503	473	7.7%
Total	1,970	2,231	2,352	2,417	22.7%
Peak Vehicles per Mechanic	1.62	1.35	1.43	1.39	(14.2%)
Peak Vehicles per Servicer	4.32	4.02	3.96	4.24	(1.9%)
Peak Vehicles Per Total Maintenace Employee	0.96	0.84	0.85	0.83	(13.5%)

SOURCE: UMTA Section 15 Reports. The staffing numbers are expressed as full-time equivalents.

EXHIBI VII-8

MAINTENANCE OVERTIME

Total Hours Worked (5/83–5/85)



showing maintenance overtime hours. During FY84, and in particular the Olympic period, SCRTD's Maintenance department utilized in excess of 60,000 hours overtime per month. Shortly after the Olympics (FY85) SCRTD effectively managed overtime at a rate almost 40 percent below prior year overtime levels. This management action positively impacted both labor productivity and cost control, resulting in an immediate savings of about $1.4 million.

5. Maintenance Absenteeism

Absenteeism, identified as an area of concern in the FY83 audit, continues to be an area of management concern in the current audit period. It is estimated to cost $4.2 million in FY85. A reasonable target for reduction is in the range of $500,000 to $1 million. Maintenance absenteeism appears to have increased moderately over the FY86 audit period, from an estimated 21.1 unscheduled absences per maintenance employee in FY82 to 22.8 unscheduled absences in FY85. Unscheduled absences include sick leave, occupational injury, absent without leave (AWOL), and disciplinary leave (suspensions). Scheduled absent days per employee are estimated at 17.3 days in FY85, although it is likely that this estimate is low. The estimate is based on October 1984 through June 1985 actual data, which may not adequately reflect the absence patterns in the months of July, August and September. Scheduled absences include vacation, holidays, requested days off, military leave and other planned absences. The figures presented are for line staff only; supervisor and management absenteeism is not included.

Both scheduled and unscheduled absenteeism vary substantially by operating division, as shown in Exhibit VII-9. In the final nine months of FY 85, scheduled absences ranged from a low of 8.2 days per employee at Division 302 to a high of 15.7 days per employee at Division 310. The same two divisions comprise the high and low unscheduled absences, with Division 302 at 13.5 days per

EXHIBIT VII-9

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

ABSENT DAYS PER MAINTENANCE EMPLOYEE

OCTOBER 1984 TO JUNE 1985[1]

Division	Number of Employees	Total Scheduled Absent Days	Scheduled Absent Days per Employee	Total Unscheduled Absent Days	Unscheduled Absent Days per Employee
301	111	1,474	13.3	1,923	17.3
302	135	1,108	8.2	1,817	13.5
303	102	1,427	14.0	1,943	19.0
304	41	617	15.0	574	14.0
305	149	2,151	14.4	2,551	17.1
306	68	826	12.1	1,466	21.6
307	106	1,320	12.5	2,397	22.6
308	96	1,337	12.3	1,946	20.3
309	133	1,769	13.3	2,289	17.2
310	97	1,520	15.7	2,356	24.3
311	-	-	-	-	-
312	84	1,135	13.5	1,508	18.0
314	402	5,105	12.7	5,757	14.3
315	121	1,495	12.4	1,482	12.2
316	63	984	15.6	1,405	22.3
318	77	1,092	14.2	1,603	20.8
804	30	183	6.1	76	2.5
DEPARTMENT-WIDE 10/84-6/85:	1815	23,543	13.0	31,039	17.1
ANNUALIZED DEPARTMENT-WIDE[2]:	1815	31,391	17.3	41,385	22.8

FOOTNOTES:

1. Only data available.

2. Annualized figures derived by multiplying available figures by 12/9. Data for nine months is available.

SOURCE: Internal RTD Report Titled: "Absent Days per Maintenance Employee"

employee and Division 310 at 24.3 days over the same nine month period. In total, maintenance employees are unavailable for work for an estimated 41 days per year. This ranges from an estimated 29 days per employee at Division 302, to an estimated 53 days at Division 310.

The difference between absenteeism at divisions is at least partially attributable to the staffing mix at individual divisions. RTD's labor contracts allows maintenance employees to bid on work location every six months based on seniority. Like other large transit operators with similar provisions, this tends to result in a large proportion of senior employees working at some divisions, and newer employees grouped at others (e.g., particularly divisions with difficult transportation access). The mix of employees does impact relative absenteeism, occupational injuries and suspensions by division.

Another way to look at absenteeism is by employee classification, as shown in Exhibit VII-10. In the final quarter of FY85, service attendants averaged 43 percent higher unscheduled absenteeism than mechanics. Servicers also incurred slightly higher lost hours due to occupational injuries, as compared to mechanics.

While maintenance absenteeism was studied over the FY86 audit period under the TOPIF program, few specific recommendations resulted beyond that already apparent to management. No visible management actions appear to have been taken with regard to absenteeism reduction over the FY86 audit period. However, significant gains were made in other areas (e.g., service attendant class and pay change) early-on in the period through contract negotiations. Some types of management action (i.e., disciplinary absence actions) may have had negative implications on contract negotiations had they been implemented.

EXHIBIT VII-10

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

MAINTENANCE ABSENTEEISM

FINAL QUARTER, FY 1985

Division	Absent Hours		Absent Hours due to Occupational Injury	
	per Mechanic	per Service Attendant	per Mechanic	per Service Attendant
301	31.2	37.2	2.1	0.9
303	30.8	52.5	1.2	0.3
304	34.4	37.7	3.8	0.0
305	39.9	57.6	2.1	11.7
306	43.6	57.3	0.0	0.0
307	36.4	50.9	5.4	12.6
308	29.3	27.5	4.4	3.1
309	31.0	31.4	6.5	0.6
310	38.6	63.2	6.0	0.4
312	25.3	40.7	0.3	12.5
314	33.7	115.2	2.2	2.1
315	26.3	42.6	2.7	2.3
316	65.9	46.1	5.2	0.0
318	29.0	45.7	0.0	0.8
804	24.3	6.0	4.7	0.0
DEPARTMENT-WIDE:	34.1	48.7	3.0	3.8

SOURCE: Equipment Maintenance Department, VMS Management Information, Mechanics Absenteeism Report (Last Quarter, FY 1985)

It is important to note that management dropped the FY83 audit period objective of reducing absenteeism to 12 days per maintenance employee per year. Given the actual performance over the three-year period (FY80 to FY82), the objective was unreasonable. No revised formal objective has been established to date, either on the department-wide or division basis. Even without an objective for the level of absence reduction, management is closely monitoring performance and acting to initiate reductions.

In FY86, Maintenance management did evaluate the absenteeism issue and develop an absenteeism reduction program which has been implemented. The program includes employee incentives for improved attendance and allows some flexibility in application by division. The program appears to have resulted in some immediate improvements, albeit it is premature to judge what the real long-term impacts will be.

6. Technology Changes

SCRTD has been proactive in pursuing technology enhancements as a means to improve maintenance effectiveness and efficiency, and has been successful in this area to date. Several specific programs warrant attention here, including the Vehicle Management System (VMS), fareboxes, paint shop robotics and brake life enhancements.

The VMS, implemented in FY84, fills an information void in the areas of worker productivity, work levels, component life, vehicle histories and numerous other areas on both a real time and cumulative basis. The information provided by VMS is invaluable when used to better plan and manage maintenance work and to control staffing productivity and work quality. The VMS output has been used to compile and compare tables of total and

average time to conduct primary maintenance tasks, in the interest of better job scheduling and planning. Additionally, it is used to monitor actual vehicle and fleet status by peak period by day, planned and actual production levels, employee absenteeism and other performance attributes too numerous to print here.

