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Final Report
On A Study To Test
And Refine An Evaluation Methodology
For Mid-Size Transit Systems In Michigan

June 1982

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16. Abstract The objectives of this report are to 1) review the activities of a statewide pilot test; 2) present the findings and conclusions of the test; and 3) discuss recommendations for potential refinements to the evaluation project. The latter objective focuses on the following areas: - the quality of the data and its effect on evaluation results; - the usefulness of peer comparisons; - the 'ease' of information gathering; - the opportunities to minimize the time requirements for evaluation; - the uses of the evaluation results by the transit operators; and - the potential outcome of the evaluation including a) providing an explanation for performance characteristics; b) identifying the need for further study; c) identifying opportunities for improvement; and d) recommending solutions.			
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I. INTRODUCTION

This is the final report for the project to Test and Refine an Evaluation Methodology for Mid-Size Transit Systems in Michigan.¹ The objectives of this report are to:

- . review the activities conducted in the pilot test;
- . present the findings and conclusions of the test; and
- . discuss recommendations for potential refinements to the evaluation process.

Following this introduction, which includes a brief overview of the evaluation methodology, the report is presented in three sections which correspond to each of these objectives.

PHASE I: DIAGNOSTIC REVIEW

The evaluation methodology developed for the mid-size transit systems in Michigan consists of two phases: diagnostic review and detailed performance evaluation. Exhibit 1 illustrates the basic steps in each phase.

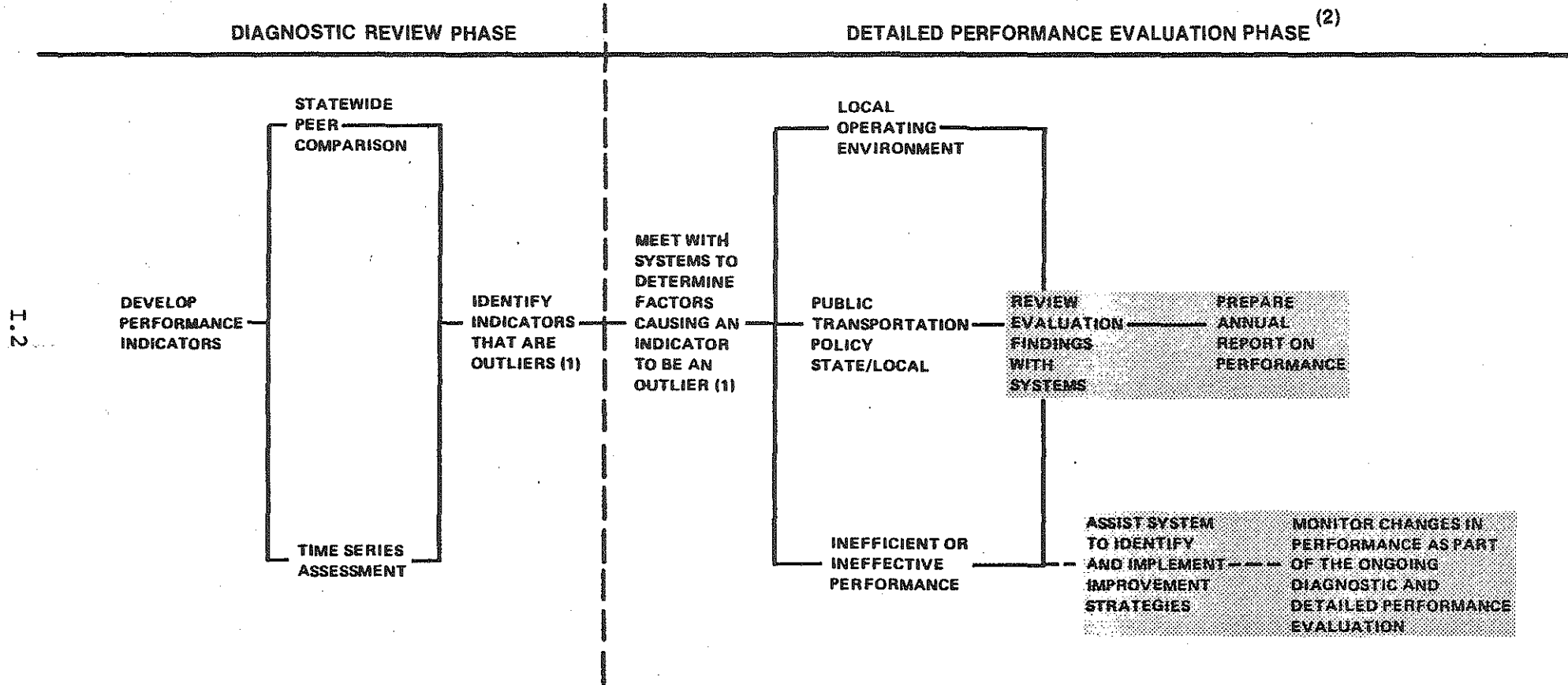
The first phase is a diagnostic review. In this phase a set of performance indicators are used to measure various aspects of transit system efficiency and effectiveness. The indicator values from each mid-size transit system in Michigan are compared across transit systems and over time. Indicator values that are significantly higher or lower than the average of other systems and that are changing significantly over time are identified.

The primary objectives of the first phase of the evaluation are to conduct a preliminary review of each transit system and to provide focus to the more detailed reviews. Through the use of indicators, the scope of the evaluations and resources required to conduct them can be limited and the analysis can be more productive.

¹ This is the Final Report for contract 79-1829, as amended. This contract is separate from an earlier Peat Marwick State of Michigan contract 78-1869 to develop and test an evaluation methodology for transit.

EXHIBIT 1

OVERVIEW OF THE EVALUATION METHODOLOGY



(1) "Outlier" is the term used to describe performance indicator values that are significantly higher or lower than those in other systems or that are changing significantly over time.

(2) The final activities in the Evaluation Methodology that are shaded on this exhibit were not conducted during the statewide test.

PHASE II: DETAILED PERFORMANCE EVALUATION

The second phase is a detailed performance evaluation. This phase consists of a more detailed investigation of transit agency performance. Through direct contact with the transit operators, information is gathered about the local operating environment of the transit system, the effects of state and local policy on performance, and the management and operating procedures within the transit system. Information gathering is focused on attributes of the transit system suggested by the indicators identified in the Diagnostic Review Phase of the evaluation. The information gathered in this second phase of the evaluation is intended to:

- . provide information on and explain performance characteristics;
- . identify examples of innovative or exemplary performance that may be shared among the local transit systems in Michigan;
- . suggest the need for further analysis; and
- . identify opportunities for improvement and potentially recommend solutions.

This information serves as the basis for monitoring performance over time and annually assessing the efficiency, effectiveness, and progress of each transit system.

A Data Needs Manual was developed in conjunction with the evaluation procedures. The Data Needs Manual defines each performance indicator included in the Diagnostic Review Phase and explains how each indicator was developed. With the exception of several indicators which include demographic data (available from UPTRAN), the performance indicators are composed of financial and operating statistics included in the (required level) Section 15 reporting requirements developed by the Urban Mass Transportation Administration (UMTA) of the U.S. Department of Transportation.¹ Section 15 data are routinely reported to the Federal Government each fiscal year by transit operators who receive Section 5 federal funds.

¹ UPTRAN currently requires that most of these data be submitted annually by transit operators in its Operating Assistance Report.

II. REVIEW OF PILOT TEST ACTIVITIES

This section presents a review of the pilot test activities including:

- . background and overview;
- . objectives of the pilot test;
- . Diagnostic Review Phase activities; and
- . Detailed Performance Evaluation Phase activities.

BACKGROUND AND OVERVIEW

The project to Test and Refine an Evaluation Methodology for Mid-Size Transit Systems in Michigan was initiated subsequent to the completion of a project in which the draft evaluation methodology was developed. Initially, UPTRAN intended to implement the evaluation program including automation of elements of the evaluation process and formal definition of roles and responsibilities as part of the development project.

The mid-size transit operators in Michigan stated that implementation of the evaluation program at that time was premature. As a result, UPTRAN agreed to more extensively test the evaluation methodology through pilot application in each of Michigan's ten mid-size transit systems and, as necessary, refine the methodology to reflect this more thorough testing process.¹

The state-wide pilot testing effort was structured to complement the evaluation methodology. First, the Diagnostic Review Phase was conducted. Later, the Detailed Performance Evaluation Phase was conducted through on-site interviews at the eight participating mid-size transit systems.

¹ Data from Grand Rapids Transit Authority were included in the first phase of the pilot test activities but, at its request, Grand Rapids did not participate in the second phase of the test. Kalamazoo was not included in the Detailed Evaluation Phase because of a scheduling conflict. Consequently, the pilot included the active participation of eight of the ten mid-size transit systems in Michigan.

OBJECTIVES OF THE PILOT TEST

The following objectives for conducting the state-wide pilot test were specified in advance of conducting the test. They reflect the concerns and interests of UPTRAN, the Michigan Public Transit Association (MPTA), and the transit operators that were expressed during the development of the evaluation methodology. The objectives were to:

1. pilot test the methodology in all ten of the mid-size transit systems in Michigan. (During the initial project, the evaluation methodology was tested on one Michigan and several mid-size transit systems elsewhere in the United States.)
2. provide an opportunity for Michigan transit operator involvement in the refinement of the evaluation procedures.
3. refine and tailor the evaluation methodology to better serve the State and the transit operators. Areas identified for review included:
 - . the quality of the data and its effect on evaluation results;
 - . the usefulness of peer comparisons;
 - . the 'ease' of information gathering;
 - . the opportunities to minimize the time requirements for evaluation;
 - . the uses of the evaluation results by the transit operators; and
 - . the potential outcome of the evaluation including a) providing an explanation for performance characteristics; b) identifying the need for further study; c) identifying opportunities for improvement; and d) recommending solutions.

DIAGNOSTIC REVIEW PHASE ACTIVITIES

The first phase of the pilot test involved a diagnostic review of performance indicators included in the Data Needs Manual developed for this project. The diagnostic review included 1) a review of data reasonableness, 2) the development of performance indicators, 3) a peer comparison of performance

for all mid-size Michigan transit systems, and 4) a time series assessment in which the performance of each system was assessed against itself over time and against the average change in performance over time of other mid-size transit systems in the State.

As stated above, the primary objective of the diagnostic review phase of this methodology was to identify performance indicator values that appeared to be outliers (i.e. apparently different from normal) in that they:

- . differed from the average state-wide indicator value, having a value significantly higher or lower than the norm; or
- . were changing significantly in magnitude or direction in comparison to past values of the indicator for the transit system or for the average of all mid-size systems in the State.

By identifying indicator values that are outliers, the detailed evaluation could be focused on those areas which appear to merit the greatest attention.

It is important to note that the identification of an indicator as an outlier does not presume that the performance of the transit system is either good or bad. It simply serves to identify areas for further investigation in the Detailed Performance Evaluation Phase.

The Diagnostic Review Phase included the following steps:

1. Performance indicators in the Data Needs Manual were developed for each of the ten mid-size transit systems in Michigan using available Section 15 data reported to UMTA for FY79 (1978-79) and FY80 (1979-80). The indicators were developed for (1) total system, (2) motor bus mode, and (3) demand response mode, as appropriate. Because of the Section 15 Report structure, not all indicators could be developed by mode. For example, indicators which include revenue data could be developed with Section 15 data only on a total system basis. Indicator values were not developed for a transit system if data were not reported to UMTA by that transit system. Exhibit 2 illustrates the type of summary tables that were prepared including the performance indicator values for each transit system for each fiscal year.

