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COMPARATIVE ANALYSIS OF TRANSIT PERFORMANCE

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FINAL REPORT

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16. Abstract

Data available from the inaugural year (1978-1979) of the UMTA Section 15 requirement are examined for three purposes: 1) to assess reliability of the data; 2) develop a small set of performance indicators; and 3) to produce a classification of bus systems based upon inherent characteristics.

To assess the reliability of the transit data, econometric models based upon previous data sets were replicated. Improvements in data collection are recommended.

Development of performance indicators was accomplished using factor analysis. Forty-eight performance measures were grouped into nine performance dimensions. A standardized value on each performance indicator was calculated for each transit property. Transit properties were ranked by their sum on each of the nine performance indicators.

Several methods were tested for clustering transit systems into peer groups. The most satisfying clusters were based upon four variables: two representing size--active buses and annual vehicle miles--and two representing nature of operations --average speed and peak to base ratio. Eight groups of transit properties were identified and described in terms of the four variables. The performance of 198 properties on the nine indicators is listed by group. Properties are identified by code number not by name.

Despite the inadequacies found in the data collected in the inaugural year, methods were developed which can help managers and administrators to use Section 15 data to improve transit management.

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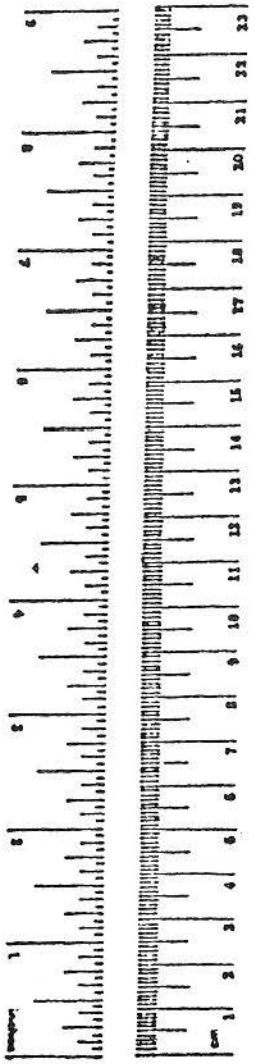
METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
in	inches	*2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
		AREA		
in^2	square inches	6.5	square centimeters	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.8	square meters	m^2
mi^2	square miles	2.6	square kilometers	km^2
	acres	0.4	hectares	ha
		MASS (weight)		
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
		VOLUME		
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.96	liters	l
gal	gallons	3.8	liters	l
ft^3	cubic feet	0.03	cubic meters	m^3
yd^3	cubic yards	0.76	cubic meters	m^3
		TEMPERATURE (exact)		
	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

*1 in = 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price $2.25, SD Catalog No. C13.10:286.



Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
		AREA		
cm^2	square centimeters	0.16	square inches	in^2
m^2	square meters	1.2	square yards	yd^2
km^2	square kilometers	0.4	square miles	mi^2
ha	hectares (10,000 m^2)	2.5	acres	
		MASS (weight)		
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
		VOLUME		
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m^3	cubic meters	35	cubic feet	ft^3
m^3	cubic meters	1.3	cubic yards	yd^3
		TEMPERATURE (exact)		
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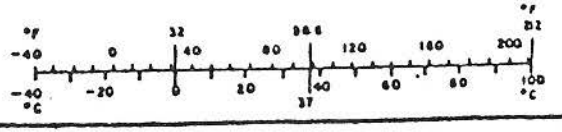

ACKNOWLEDGMENTS

Using Section 15 data for performance analysis follows four previous studies at the University of California, Irvine, in which transit performance concepts were defined and used. Each of the previous studies encountered difficulty in obtaining uniform transit statistics. This study tests the usefulness of the inaugural Section 15 Report and suggests techniques for data analysis.

In accord with the purposes of the UMTA University Research and Training Program, we have had a high level of graduate student participation. David Methe assisted with the data analysis and the analysis of transit supply, demand and cost (Chapter I). Timlynn Babitsky performed the factor analysis used in Chapter II and Mary E. Brenner the cluster analyses used in Chapter III. For all three, this was their first exposure to research opportunities in transportation.

We would also like to acknowledge the assistance received from the staff of the Institute of Transportation Studies: to Esther Frank for secretarial assistance; to Al Hollinden for financial management; to Linda Ahlberg for editorial assistance; and to Lyn Long for bibliographic and research reviews. Manuscript typing was completed by the Word Processing Center, School of Social Sciences.