The total benefit of VMS has not been realized, although management is steadily "mining" the information riches it has to offer. Programs such as FOCUS, currently underway, are undergoing development to provide managers with flexible information system access to analyze and evaluate different performance issues as they occur. Management is actively involved in the design and use of analytical tools related to the recently established maintenance data base. The VMS has proved to be an important management asset to date, and is becoming increasingly important to departmental operations and control.

RTD has experienced difficulties with its Cleveland fareboxes (circa 1945) in the collection and security of passenger fares. The Cleveland farebox is a mechanical farebox comprised of a manual drop plate and a simple fare vault. The vault, designed for simpler times, incurs serious deficiencies in terms of capacity and security with high fares and is particularly inept at collecting dollar bills. Fare short-changing and potential theft are specific concerns. Half dollar bills (i.e., bills torn in half and used for two trips) alone result in a revenue loss of about $550,000 annually.

SCRTD is currently in the process of testing new electronic, registering fareboxes designed to accept and allow verification of currency and coin fares paid. As might be expected, some technical difficulties have surfaced in the test phase and are being worked on by the manufacturer. RTD plans to implement the fare collection system fleetwide in June 1986.

This change in technology is expected to increase overall revenues by between two and five percent, or $2.5 million to $6.3 million recurring annually (based on the experience of other transit agencies). The increased equipment complexity is expected to result in a higher maintenance cost. An additional 39 full-time mechanics above the current farebox staffing is planned, along with higher materials cost, resulting in a cost increase of $1.7 to 2.0 million per annum. The technology change, therefore, is expected to result in a net gain of $0.8 million to $4.3 million annually.

Another planned technology improvement entails using robotics in the new Central Maintenance Facility workshop. The workshop, expected to open in December 1986, is designed to use a new technology not in response to an existing problem, but rather in response to a cost savings opportunity. This change is expected to result in an immediate reduction of fifteen bus painters, with a corresponding reduction of $500,000 to $700,000 reduction in annual expenditures. A less obvious benefit stems from removing employees from the hazardous (toxic) environment of spray painting. This could have positive residual impacts on insurance and worker's compensation expenditures.

A further technology improvement opportunity, brake life, is being researched currently at the RTD. There is no apparent problem with brake life, but with relines occuring every 19,000 miles using 20 manhours and $400 in parts, the RTD expends $5.4 million on relines annually. In an effort to realize potential cost savings, RTD is currently testing both output retarders on GMC transmissions and new non-asbestos brake lining materials. Given a potential improvement of 5 to 20 percent in miles between relines, RTD stands to save a potential $250,000 to $900,000 per year, recurring.

C. CONCLUSIONS

Overall, the maintenance function has demonstrated improved performance relative to the FY83 audit period. Specific strengths and weaknesses based on study findings follow:

- Maintenance goals and objectives are complete, well communicated, monitored and used in making decisions. Goals and objectives could be further improved by establishing a formal objective for absence reduction by division and formalizing non-revenue vehicle goals and objectives. An improved set of goals and objectives are being prepared by RTD Maintenance management as part of the FY87 budget submitted, but have not been reviewed under the FY86 performance audit.

- Maintenance cost per mile has been effectively controlled by management with overall cost growth equalling inflation in FY85. This represents a significant slowing in cost growth which was substantially higher than inflation over the FY83 audit period.

- Service reliability fell in the initial two years of this study, but improved in FY85 (measured in terms of mean miles between mechanical failures). Increasing fleet age, use of borrowed and reserve vehicles for the Olympics, engineering problems with new Carpenters and Neoplans, and engine rebuild requirements all contributed to performance. Given these factors, the reduction appears justified and performance is on the upswing through the current period in FY86.

- Vehicle availability appears to have been adequate and has required a higher-than-desired spare vehicle ratio. The spare ratio, at 22 percent currently, is planned for reduction to 20 percent in the 1987 fiscal year. The Olympics, new fleet reliability problems and used bus surplus on the open market all contribute to the current spare ratio.

- Maintenance staffing has fluctuated over the FY86 audit period resulting in a moderate decline in productivity. Maintenance employee overtime was effectively controlled with a cost savings of about $1.4 million in FY85.

- Maintenance absenteeism has continued at a rate exceeding management desires at a cost of about $4.2 million in FY 85. Absenteeism was studied by SCRTD over the audit period, with few tangible impacts. The labor contract negotiations and other management priorities (e.g., VMS implementation, Olympic service, rebuild program) may have superseded immediate absenteeism reduction actions. In FY86, Maintenance management implemented an incentive program aimed at reducing absence frequencies, with some success reported to date. More improvements are possible and are appropriate, with a reasonable target for cost reduction in the range of $500,000 and $1 million.

- Technology enhancements have been effectively exploited by RTD management to realize effectiveness and efficiency improvements. This focus continues to be an integral and viable element of RTD's plans and programs for improved results.

Specific recommendations for improvement opportunities are presented in the final section of this report.

VIII. GENERAL ADMINISTRATION

SCRTD's General Administration function includes agency-wid management and support services not directly attributable t another function (e.g., vehicle maintenance). Such service include budgeting and financial planning, service planning, an marketing and public relations, which is discussed in late sections of this chapter.

Over the audit period FY 1982 through FY 1985, reported Genera Administration labor staffing declined by 10.8 perecent, as show in Exhibit VIII-1. The relationship of General Administratio management staff to support staff changed considerably from management/professional/supervisory staff member per 1.05 suppor staff, to 1 manager per 0.6 of a support staff member -- wit significant cost consequences.

Examining staff assigned to the General Administration functio provides only part of the picture, given that the two othe functions (i.e., Transportation and Maintenance) also ar assigned support and management personnel. The second part o Exhibit VIII-1 reports total agency management and support staf (excluding capital staff), and shows almost 10 percent growt over the audit period. As with those staff reported as Genera Administration, the total management size has grown at relatively high rate (i.e., 27.2 percent) and support staff ha declined.

The overall result of administrative staff growth has been lo productivity, measured as vehicle service hours per employee. I FY85, SCRTD's management and support staff grew at a rate of 6. percent higher than the change in service hours.

EXHIBIT VIII-1

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

GENERAL ADMINISTRATION

STAFFING LEVELS AND PRODUCTIVITY

	FY 1982[1]	FY 1983	FY 1984	FY 1985	FY82-FY85
GENERAL ADMINISTRATION STAFF					
Management Staff	353	341	383	399	
% change from previous year		(3.4)%	12.3%	4.2%	13.0%
Support Staff	372	256	252	248	
% change from previous year		(31.2)%	(1.6)%	(1.6)%	(33.3)%
Total General Administration Staff	725	597	635	647	
% change from previous year		(17.7)%	6.4%	1.9%	(10.8)%
TOTAL MANAGEMENT/SUPPORT STAFF					
Management Staff	940	1,019	1,018	1,196	
% change from previous year		8.4%	0.0%	17.5%	27.2%
Support Staff	864	733	835	775	
% change from previous year		(15.2)%	13.9%	(7.2)%	(10.3)%
Total Management/Support Staff	1,804	1,752	18,53	1,971	
% change from previous year		(2.9)%	5.8%	6.4%	9.3%
PRODUCTIVITY INDICATORS					
Vehicle Service Hours/Total Management Staff	7,176	6,636	6,938	5,888	
% change from previous year		(7.5)%	4.6%	(15.1)%	(18.0)%
Vehicle Service Hours/Total Support Staff	7,808	9,225	8,459	9,086	
% change from previous year		18.3%	(8.3)%	7.4%	16.4%
Vehicle Service Hours/Total Management and Support Staff	3,739	3,860	3,812	3,573	
% change from previous year		2.7%	(1.2)%	(6.3)%	(4.4)%

FOOTNOTE:

1. FY 1982 systemwide total vehicle service hours were not reported in the UMTA Section 15 Report. The figure was estimated by multiplying the reported figures for average weekday, Saturday and Sunday by the respective number of days in the fiscal year.