EXHIBIT 2

PERFORMANCE INDICATOR VALUES FOR EACH SYSTEM

FISCAL YEAR _____

INDICATOR	ANN ARBOR	BATTLE CREEK	BAY COUNTY	FLINT	GRAND RAPIDS	JACKSON	KALAMAZOO	LANSING	MUSKEGON	SAGINAW	MINIMUM	MAXIMUM	AVERAGE (Mean)
OVERVIEW: LABOR BY FUNCTION NON-LABOR SYSTEM - WIDE													
<u>Total Operations Labor Expense</u> Total Vehicle Miles													
<u>Total Vehicle Operations Labor Expense</u> Total Vehicle Miles													
<u>Total Maintenance Labor Expense</u> Total Vehicle Miles													
<u>Total Administrative Labor Expense</u> Total Vehicle Miles													
<u>Total Material and Supplies Expense</u> Total Vehicle Miles													
<u>Total Casualty and Liability Expense</u> Total Vehicle Miles													
<u>Total Other Expense</u> Total Vehicle Miles													
OVERVIEW: BY FUNCTION													
<u>Total Operations Expense</u> Total Vehicle Miles													
<u>Total Vehicle Operations Expense</u> Total Vehicle Miles													
<u>Total Maintenance Expense</u> Total Vehicle Miles													
<u>Total Administrative Expense</u> Total Vehicle Miles													

2. Indicator values were reviewed to assess data quality. Indicator values that appeared suspect were identified and the data included in the indicators were examined. The transit systems were then contacted to reconfirm selected Section 15 data that were considered suspect. In some instances data were corrected, in others reconfirmed. In instances where no corrections were made but data were considered suspect, statistics such as state-wide averages and standard deviations (discussed below) were calculated twice: once including and once excluding the suspect data.
3. Data summary sheets were prepared for each transit system which included the data elements used in the performance indicators. Separate sheets were prepared for total system, motor bus, and demand response mode data, as available. Exhibit 3 is an example of a data summary sheet.
4. The state-wide average indicator values (i.e., for the ten mid-size transit systems) for FY79 and FY80 were calculated for each performance indicator and the indicator values that were one and two standard deviations above and below the statewide average value for each year were identified.
5. All indicator values were then identified in terms of the extent (based on percent) they were greater or less than the state-wide average indicator value in each year FY79 and FY80.
6. The time series self comparison, comparison to current statewide average indicator values, and time series comparison to statewide average indicator values were then summarized using the analysis sheet shown in Exhibit 4.
7. Transit systems in which the percent change in indicator value were at least one standard deviation (expressed as a percentage of the average) greater or less than the state-wide average percent change were identified.
8. The performance indicators for each of the mid-size transit systems were reviewed in terms of the following decision rules for identifying outliers:

**EXHIBIT 3
DATA SUMMARY SHEET**

SYSTEM _____ (NAME) _____ MODE _____ (MOTOR BUS, DEMAND RESPONSIVE TOTAL)

Past Year	Corrected Data	Current Year	Corrected Data	Data Element (Annual Total)
				Accidents (#)
				Active Vehicles (#)
				Administrative Employee (#)
				Administrative Expense (Total) (\$)
				Administrative Salaries and Wages (\$)
				Administrative Labor Expense (\$)
				Casualty and Liability Expense (\$)
				Fare Revenue - Total (\$)
				Federal Operating Assistance for Transit (\$)
				Fuel and Lubricant Expense (\$)
				Fuel and Lubricant Gallons Consumed
				Local General Fund Revenue for Transit Operating and Special Fare Assistance (\$)
				Maintenance Employees - Total (#)
				Maintenance Expense - Total (\$)
				Maintenance Labor Expense (\$)
				Maintenance Salaries and Wages (\$)
				Materials and Supplies Expense - Other (\$)
				Materials and Supplies Expense - Total (\$)
				Mechanics and Servicing Employees (#)
				Nonfare Transit Revenue (\$)
				Operating Expense - Total (\$)
				Operators - Total Number (#)
				Operator Salaries and Wages (\$)
				Operator Unscheduled Overtime Premium Hours (hours)
				Other Expense - (Services, Utilities, Taxes, Purchased Transportation, Miscellaneous Expense and Expense Transfer) (\$)
				Passengers (#)
				Passenger Miles (#)
				Peak Vehicles (#)
				Platform Hours (hours)
				Population of the Area Served by Transit (#)
				Revenue Capacity Miles (#)
				Road Calls for Mechanical Failure (#)
				Road Calls for Other Reasons (#)
				Service Area Size - (Sq. MI.)
				State Operating and Special Fare Assistance (\$)
				Tires and Tubes Expense (\$)
				Taxes Levied Directly by the Transit System (\$)
				Vehicle Hours (hours)
				Vehicle Miles (miles)
				Vehicle Operations Expense - Total (\$)
				Vehicle Operations Labor Expense (\$)
				Vehicle Operations Salaries and Wages (\$)
				Vehicle Revenue Miles (miles)

**EXHIBIT 4
ANALYSIS SHEET**

TRANSIT SYSTEM FY ENDING INDICATOR	TIME SERIES SELF COMPARISON		CURRENT YEAR COMPARISON TO STATEWIDE AVERAGE INDICATOR VALUES		TIME SERIES COMPARISON TO STATEWIDE AVERAGE INDICATOR VALUES		
	INDICATOR VALUE		PERCENT CHANGE BETWEEN CURRENT AND LAST YEAR	STATEWIDE AVERAGE INDICATOR VALUE CURRENT YEAR	PERCENT DIFFERENCE BETWEEN TRANSIT SYSTEM AND STATEWIDE AVERAGE VALUE	PERCENT CHANGE IN STATEWIDE VALUE BETWEEN CURRENT AND LAST YEAR	PERCENT DIFFERENCE CHANGE IN TRANSIT SYSTEM AND CHANGE IN STATEWIDE VALUE
	LAST YEAR	CURRENT YEAR					
OVERVIEW: LABOR BY FUNCTION NON-LABOR SYSTEM-WIDE							
<u>Total Operations Expense</u> Total Vehicle Miles							
<u>Total Vehicle Operations Labor Expense</u> Total Vehicle Expenses							
<u>Total Maintenance Labor Expense</u> Total Vehicle Miles							
<u>Total Administrative Labor Expense</u> Total Vehicle Miles							
<u>Total Material and Supplies Expense</u> Total Vehicle Miles							
<u>Total Casualty and Liability Expense</u> Total Vehicle Miles							
OVERVIEW BY FUNCTION							
<u>Total Operations Expense</u> Total Vehicle Miles							
<u>Total Vehicle Operations Expense</u> Total Vehicle Miles							
<u>Total Maintenance Expense</u> Total Vehicle Miles							
<u>Total Administrative Expense</u> Total Vehicle Miles							

II.7

- . the data reported for FY79 or FY80 appeared to be suspect;
- . the value of the indicator for FY79 or FY80 is at least one standard deviation above or below the average indicator value for the ten mid-size transit systems in Michigan for the respective year;
- . the percent change in indicator value was at least one standard deviation greater or less than the state-wide average percent change; and
- . the indicator value changed in the opposite direction of the change in the state-wide average indicator value.

In addition, the performance of each of the mid-size transit systems was reviewed in terms of the 12 scenarios presented in Exhibit 5.

9. An outlier sheet was prepared for each transit system identifying indicators that were outliers (see Exhibit 6).

DETAILED PERFORMANCE EVALUATION PHASE ACTIVITIES

The second phase of the evaluation methodology requires a detailed investigation and assessment of transit system performance that includes site visits with the mid-size transit systems. This phase of the methodology includes three basic steps:

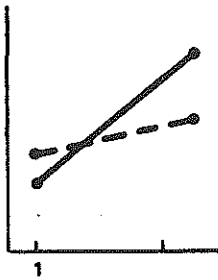
- . preparation for the site visit(s) with each transit operator;
- . conducting a site visit(s) at each transit system and discuss transit performance; and
- . documenting detailed phase evaluation findings.

Preparation for Site Visits

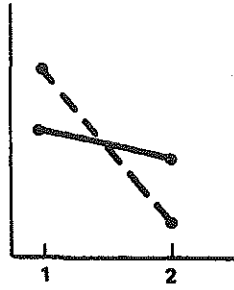
Preparation for the site visits requires the evaluator to 1) conduct a structured review of all of the performance indicator values identified as outliers in the Diagnostic Review Phase, and 2) develop questions and issues for discussion about these indicators for each transit system.

EXHIBIT 5

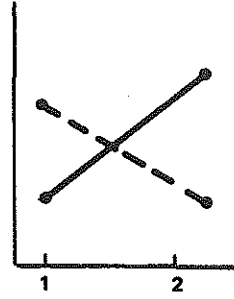
**SCENARIOS RESULTING FROM
COMPARING TRANSIT SYSTEM PERFORMANCE
INDICATOR VALUES TO STATE-WIDE AVERAGES**



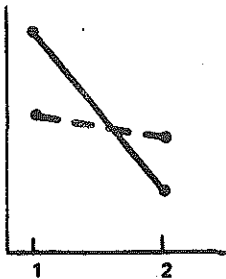
Lower than the state-wide average indicator value in the first year and higher in the second year and increasing faster



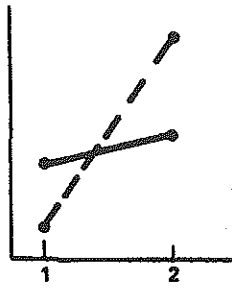
Lower than the state-wide average indicator value in the first year and higher in the second year and decreasing slower



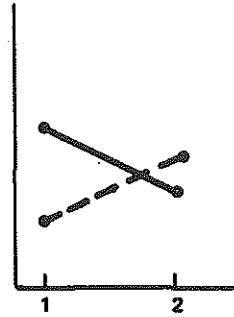
Lower than the state-wide average indicator value in the first year and higher in the second year and changing in the opposite direction



Higher than the state-wide value in the first year and lower in the second year and decreasing faster



Higher than the state-wide average indicator value in the first year and lower in the second year and increasing slower

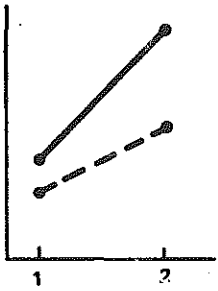


Higher than the state-wide average value in the first year and lower in the second year and changing in the opposite direction

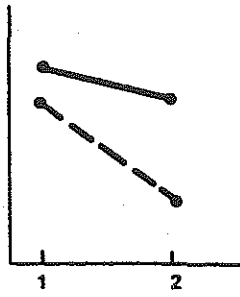
KEY



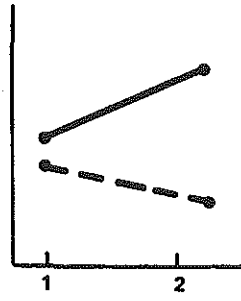
EXHIBIT 5 (Con't)



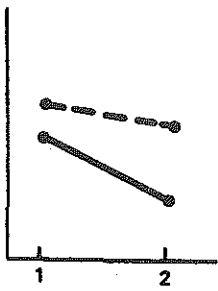
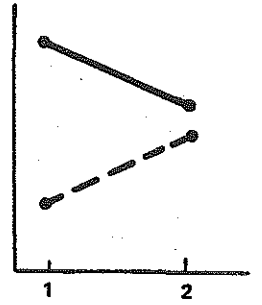
Higher than the state-wide average in both years and increasing faster



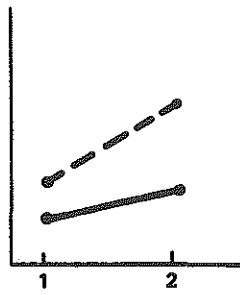
Higher than the state-wide average in both years and decreasing slower



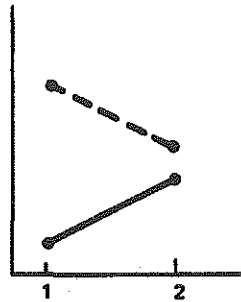
Higher than the state-wide average indicator value in each year and changing in the opposite direction



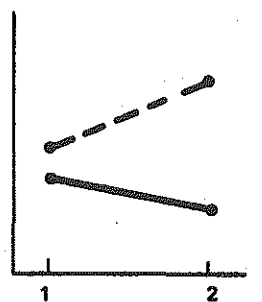
Lower than the state-wide average indicator value in both years and decreasing faster



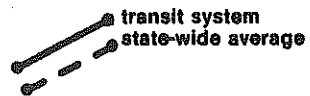
Lower than the state-wide average indicator value in both years and increasing slower



Lower than the state-wide average indicator value in each year and changing in the opposite direction



KEY



In the state-wide pilot test the structured review of indicators proceeded generally in the order suggested in the Evaluation Manual for Mid-Size Transit Systems in Michigan:

- . Step 1 - overall and functional areas expense indicators;
- . Step 2 - labor-related indicators;
- . Step 3 - materials and supplies-related indicators;
- . Step 4 - casualty and liability-related indicators;
- . Step 5 - other expense indicators;
- . Step 6 - level of service and demographic indicators;
- . Step 7 - vehicle utilization indicators; and
- . Step 8 - transit revenue and financing indicators.

This review was followed by the development of questions for each indicator identified as an outlier in the Diagnostic Review Phase of the pilot test. Exhibits 7 and 8 illustrate the types of questions or issues raised for discussion with each transit operator, as appropriate. The questions were developed to solicit information about past performance as well as anticipated changes in performance in the upcoming years). Time series and peer comparison analysis results largely served as the basis for these questions. To accompany the questions, graphs were developed for each indicator to illustrate why the indicator was defined as an outlier. Exhibit 9 provides an example of these graphs.

Materials were prepared and assembled for each site visit jointly by Peat Marwick and UPTRAN. The site-visit packets included 1) data summary sheets of the data included in the indicators, 2) questions for each outlier, and 3) graphs of indicator values for each outlier.