Encouragement and cooperation from UMTA has also affected the direction and quality of the research. Donald M. Chapman served as technical monitor and he, together with Stephen J. Morin, Transportation Systems Center, helped by obtaining access to the data and with their revisions. Judy Z. Meade, UMTA University Research and Training Program, served as contract monitor and cheerfully assisted with the administrative and budget issues which arise when a 12-month grant is extended.

Shirley C. Anderson
G. J. (Pete) Fielding
January, 1982

EXECUTIVE SUMMARY

This research tests the usefulness for performance analysis of data resulting from Section 15 of the Urban Mass Transportation Act of 1964 as amended. To attain this objective, 1978-79 statistics were used to validate a framework for performance analysis based upon efficiency and effectiveness. Sixty performance measures were described and nine dimensions were selected for development of the transit performance index. Research was targeted at the performance of bus transit; exclusively demand-responsive operators and rail transit were omitted. The Transportation System Center (TSC) compiled the inaugural Section 15 report and provided the data on 311 transit properties used in the study.

Accuracy of the 1978-79 data was assessed by replicating previous experiments with demand, supply and cost equations. The results from the regression analyses were inconclusive. Section 15 data for 1978-79 must be used with caution. Omissions, coding errors and practices, as well as larger than expected variance make the data set difficult to use for performance research. To assist UMTA in improving the data set, recommendations are made on items, to be included or excluded and methods of data presentation.

Despite the inadequacies found in the data collected in the inaugural year, the methods developed in this study can help managers and administrators improve transit. Evaluations of transit performance have been obscured by the tendency to use large numbers of performance indicators to represent various transit functions. This study successfully tests the hypothesis that 48 indicators can be reduced to a set of 9 representing the input, output and consumption dimensions of transit performance. Local, state and federal officials, using the small set of indicators can examine transit performance without large data sets. Transit managers can also benefit. The same nine indicators can be used to analyze performance against local goals and objectives. Indicators were selected for the

small set based upon the results of factor analysis. The best statistical and logical measure from the variables which had the highest loading on each factor was chosen as representative.

The set consists of the following performance measures:

- Revenue vehicle hours per operating expense (RVH/OEXP)
- Total passengers per revenue vehicle mile (TPAS/RVM)
- Total vehicle miles per peak vehicle (TVM/PVEH)
- Total vehicle miles per gallons of fuel consumed (TVM/FUEL)
- Passenger revenue per operating assistance (REV/OSUB)
- Revenue vehicle hours per urban population (RVH/POP)
- Total vehicle miles per maintenance employee (TVM/MNT)
- Passenger revenue per operating expense (REV/OEXP)
- Revenue vehicle hours per accident (RVH/ACC)

This standard set is used as the basis for ranking system performance and allocation to peer groups (Appendix F).

Several methods were used to establish peer group clusters based upon the nine performance indicators and demographic and environmental variables affecting transit performance. The most satisfying clusters were based upon two variables representing size--active buses and annual vehicle miles--and two representing the nature of operations--average speed and peak to base ratio. Using cluster analysis, eight groups of transit properties were identified which included 198 of the 209 systems for which sufficient data was available. Appendix H provides the grouping of properties and their performance on each of the nine performance indicators.

Most of the systems which clustered into groups are moderately sized with a few very large systems in the northeast. Total vehicle miles and the active number of vehicles are directly proportional to each other for all groups of systems. Thus most clusters are groups of moderate sized systems which differ in the relationship between speed and the peak-to-base ratio. Systems with the highest peak-to-base ratio seem to trade off this characteristic with a lower operating speed. But the fastest systems are not necessarily characterized by a lower peak to base ratio.

The cases not included in clusters are outliers in terms of size--either very large or very small--with wide variation in peak hour service.

Clear geographic areas identified with each cluster seldom occur and even then, only with exceptions. Thus a typology based upon operating characteristics may better reflect characteristics of the service areas than those based on demographic or environmental variables. Cluster analysis provides the basis for further analysis because it clearly divides the transit systems into exclusive groups with distinctive characteristics. The few cases which do not fit the typology are unique, and should be treated as such in performance analysis.

Availability of this type of performance analysis will improve comparative assessment of transit properties. Most transit managers choose peer groups against which they compare achievements. Cluster analysis provides an objective method for aggregating properties which are similar in several respects. The performance results of each system can then be analyzed across nine dimensions as well as against the clustered group mean.