Sources: UMTA Section 15 Reports, FY 1982 to FY 1985. Capital staff not included.

EXHIBIT VIII-2

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

GENERAL ADMINISTRATION

COST INDICATORS

GENERAL ADMINISTRATION NORMALIZED COSTS	FY 1982[1]	FY 1983	FY 1984	FY 1985
General Administration Labor Costs per Vehicle Service Hour	$4.28	$4.99	$5.87	$7.05
% change from previous year		16.6%	17.6%	20.1%
Other General Administration Costs per Vehicle Service Hour	$5.32	$5.10	$5.02	$5.08
% change from previous year		(4.1)%	(1.6)%	1.2%
Total General Administration Costs per Vehicle Service Hour	$9.60	$10.09	$10.90	$12.13
% change from previous year		5.1%	8.0%	11.3%
Los Angeles/Long Beach/Anaheim CPI-W % change from previous year		1.6%	2.5%	3.0%

FOOTNOTE:

1. FY 1982 systemwide total vehicle service hours were not reported in the UMTA Section 15 Report. The figure was estimated by multiplying the reported figures for average weekday, Saturday and Sunday by the respective number of days in the fiscal year.

Sources: UMTA Section 15 Reports, FY 1982 to FY 1985.

As outlined in Exhibit VIII-2, total General Administration costs (i.e., costs assigned to the General Administration function only in Section 15) -- normalized by dividing by vehicle service hours -- increased at a rate significantly greater than local inflation in each year of the audit period. In FY 1985, General Administration costs totalled $12.13 for each hour of vehicle revenue service. The reason for the substantial decline over the period was labor costs, which increased 18 percent and 20 percent in the last two years of the period, following a 17 percent increase in FY 1983. These increases offset declines in other General Administration costs (materials and supplies, casualty and liability, etc.) in FY 1983 and FY 1984, and a marginal increase in FY 1985. In the final year of the audit period General Administration labor costs were $7.05 and other General Administration costs were $5.08 for each hour of vehicle revenue service. Total cost growth between FY82 and FY85 was 26.4 percent, or almost four times the rate of inflation.

The following sections present detailed reviews of each of the subfunctions within General Administration -- budgeting and financial planning, service planning, and marketing and public relations.

A. BUDGETING AND FINANCIAL PLANNING

The Office of Management and Budget is responsible for the preparation and review of the operating and capital budgets and grants. The Controller/Treasurer is responsible for financial planning and cash management.

The budget is based on departmental goals and objectives, line item justifications, requirements for detailed program improvement requests and three year budget item comparisons. This budget process is known as the Management by Objectives approach.

Beginning with fiscal year 1984, all departmental expenditures were identified in each department's budgetary allocation. This allowed control of the overall size and complexity of District programs and operations by those who have responsibility for each department, and further allowed the Board an opportunity to review and change, if appropriate, departmental budgets as part of its approval process.

A major change was implemented in the 1985 Annual Budget, toward improved personnel management. For the first time, those temporarily working in positions other than their usual position are fully budgeted and uniformly counted. Therefore, departmental budgets now provide a comprehensive picture of staffing and expenditures.

RTD uses a letter of credit when borrowing monies. RTD employs an aggressive revenue enhancement program. Two programs in use are:

- Revenue Anticipation Notes - This is the sale of revenue anticipation notes which involves metro and bus short term, one year borrowings.

- Sale and Leaseback Agreements - RTD maintains a policy of selling the depreciation benefits of its equipment to private corporations.

As with all other departments, goals and objectives are monitored and maintained.

B. SERVICE PLANNING

One function keenly aware of RTD's transition to a multi-modal organization is Planning. Its responsibilities include conducting on-going analyses of the bus system, performing a wide variety of short- and long-range planning studies, and providing

analytical support to other units of RTD. The Planning Department, with assistance from the Treasurer's Office and OMB, prepares the annual SRTP Schedules Department, as its name implies, is responsible for preparing schedules and driver work assignments. In support of both scheduling and planning activities, the department also collects, processes, and analyzes passenger and service data. In 1983, the Service Analysis Section became part of the Department of Planning and Communications and Scheduling moved to Operations.

The purpose of the Service Analysis Section is to provide the most up-to-date, comprehensive and accurate data to scheduling and planning functions. Phase I of this audit program reviewed several of RTD's data collection efforts. A major strength of RTD's data collection procedures is that service cost and use statistics are electronically processed and maintained for each individual line by day of week. The result is a disaggregate, yet integrated, data base.

Three field data collection techniques are continuously performed: (1) ride checks for comprehensive line data; (2) point checks for maximum load counts, and (3) fare surveys for input to the systemwide patronage and revenue model. The information is collected, processed and reported by the Service Analysis section and is used for several purposes, as outlined below:

- Scheduling
  - Justification for service changes
  - Monitoring and planning Proposition A service
  - Input to Service Adjustment Reports which are submitted to the Commission for Proposition A funds

- o Planning
  - TDA, TPM, Section 15 reporting
  - Line monitoring
  - Service planning studies, (e.g., sector planning and special studies)
- o Management
  - Policy guidance
  - Financial planning and budgeting

The Planning Department has continued to monitor and analyze its effectiveness and efficiency. RTD continually reviews the performance of its operating lines. Due to Proposition A, boardings per service hour have increased from 54 in 1979 to 71 in 1985. The District was restricted from increasing levels of bus service that would incur addition operating costs beyond the agreed amounts. The District anticipated a ridership decline with the termination of Proposition A.

The SRTP facilitated its use as the Agency's Action Plan due to the participation of a cross section of top management in its development. RTD's SRTP consolidates a myriad of planning and policy issues generated within the organization as well as those generated by external agencies, e.g., the LACTC. The document is prepared by the Planning Department with direct oversight and involvement of executive staff. The process begins with the Planning Department reviewing past performance, and current programs, proposed issues and policy statements developed by planning staff are submitted to executive staff for review and comment. Following executive staff approval, a workshop session

is conducted for Board members. Upon Board approval of major issues and policy statements, the planning staff with assistance from the Treasurer's Office, prepares the SRTP document. Once adopted by the Board, the SRTP becomes the key working document for the development of the operating budget.

C. MARKETING AND PUBLIC RELATIONS

The objective of this section is to evaluate the manner and extent to which management addresses the effective and efficient conduct of marketing and public relations.

Marketing and public relations functions are conducted by the Marketing and Communications Department and the Telephone Information and Passenger Services Sections of the Customer Relations Department. Public relations functions are also performed by the Community Affairs and Government Affairs Departments. The Marketing and Communications Department is responsible for planning and executing the District's media relations, promotional, advertising, prepaid sales and market research programs. Passenger Services receives and processes passenger inquiries and complaints. The Telephone Information Center responds to callers requests for route schedule and fare information.