Site Visits

Originally the state-wide pilot test was planned to include two approaches for testing the second phase of the methodology: a site-visit and self-assessment approach. The two approaches involved basically the same preparation of materials by UPTRAN. The site-visit approach would include meeting with the transit operators in person to discuss performance while the self-assessment approach would include sending materials prepared by

EXHIBIT 7

QUESTIONS FOR REVIEW WITH TRANSIT OPERATOR

Transit System Name _____

INDICATOR

total operating expense

total vehicle miles

This indicator represents the total operating expense of your transit system for each vehicle mile traveled. The values of this indicator for your motor bus mode increased relatively little as compared to the increases in their respective state-wide average values between 1979 and 1980. For example, while operating expenses per mile increased by only 0.7 percent for your motor bus mode (from \$1.963 to \$1.978 per mile), the state-wide average value increased by 19.6 percent.

Q. The ability to contain costs during inflationary times is commendable. Does this reflect specific efforts to control costs? If so, please provide information about these efforts.

The value of this indicator for your demand-response mode increased 100.2 percent between 1979 and 1980 (from \$2.08 to \$4.16 per mile). As a result, in 1980 operating expenses per mile reported for your demand-response mode were 155.3 percent greater than the state-wide average value for the same year.

Q. Does the doubling of demand-response operating expenses per mile reflect specific expansion efforts? If so, please provide information about this effort. If not, can you identify factors leading to this increase in operating expenses per mile? Please consider allocation of costs between modes.

RESPONSE

EXHIBIT 8

**QUESTIONS FOR REVIEW WITH
TRANSIT OPERATOR RELATING TO
THE MAINTENANCE FUNCTION**

Transit System Name _____

**MAINTENANCE FUNCTION
INDICATOR**

total maintenance labor expense
total vehicle miles

This indicator is an overall efficiency measure of maintenance labor expense per mile of transit service provided. The value of this indicator is affected by the number of maintenance employees; maintenance salaries, wages, and benefits; and employee productivity and utilization.

A 2-percent reduction in your total system's indicator value was reported between 1979 and 1980 from 34.6¢ to 33.9¢ per mile. This reduction occurred at a time when most of the other mid-size transit systems in Michigan were reporting increases in maintenance labor expense per vehicle mile. Four of the ten transit systems reported increases of over 20 percent.

- Q. How were you able to reduce your maintenance labor expense per vehicle mile?
- Q. Do you think that other transit systems in Michigan could benefit from more information about your efforts and experience?

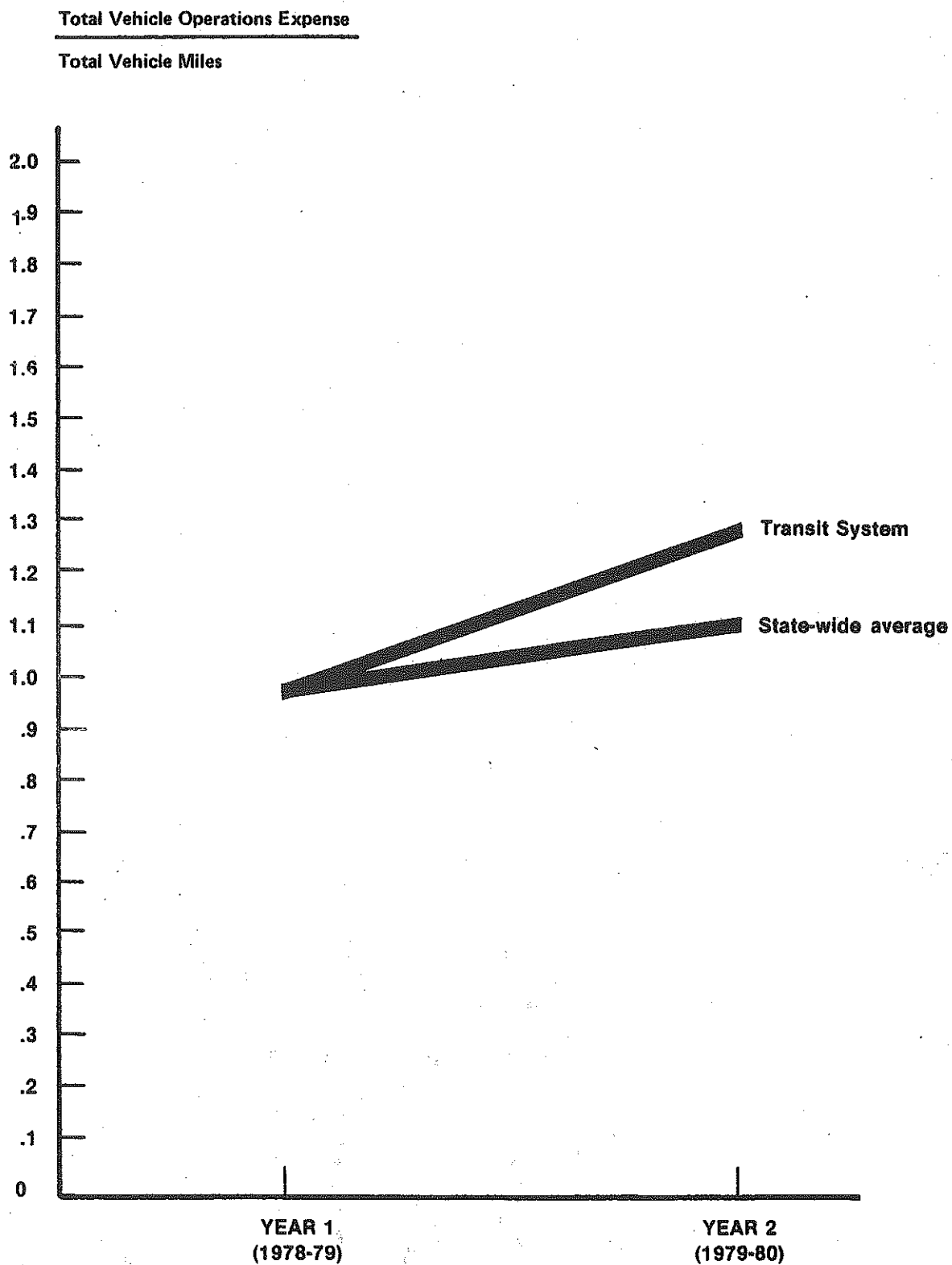
It is important to also note that your total system's maintenance labor expense per vehicle mile was 47.5 percent and 35.6 percent greater than the state-wide average indicator value in 1979 and 1980.

- Q. Could you briefly discuss the key factors that contribute to your comparatively higher maintenance labor expenses per mile?

RESPONSE

EXHIBIT 9

ILLUSTRATION OF INDICATOR VALUE GRAPH PREPARED FOR SITE VISIT



UPTRAN to the operators and requesting written responses to inquiries on performance.

A decision was made by UPTRAN to test only the site-visit approach. It was believed that this approach would be less time-consuming for the operators and UPTRAN, would improve the quality of information and data gathered, and would increase understanding of the transit management issues by UPTRAN.

Eight site visits were conducted during the fall of 1981 at the transit systems in:

- . Ann Arbor;
- . Battle Creek;
- . Bay County;
- . Flint;
- . Jackson;
- . Lansing;
- . Muskegon; and
- . Saginaw.

These site visits involved interviews lasting two to three hours with the general manager or assistant general manager of the transit system. During the site visit, the objectives of the pilot test and diagnostic phase activities were reviewed. This was followed by an informal but structured discussion focusing on the review of data, questions, and graphs prepared for the site visits.

Detailed Performance Evaluation Phase Findings

The documentation of the evaluation findings for this pilot test was restricted to the preparation of answers to each question posed in the site visit. No formal evaluation report was prepared on any of the transit systems as a result of this project.

As originally designed, it was intended that this project would develop a draft format for an annual report to the Michigan State Legislature on transit performance and that the results of the pilot (and future) transit system evaluations would provide important input to this report.

An agreement was made, however, between UPTRAN and representatives of the transit operators prior to the initiation of the pilot test to not include the preparation of any final report on transit performance based on the pilot test results. The format for any report to the legislature including the evaluation results could be developed by UPTRAN but not as part of this project.

III. FINDINGS AND CONCLUSIONS FROM THE STATE-WIDE PILOT TEST

This section presents the findings and conclusions of the state-wide pilot test. The information in this section is organized to correspond to each of the areas identified during assessment for the pilot test (discussed under the heading "Objectives of the Pilot Test" in the previous section of this report). A final subsection of other findings and conclusions is presented at the end of this section to ensure complete reporting.

DATA QUALITY AND ITS EFFECT ON EVALUATION RESULTS

The data base used in the pilot test was composed of selected financial and nonfinancial data reported by the Michigan transit operators to the Urban Mass Transportation Administration (UMTA) in the operators' FY79 and FY80 Section 15 reports. For all but one of the ten mid-size systems, these were the first two Section 15 reports prepared.

Peat Marwick has had the opportunity, under a separate contract with UMTA, to obtain a detailed working knowledge of the Section 15 data and the quality of data reported nationwide. Drawing on this experience we were able to anticipate areas where the Section 15 data reported in Michigan were likely to be strong and where they might be weak.

By and large, the data used in the pilot test bore out our expectations:

- . The systemwide financial data (i.e., combined expenses of all modes operated) were consistently the most accurate information reported for both FY79 and FY80.
- . One of the ten transit operators reported direct expenses by object class for all modes operated. Several systems allocated a portion of the expenses by mode, but the majority of systems reported joint expenses for some or all object classes. Because data were not available for each mode by object class, analysis was generally not possible at this level of detail either among systems or over time.
- . The quality of nonfinancial data varied considerably among systems. In general, the FY80 data appear to be more accurate than the FY79 data, and the motor bus mode data were more accurate than the demand

response mode data. The level of service (miles and hours provided) was generally reported accurately while the passenger statistics were most frequently inconsistent in one or both reporting years. Other nonfinancial data such as accidents and road calls varied among systems because definitions provided by UMTA are fairly broad and have been interpreted differently. The quality of nonfinancial data required careful consideration during analysis in the Diagnostic Review Phase. Validation of data was therefore a first step in the site-visit interview.

Despite the limitations in data quality summarized above, we found that the data and resulting performance indicators provided an effective means for initiating discussion and producing useful information about transit system performance during each of the site visits. The analysis of performance indicators in the Diagnostic Review Phase and the questions generated in preparation for the site visits appeared to successfully identified areas in which:

- . the transit system made an error in reporting;
- . a significant change in performance occurred between FY79 and FY80; and
- . the transit system was distinct from the other mid-size systems because of financial or operational characteristics unique to that system.

In instances where a reporting error was identified, we discussed how this could be corrected to avoid future errors. In instances when changes over time or unique system characteristics were identified, a discussion ensued providing needed background and perspective.

Suggestions on means to improve data reporting practices were well received by the operators, reflecting their interest in reporting accurate data for external reporting purposes as well as for internal management needs. In addition, each of the transit operators indicated that their reporting procedures had improved between the first and second Section 15 reports and that they anticipated further improvement in the next year's report. Having more accurate data will enable greater focusing on transit system performance and will produce improved results from the Detailed Performance Evaluation Phase.

USEFULNESS OF PEER COMPARISONS

During the project concerns were raised about the usefulness of peer comparisons. The general concern was that peer comparisons would produce limited information because of the uniqueness of each transit system. However, this methodology is designed to use indicators to isolate characteristics of transit systems for further investigation during the Detailed Performance Evaluation Phase. The causes for performance indicator outliers are then investigated. These causes may include the unique circumstances of the particular transit agency that may be beyond management control. Thus the methodology is designed to pursue additional information to help explain apparent differences in performance.

Peer comparisons were conducted in the state-wide pilot test through the following types of comparisons:

- . indicator values for FY79 and FY80 for each transit system were compared to the simple average (i.e., state-wide average) indicator value for all systems reporting the data; and
- . the change in indicator value between FY79 and FY80 for each system was compared to the change in state-wide average indicator value.

Care was taken to develop the state-wide average indicator values both including and excluding data that were suspect.

Peer comparison results were used in the pilot test to:

- . identify indicators that were outliers;
- . develop and discuss questions on a system's performance in the Detailed Performance Evaluation Phase; and
- . identify unique system characteristics.

The intent of these comparisons was to identify indicator values that were significantly different from the state average to merit further investigation during the site visit. The intent was not to make one-to-one comparisons of transit systems to assess differences in performance. Differences in values were insufficient evidence to draw conclusions on performance. Only after the detailed evaluation were the causes of indicator value variability identified.

During the site visits information was presented comparing a system to the state-wide average through the careful wording of questions and the use of graphs (discussed in the previous section of this report and illustrated in Exhibits II-7 through II-9). The questions and discussions raised were informative and appeared to be acceptable to the transit system.

Based on our discussions during and at the conclusion of the site visits we concluded that the transit operators with whom we met were comfortable with the use of peer comparisons as conducted in the pilot evaluations. We did, however, jointly discuss the operators' concern about the potential for misuse of information that could be generated from peer comparisons including subsequent misreporting to outside sources such as the news media, public officials, or the legislature. Because of this sensitivity to misuse of data, we recommend that no indicator value data be made available in public form until both phases of the evaluation process are completed. These data should not be released without supporting explanation from the evaluation findings.