Comparative analysis of transit performance which is required by the state programs in California, Minnesota and New York and proposed for Massachusetts and other states, will be aided by this technique. Using this method, local and state officials can cluster properties within a state into groups based upon attributes of performance, rather than relying on a criterion like "number of active vehicles" or on unproven relationships with environmental or demographic variables.

Because of the missing data and funding constraints, the cluster groupings were not statistically analyzed. This should be completed in subsequent years as Section 15 yields a more complete data base. Data for thirty percent of the 198 systems in the eight cluster groups was not available and more than one-third of the cases could not be included.

Availability of the National Urban Mass Transportation Statistics provides data which can be analyzed using a range of statistical methods. This research demonstrates the methods which should be used in subsequent years to analyze transit performance. The recommendations on items to be included or excluded and methods of data presentation are made so as to improve the statistics for use by transit managers, by

those responsible for the administration of public funds and by academic researchers.

UMTA should simplify the regulations by including route-based data such as route miles, annual revenue passengers and annual total passengers. Passenger mile data is not worth the cost of collection for bus transit. Ownership by type (independent board or municipal council) should also be included. A standardized definition of state versus local taxes and subsidies would eliminate the problems that now exist when definition is left up to the transit property. The allocation of cost by revenue hours rather than by capacity mile is recommended so as to yield comparable information. The inclusion of operating time, minimum weekly guarantee, spread time premium, shift premium, student training time, total non-operating paid work time, and total operating time is crucial for analysis of labor costs. Inclusion of fare structure data and total revenue passengers is necessary for valid analysis of subsidy effects. And lastly, inclusion of demographic variables such as service area in square miles, and service area population would be most useful for future research.

Other requirements could be deleted. Complete details of the balance sheet (Form 101) are unnecessary. The three summary statistics for "total assets," "total liabilities" and "accumulated earnings" would be sufficient.

In addition to the suggested changes, comments are included about the content of the Section 15 data and their usefulness for research. Data from Section 15 should be listed by case (by transit property) rather than by variable when assembled on tape. This would assist researchers engaged in cross-sectional studies. In addition, missing values should be consistently assigned some obvious symbol such as "-9.00" which can not be confused with a valid "0.00" entry.

The Section 15 requirement is worth improving. Availability of the 1978-79 data provides, for the first time, national data collected on a standard format. Using the data set, researchers have an opportunity to examine the costs of producing transit service and the factors influencing consumption. The data is also extremely useful to managers who wish to compare their efforts to reduce costs with those of peer group systems.

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CHAPTER I

INTRODUCTION AND DATA ASSESSMENT

Improving transit through performance analysis is possible because changes in performance have previously gone undetected. Costs per vehicle hour have been rising faster than inflation, employee productivity measured by miles operated is declining and passengers carried per revenue vehicle hour is static. Although the results of this research should improve performance monitoring, the object of this research was to test the usefulness of data resulting from Section 15 of the Urban Mass Transportation Act of 1964, as amended.

Section 15 statistics for the inaugural year (1978-79) were published in May, 1981.[1] These data were used to validate, at the national level, the framework for performance analysis developed by Fielding, Glauthier and Lave for California.[2] Nine dimensions of performance, developed from 60 measures, were used to develop a performance index which can be applied to individual transit properties. Transit operators were grouped into classes based upon their inherent characteristics of transit performance and norms for each class calculated.

The research results are important for policy analysis. They will allow federal, state and local agencies to audit transit performance using nine indices, rather than the 60 measures summarized in Chapter II,

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[1]U.S. Dept. of Transportation, Transportation Systems Center, National urban mass transportation statistics: First annual report Section 15 reporting system: Transit financial and operating data reported for fiscal years ending between July 1, 1978 and June 30, 1979. Prepared for the Urban Mass Transportation Administration, Office of Transportation Management as report #UMTA-MA-06-0107-81-1. (Washington, D.C.: U.S. Government Printing Office, May 1981).

[2]Gordon J. Fielding, Roy E. Glauthier, & Charles A. Lave, Development of performance indicators for transit. Final report #UMTA-CA-11-0014-78-1. (Irvine, Calif.: University of California, Institute of Transportation Studies, December 1977). (NTIS #PB 278 678).

and know that they are capturing the major dimensions of performance. California is already requiring only five indicators based upon the 1977 research.[3] Other states including Florida, Iowa, Michigan and Pennsylvania have used these same performance concepts to develop performance monitoring and reporting requirements.[4] As a result of this research, they will be able to use the Section 15 data with confidence, and change the weights of the dimensions to emphasize either efficiency or effectiveness attributes.