A major changes which occured from 1983 to 1984 was the decision to increase the number of District operated pass sale outlets and commission agency outlets. There are now 440 locations for pass sales. In 1985, the major change was the purchase of material to prevent the use of counterfeit passes. The departmental objectives for fiscal year 1985 emphasize the increase of promotional revenue by the implementation of a new sales program which planned a 5% increase in this revenue for the District. In order to concentrate on the promotional revenue programs, line

specific promotional programs were dropped. Another item addressed included the establishment of a program to determine the eligibility of students for discount fares and the issuing of identification cards in order to eliminate fraudulent passes.

Prior to Proposition A, the advertising budget for this department was $800,000. After Proposition A, the marketing department was no longer funded as it had been in the past and its budget declined to $150,000. Marketing and advertising activities had been geared toward increasing off-peak ridership as well as pass sales which is reflected in the decrease of the budget.

The most significant change in customer relations from 1984 was funds made available for CCIS software development, telephone center office modules and response and inquiry systems. Key objectives include 10 day turnaround on all correspondence and an increase in answers to telephone calls. The CCIS program became an "on-line" program in 1985.

The Passenger Service Section closely monitors the level and cause of customer complaints. These complaints are summarized and forwarded to OMB for review and also sent to the appropriate departments for action. RTD now has a 10 day turnaround on letters. Responding to complaints received the highest priority in the past three years. Telephone call productivity has also increased. Automation has decreased the workforce but increased productivity.

Marketing research activities investigate methods by which service and passenger information can be improved to attract riders. Activities include market segmentation analyses, attitude and service awareness surveys, fare alternative surveys, energy crisis impacts and an analysis of user understanding of the system's timetables.

IX. RECOMMENDATIONS

This section of the SCRTD FY86 Performance Audit Report details the specific recommendations resulting from study findings and conclusions. As this represents the results of the initial phase in a two-phased process, several areas are recommended for more detailed review in the next audit phase. The recommendations are discussed in terms of findings, recommended actions, cost/savings implications, and monitoring methodology.

A. TDA/TPM RECOMMENDATIONS

A single recommendation was developed to improve the RTD's compliance with external reporting requirements.

1. RTD Should Follow the TPM Definition of Peak Vehicles in Reporting this Statistic to LACTC

a. Relevant Findings

The consultant's TDA/TPM investigation identified two significant findings indicating a need for change in RTD's reporting of peak vehicles under the TPM program:

- RTD did not follow the TPM definition of peak vehicles. Values were reported on an annualized average basis as RTD believe this to be a more representative value than peak day requirements (the TPM definition).

- Peak vehicles were estimated on an annual basis dependent upon the estimated level of service annually. Many scheduling changes may occur during the year,

which potentially change the actual peak period from the annualized average (e.g., summer months typically have fewer peak vehicles than fall or spring service, effectively lowering the annualized average peak from the actual peak day vehicle requirements).

b. Recommended Actions

RTD should change its peak vehicle reporting practices relative to the TPM program immediately, and conform to the actual TPM definition. This does not require any additional data collection or compilation efforts. RTD should simply report the highest day peak vehicle requirements to LACTC in its TPM submittals. The TPM program is intended to provide a common performance reporting mechanism for all Los Angeles County operators. This should be implemented not later than June 1986.

In the consultant's opinion, the RTD does have a valid point regarding the usefulness and definition of peak vehicles. In cases where the peak day varies substantially from the annualized average peak vehicles, performance indicators using peak vehicles as a yardstick for productivity measurement (e.g., employees per peak vehicle) become distorted as a result of comparing a single day's service with annual resource input. If the number of peak vehicles is used for these or similar purposes, RTD may desire to request a change in LACTC's current definition. The issue could be discussed at a Bus Operations Subcommittee (BOS) meeting or directly between RTD and LACTC. If the alternate definition is preferred by all reporting parties, the definition should be changed. As long as the definition remains unchanged, RTD should comply with the current reporting requirements.

c. Cost/Savings Implications

There are no cost or savings implications. The recommendation is solely intended to improve RTD's reporting accuracy relative to the TPM program.

d. Cost Monitoring Program

No cost monitoring program is required.

B. SCHEDULING AND TRANSPORTATION RECOMMENDATIONS

Two recommendations were developed in the Phase I audit, addressing goals and objectives, and operator absenteeism. Each is discussed below.

1. SCRTD Should Enhance the Goals and Objectives of the Scheduling and Transportation Departments

a. Relevant Findings

While the objectives used in Scheduling and Transportation reflect the major performance requirements at the line management level, there are two key improvements which would strengthen the use of objectives as a tool for improving performance:

- The linkage of objectives between successive layers of management could be strengthened to reflect the common and unique responsibilities of each level.
- Cost objectives could be established to support budget control.

b. Recommended Actions

Recommended actions correspond to each of the findings, as discussed below:

- RTD should strengthen the linkage of objectives between successive layers of management to better reflect the specific responsibilities of each management level. Above the line management level, objectives tend to be

a statement of general responsibilities as opposed to being an expression of priorities for performance. RTD should tailor performance objectives to the specific responsibilities of each given manager, rather than have objectives limited to overall department objectives.

- RTD should prepare specific cost control objectives, such as Transportation scheduled and unscheduled cost per in-service vehicle hour, for the Transportation and Scheduling departments, respectively. This is an important element of budget planning and control given RTD's and LACTC's interest in cost control. The Scheduling department cost objectives could be used to tailor performance improvements based on existing conditions. Since the actual service levels operated by SCRTD may vary from the projection at the beginning of the fiscal year, and because Transportation expenses are governed by service levels, there is a logical need for a cost objective which is responsive to changes in service levels for the Transportation department.

The recommendation should be implemented as part of the established goals, objectives, and budgeting process in place now, and updated as needed. While some changes are already being made in FY86, the recommendation should be fully implemented during the FY88 budgeting cycle (i.e., by June 1987).

c. Cost/Savings Implications

There are no direct savings improvements which are quantifiable at present. However, the establishment of clear, useable cost control objectives is expected to exert some downward pressure on cost growth.

d. Cost Monitoring Program

As no direct cost savings are anticipated, a cost monitoring program is not appropriate.

2. RTD Should Take Steps to Reduce Operator Absenteeism and Establish a System of Management Controls and Monitoring

a. Relevant Findings

The total field of absenteeism and lost time among SCRTD drivers is estimated to cost about $16.3 million, annually. About 80 percent of this cost is due to sick leave, injury on duty and requested days off. Absenteeism reduction efforts should focus on these absences, with a reasonable objective of reduction falling between $1.3 and $3.8 million -- based on the experience of other industry operators. The remaining 20 percent is due to lost time such as suspensions, absent without leave and missouts. Lost time due to these activities is not considered to be a significant improvement opportunity.

Absenteeism and lost time are cited as an improvement area in the FY86 audit for two reasons:

- There has been no improvement in this area of performance during the audit period (a five percent increase in total absenses actually occurred), and it was cited as an area of significant concern in the FY83 audit.

- It is more extensive than previously believed because of a misunderstanding regarding the manner in which SCRTD summarizes its attendance statistics.