Based on these findings we would conclude that the peer comparisons, as conducted, were an important part of the analysis which contributed meaningfully to the production of information about transit system performance. However, care should be taken in future analyses to continue to use peer analysis in the two-phased approach, since the use of peer comparison statistics without followup evaluation is not a professional evaluation procedure.

EASE OF GATHERING INFORMATION

The question for which an answer was being sought in this area of assessment in the pilot test was, "How easy is it to gather information about transit performance using the evaluation methodology?" Two important factors influenced the ease with which information was gathered:

- . First is the ability of the evaluator(s) to apply the methodology and their understanding of transit system operations and performance.
- . Second is the willingness and ability of the transit operators to participate in the Detailed Performance Evaluation Phase site visits, to provide adequate responses to the discussion materials, and to produce useful information about their system's performance.

Findings and conclusions relating to each of these factors are discussed below.

Evaluators Ability and Understanding of Transit

During the state-wide test of the evaluation methodology, Peat Marwick observed that the UPTRAN evaluators were readily able to use the Evaluation Manual to apply the methodology. An important objective of the pilot test was to provide hands-on training to UPTRAN staff for future applications of the methodology. This was easily and successfully accomplished since the evaluators were capable and interested in meeting this objective.

Generally speaking, information is easier to gather if transit operations, administrative procedures, and management practices are understood. Such an understanding facilitates analyzing and gathering information on transit performance during the following stages of the evaluation activities:

- 1) in the Diagnostic Review Phase by enabling the evaluator to more readily identify data and performance indicators that may be suspect;
- 2) in the preparation for the site visits (Detailed Performance Evaluation Phase), by ensuring that indicator values can be more easily and selectively analyzed in generating questions and discussion materials about transit performance; and
- 3) during the site visit, by increasing the evaluator's ability to effectively utilize and move beyond the prepared discussion materials in a comfortable personal interview.

The UPTRAN evaluator's understanding of transit operations and performance increased notably during the course of the pilot test. This, we believe, will increase the ease of information gathering using the methodology in the future, assuming the current staff are involved in its application.

If the current staff were to be replaced by people with more limited understanding of transit operations the replacements should be given suitable orientation. Ideally this orientation would include involvement in an application of the methodology.

Operators' Participation in Detailed Performance Evaluation Phase

Based on the results of the site visits it was concluded that the ease of information gathering generally met or exceeded

our expectations based on the willingness and ability of the transit operators to participate in the site visits. The operators provided adequate responses to the discussion materials which produced useful information about their systems performance. Within a two-hour to half-day period, all of the discussion materials were covered and responses provided. The operators were often willing to go beyond the questions posed to provide background information, insight to current activity and future plans, and additional documentation to support the discussions.

We concluded that the site visit was a much easier method of gathering information than the alternative approach of sending the operators' materials and questions with a request for a written response. The operators could comfortably and quickly recount information in an interview that might have been more cumbersome to produce in writing.

TIME REQUIREMENTS FOR THE EVALUATION

The most significant single opportunity to reduce the time requirements for applying the evaluation methodology would be through the automation of the Diagnostic Review Phase activities. Automating the data base and subsequently producing, validating, and analyzing the transit system performance indicators would result in substantial time and labor savings. The diagnostic phase activities could, in fact, be improved through automation since additional analyses could easily be conducted and information could quickly be updated and analyses repeated if corrected data were received when errors were detected.

UPTRAN had intended to automate the data base and conduct the diagnostic phase through a computerized process. This effort was postponed in response to a request by transit operator representatives who stated that the methodology should be further tested (state-wide) and refined before an investment was made to automate portions of the process.

The time requirements for the second phase of the evaluation methodology (i.e., preparing for and conducting the site visits and documenting results) will, in all likelihood, be reduced as the evaluators gain more experience with evaluation. Opportunities for completing the evaluations more quickly can probably be achieved by reducing the time required to generate discussion materials.

As mentioned earlier in this report, it may be possible to reduce the amount of time spent in the site visit with the transit operators if the data produced for the Section 15 reports

become more accurate. Data improvements would reduce the time spent validating and correcting the data base during the site visit. This improvement in data is anticipated.

It is not possible to comment on opportunities to reduce the time requirements of documenting the evaluation results since no formal documentation was produced in the pilot test as was agreed upon at the initiation of the test.

USES OF THE EVALUATION RESULTS BY THE TRANSIT OPERATORS

Based on the results of the state-wide pilot test the transit operators in Michigan may find the following uses for the evaluation results:

- . The information produced in the evaluation activities can serve as a means of validating and improving recent and future Section 15 reports. Once errors in reporting are identified they can be corrected and methods to preclude future errors established.
- . The evaluation data base and indicators can be used by the operators as a means to monitor and assess their performance over time. All of the mid-size transit operators in Michigan currently conduct self-evaluations of their performance. Some utilize automated and others manual evaluation procedures. This methodology could serve to supplement the operators' current information base and evaluation framework.
- . The opportunity to have the type of exchange with UPTRAN representatives that occurred in the pilot test can be a useful and constructive forum for maintaining ongoing relations.
- . Ultimately the information produced from the documentation of evaluation results could be a useful means of providing information on transit performance in each community and may be particularly useful in local policy decisionmaking.

POTENTIAL OUTCOME OF THE EVALUATION

This area of assessment was to focus on consideration of the type of information produced in the evaluation of performance. Several potential scenarios were identified in advance

of conducting the test. These included producing information which:

- 1) provides an explanation about the performance characteristics of each transit system;
- 2) identifies the need for further analysis in particular areas of performance;
- 3) identifies opportunities for improvement; and
- 4) recommends solutions for improving the efficiency or effectiveness of transit system operations and management.

In each of the site visits information was produced to provide an explanation about transit performance. In some instances, we considered the need to recontact the operators by telephone after the interview notes were reviewed to obtain additional information or clarification in selected areas. Because the application was a test of the methodology, a decision was made not to follow up this year.

During the course of the site visits, it was common for the operators to discuss areas of performance in which they felt further investigation or improvement was merited. Often the operators were already pursuing activities that would improve performance. These were most common in the area of data base improvement for use in improved management decisionmaking but were also discussed in relation to absenteeism, fare policy, and service levels.

The evaluation activities did not go so far as to recommend specific solutions for improving the efficiency and effectiveness of transit system operations and management. General solutions being considered or pursued by other transit systems nationwide in certain areas of performance were discussed during the course of most interviews but not with the intention of fulfilling any of a specific system's current need. In the future, specific recommendations could be formulated in joint discussion with operators to improve performance and their recommendations translated into improvement projects.

OTHER FINDINGS AND CONCLUSIONS

In addition to the findings and conclusions outlined above, several results of the evaluation test deserve further discussion. Perhaps the most important conclusion is that the metho-

dology offers an efficient mechanism for collecting valuable diagnostic data and a process for utilizing these data to inform the State on the progress of the transit program. It provides the basis for systemwide evaluation of performance over time through the use of (1) consistent data and a limited set of structured indicators, and (2) organized interaction and exchange of information between the operators and the State.

This process suggests the potential for use of the evaluation methodology in developing input for an annual report on transit performance to the legislature and other State and local agencies. The format and content for this report, however, would need to be carefully developed to ensure that the mutual interests of the State and individual operators are properly represented and that the constructive orientation of the methodology is adhered to.

One possible refinement to the methodology that could prove to be informative and useful in the context of this report would be to include data from the national Section 15 data base in the diagnostic phase of the analysis. This refinement could ultimately lead to a productive exchange of information on new management, operating, and maintenance practices.

Whether this refinement is incorporated or not, the methodology also offers potentially useful information to other staff in UPTRAN responsible for making informed decisions concerning grant applications, appropriate interaction with the legislature, and ongoing efforts to forward the progress of the transit program. Better understanding of transit system activities by state officials support each of these functions.

IV. RECOMMENDATIONS

This section offers recommendations for potential refinements to the evaluation process for future application of the methodology and use of the evaluation results.

1. CONDUCT THE DIAGNOSTIC REVIEW PHASE IN TWO STEPS - During the initial years of reporting under the Section 15 System of accounts and records, it is recommended that the diagnostic phase of the evaluation process include an initial data validation step followed by the formation and evaluation of performance indicators. Although the importance of data validation may diminish over time, as each transit operator becomes more familiar with the Section 15 system, and as ambiguities in the definition of certain data elements are eliminated, data validation will always serve a valuable function in improving the confidence which can be placed on the evaluation results. In addition, staff turnover at the State and operator level suggests the need for continuing the data validation step as a routine element in the diagnostic phase of the methodology.
2. AUTOMATE THE DIAGNOSTIC ANALYSIS - Much of the diagnostic phase of the evaluation process is mechanical and could be easily automated. This would speed up this phase of the evaluation methodology, relieve the State of a time-consuming and costly staff effort, reduce the possibility of manual errors in the development of performance indicators, and allow for the incorporation of new indicators and updated data for each system. Automation will become increasingly critical as the evaluation process expands to include additional years of data for time series analysis.
3. MAINTAIN PEER COMPARISON AS AN ELEMENT OF THE DIAGNOSTIC REVIEW PHASE AND CONSIDER EXPANDING THE PEER GROUP TO INCLUDE NATIONAL DATA - The pilot test verified the usefulness of peer comparisons as an element of an evaluation process. The peer group analysis resulted in the development of a structured interview with each participating operator and logically organized the discussion of issues raised during the diagnostic phase. A possible refinement that may be considered by UPTRAN would be to include operators reporting data under the national Section 15 system in the selecting of peers for the diagnostic analysis. If this refinement is adopted, the argument is strengthened for automation of the diagnostic phase (Recommendation 2).

4. CONTINUE THE SITE-VISIT APPROACH IN THE DETAILED PERFORMANCE EVALUATION PHASE - This approach offers an efficient method for obtaining the information necessary to adequately reflect the complex and material differences in the operating environment, and management and operating practices of individual transit systems. It also provides a mechanism for encouraging an ongoing dialogue between the State and local operators on efforts to forward the progress of the transit program.
5. MAINTAIN CONTINUITY IN STAFF RESPONSIBLE FOR IMPLEMENTATION THE EVALUATION METHODOLOGY - Staff continuity will streamline the application of the methodology in each successive year. Familiarity with the basic data, performance indicators, and individual systems will facilitate development of sensitive, informed, and productive evaluation questions and eliminate repetitive questioning from year to year. At a minimum, it is necessary that sufficient time be allowed to orient new staff during a transition period if staff turnover occurs.
6. ENCOURAGE COORDINATION OF DIVISIONS WITHIN UPTRAN IN FOCUSING THE DIAGNOSTIC ANALYSIS, EVALUATING DIAGNOSTIC RESULTS AND DEVELOPING DETAILED EVALUATION QUESTIONS - This will facilitate the use of evaluation results by participating divisions and will improve the application of the methodology by drawing on the accumulated experience of UPTRAN personnel. For example, input should be solicited on current transit activities from UPTRAN personnel involved in grants administration and other transit oversight activities.
7. FORMALIZE INTERACTION WITH THE TRANSIT OPERATORS TO ROUTINELY REFINE AND IMPROVE THE EVALUATION PROCESS - The transit operators have a vested interest in the proper application and use of the evaluation methodology and therefore should be afforded the opportunity to constructively influence the evaluation process. The methodology itself requires cooperative interaction between the State and the operators and joint responsibility in the improvement of the methodology will reinforce and strengthen the process.
8. CONSIDER POTENTIAL FOR STATEWIDE APPLICATION OF AN EVALUATION METHODOLOGY - Having completed the development and statewide testing of an evaluation methodology for the mid-size transit systems in Michigan, UPTRAN may wish to consider the potential for statewide application of a transit evaluation methodology for smaller transit systems in

the State. The evaluation methodology for the mid-size systems and the Annual Operating Assistance Report could serve as the basis for such consideration. To initiate this effort, UPTRAN should carefully consider the current and future data reporting requirements of the other transit operators, the usefulness of evaluation to UPTRAN and the operators, and the need to refine the evaluation methodology for use in the smaller, less complex transit systems.

9. CONDUCT ANALYSIS WITH CURRENT DATA - Every effort should be made to conduct the Diagnostic Phase of the evaluation methodology as soon as the operators have prepared the data and submitted it to UPTRAN.

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I. INTRODUCTION

This is the final report for the project to Test and Refine an Evaluation Methodology for Mid-Size Transit Systems in Michigan.¹ The objectives of this report are to:

- . review the activities conducted in the pilot test;
- . present the findings and conclusions of the test; and
- . discuss recommendations for potential refinements to the evaluation process.

Following this introduction, which includes a brief overview of the evaluation methodology, the report is presented in three sections which correspond to each of these objectives.

PHASE I: DIAGNOSTIC REVIEW

The evaluation methodology developed for the mid-size transit systems in Michigan consists of two phases: diagnostic review and detailed performance evaluation. Exhibit 1 illustrates the basic steps in each phase.