Improved utilization of Section 15 data at the individual transit property level promises even more beneficial results. Using the preliminary results of this research, the Orange County Transit District, California, and the Transit Department of Seattle METRO are revising their management information systems to provide monthly and quarterly reports representing the major dimensions of performance based upon the Section 15 data format. It will be important to study these results in future years, as well as to examine the consequences for agencies like the Washington D.C. Metropolitan Area Transit Authority that use a much larger list of performance indicators.

Another result from the research has been the independent assessment of the Section 15 federal data submission requirement. The research results demonstrate the usefulness of the requirement. It is essential that it be continued and accuracy improved. Revisions are recommended and more data should be requested on the operating environment for each property. Attempts to relate transit performance to local and demographic variables were unsuccessful. Replication of previous research on transit demand models was unsuccessful because of the inability to associate demographic data with individual transit service areas. Unsuccessful results

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[3]California. Business and Transportation Agency. Transportation Development Act: Statutes as amended and related sections of the California Administrative Code as adopted by the Secretary of the Business and Transportation Agency. (#DMT-032). (Sacramento, Calif.: California Dept. of Transportation, Division of Mass Transportation, February 1978.)

[4]James H. Miller, The use of performance-based methodologies for the allocation of transit operating funds, Traffic Quarterly, October 1980, 34(4), 555-585.

are also reported in Chapter III for the association of locality and demographic variables with individual dimensions of performance, because of the large variance between transit properties (Appendix C). Chapter I concludes that Section 15 data yield satisfactory results at the aggregate level, but researchers should be cautious in interpreting causal associations.

Care should also be exercised when using Section 15 for performance analysis. The 1979 results--for the fiscal year ending between July 1, 1978 and June 30, 1979--represent the inaugural year of the requirements, when reporting requirements were relaxed. It is anticipated that reports will become more reliable as transit agencies realize how the data will be used by local, state and federal agencies, and how the same data can improve internal management.

The Transportation Systems Center (TSC) compiled the first annual report but warned that "care should be taken in the application and use of the data as presented."[5] Although there was extensive checking and editing, reporting deficiencies and erroneous data remained in the data tape supplied to the UCI research team. Omission of important data was common and in other instances obviously erroneous data remained uncorrected. Where possible the errors were corrected or entries deleted so that the data set (UCI data set) used for this research differs from the TSC data set. The UCI data were used to calculate the results reported in Appendices C-H. Copies of the data arrayed by the 48 performance indicators and listed by transit property is not included. These data are available from the authors on request.

Only the performance of bus transit was examined in this research. The TSC data set contained information on 324 single and multimodal transit properties. This was divided into two groups for the UCI data set:

1. Single mode, bus operators, (216 properties) used for replicating the supply demand and cost equations specified in Chapter I.

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[5]U.S. Dept. of Transportation, National urban mass transportation statistics, p. vi.

2. Bus operations (311 properties) which included the 216 single mode operators and the motor bus records reported by multi-mode operators.

Exclusive demand-responsive operators were excluded from both data sets.

Because analysis of the data and its limitations is an important product of the research, the difficulties encountered are summarized in the remainder of this chapter. A brief history of Section 15 is provided together with two sections discussing its usefulness. The first of these deals with the format of the data available to researchers. Documentation, structure of data files and other factors related to use of the data for research is presented. The second section discusses the content of the data.

ORIGINS OF SECTION 15 REPORTING REQUIREMENTS

In the spring of 1971, several associations connected with urban mass transit submitted a proposal to the Urban Mass Transportation Administration (UMTA), outlining a project to develop a ". . . uniform industry reporting system".[6] Project FARE (Uniform Financial Accounting and Reporting Elements) was formed under a contract to Arthur Andersen and Company and begun on March 1, 1972. The project's primary objective was to develop and test a reporting system which would accumulate transit industry financial and operating results by uniform categories.

The FARE reporting system's information was designed to meet the needs of: (1) individual transit systems for comparing their performance with other transit systems with similar characteristics; (2) transit industry associations for monitoring industry performance; and (3) Federal, State, and local government agencies for transit industry analysis and for financial assistance program administration.