Currently, SCRTD operators are absent from work for approximately 36 days annually per operator, exclusive of vacation, holidays and military leave. Sick leave, including injury on duty, accounts for 23.2 days of this total, and requested days off account for 5.2 days. In percentage terms, total absence time represents 13.9 percent of a standard 260 day work year, total sick leave represents about 8.9 percent (e.g., SCRTD's reported sick leave rate has been about 7 percent). These numbers are higher than previously reported in the audit. The reason for this increase is that SCRTD compiles summary absence statistics based on weekday absences, while calculating percentages relative to total operators (i.e., including those operators not working on weekdays). As a result, SCRTD's absence rates have been understated because they have excluded weekend absences, and thus the extent of absence cost is greater than previously believed.

b. Recommended Actions

Price Waterhouse recommends that RTD absences and lost time be investigated further from the standpoint of management controls. SCRTD has historically focused on absenteeism from a behavioral perspective and has retained a consulting firm to review and recommend an employee incentive-based program for improving operator attendence. We suggest that further evaluation be conducted in Phase II of the audit. We believe that additional, higher-level management commitment is required before any significant improvement can be achieved in this area.

The Phase II audit investigation of absenteeism and lost time would focus on:

- Defining the location and extent of the problem.
- Reviewing the adequacy of management controls and reporting to promote improved performance.

- Obtaining management's opinions as to why the current system has not improved performance.

- Identifying factors which are not controllable by SCRTD management and the extent to which absenteeism is affected by these factors.

- Recommend changes in controls and reporting which would improve the measurement and accountability for improved performance.

We anticipate that improvements in attendance should be attainable based on the range of reasonable cost savings objectives identified in Chapter VI. We also believe that better information about factors hindering improved attendance is a necessary first step and is in fact vital in determining the extent to which these costs are controllable. Reductions in absence cost are not expected to occur overnight given the long-term historical trend of absences amongst RTD drivers. The cost savings of between $1.3 million and $3.8 million should be realized by June 1988.

We recommend that the performance audit team conduct this review in Phase II of the audit. This work is not intended to duplicate efforts underway by RTD and other consultants -- but rather to review the issue from the perspective of management control improvements.

c. Cost/Savings Implications

Because a specific implementation strategy will not be defined until Phase II, it is not possible to identify program costs, although they are believed to be minimal. Potential savings based on a pool of $16.3 million in annual absence costs, is estimated to be in the range of $1.3 to $3.8 million based on the experience of similar operators.

d. Cost Monitoring Program

Because the specific implementation strategy has not been defined, it is not possible to establish a monitoring program. We suggest that this issue be addressed in the second audit phase, as part of the system of management controls.

C. MAINTENANCE RECOMMENDATIONS

There are three separate improvement strategies suggested SCRTD's Maintenance function -- absenteeism reduction, fare collection equipment, and planned improvements (e.g., shop work incentives, brake life enhancements and use of robotics in the paint shop). While the first area represents a more traditional improvement opportunity, the last two improvements cause no concern at present -- SCRTD simply wishes to make adequate areas even more cost effective. Each of the improvement areas is considered high priority and is discussed below.

1. RTD Should Continue With Current Maintenance Absenteeism Reduction Plans and Should Develop and Implement a Monitoring Program

a. Relevant Findings

Maintenance contract employee absenteeism has remained at a stable, but relatively high rate for the past six years. Unscheduled absenteeism is estimated at 23 days per year per employee and costs about $4.2 million annually. SCRTD recognizes the concern and is in the early stages of implementing an incentive program for absence reduction. The program costs and benefits have not been thoroughly evaluated, nor are the characteristics of maintenance absenteeism well known (e.g., distribution of absence frequency).

Management has taken steps to address the maintenance absenteeism issue, using a combination of consultant assistance and substantial internal work efforts. The focus of this work has been behavioral in nature. The consultant, under the TOPIF program, evaluated employee characteristics, perceptions and views relative to job satisfaction and absenteeism. RTD management used this information and knowledge of agency policy, work environment and labor views to develop a flexible attendance incentive program, which was implemented in January 1986. While some initial improvements have occurred, it is premature to judge long-term implications.

While several facets of absenteeism have been addressed, a number of issues remain unanswered. First, absenteeism objectives and targets have not been formally established at the department, division or work group levels. Objectives are needed to provide a yardstick for measuring success and for establishing priorities. Second, a relative determination of controllable and non-controllable absence trends has not been made. Without specific knowledge of the pool of absences subject to management influence, it is difficult to set objectives and tailor improvement strategies to realize specific absence reduction results. Third, cost monitoring programs have not been established which make actual improvement results clear and visible. The VMS does, however, report excellent disaggregate absence occurences.

b. Recommended Actions

The assessment of maintenance absenteeism for management control purposes is recommended for inclusion in the second phase of the performance audit. Specifically, we propose to conduct a more detailed review of management control strategies which would contribute to and support the current positive absence reduction programs. The specific issues to be addressed include:

- Better define the location and mix of absence occurence.

- Determine the types of absences which can be influenced by management action.

- Define the process for development of reasonable absence reduction objectives and targets by RTD management.

- Review controls and levers available to management regarding absence reduction.

- Define a flexible cost monitoring program which can be used by divisions and department management.

We believe that this approach will significantly enhance and support current management actions and resulting performance implications. The study of these issues should be conducted in the second phase of the FY86 performance audit jointly by the auditor and RTD.

c. Cost/Savings Implications

While the specific costs and savings are not yet estimated, a reduction of one unscheduled absence day to three days per employee in the immediate future is not unreasonable. This should result in a cost savings of between $500,000 and $1 million per annum. It is expected that this savings would be fully realized by June 1988.

d. Cost Monitoring Program

A cost monitoring program should be developed as part of Phase II. The specific improvement areas and management controls will significantly impact the type of program needed.

2. RTD Should Continue With Its Fare Collection Equipment Enhancement Program and Should Develop a Cost Monitoring Program

a. Relevant Findings

Revenue collection and security at SCRTD is an area with planned improvements expected to significantly impact cost savings. SCRTD currently utilizes Cleveland fareboxes to collect passenger fares for bus service. The Cleveland farebox, circa 1945, is a simple mechanical farebox comprised of a manual drop plate and a simple fare vault. The box, designed for simpler times, incurs serious security failures with high fares and is particularly inept in collecting dollar bills. Fare short-changing and potential theft are major concerns. SCRTD does not have a firm handle on the total fare revenue loss related to equipment deficiencies, but believes it to be about five percent of total revenues (i.e., $6.3 million annually, recurring) based on the experience of similar agencies. Half dollar bills (i.e., bills torn in half and used for two trips) alone result in a revenue loss of about $550,000 annually.

SCRTD is in the process of testing new fareboxes designed to verify dollar bills, exact fares paid, and provide high vault integrity. The agency plans to install new fareboxes fleetwide in June 1986 and hence reduce the cost of fare evasion and potential theft. This effort will come at a higher implementation cost in the maintenance of the more complicated fareboxes (Price Waterhouse made a preliminary cost estimate of about $1.8 million annual recurring additional cost for maintenance).

b. Recommended Action

The RTD should continue with its testing and fleet-wide implementation of improved farebox equipment. RTD should also work with the auditor in Phase II to develop an internal cost and

savings monitoring program to allow the anticipated savings over prior revenue loss to be applied toward the TPM penalty amount. The technique should be designed so as not to require extensive data collection by RTD.