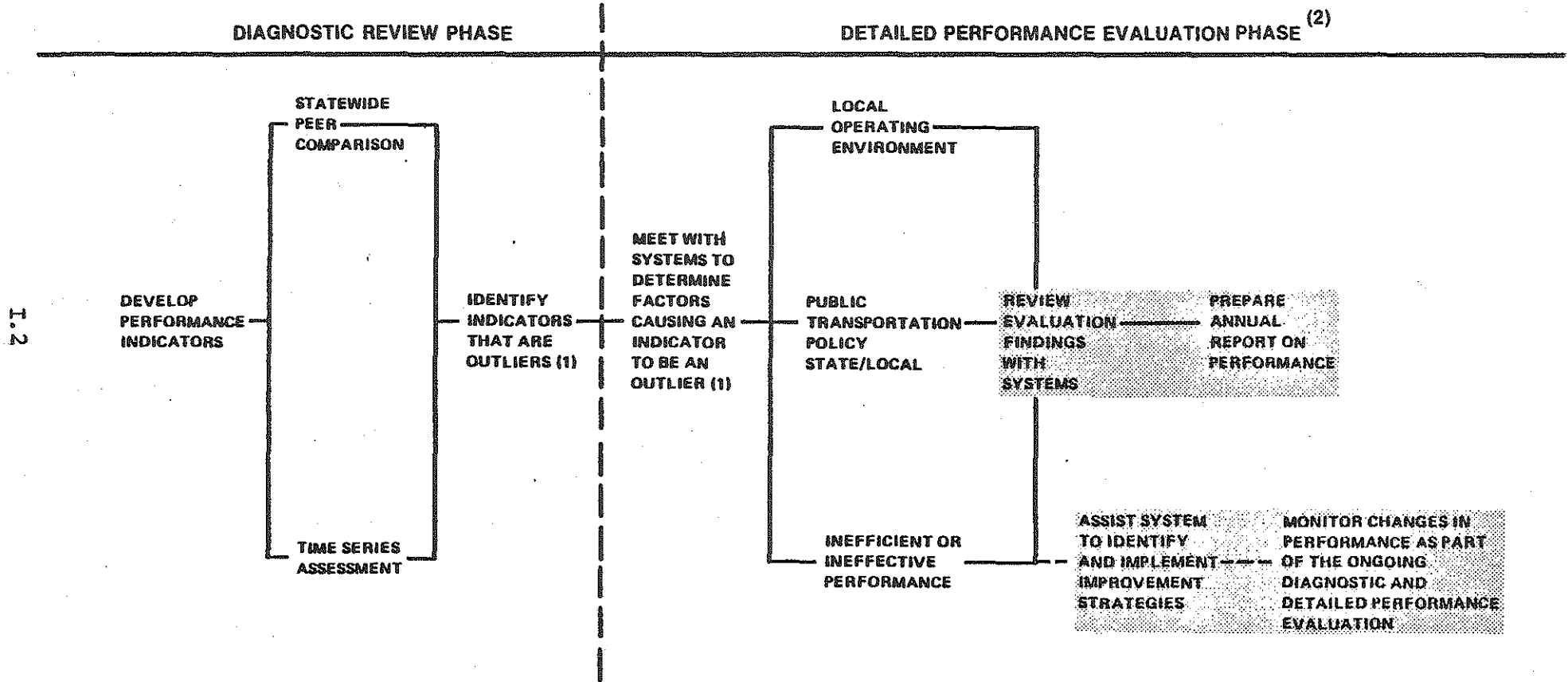
The first phase is a diagnostic review. In this phase a set of performance indicators are used to measure various aspects of transit system efficiency and effectiveness. The indicator values from each mid-size transit system in Michigan are compared across transit systems and over time. Indicator values that are significantly higher or lower than the average of other systems and that are changing significantly over time are identified.

The primary objectives of the first phase of the evaluation are to conduct a preliminary review of each transit system and to provide focus to the more detailed reviews. Through the use of indicators, the scope of the evaluations and resources required to conduct them can be limited and the analysis can be more productive.

¹ This is the Final Report for contract 79-1829, as amended. This contract is separate from an earlier Peat Marwick State of Michigan contract 78-1869 to develop and test an evaluation methodology for transit.

EXHIBIT 1

OVERVIEW OF THE EVALUATION METHODOLOGY



(1) "Outlier" is the term used to describe performance indicator values that are significantly higher or lower than those in other systems or that are changing significantly over time.

(2) The final activities in the Evaluation Methodology that are shaded on this exhibit were not conducted during the statewide test.

PHASE II: DETAILED PERFORMANCE EVALUATION

The second phase is a detailed performance evaluation. This phase consists of a more detailed investigation of transit agency performance. Through direct contact with the transit operators, information is gathered about the local operating environment of the transit system, the effects of state and local policy on performance, and the management and operating procedures within the transit system. Information gathering is focused on attributes of the transit system suggested by the indicators identified in the Diagnostic Review Phase of the evaluation. The information gathered in this second phase of the evaluation is intended to:

- . provide information on and explain performance characteristics;
- . identify examples of innovative or exemplary performance that may be shared among the local transit systems in Michigan;
- . suggest the need for further analysis; and
- . identify opportunities for improvement and potentially recommend solutions.

This information serves as the basis for monitoring performance over time and annually assessing the efficiency, effectiveness, and progress of each transit system.

A Data Needs Manual was developed in conjunction with the evaluation procedures. The Data Needs Manual defines each performance indicator included in the Diagnostic Review Phase and explains how each indicator was developed. With the exception of several indicators which include demographic data (available from UPTRAN), the performance indicators are composed of financial and operating statistics included in the (required level) Section 15 reporting requirements developed by the Urban Mass Transportation Administration (UMTA) of the U.S. Department of Transportation.¹ Section 15 data are routinely reported to the Federal Government each fiscal year by transit to operators who receive Section 5 federal funds.

¹ UPTRAN currently requires that most of these data be submitted annually by transit operators in its Operating Assistance Report.

II. REVIEW OF PILOT TEST ACTIVITIES

This section presents a review of the pilot test activities including:

- . background and overview;
- . objectives of the pilot test;
- . Diagnostic Review Phase activities; and
- . Detailed Performance Evaluation Phase activities.

BACKGROUND AND OVERVIEW

The project to Test and Refine an Evaluation Methodology for Mid-Size Transit Systems in Michigan was initiated subsequent to the completion of a project in which the draft evaluation methodology was developed. Initially, UPTRAN intended to implement the evaluation program including automation of elements of the evaluation process and formal definition of roles and responsibilities as part of the development project.

The mid-size transit operators in Michigan stated that implementation of the evaluation program at that time was premature. As a result, UPTRAN agreed to more extensively test the evaluation methodology through pilot application in each of Michigan's ten mid-size transit systems and, as necessary, refine the methodology to reflect this more thorough testing process.¹

The state-wide pilot testing effort was structured to complement the evaluation methodology. First, the Diagnostic Review Phase was conducted. Later, the Detailed Performance Evaluation Phase was conducted through on-site interviews at the eight participating mid-size transit systems.

¹ Data from Grand Rapids Transit Authority were included in the first phase of the pilot test activities but, at its request, Grand Rapids did not participate in the second phase of the test. Kalamazoo was not included in the Detailed Evaluation Phase because of a scheduling conflict. Consequently, the pilot included the active participation of eight of the ten mid-size transit systems in Michigan.

OBJECTIVES OF THE PILOT TEST

The following objectives for conducting the state-wide pilot test were specified in advance of conducting the test. They reflect the concerns and interests of UPTRAN, the Michigan Public Transit Association (MPTA), and the transit operators that were expressed during the development of the evaluation methodology. The objectives were to:

1. pilot test the methodology in all ten of the mid-size transit systems in Michigan. (During the initial project, the evaluation methodology was tested on one Michigan and several mid-size transit systems elsewhere in the United States.)
2. provide an opportunity for Michigan transit operator involvement in the refinement of the evaluation procedures.
3. refine and tailor the evaluation methodology to better serve the State and the transit operators. Areas identified for review included:
 - . the quality of the data and its effect on evaluation results;
 - . the usefulness of peer comparisons;
 - . the 'ease' of information gathering;
 - . the opportunities to minimize the time requirements for evaluation;
 - . the uses of the evaluation results by the transit operators; and
 - . the potential outcome of the evaluation including a) providing an explanation for performance characteristics; b) identifying the need for further study; c) identifying opportunities for improvement; and d) recommending solutions.

DIAGNOSTIC REVIEW PHASE ACTIVITIES

The first phase of the pilot test involved a diagnostic review of performance indicators included in the Data Needs Manual developed for this project. The diagnostic review included 1) a review of data reasonableness, 2) the development of performance indicators, 3) a peer comparison of performance

for all mid-size Michigan transit systems, and 4) a time series assessment in which the performance of each system was assessed against itself over time and against the average change in performance over time of other mid-size transit systems in the State.

As stated above, the primary objective of the diagnostic review phase of this methodology was to identify performance indicator values that appeared to be outliers (i.e. apparently different from normal) in that they:

- . differed from the average state-wide indicator value, having a value significantly higher or lower than the norm; or
- . were changing significantly in magnitude or direction in comparison to past values of the indicator for the transit system or for the average of all mid-size systems in the State.

By identifying indicator values that are outliers, the detailed evaluation could be focused on those areas which appear to merit the greatest attention.

It is important to note that the identification of an indicator as an outlier does not presume that the performance of the transit system is either good or bad. It simply serves to identify areas for further investigation in the Detailed Performance Evaluation Phase.

The Diagnostic Review Phase included the following steps:

1. Performance indicators in the Data Needs Manual were developed for each of the ten mid-size transit systems in Michigan using available Section 15 data reported to UMTA for FY79 (1978-79) and FY80 (1979-80). The indicators were developed for (1) total system, (2) motor bus mode, and (3) demand response mode, as appropriate. Because of the Section 15 Report structure, not all indicators could be developed by mode. For example, indicators which include revenue data could be developed with Section 15 data only on a total system basis. Indicator values were not developed for a transit system if data were not reported to UMTA by that transit system. Exhibit 2 illustrates the type of summary tables that were prepared including the performance indicator values for each transit system for each fiscal year.

EXHIBIT 2

PERFORMANCE INDICATOR VALUES FOR EACH SYSTEM

FISCAL YEAR _____

INDICATOR	ANN ARBOR	BATTLE CREEK	BAY COUNTY	FLINT	GRAND RAPIDS	JACKSON	KALAMAZOO	LANSING	MUSKEGON	SAGINAW	MINIMUM	MAXIMUM	AVERAGE (Mean)
OVERVIEW: LABOR BY FUNCTION													
NON-LABOR SYSTEM - WIDE													
<u>Total Operations Labor Expense</u>													
<u>Total Vehicle Miles</u>													
<u>Total Vehicle Operations Labor Expense</u>													
<u>Total Vehicle Miles</u>													
<u>Total Maintenance Labor Expense</u>													
<u>Total Vehicle Miles</u>													
<u>Total Administrative Labor Expense</u>													
<u>Total Vehicle Miles</u>													
<u>Total Material and Supplies Expense</u>													
<u>Total Vehicle Miles</u>													
<u>Total Casualty and Liability Expense</u>													
<u>Total Vehicle Miles</u>													
<u>Total Other Expense</u>													
<u>Total Vehicle Miles</u>													
OVERVIEW: BY FUNCTION													
<u>Total Operations Expense</u>													
<u>Total Vehicle Miles</u>													
<u>Total Vehicle Operations Expense</u>													
<u>Total Vehicle Miles</u>													
<u>Total Maintenance Expense</u>													
<u>Total Vehicle Miles</u>													
<u>Total Administrative Expense</u>													
<u>Total Vehicle Miles</u>													

2. Indicator values were reviewed to assess data quality. Indicator values that appeared suspect were identified and the data included in the indicators were examined. The transit systems were then contacted to reconfirm selected Section 15 data that were considered suspect. In some instances data were corrected, in others reconfirmed. In instances where no corrections were made but data were considered suspect, statistics such as state-wide averages and standard deviations (discussed below) were calculated twice: once including and once excluding the suspect data.
3. Data summary sheets were prepared for each transit system which included the data elements used in the performance indicators. Separate sheets were prepared for total system, motor bus, and demand response mode data, as available. Exhibit 3 is an example of a data summary sheet.
4. The state-wide average indicator values (i.e., for the ten mid-size transit systems) for FY79 and FY80 were calculated for each performance indicator and the indicator values that were one and two standard deviations above and below the statewide average value for each year were identified.
5. All indicator values were then identified in terms of the extent (based on percent) they were greater or less than the state-wide average indicator value in each year FY79 and FY80.
6. The time series self comparison, comparison to current statewide average indicator values, and time series comparison to statewide average indicator values were then summarized using the analysis sheet shown in Exhibit 4.
7. Transit systems in which the percent change in indicator value were at least one standard deviation (expressed as a percentage of the average) greater or less than the state-wide average percent change were identified.
8. The performance indicators for each of the mid-size transit systems were reviewed in terms of the following decision rules for identifying outliers:

**EXHIBIT 3
DATA SUMMARY SHEET**

SYSTEM _____ (NAME) MODE _____ (MOTOR BUS, DEMAND RESPONSIVE TOTAL)

Past Year	Corrected Data	Current Year	Corrected Data	Data Element (Annual Total)
				Accidents (#)
				Active Vehicles (#)
				Administrative Employees (#)
				Administrative Expense (Total) (\$)
				Administrative Salaries and Wages (\$)
				Administrative Labor Expense (\$)
				Casualty and Liability Expense (\$)
				Fare Revenue - Total (\$)
				Federal Operating Assistance for Transit (\$)
				Fuel and Lubricant Expense (\$)
				Fuel and Lubricant Gallons Consumed
				Local General Fund Revenue for Transit Operating and Special Fare Assistance (\$)
				Maintenance Employees - Total (#)
				Maintenance Expense - Total (\$)
				Maintenance Labor Expense (\$)
				Maintenance Salaries and Wages (\$)
				Materials and Supplies Expense - Other (\$)
				Materials and Supplies Expense - Total (\$)
				Mechanics and Servicing Employees (#)
				Nonfare Transit Revenue (\$)
				Operating Expense - Total (\$)
				Operators - Total Number (#)
				Operator Salaries and Wages (\$)
				Operator Unscheduled Overtime Premium Hours (hours)
				Other Expense - (Services, Utilities, Taxes, Purchased Transportation, Miscellaneous Expense and Expense Transfer) (\$)
				Passengers (#)
				Passenger Miles (#)
				Peak Vehicles (#)
				Platform Hours (hours)
				Population of the Area Served by Transit (#)
				Revenue Capacity Miles (#)
				Road Calls for Mechanical Failure (#)
				Road Calls for Other Reasons (#)
				Service Area Size - (Sq. MI.)
				State Operating and Special Fare Assistance (\$)
				Tires and Tubes Expense (\$)
				Taxes Levied Directly by the Transit System (\$)
				<u>Vehicle Hours (hours)</u>
				Vehicle Miles (miles)
				Vehicle Operations Expense - Total (\$)
				Vehicle Operations Labor Expense (\$)
				Vehicle Operations Salaries and Wages (\$)
				Vehicle Revenue Miles (miles)

**EXHIBIT 4
ANALYSIS SHEET**

TRANSIT SYSTEM FY ENDING INDICATOR	TIME SERIES SELF COMPARISON		CURRENT YEAR COMPARISON TO STATEWIDE AVERAGE INDICATOR VALUES		TIME SERIES COMPARISON TO STATEWIDE AVERAGE INDICATOR VALUES		
	INDICATOR VALUE		PERCENT CHANGE BETWEEN CURRENT AND LAST YEAR	STATEWIDE AVERAGE INDICATOR VALUE CURRENT YEAR	PERCENT DIFFERENCE BETWEEN TRANSIT SYSTEM AND STATEWIDE AVERAGE VALUE	PERCENT CHANGE IN STATEWIDE VALUE BETWEEN CURRENT AND LAST YEAR	PERCENT DIFFERENCE CHANGE IN TRANSIT SYSTEM AND CHANGE IN STATEWIDE VALUE
	LAST YEAR	CURRENT YEAR					
OVERVIEW: LABOR BY FUNCTION NON-LABOR SYSTEM-WIDE							
<u>Total Operations Expense</u> Total Vehicle Miles							
<u>Total Vehicle Operations Labor Expense</u> Total Vehicle Expenses							
<u>Total Maintenance Labor Expense</u> Total Vehicle Miles							
<u>Total Administrative Labor Expense</u> Total Vehicle Miles							
<u>Total Material and Supplies Expense</u> Total Vehicle Miles							
<u>Total Casualty and Liability Expense</u> Total Vehicle Miles							
OVERVIEW BY FUNCTION							
<u>Total Operations Expense</u> Total Vehicle Miles							
<u>Total Vehicle Operations Expense</u> Total Vehicle Miles							
<u>Total Maintenance Expense</u> Total Vehicle Miles							
<u>Total Administrative Expense</u> Total Vehicle Miles							

II.7

- . the data reported for FY79 or FY80 appeared to be suspect;
- . the value of the indicator for FY79 or FY80 is at least one standard deviation above or below the average indicator value for the ten mid-size transit systems in Michigan for the respective year;
- . the percent change in indicator value was at least one standard deviation greater or less than the state-wide average percent change; and
- . the indicator value changed in the opposite direction of the change in the state-wide average indicator value.

In addition, the performance of each of the mid-size transit systems was reviewed in terms of the 12 scenarios presented in Exhibit 5.

9. An outlier sheet was prepared for each transit system identifying indicators that were outliers (see Exhibit 6).

DETAILED PERFORMANCE EVALUATION PHASE ACTIVITIES

The second phase of the evaluation methodology requires a detailed investigation and assessment of transit system performance that includes site visits with the mid-size transit systems. This phase of the methodology includes three basic steps:

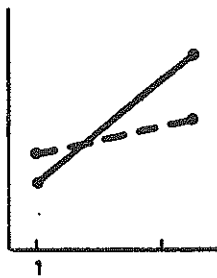
- . preparation for the site visit(s) with each transit operator;
- . conducting a site visit(s) at each transit system and discuss transit performance; and
- . documenting detailed phase evaluation findings.

Preparation for Site Visits

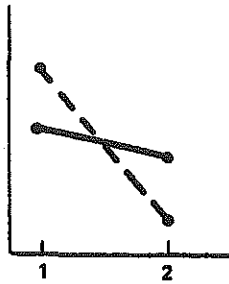
Preparation for the site visits requires the evaluator to 1) conduct a structured review of all of the performance indicator values identified as outliers in the Diagnostic Review Phase, and 2) develop questions and issues for discussion about these indicators for each transit system.

EXHIBIT 5

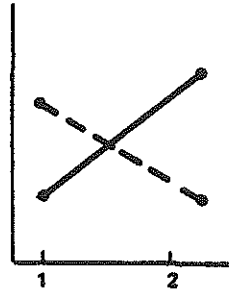
**SCENARIOS RESULTING FROM
COMPARING TRANSIT SYSTEM PERFORMANCE
INDICATOR VALUES TO STATE-WIDE AVERAGES**



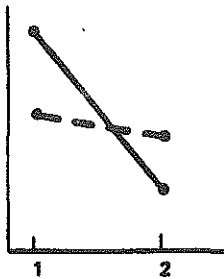
Lower than the state-wide average indicator value in the first year and higher in the second year and increasing faster



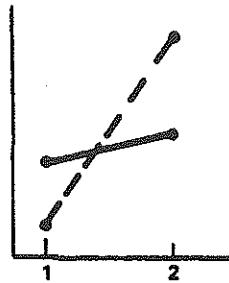
Lower than the state-wide average indicator value in the first year and higher in the second year and decreasing slower



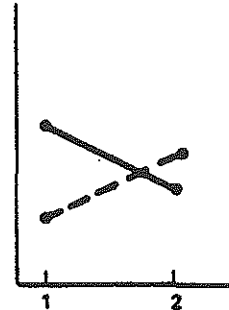
Lower than the state-wide average indicator value in the first year and higher in the second year and changing in the opposite direction



Higher than the state-wide value in the first year and lower in the second year and decreasing faster



Higher than the state-wide average indicator value in the first year and lower in the second year and increasing slower

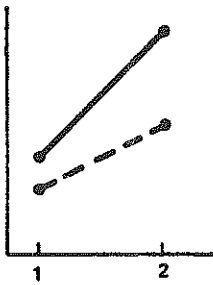


Higher than the state-wide average value in the first year and lower in the second year and changing in the opposite direction

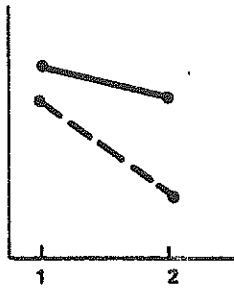
KEY

 transit system
 state-wide average

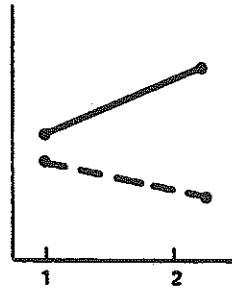
EXHIBIT 5 (Con't)



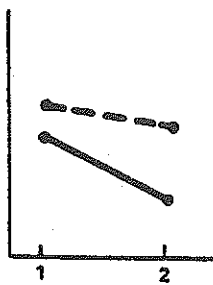
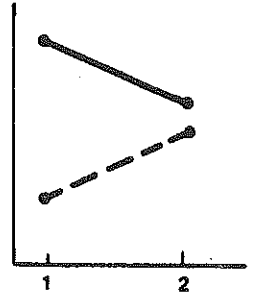
Higher than the state-wide average in both years and increasing faster



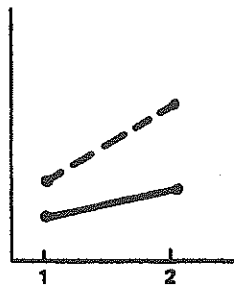
Higher than the state-wide average in both years and decreasing slower



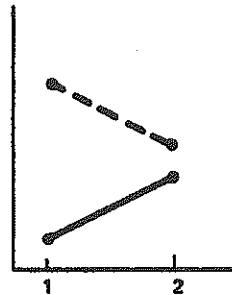
Higher than the state-wide average indicator value in each year and changing in the opposite direction



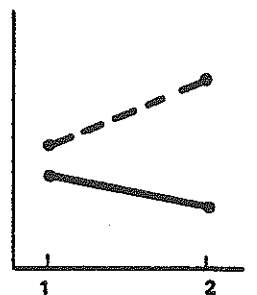
Lower than the state-wide average indicator value in both years and decreasing faster



Lower than the state-wide average indicator value in both years and increasing slower



Lower than the state-wide average indicator value in each year and changing in the opposite direction



KEY

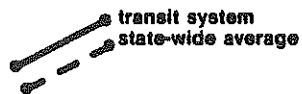


EXHIBIT 6
OUTLIER SHEET

INDICATOR	SCENARIO CLASSIFICATION															
	Suspect Data 1879/1980	Number of Standard Deviations From The Average		Number of Standard Deviations From The Average Change	Higher Both Years			Lower Both Years			Higher 1st Year Lower 2nd Year			Lower 1st Year Higher 2nd Year		
		1979	1980		In-creasing Faster	De-creasing Slower	Chang- ing In Opposite Direction	In-creasing Faster	De-creasing Slower	Chang- ing In Opposite Direction	In-creasing Faster	De-creasing Slower	Chang- ing In Opposite Direction	De-creasing Faster	In-creasing Slower	Chang- ing In Opposite Direction
OVERVIEW: LABOR BY FUNCTION NON-LABOR SYSTEM-WIDE																
<u>Total Operating Expense</u> Total Vehicle Miles																
<u>Total Vehicle Operations Labor Expenses</u> Total Vehicle Miles																
<u>Total Maintenance Labor Expenses</u> Total Vehicle Miles																
<u>Total Material and Supplies Expense</u> Total Vehicle Miles																
<u>Total Casualty and Liability Expense</u> Total Vehicle Miles																
<u>Total Other Expense</u> Total Vehicle Miles																
OVERVIEW: BY FUNCTION																
<u>Total Operations Expense</u> Total Vehicle Miles																
<u>Total Vehicle Operations Expense</u> Total Vehicle Miles																
<u>Total Maintenance Expense ¹</u> Total Vehicle Miles																
<u>Total Administrative Expense</u> Total Vehicle Miles																

¹ Includes vehicle and nonvehicle maintenance expenses.

II.11

In the state-wide pilot test the structured review of indicators proceeded generally in the order suggested in the Evaluation Manual for Mid-Size Transit Systems in Michigan:

- . Step 1 - overall and functional areas expense indicators;
- . Step 2 - labor-related indicators;
- . Step 3 - materials and supplies-related indicators;
- . Step 4 - casualty and liability-related indicators;
- . Step 5 - other expense indicators;
- . Step 6 - level of service and demographic indicators;
- . Step 7 - vehicle utilization indicators; and
- . Step 8 - transit revenue and financing indicators.

This review was followed by the development of questions for each indicator identified as an outlier in the Diagnostic Review Phase of the pilot test. Exhibits 7 and 8 illustrate the types of questions or issues raised for discussion with each transit operator, as appropriate. The questions were developed to solicit information about past performance as well as anticipated changes in performance in the upcoming years). Time series and peer comparison analysis results largely served as the basis for these questions. To accompany the questions, graphs were developed for each indicator to illustrate why the indicator was defined as an outlier. Exhibit 9 provides an example of these graphs.