One year after the completion of project FARE, in 1973, the Urban Mass Transportation Act of 1964 was amended to include Section 15, which

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[6]U.S. Dept. of Transportation, Urban mass transportation industry uniform system of accounts and records and reporting system. Volume I: General description. Report #UMTA-IT-06-0094-77-1. (Washington, D.C.: U.S. Dept. of Transportation, Urban Mass Transportation Administration, Office of Transit Management, January 10, 1977), p. 1-6. (NTIS #PB 264 876.)

requires that a uniform system of accounts and records as well as a uniform reporting system be maintained by those transit agencies receiving Federal operating assistance. In December of 1975, UMTA began Task V of FARE, which was to adapt the system of accounts and records and the reporting system developed in Tasks I-IV of FARE, to the requirements of Section 15.[7]

DATA FORMAT AND USE

Considerable difficulty was encountered in using the Section 15 data for performance analysis. Since one of the objectives of the research was to analyze the usefulness of the Section 15 data, full documentation of the difficulties is provided below and recommendations are made on how the data set might be improved.

TSC March, 1981 Data Set

The first Section 15 tape was received from the Transportation Systems Center (TSC) in March 1981. The tape was compatible with the DEC-10 computer and that system was used initially. However, since the statistical analysis was to be conducted using SPSS on the Sigma 7 computer, the files on the tape were transferred. Once this was completed, analysis was begun. Several problems were encountered. While the documentation for the tape was adequate in terms of detail, the structure of the files posed problems. The files were structured by variable rather than by case. Since the research that was being conducted was cross-sectional, the Section 15 data had to be reorganized and listed by transit property.

Further complicating that task was the fact that TSC, in an effort to improve the quality of the data, had corrected obvious errors in the data. Since time was short, these corrections were not sorted by identification number. This had to be done in order to present uniform computer files for statistical analysis.

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[7]David L. Harvey, John V. Nagel, William T. vanLieshout, & Daniel Malachuck Jr., Project FARE Task IV report: Urban mass transportation industry financial and operating data reporting system. Report #UMTA-IT-06-0034. (Washington, D.C.: Arthur Andersen & Co., November 1973.) 5 vols. (NTIS #s PB 226 354 through 226 358.)

Since most statistical analyses are done on a case by case basis, analysis of Section 15 data would be aided if the data were presented in a case by case format. This would shorten the startup time of future researchers.

Several other problems were encountered with the data. In comparing the data on the tape with selected cases from California, some discrepancies were found. With a number of files such as Form 406 and Form 408, the figures for particular variables that appeared on the written reports differed from the values that appeared on the tape. In some cases it could be determined that the errors were probably key punching errors. However, in other cases more serious doubts were raised. In particular, it was difficult to determine what the units were in some of the variables. For example, vehicle miles might be reported in number of vehicle miles on the tape whereas in the original reports the same numerals would appear, but representing thousands. The numbers were the same but the units they represented were vastly different.

For some of the transit properties, the numbers on the tape and in the reports differed and it could not be determined which were the valid numbers. Also, in the case of several of the large systems such as Los Angeles, variables which appeared in Form 406 such as Revenue Capacity Miles and Unlinked Passenger Miles had large numbers on the written reports which appeared on the tape as an overflow value: ten raised to the power 69. The only alternative when dealing with these items was to delete them from the UCI data set.

Deleting data exacerbated an already acute problem with missing values. Fewer than 70 systems reported passenger mile values. This was also true for revenue capacity miles, unlinked passenger trips, and the number of vehicles in operation for peak service. The severity of the problem reveals itself when several variables must be combined into a ratio variable such as cost per vehicle mile or revenue vehicle hours per operating expense. When either the cost variable or vehicle mile variable in the first case or revenue vehicle hour or operating expense variable in the second is missing, the combined variable must be omitted. As a result, the number of missing values increased rapidly when two or more variables were combined.

A similar situation occurred with the interpretation of zero on a number of the forms. This was especially true for the employee and cost and revenue forms. Since there were no blanks, it was impossible to determine which were valid zeros and which had been coded zero but were actually missing values. This may have introduced a bias in the data, although provision was made to accept as a true value the zeros which represented logical possibilities.