The cost monitoring program should encompass both implementation costs and enhanced revenues. Several specific elements should be included:

- Implementation costs should compare existing staffing and materials cost with the Cleveland farebox to staffing and materials cost for the new farebox. Because staff is dedicated to this function, actual salaries, fringes and materials should be used. The net cost is the difference between total annualized Cleveland costs and total annualized Cubic Western Data costs.

- Savings from reduction in revenue loss should be calculated on a relative basis (i.e., average fare per passenger) rather than comparing absolute before and after fare revenue collected. To establish fare per passenger, RTD should consider using a limited boarding count (i.e., count of passengers by fare category) on representative routes to establish a theoretical fare level (i.e., passengers times respective fares equals theoretical fare levels). The fareboxes correlating with the counts should be separated and counted as an audit of actual revenue. Comparison of actual and theoretical fare levels results in a fare degeneration factor, applied to systemwide ridership and revenue, is the annual savings.

The monitoring methodology should be implemented by July 1986, and actual cost savings should occur within the first year of operations (i.e., by June 1987).

c. Cost/Savings Implications

Based on a preliminary review of implementation strategies, Price Waterhouse estimates net implementation costs to be in the range of $1.7 to $2.0 million per annum. Potential gross savings range from $2.5 to $6.3 million, recurring annually. Potential net savings, therefore, are expected to fall between $800,000 and $4.3 million annually. The first year of cost savings should be realized by June 1987.

d. Cost Monitoring Program

It is recommended that RTD develop a cost monitoring program, in conjunction with the auditor in Phase II, compatible with internal data collection programs.

3. SCRTD Should Aggressively Pursue its Planned Cost Improvement Strategies and Should Develop Cost Estimating and Monitoring Programs

a. Relevant Findings

RTD has been proactive in pursuing technology enhancements and procedural changes as a means to improve maintenance efficiency and effectiveness. Several key improvement strategies are in process or planned which could signficantly impact cost efficiency and contribute to TPM penalty dismissal. These include shop work incentives, brake life enhancements and automated paint shop implementation.

RTD has retained an industrial engineering consultant to help define shop productivity improvements at the Central Maintenance Facility (South Park). The RTD, in conjunction with the consultant, is in the process of defining engineered time and cost reductions for routine activities. No cost reduction monitoring program is in place or planned.

While there is no apparent problems in brake repair, SCRTD is currently testing both output retarders on GMC transmissions and new non-asbestos brake lining materials in an effort to realize cost savings. Given that RTD currently relines brakes every 19,000 miles and operates over 100 million miles per year, even a small improvement per reline offers large dollar savings. No plan for cost and savings monitoring or scheduling is in place.

Finally, RTD is planning to implement an automated bus paint shop at the new Central Maintenance Facility to be operational in December 1986. The new facility incorporates robotics to paint transit buses, which are manually painted now. In addition to an immediate reduction of fifteen painters, paint consumption may decline due to avoidance of overspray. A less obvious benefit relates to removing mechanics from the hazardous environment of spray painting. This could have positive residual impacts on insurance and workers' compensation expenditures. It is anticipated the type and scale of maintenance costs will change. However, no cost monitoring program is planned.

b. Recommended Actions

Price Waterhouse recommends that RTD establish specific cost monitoring techniques to track the results of these planned improvements. Such a program will allow credit towards the TPM penalty as well as support continuing management decisions regarding program implementation, control and mid-course corrections. Given that the intent of these programs are to improve efficiency, it is essential that management monitor costs and savings to assess degree of success.

The audit team believes that it is within RTD's capabilities to develop a fair and demonstrable means of tracking the cost and savings results of each of these programs. Such a monitoring program is expected to support management control by making operating results visible. The cost monitoring programs should include:

- Specific monitoring strategies for individual types of engineered improvements in the central shop. Because a wide mix of labor may be assigned to a given task, average unit wages and benefits should be used to determine annualized cost implications.

- Because brake relines are conducted by a variety of mehanics (i.e., not a dedicated pool) and more than 68 full-time mechanic equivalents were required for brake repair in FY85, average wage and benefit costs per rebuild are appropriate measures of cost. Given the definition of average wage, fringes and productivity, the cost monitoring program should key in on changes in the mean miles between relines, and materials costs.

- The final technology improvement to be considered, paint shop automation, should focus on actual wages and benefits reduction. The program is expected to impact a small staff of dedicated mechanics (painters) who receive unique pay rates. It is unclear as to the impact of the automated equipment on maintenance and operating costs.

The cost monitoring programs should be in place by December 1986, to insure appropriate monitoring of cost savings.

c. Cost/Savings Implications

Each planned improvement has unique cost savings characteristics. Preliminary estimates by Price Waterhouse include:

- Shop incentives, contract costs of $430,000 to $500,000. Expected savings of $1 to $1.4 million. Net benefit of $500,000 to $900,000, recurring. The first year of savings should occur by June 1987.

- Brake life enhancements, implementation costs expected to be nominal. Anticipated savings of $250,000 to $900,000 annually (recurring). Actual savings could be higher. Because of the relatively long lead time, savings may not occur until December 1987.

- Automated paint shop, implementation costs unknown. Potential savings of $500,000 to $700,000, recurring annually. The first six months of savings should be realized by June 1987.

d. Cost Monitoring Program

Separate cost monitoring programs are recommended for development by RTD over the 1986 calendar year.

D. GENERAL ADMINISTRATION

There are two recommendations in the General Administration area, dealing with risk, insurance and claims.

1. RTD Should Evaluate Workers' Compensation Costs to Isolate Areas for Potential Improvement

a. Relevant Findings

As with the transit industry as a whole, the cost of workers' compensation benefits is a matter of significant concern to SCRTD. During the period FY83-85, workers' compensation costs at SCRTD grew from $10.2 million to $19.1 million, an increase of 87 percent. This increase accounted for nearly half of SCRTD's growth in fringe benefits cost in the audit period, and accordingly has been identified as an issue area for the Phase II audit.

Workers' compensation costs result from injuries to employees sustained while on duty. These costs include direct claims payments, reserves estimated for future payments of current claims, medical costs and other expenses (e.g., legal fees). Injured employees receive payment for time lost for work and may also be entitled to long-term disability payments based on the extent and type of injury. SCRTD is self-insured for these costs and the workers' compensation program is managed centrally (i.e., it is not cost center-based). Administration claims processing and payment is performed via contract with a private firm.

Two significant changes have occured over the FY86 audit period which contribute to the cost growth of workers' compensation. First, two benefit increases were mandated by State law -- one in January 1983 and the other in January 1984. Second, RTD changed its workers' compensation program administrator in October 1984. The new administrator changed the reserve determination methodology which resulted in increased costs. RTD believes that the prior administrator under-reserved for claims.

b. Recommended Actions

Over the FY86 audit period, RTD has focused on improving safety and reducing on-the-job injuries as a means of workers' compensation cost control. RTD has been successful in reducing the number of injuries but the corresponding impact on cost is undefined.

In Phase II of the performance audit, Price Waterhouse recommends an analysis of several facets of workers' compensation costs to isolate areas for potential improvement and determination of cost impacts of management actions:

- Location and costs of claims;
- Policies for estimating reserves;
- Analysis of claims for reduction in risks; and
- Development and implementation of claims and costs.