Materials were prepared and assembled for each site visit jointly by Peat Marwick and UPTRAN. The site-visit packets included 1) data summary sheets of the data included in the indicators, 2) questions for each outlier, and 3) graphs of indicator values for each outlier.

Site Visits

Originally the state-wide pilot test was planned to include two approaches for testing the second phase of the methodology: a site-visit and self-assessment approach. The two approaches involved basically the same preparation of materials by UPTRAN. The site-visit approach would include meeting with the transit operators in person to discuss performance while the self-assessment approach would include sending materials prepared by

EXHIBIT 7

QUESTIONS FOR REVIEW WITH TRANSIT OPERATOR

Transit System Name _____

INDICATOR

total operating expense

total vehicle miles

This indicator represents the total operating expense of your transit system for each vehicle mile traveled. The values of this indicator for your motor bus mode increased relatively little as compared to the increases in their respective state-wide average values between 1979 and 1980. For example, while operating expenses per mile increased by only 0.7 percent for your motor bus mode (from \$1.963 to \$1.978 per mile), the state-wide average value increased by 19.6 percent.

Q. The ability to contain costs during inflationary times is commendable. Does this reflect specific efforts to control costs? If so, please provide information about these efforts.

The value of this indicator for your demand-response mode increased 100.2 percent between 1979 and 1980 (from \$2.08 to \$4.16 per mile). As a result, in 1980 operating expenses per mile reported for your demand-response mode were 155.3 percent greater than the state-wide average value for the same year.

Q. Does the doubling of demand-response operating expenses per mile reflect specific expansion efforts? If so, please provide information about this effort. If not, can you identify factors leading to this increase in operating expenses per mile? Please consider allocation of costs between modes.

RESPONSE

EXHIBIT 8

**QUESTIONS FOR REVIEW WITH
TRANSIT OPERATOR RELATING TO
THE MAINTENANCE FUNCTION**

Transit System Name _____

**MAINTENANCE FUNCTION
INDICATOR**

total maintenance labor expense
total vehicle miles

This indicator is an overall efficiency measure of maintenance labor expense per mile of transit service provided. The value of this indicator is affected by the number of maintenance employees; maintenance salaries, wages, and benefits; and employee productivity and utilization.

A 2-percent reduction in your total system's indicator value was reported between 1979 and 1980 from 34.6¢ to 33.9¢ per mile. This reduction occurred at a time when most of the other mid-size transit systems in Michigan were reporting increases in maintenance labor expense per vehicle mile. Four of the ten transit systems reported increases of over 20 percent.

- Q. How were you able to reduce your maintenance labor expense per vehicle mile?
- Q. Do you think that other transit systems in Michigan could benefit from more information about your efforts and experience?

It is important to also note that your total system's maintenance labor expense per vehicle mile was 47.5 percent and 35.6 percent greater than the state-wide average indicator value in 1979 and 1980.

- Q. Could you briefly discuss the key factors that contribute to your comparatively higher maintenance labor expenses per mile?

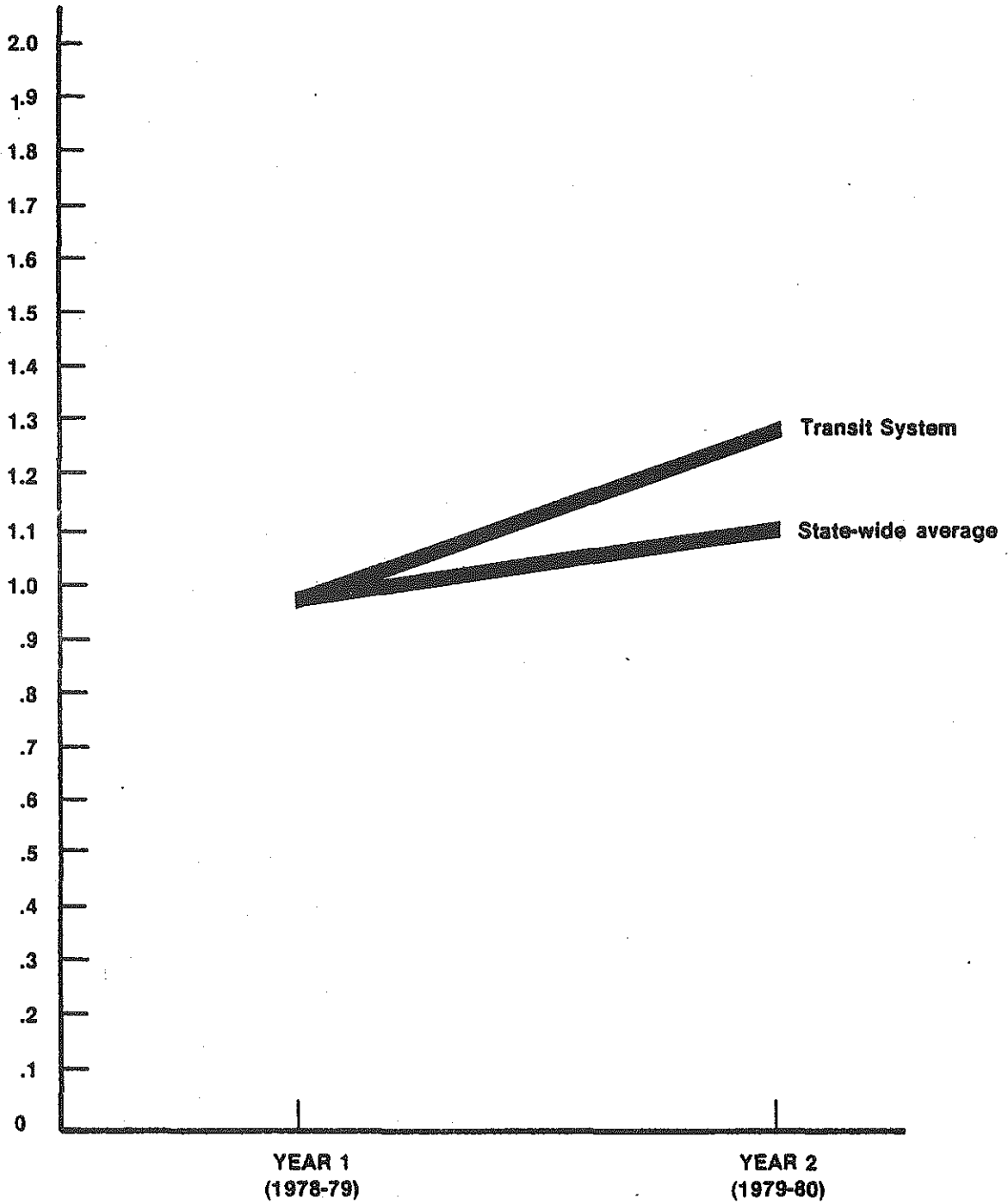
RESPONSE

EXHIBIT 9

ILLUSTRATION OF INDICATOR VALUE GRAPH PREPARED FOR SITE VISIT

Total Vehicle Operations Expense

Total Vehicle Miles



UPTRAN to the operators and requesting written responses to inquiries on performance.

A decision was made by UPTRAN to test only the site-visit approach. It was believed that this approach would be less time-consuming for the operators and UPTRAN, would improve the quality of information and data gathered, and would increase understanding of the transit management issues by UPTRAN.

Eight site visits were conducted during the fall of 1981 at the transit systems in:

- . Ann Arbor;
- . Battle Creek;
- . Bay County;
- . Flint;
- . Jackson;
- . Lansing;
- . Muskegon; and
- . Saginaw.

These site visits involved interviews lasting two to three hours with the general manager or assistant general manager of the transit system. During the site visit, the objectives of the pilot test and diagnostic phase activities were reviewed. This was followed by an informal but structured discussion focusing on the review of data, questions, and graphs prepared for the site visits.

Detailed Performance Evaluation Phase Findings

The documentation of the evaluation findings for this pilot test was restricted to the preparation of answers to each question posed in the site visit. No formal evaluation report was prepared on any of the transit systems as a result of this project.

As originally designed, it was intended that this project would develop a draft format for an annual report to the Michigan State Legislature on transit performance and that the results of the pilot (and future) transit system evaluations would provide important input to this report.

An agreement was made, however, between UPTRAN and representatives of the transit operators prior to the initiation of the pilot test to not include the preparation of any final report on transit performance based on the pilot test results. The format for any report to the legislature including the evaluation results could be developed by UPTRAN but not as part of this project.

III. FINDINGS AND CONCLUSIONS FROM THE STATE-WIDE PILOT TEST

This section presents the findings and conclusions of the state-wide pilot test. The information in this section is organized to correspond to each of the areas identified during assessment for the pilot test (discussed under the heading "Objectives of the Pilot Test" in the previous section of this report). A final subsection of other findings and conclusions is presented at the end of this section to ensure complete reporting.

DATA QUALITY AND ITS EFFECT ON EVALUATION RESULTS

The data base used in the pilot test was composed of selected financial and nonfinancial data reported by the Michigan transit operators to the Urban Mass Transportation Administration (UMTA) in the operators' FY79 and FY80 Section 15 reports. For all but one of the ten mid-size systems, these were the first two Section 15 reports prepared.

Peat Marwick has had the opportunity, under a separate contract with UMTA, to obtain a detailed working knowledge of the Section 15 data and the quality of data reported nationwide. Drawing on this experience we were able to anticipate areas where the Section 15 data reported in Michigan were likely to be strong and where they might be weak.

By and large, the data used in the pilot test bore out our expectations:

- . The systemwide financial data (i.e., combined expenses of all modes operated) were consistently the most accurate information reported for both FY79 and FY80.
- . One of the ten transit operators reported direct expenses by object class for all modes operated. Several systems allocated a portion of the expenses by mode, but the majority of systems reported joint expenses for some or all object classes. Because data were not available for each mode by object class, analysis was generally not possible at this level of detail either among systems or over time.
- . The quality of nonfinancial data varied considerably among systems. In general, the FY80 data appear to be more accurate than the FY79 data, and the motor bus mode data were more accurate than the demand

response mode data. The level of service (miles and hours provided) was generally reported accurately while the passenger statistics were most frequently inconsistent in one or both reporting years. Other nonfinancial data such as accidents and road calls varied among systems because definitions provided by UMTA are fairly broad and have been interpreted differently. The quality of nonfinancial data required careful consideration during analysis in the Diagnostic Review Phase. Validation of data was therefore a first step in the site-visit interview.

Despite the limitations in data quality summarized above, we found that the data and resulting performance indicators provided an effective means for initiating discussion and producing useful information about transit system performance during each of the site visits. The analysis of performance indicators in the Diagnostic Review Phase and the questions generated in preparation for the site visits appeared to successfully identified areas in which:

- . the transit system made an error in reporting;
- . a significant change in performance occurred between FY79 and FY80; and
- . the transit system was distinct from the other mid-size systems because of financial or operational characteristics unique to that system.

In instances where a reporting error was identified, we discussed how this could be corrected to avoid future errors. In instances when changes over time or unique system characteristics were identified, a discussion ensued providing needed background and perspective.

Suggestions on means to improve data reporting practices were well received by the operators, reflecting their interest in reporting accurate data for external reporting purposes as well as for internal management needs. In addition, each of the transit operators indicated that their reporting procedures had improved between the first and second Section 15 reports and that they anticipated further improvement in the next year's report. Having more accurate data will enable greater focusing on transit system performance and will produce improved results from the Detailed Performance Evaluation Phase.

USEFULNESS OF PEER COMPARISONS

During the project concerns were raised about the usefulness of peer comparisons. The general concern was that peer comparisons would produce limited information because of the uniqueness of each transit system. However, this methodology is designed to use indicators to isolate characteristics of transit systems for further investigation during the Detailed Performance Evaluation Phase. The causes for performance indicator outliers are then investigated. These causes may include the unique circumstances of the particular transit agency that may be beyond management control. Thus the methodology is designed to pursue additional information to help explain apparent differences in performance.

Peer comparisons were conducted in the state-wide pilot test through the following types of comparisons:

- . indicator values for FY79 and FY80 for each transit system were compared to the simple average (i.e., state-wide average) indicator value for all systems reporting the data; and
- . the change in indicator value between FY79 and FY80 for each system was compared to the change in state-wide average indicator value.

Care was taken to develop the state-wide average indicator values both including and excluding data that were suspect.

Peer comparison results were used in the pilot test to:

- . identify indicators that were outliers;
- . develop and discuss questions on a system's performance in the Detailed Performance Evaluation Phase; and
- . identify unique system characteristics.

The intent of these comparisons was to identify indicator values that were significantly different from the state average to merit further investigation during the site visit. The intent was not to make one-to-one comparisons of transit systems to assess differences in performance. Differences in values were insufficient evidence to draw conclusions on performance. Only after the detailed evaluation were the causes of indicator value variability identified.