An example may help to illustrate the problem. In order to understand the effect of subsidies on transit efficiency, it was necessary to sum the various types of state and local subsidies on Form 203 with the federal subsidies. When missing values were coded as zero, it was impossible to determine if a zero for property tax dedicated in transit means that no property tax was dedicated or that the value was missing.

The problem of missing values cannot be minimized. In the calculation of the regression variables and performance indicators used in the study, the number of valid cases were often far below the total number of cases for the study as a whole.

A standard way of handling missing data, for example, is coding them as "-9.00." This would help researchers determine the true sample size. Also, the researcher could then determine if it is worthwhile to collect the missing data.

When these problems were discussed with TSC we were informed that a new tape would be made available on which many of the obvious reporting and coding errors would have been corrected. This tape arrived in May, 1981.

TSC May, 1981 Data Set

A similar process was conducted with the second tape. The same problem with the structure of the files was encountered. There also remained some discrepancies between data on the tape and data on the written Section 15 reports. Also, the problems resulting from missing values remained. The tape was improved in that the more obvious errors were eliminated, and because the researchers were now familiar with the file structure and what was needed to be done in order to ready it for

statistical analysis, the startup time was cut in half, from over four weeks down to two weeks.

Additional paring down of the data was required. It was determined by the researchers that high and low values on many of the variables would have to be eliminated. This was decided after comparative analysis of the data indicated that large values and small values were often erroneous. This was particularly apparent when examining the performance indicators. It was decided that any value that was three or more standard deviations above or below the mean value for the variable would be dropped from the set of valid values. Only when this time consuming, data preparation stage was completed could the factor and cluster analysis be started. Such lengthy delays had not been anticipated in advance and, as a result, the cluster analysis and the comparison between groups (see Chapter III) were curtailed.

DATA CONTENT

In addition to the structural problems with the data, comments should be made about the content of the Section 15 data and its usefulness for further research. These comments are derived from our attempt to replicate previous transit studies.

Difficulty was encountered in the replication of previous regression studies. This was due to the absence of critical variables. While the hourly wage rate of operators will be included in subsequent years, it was missing in this inaugural year. This meant that in order to replicate the cost and supply studies, we had to collect that variable ourselves.

Of more importance, because these variables will not be included in subsequent years, are the absence of route miles (miles of line is the nearest available proxy), population of area served, area served in square miles and number of revenue passengers. These variables along with operator wage rate were collected in a survey conducted by the researchers. Since the data were collected along with a number of other demographic factors, an explanation of the survey occurs in the section on demographic variables.

Other variables were included which are not useful for performance analysis and could be deleted from the Section 15 requirement. Balance Sheet (Form 101) variables are not generally used for performance comparison of transit systems or in econometric models. However, more ownership information such as "type of ownership" and "structure of operations control" (e.g., independent board, municipal council, or county board) would be a useful addition to the current public/private variable on the balance sheet. In the Capital Subsidiary Schedule (Form 103), definition of "state" vs. "local" tax is ambiguous and dependent upon local interpretation. For example, some California operators define Transportation Development Act (TDA) funds as state tax receipts but most list it among local tax receipts. It is a state tax. Similarly, the allocation of much of the state and local tax monies to "capital assistance" (Form 103) versus "revenue assistance" (Form 203) is defined by each operator and is not uniform across systems. Thus, the state/local tax distinction is not useful for statistical analysis without further information. They would be better aggregated.

The Revenue Summary Schedule (Form 201) omits important data, such as the number of passengers for each major revenue type. For example, a commonly used variable in transit research, the total number of revenue passengers, should be included so that the average fare (passenger revenue per revenue passenger) can be calculated. It would also be useful to have additional fare data (which is readily available from the transit system), such as the fare structure. Average revenue is a poor substitute for the fare structure when attempting to analyze the subsidy effects.

Instructions for completing Expenses Classified by Function (Form 310) state that the joint cost is to be allocated on the basis of "percent of capacity miles" contributed by each mode. However, "capacity miles" is biased by the arbitrary factor which allows each system to decide whether or not to include standing capacity. A more consistent basis for allocation would be "percent of revenue hours" or "percent of revenue miles" or "percent of seated-capacity miles." The requirement that a single method of joint-cost allocation be used substantially increases the data comparability, but substitution of "hours" for "miles" would also reduce the

extraneous local environment effects of speed variation among systems. Allocation of joint-cost by a formula remains inherently arbitrary. Researchers should consider the importance of potential bias introduced by the methods used. Undoubtedly it has had an effect on the performance measures used (see Chapter II). Only 216 of the 311 properties used were single mode bus operators. The remaining 95 were multi-mode operators whose costs were apportioned based upon "percent of capacity miles."