The review will not entail any actuarial analysis and is expected to culminate in an assessment of claims and risk management and identification of cost reduction opportunities, as appropriate. The review is to be completed by July 1986.

c. Cost/Savings Implications

The auditor has not developed a potential cost savings estimate for this area because of the complexity and detail involved in reaching such a conclusion. Due to the rapid growth in workers' compensation costs during the audit period and the changes in policy and management, we believe further analysis of this area is required. Because a cost reduction plan has not been identified, it is not practical to estimate the period over which cost savings can be realized.

d. Cost Monitoring Program

Development of a cost monitoring program is not appropriate at this time. Cost monitoring procedures will be identified in Phase II for appropriate cost savings improvements.

2. RTD Should Monitor Administrative Staffing and Costs to Capture Potential Efficiencies, Should They Arise

a. Relevant Findings

Over the FY86 audit period, the District's General Administration function costs have risen at four times the rate of inflation when adjusted for vehicle hours of service. Because this only includes General Administration costs it actually under-represents actual total administration (i.e., non-operating personnel) cost growth as management, supervision and support staff have been growing in Transportation and Maintenance as well. The overall productivity of total administrative personnel has fallen over the audit period by 4.4 percent.

The primary cause of the cost growth has been labor-related. General Administration labor costs have escalated by 64.7 percent, compared to inflation of 7.1 percent between FY82 and FY85. While the number of staff members assigned to General Administration actually declined by 10.8 percent over this period, the mix of staff changed considerably towards a higher percentage of management/supervisory staff.

The auditor's review was at a high level of detail, as provided in Section 15 Reports, and does not necessarily identify a problem in this area. RTD has made many effectiveness improvements over the audit period related to management and administrative functions (e.g., goal setting, budgeting, information systems, route restructuring). Given increased requirements and improved performance, the trends may be reasonable, albeit this audit did not investigate these issues in detail.

b. Recommended Actions

RTD should monitor administrative staffing and cost growth carefully over the next several years and determine whether or not this trend supports the overall agency objectives of economy, efficiency and effectiveness. Evaluating the "pay-off" of changes in this area will provide sound basis for decisions and justifications for needs in this area. As in the prior year, RTD should continue to evaluate the need for administrative staffing positions in the budget process.

c. Cost/Savings Implications

No specific cost/savings are apparent based on the high-level analysis. RTD should monitor needs and identify savings opportunities as they arise.

d. Cost Monitoring Program

No cost monitoring program is required at this time.

APPENDICES

APPENDIX A

INFORMATION REFERENCES AND INTERVIEWS

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

I. INTERVIEWS (List not all-inclusive)

Name and Title

Priscilla Adler, Performance Audit Coordinator
Ellen Friedman, Budget Analyst

Ed Nash, Director of Transportation
Bob Korach, Assistant General Manager for Operations
Art Leahy, Transportation Superintendent
Bert Becker, Director of Management and Budget
Mike Butler, Director of Finance

Jim Falick, Transportation Systems Coordinator
Larry Schlegel, Budget Analyst
Ed Paul Fringe Benefits

John Dyer, General Manager
John Richeson, Assistant General Manager for Management
Marvin Williams, Assistant General Manager for Equal Opportunity

Al Perdon, Assistant to the General Manager
Joe Scatchard, Controller, Treasurer, Auditor

Gary Spivack, Director of Planning

Rich Davis, Director of Equipment Maintenance
Larry Lenihan, Acting Superintendent of South Park
Dave Lane, Maintenance Information Systems
Mike Leahy, Equipment Maintenance Administration and Special Projects

Name and Title

Antonio Chavira, Jr., Superintendent of Maintenance

Frank Kershner, Equipment Engineering

Roger Flynn, Production Control

Lita Reyes, Maintenance Information Support

II. DOCUMENTS

- LACTC Performance Audit Program Phase I. Final Report, October 1982.
- LACTC Performance Audit Program Phase II. Task 1 Audit Report, March 1983 and Task II, Audit Report, August 1983.
- SCRTD Productivity Report on 1983 Audit Progress. May 1984.
- SCRTD Productivity Report Update for FY84-85, May 1985.
- Audit Report Update, Interdepartmental memorandum dated November 26, 1985.
- SCRTD Short Range Transit Plans for FY82-86, FY83-87, FY84-88, and FY85-89, FY86-90.
- Energy Shortage Contingency Plan, Fiscal Years 1986-90, Southern California Rapid Transit District, March 1985.
- Bus Maintenance Facilities Plan, Fiscal Years 1986-90, Southern California Rapid Transit, March 1985.
- Twelve Year Maintenance Plan, Fiscal Years 1986-97, Southern California Rapid Transit District, March 1985.
- SCRTD Annual Reports for Fiscal Years 1982-83, 1983-84, 1984-85.
- Agreement between the Southern California Rapid Transit District and the Amalgamated Transit Union, Division 1277, Effective April 1, 1985.
- UMTA Section 15 Reports for years ending June 30, 1983 and June 30, 1984.

III. SUPPLEMENTARY MATERIALS

- 3-5 Reports (Transportation Department), April 1984 to November 1985.
- Contract Between SCRTD and UTU, current and prior contracts.
- Summary of operator and part-time ratios compiled by OMB from 3-5 reports, July 1984 to June 1985.
- Summary of operator wages compiled by OMB, February 1983 to September 1985.
- Budget documents for Fiscal Years 83, 84, 85 and 86.
- Sample Quarterly Performance Reports for Fiscal Years 83, 84, 85.
- SCRTD Performance Monitoring Records.
- Internal absenteeism and overtime reports.

APPENDIX B

COST SAVINGS OF FOLLOW-UP ACTIONS
SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

This appendix details cost savings calculations in three areas: operator ratio reductions, part-time driver utilization and absence cost.

A. Savings from Reducing the Operator Ratio

The Operator Ratio is used to adjust weekly scheduled full-time equivalent assignments to arrive at a total staffing estimate. It is applied to four categories of assignments: (1) regular runs; (2) the maximum of AM and PM non-biddable trippers (3) the maximum of AM and PM open biddable trippers; and (4) the maximum of AM and PM extra work. The full-time driver estimate is then allocated between full-time and part-time drivers based on the allowable percentage of part-time drivers. The operator ratio also provides for back-up coverage for the drivers who would operate these four types of assignments, primarily in respect to absences, vacations and contractually-obligated leave, and other types of lost time.

The current operator ratio is 1.27. It was reduced from 1.32 based on the results of the Operator Planning Study sponsored by the Transportation Department and the Office of Management and Budget (OMB). RTD notes that this is a trial program and the District is evaluating the impact of the reduced ratio on absenteeism, service reliability and safety to help determine the best operating ratio which is sensitive to changing conditions.

Our estimate of the cost savings is approximately $2.2 million and was calculated in respect to two types of cost:

- o Fixed Costs

  The annual fixed cost of the average full-time operator is $9,589. This includes medical coverage ($3,264), life insurance ($48); uniforms ($125); vacation ($1,574); holidays ($1,229); sick leave and other lost time ($2,565); and FICA and pension respective to paid leave ($784). Collectively, these represent the expected cost of each full-time operator on the payroll exclusive of wages earned for driving. Part-time operator fixed costs are $1,025 annually, and are lower because they include only uniform cost ($125) and pre-rated medical cost ($900).

  Based on the schedule effective as of 11/30/85, there were 3,452 full-time equivalent weekly assignments (i.e., 2,807 runs and 645 tripper-combination assignments, including non-biddable tripper combinations; open bid tripper combinations; and extra work combinations). Based on the way the Operator Ratio is applied, there would be 4,255 full-time and 604 part-time operators if the ratio were 1.32, and 4,093 full-time and 581 part-time operators if the ratio were 1.27.