During the site visits information was presented comparing a system to the state-wide average through the careful wording of questions and the use of graphs (discussed in the previous section of this report and illustrated in Exhibits II-7 through II-9). The questions and discussions raised were informative and appeared to be acceptable to the transit system.

Based on our discussions during and at the conclusion of the site visits we concluded that the transit operators with whom we met were comfortable with the use of peer comparisons as conducted in the pilot evaluations. We did, however, jointly discuss the operators' concern about the potential for misuse of information that could be generated from peer comparisons including subsequent misreporting to outside sources such as the news media, public officials, or the legislature. Because of this sensitivity to misuse of data, we recommend that no indicator value data be made available in public form until both phases of the evaluation process are completed. These data should not be released without supporting explanation from the evaluation findings.

Based on these findings we would conclude that the peer comparisons, as conducted, were an important part of the analysis which contributed meaningfully to the production of information about transit system performance. However, care should be taken in future analyses to continue to use peer analysis in the two-phased approach, since the use of peer comparison statistics without followup evaluation is not a professional evaluation procedure.

EASE OF GATHERING INFORMATION

The question for which an answer was being sought in this area of assessment in the pilot test was, "How easy is it to gather information about transit performance using the evaluation methodology?" Two important factors influenced the ease with which information was gathered:

- . First is the ability of the evaluator(s) to apply the methodology and their understanding of transit system operations and performance.
- . Second is the willingness and ability of the transit operators to participate in the Detailed Performance Evaluation Phase site visits, to provide adequate responses to the discussion materials, and to produce useful information about their system's performance.

Findings and conclusions relating to each of these factors are discussed below.

Evaluators Ability and Understanding of Transit

During the state-wide test of the evaluation methodology, Peat Marwick observed that the UPTRAN evaluators were readily able to use the Evaluation Manual to apply the methodology. An important objective of the pilot test was to provide hands-on training to UPTRAN staff for future applications of the methodology. This was easily and successfully accomplished since the evaluators were capable and interested in meeting this objective.

Generally speaking, information is easier to gather if transit operations, administrative procedures, and management practices are understood. Such an understanding facilitates analyzing and gathering information on transit performance during the following stages of the evaluation activities:

- 1) in the Diagnostic Review Phase by enabling the evaluator to more readily identify data and performance indicators that may be suspect;
- 2) in the preparation for the site visits (Detailed Performance Evaluation Phase), by ensuring that indicator values can be more easily and selectively analyzed in generating questions and discussion materials about transit performance; and
- 3) during the site visit, by increasing the evaluator's ability to effectively utilize and move beyond the prepared discussion materials in a comfortable personal interview.

The UPTRAN evaluator's understanding of transit operations and performance increased notably during the course of the pilot test. This, we believe, will increase the ease of information gathering using the methodology in the future, assuming the current staff are involved in its application.

If the current staff were to be replaced by people with more limited understanding of transit operations the replacements should be given suitable orientation. Ideally this orientation would include involvement in an application of the methodology.

Operators' Participation in Detailed Performance Evaluation Phase

Based on the results of the site visits it was concluded that the ease of information gathering generally met or exceeded

our expectations based on the willingness and ability of the transit operators to participate in the site visits. The operators provided adequate responses to the discussion materials which produced useful information about their systems performance. Within a two-hour to half-day period, all of the discussion materials were covered and responses provided. The operators were often willing to go beyond the questions posed to provide background information, insight to current activity and future plans, and additional documentation to support the discussions.

We concluded that the site visit was a much easier method of gathering information than the alternative approach of sending the operators' materials and questions with a request for a written response. The operators could comfortably and quickly recount information in an interview that might have been more cumbersome to produce in writing.

TIME REQUIREMENTS FOR THE EVALUATION

The most significant single opportunity to reduce the time requirements for applying the evaluation methodology would be through the automation of the Diagnostic Review Phase activities. Automating the data base and subsequently producing, validating, and analyzing the transit system performance indicators would result in substantial time and labor savings. The diagnostic phase activities could, in fact, be improved through automation since additional analyses could easily be conducted and information could quickly be updated and analyses repeated if corrected data were received when errors were detected.

UPTRAN had intended to automate the data base and conduct the diagnostic phase through a computerized process. This effort was postponed in response to a request by transit operator representatives who stated that the methodology should be further tested (state-wide) and refined before an investment was made to automate portions of the process.

The time requirements for the second phase of the evaluation methodology (i.e., preparing for and conducting the site visits and documenting results) will, in all likelihood, be reduced as the evaluators gain more experience with evaluation. Opportunities for completing the evaluations more quickly can probably be achieved by reducing the time required to generate discussion materials.

As mentioned earlier in this report, it may be possible to reduce the amount of time spent in the site visit with the transit operators if the data produced for the Section 15 reports

become more accurate. Data improvements would reduce the time spent validating and correcting the data base during the site visit. This improvement in data is anticipated.

It is not possible to comment on opportunities to reduce the time requirements of documenting the evaluation results since no formal documentation was produced in the pilot test as was agreed upon at the initiation of the test.

USES OF THE EVALUATION RESULTS BY THE TRANSIT OPERATORS

Based on the results of the state-wide pilot test the transit operators in Michigan may find the following uses for the evaluation results:

- . The information produced in the evaluation activities can serve as a means of validating and improving recent and future Section 15 reports. Once errors in reporting are identified they can be corrected and methods to preclude future errors established.
- . The evaluation data base and indicators can be used by the operators as a means to monitor and assess their performance over time. All of the mid-size transit operators in Michigan currently conduct self-evaluations of their performance. Some utilize automated and others manual evaluation procedures. This methodology could serve to supplement the operators' current information base and evaluation framework.
- . The opportunity to have the type of exchange with UPTRAN representatives that occurred in the pilot test can be a useful and constructive forum for maintaining ongoing relations.
- . Ultimately the information produced from the documentation of evaluation results could be a useful means of providing information on transit performance in each community and may be particularly useful in local policy decisionmaking.

POTENTIAL OUTCOME OF THE EVALUATION

This area of assessment was to focus on consideration of the type of information produced in the evaluation of performance. Several potential scenarios were identified in advance

of conducting the test. These included producing information which:

- 1) provides an explanation about the performance characteristics of each transit system;
- 2) identifies the need for further analysis in particular areas of performance;
- 3) identifies opportunities for improvement; and
- 4) recommends solutions for improving the efficiency or effectiveness of transit system operations and management.

In each of the site visits information was produced to provide an explanation about transit performance. In some instances, we considered the need to recontact the operators by telephone after the interview notes were reviewed to obtain additional information or clarification in selected areas. Because the application was a test of the methodology, a decision was made not to follow up this year.

During the course of the site visits, it was common for the operators to discuss areas of performance in which they felt further investigation or improvement was merited. Often the operators were already pursuing activities that would improve performance. These were most common in the area of data base improvement for use in improved management decisionmaking but were also discussed in relation to absenteeism, fare policy, and service levels.

The evaluation activities did not go so far as to recommend specific solutions for improving the efficiency and effectiveness of transit system operations and management. General solutions being considered or pursued by other transit systems nationwide in certain areas of performance were discussed during the course of most interviews but not with the intention of fulfilling any of a specific system's current need. In the future, specific recommendations could be formulated in joint discussion with operators to improve performance and their recommendations translated into improvement projects.

OTHER FINDINGS AND CONCLUSIONS

In addition to the findings and conclusions outlined above, several results of the evaluation test deserve further discussion. Perhaps the most important conclusion is that the metho-

dology offers an efficient mechanism for collecting valuable diagnostic data and a process for utilizing these data to inform the State on the progress of the transit program. It provides the basis for systemwide evaluation of performance over time through the use of (1) consistent data and a limited set of structured indicators, and (2) organized interaction and exchange of information between the operators and the State.

This process suggests the potential for use of the evaluation methodology in developing input for an annual report on transit performance to the legislature and other State and local agencies. The format and content for this report, however, would need to be carefully developed to ensure that the mutual interests of the State and individual operators are properly represented and that the constructive orientation of the methodology is adhered to.

One possible refinement to the methodology that could prove to be informative and useful in the context of this report would be to include data from the national Section 15 data base in the diagnostic phase of the analysis. This refinement could ultimately lead to a productive exchange of information on new management, operating, and maintenance practices.

Whether this refinement is incorporated or not, the methodology also offers potentially useful information to other staff in UPTRAN responsible for making informed decisions concerning grant applications, appropriate interaction with the legislature, and ongoing efforts to forward the progress of the transit program. Better understanding of transit system activities by state officials support each of these functions.

IV. RECOMMENDATIONS

This section offers recommendations for potential refinements to the evaluation process for future application of the methodology and use of the evaluation results.

1. CONDUCT THE DIAGNOSTIC REVIEW PHASE IN TWO STEPS - During the initial years of reporting under the Section 15 System of accounts and records, it is recommended that the diagnostic phase of the evaluation process include an initial data validation step followed by the formation and evaluation of performance indicators. Although the importance of data validation may diminish over time, as each transit operator becomes more familiar with the Section 15 system, and as ambiguities in the definition of certain data elements are eliminated, data validation will always serve a valuable function in improving the confidence which can be placed on the evaluation results. In addition, staff turnover at the State and operator level suggests the need for continuing the data validation step as a routine element in the diagnostic phase of the methodology.
2. AUTOMATE THE DIAGNOSTIC ANALYSIS - Much of the diagnostic phase of the evaluation process is mechanical and could be easily automated. This would speed up this phase of the evaluation methodology, relieve the State of a time-consuming and costly staff effort, reduce the possibility of manual errors in the development of performance indicators, and allow for the incorporation of new indicators and updated data for each system. Automation will become increasingly critical as the evaluation process expands to include additional years of data for time series analysis.
3. MAINTAIN PEER COMPARISON AS AN ELEMENT OF THE DIAGNOSTIC REVIEW PHASE AND CONSIDER EXPANDING THE PEER GROUP TO INCLUDE NATIONAL DATA - The pilot test verified the usefulness of peer comparisons as an element of an evaluation process. The peer group analysis resulted in the development of a structured interview with each participating operator and logically organized the discussion of issues raised during the diagnostic phase. A possible refinement that may be considered by UPTRAN would be to include operators reporting data under the national Section 15 system in the selecting of peers for the diagnostic analysis. If this refinement is adopted, the argument is strengthened for automation of the diagnostic phase (Recommendation 2).

4. CONTINUE THE SITE-VISIT APPROACH IN THE DETAILED PERFORMANCE EVALUATION PHASE - This approach offers an efficient method for obtaining the information necessary to adequately reflect the complex and material differences in the operating environment, and management and operating practices of individual transit systems. It also provides a mechanism for encouraging an ongoing dialogue between the State and local operators on efforts to forward the progress of the transit program.
5. MAINTAIN CONTINUITY IN STAFF RESPONSIBLE FOR IMPLEMENTATION THE EVALUATION METHODOLOGY - Staff continuity will streamline the application of the methodology in each successive year. Familiarity with the basic data, performance indicators, and individual systems will facilitate development of sensitive, informed, and productive evaluation questions and eliminate repetitive questioning from year to year. At a minimum, it is necessary that sufficient time be allowed to orient new staff during a transition period if staff turnover occurs.
6. ENCOURAGE COORDINATION OF DIVISIONS WITHIN UPTRAN IN FOCUSING THE DIAGNOSTIC ANALYSIS, EVALUATING DIAGNOSTIC RESULTS AND DEVELOPING DETAILED EVALUATION QUESTIONS - This will facilitate the use of evaluation results by participating divisions and will improve the application of the methodology by drawing on the accumulated experience of UPTRAN personnel. For example, input should be solicited on current transit activities from UPTRAN personnel involved in grants administration and other transit oversight activities.
7. FORMALIZE INTERACTION WITH THE TRANSIT OPERATORS TO ROUTINELY REFINE AND IMPROVE THE EVALUATION PROCESS - The transit operators have a vested interest in the proper application and use of the evaluation methodology and therefore should be afforded the opportunity to constructively influence the evaluation process. The methodology itself requires cooperative interaction between the State and the operators and joint responsibility in the improvement of the methodology will reinforce and strengthen the process.
8. CONSIDER POTENTIAL FOR STATEWIDE APPLICATION OF AN EVALUATION METHODOLOGY - Having completed the development and statewide testing of an evaluation methodology for the mid-size transit systems in Michigan, UPTRAN may wish to consider the potential for statewide application of a transit evaluation methodology for smaller transit systems in

the State. The evaluation methodology for the mid-size systems and the Annual Operating Assistance Report could serve as the basis for such consideration. To initiate this effort, UPTRAN should carefully consider the current and future data reporting requirements of the other transit operators, the usefulness of evaluation to UPTRAN and the operators, and the need to refine the evaluation methodology for use in the smaller, less complex transit systems.

9. CONDUCT ANALYSIS WITH CURRENT DATA - Every effort should be made to conduct the Diagnostic Phase of the evaluation methodology as soon as the operators have prepared the data and submitted it to UPTRAN.