  This calculation is based on the difference between total full-time operators and those full-time operators needed for driving regular runs and non-biddable trippers not assigned to part-time operators.

  The fixed cost estimates are:

  - $41,420,295 for a 1.32 ratio
  - $39,843,302 for a 1.27 ratio

- o Extra Wages

  These wages, which include nonscheduled overtime and nonscheduled guarantee (or shine-out pay), are incurred whenever extraboard driver availability falls below or exceeds, respectively, the need for extraboard drivers (e.g., such as runs left vacant due to the absence of the scheduled operator). The need for extraboard operators varies on a daily basis, reflecting variations in absence rates.

  The probable occurrence of extra wages can be estimated by comparing extraboard size (e.g., 32 or 27 percent) against an expected range of absence and lost time

rates. The average absence/lost time rate of RTD full-time drivers is approximately 24 percent in respect to all drivers, or 28 percent in respect to scheduled runs and trippers (i.e., allowing for the fact that some extraboard operators will also be absent). The range of absence/lost time rates which could be expected should vary approximately between 25 percent and 31 percent in respect to scheduled runs. Expressed in this way, the range can be compared directly to the "coverage" portion of the operator ratio.

The 1.32 operator ratio would exceed the upper range of expected absence rates (i.e., 31 percent). This would result in substantial payment of nonscheduled guarantee wages, and practically no nonscheduled overtime wages. Our estimate of this cost for the current schedule is $1,947,923 annually.

This reflects the fact that RTD economizes on operator surpluses by splitting tripper combinations. The average tripper combination, according to the Transportation Department, incurs 11.3 hours pay (i.e., 8 hours regular pay plus 3.3 hours overtime). When, for example, two operators are available but only one tripper combination is available, each operator would work only 1 of the trippers. The total cost for the two operators would be 16 hours, versus 11.3 hours if only a single operator were available, because no premium pay would be incurred. This somewhat reduces the cost impact of having excess operators available. Because less pay hours are incurred when in an operator "deficit" situation (i.e., per assignment, ovetime costs a margin of 4 hours, versus 4.7 hours when no work is available for an operator), the 1.27 ratio yields a lower estimate of non-scheduled wate cost. Our estimate for this cost in respect to the current schedule is $1,388,758 annually.

In all, the 1.32 operator ratio would produce about $43.4 million in marginal cost, while the 1.27 ratio would produce about $41.2 million, resulting in an annual savings of $2.2 million.

B. Savings from Improving the Utilization of Part-Time Drivers

RTD increased the ratio of part-time drivers to full-time drivers since the time of the prior audit. Currently, the ratio is 14.2 percent versus an average of 8.35 percent in FY82. Part-time

drivers incur lower cost for the District in respect to both wages and benefits. As a result, more widespread use of part-time drivers can be translated directly into cost savings.

We estimate that RTD is currently saving about $3.5 million annually due to increased part-time driver utilization. This is based on what the cost of current service would be if the part-time driver ratio were 8.35 percent as it was in the prior audit, and is calculated in respect to three types of cost:

- o Fixed Cost

  Part-time drivers represent a fixed annual cost of about $1,025 exclusive of wages. This is composed of medical insurance ($900) and uniforms ($125). These drivers receive no other benefits, including compensation for lost time. This contrasts substantially with the fixed cost of full-time operators cited earlier ($9,589).

  It is estimated that the increase in the part-time ratio represents about 236 part-time drivers or 118 full-time equivalents in respect to the current number of part-time drivers.

  A savings of about $0.9 million results from the difference in fixed costs for these two driver groups.

  - $241,900 in part-time driver fixed cost
  - $1,131,502 in full-time driver fixed cost

- o Relief Cost

  This is the cost of extraboard operators required to provide coverage for absences and lost time. Since part-time drivers have a much lower lost-time rate (about 10 days annually) than do full-time drivers (about 62 days annually, including vacation, personal holidays and other lost time), relief costs are lower.

  A savings of about $297,000 is calculated from the difference between the relief cost for full-time drivers versus that for part-time drivers:

- Full-time

  ((118 drivers x 62 days lost)/198 days worked by relief operators)

  x $9,589 fixed cost

  = $354,308

- Part-time

  (((236 drivers x 10 days)/2)
  /198 days worked by FT relief operators)

  x $9,589

  = $57,147

o Wage Cost

There are savings in part-time wages for three reasons: (1) lower average wage rates ($10.60 per hour versus $12.80 per hour), (2) no pay hour guarantee (i.e., part-time drivers are paid for time worked while full-time drivers are paid a minimum of 8 hours regardless of time worked); and (3) part-time drivers do not receive a pension contribution from RTD (7.56 percent for full-time drivers). We assumed that part-time drivers work 4 hours per day, and calculated an annual wage savings of $2.3 million:

- Full-time wages

  118 drivers x 11.3 hours x 260 days x $12.80

  x 1.1461 (for FICA and pension)

  = $5,085,882

- Part-time wages

  236 drivers x 4 hours x 260 days x $10.60

  x 1.0705 (FICA only)

  = $2,785,081

C. Absence Cost

Absence cost includes direct compensation for lost time (e.g., sick leave) as well as indirect cost associated with maintaining a reserve work force to cover for absences. As used herein, absence refers to all time lost from driving except contractually-obligated leave (i.e., vacations and holidays).

Currently, RTD full-time operators are absent from driving duties for about 36 days per operator annually. This includes sick leave (23 days); requests for time off (5 days); and other absences (8 days). Part-time drivers are not available about 10 days per operator annually. This includes sick leave (6 days) and other absences (4 days).

Total annual absence cost, based on current schedules and cost rates, is approximately $16.3 million:

- Direct Costs

  These are calculated for full-time operators only since part-time drivers are not paid for time lost. We have assumed that only 75 percent of lost time is actually paid, and have excluded miss-outs, absent without pay and suspension days lost (collectively about 4.4 days) from the calculation:

  4,093 drivers x 31.5 days x 8 hours

  x .75 x $12.80 x 1.1461 (Pension & FICA)

  = $11,348,436

- Indirect Costs

  These include relief costs and the unscheduled wage costs calculated earlier, and collectively are about $5 million:

  - Reliefs are calculated in respect to regular full-time operator lost time (36 days) and part-time operator lost time, converted to full-time equivalents. In the November 85 schedule there were 3,144 full-time assignments (2,807 weekly runs and 337 weekday assignments comprised of open

non-biddable trippers, open bid trippers and other extra work), and 573 part-time assignments. The annual fixed cost per full-time operator is adjusted to $6,649 from $9,589 to account for the inclusion of paid absence in the "Direct Cost" category.

(((3,144 FT operators x 36 days)
+((573 PT operators x 10 days)/2))
/198 days worked per relief operator[(a)])
x $6,649
= $3,897,019

- Extra wages are also incurred relative to the above absences because they create daily variations in requirements for operators. These can be factored from the total estimate for extra wage cost ($1,388,758) presented in Section A of this appendix. This estimate was based on 47 days spent by operators away from driving duties, of which time lost due to absence is a subset. Since we estimated that there are 36 days lost due to absences (about 77 percent of total time away from driving duties) per operator, extra wage cost attributable to these absences is estimated to be $1,064,730.

(a) Note that relief operators, on average, are available for 198 days out of a 260-day work year due to the 36 days of absence as well as 15 days vacation, 5 personal holidays, 1 day of instruction and 5 days in other positions.