The voluntary 310 Forms appear much too tedious for the many multi-modal systems. In general, it would appear that the flexibility gained by splitting the sample set into four different reporting types is gained at great cost and results in omitted data.

The Operators' Wages Subsidiary Schedule (Form 321) was not required for the first reporting year, and will not be required at all from small operators. However, the following six items are critical to research on labor cost: operating time, minimum weekly guarantee, spread time premium, shift premium, student training time, total time spent in transportation administration, total non-operating paid work time, and total operating time. It would aid analysis if labor hours were reported by function, e.g., administration and maintenance labor hours, as well as total-vehicle-operations labor hours. The required Transit System Employee Count, (Form 404) lists labor hours by function only to the nearest 200 annual hours. Two useful data items that could be added are the "top operator wage rate" and "top mechanic wage rate."

The Fringe Benefits Subsidiary Schedule (Form 331) is of little use for efficiency and effectiveness comparisons across systems because of the probable inconsistency in classifications. Items such as the "sick leave" or "holiday benefits" may or may not be included in "salary" and thus are inconsistently reported. Similarly, the Pension Plan Questionnaire (Form 332) would appear to be of value for internal management rather than for comparison of transit system performance.

The directions for generating number of road calls and hours of maintenance labor (Form 401) are precise and facilitate data consistency and comparability. An additional question appropriate to this form is

the "number of gallons of lubricating oil used." This data item, collected by APTA, has been found useful in previous research on transit performance.

The "number of directional miles of roadway" (Form 403) is a uniform measure, which should generate comparable one-way miles of line which is useful for computing coverage area. However, the omitted variable, "route miles," is equally important for calculating a simple measure of service intensity.

The Transit System Employee Count (Form 404) addresses a long-standing problem of comparable counting of part-time employees by homogenizing employee units into "employee equivalents," equal to 2000 employee hours. The requirement that employee hours be allocated to operating and capital labor adds little of statistical importance and is probably inconsistently performed across systems.

Transit System Accidents Schedule (Form 405), classified by "pedestrian," revenue vehicle" or "other vehicle" occupancy, would be sufficient accident data for cross-system comparisons. Number of crimes during transit operation is an important omitted item in defining quality of service.

The measures of consumed-service (Form 406) are calculated by system sampling for which a recommended sampling technique is offered. Additional research on the sampling methodology is needed because the results provide area-based statistics rather than route-based statistics which could be used for route refinement. Some consumed-service data has been lost by omitting two historically available statistics: "annual revenue passengers" and "annual total passengers." Similarly the annual totals of vehicle hours and service personnel would be as useful because these are difficult to compute from the disaggregated figures by daily time period. Revenue capacity, as defined, is not physical fleet capacity but only policy capacity--equal to seated capacity or seated plus standee capacity.

The Section 15 revenue vehicle inventory (Form 408) is more comparable across systems than the traditional total vehicle inventory available in previous data sources. The "total mileage on the vehicles" item facilitates calculation of average mileage per fleet and use of a sophisticated fleet-based depreciation formula.

Additional Survey Information

In order to compensate for some of the deficiencies noted above, a survey was sent out to the 311 bus transit systems. Of the 311 transit properties queried, 132 responded. The survey asked for seven pieces of information, five of which concerned operating statistics. These were: base cash fare for adults and the amount of any transfer change; number of annual revenue passengers, that is linked revenue passengers for the 1979 fiscal year; miles of route, (one-way); and the top operator wage rate at the midpoint of the 1979 fiscal year (the base wage plus any cost-of-living increment).

Two other questions were asked concerning characteristics of the transit property. These were the size, in square miles, of the service area and the population of the area served. The population of area served was defined as the population of the area accessible to transit service, for example, the population residing within one quarter mile of a transit route. Although 132 transit properties responded to the questionnaire, not all seven items received answers which limited the usefulness of the information in subsequent analysis. The limited survey response, and the number of missing values, both in the survey and the Section 15 data, were contributing factors to the low number of cases that occurred within the regression, factor, and cluster analyses. If this information is included in future Section 15 data requirements, then the response rate should be higher. Inclusion is recommended.

Additional demographic variables were collected from statistical sources. A complete list, as well as sources, is provided in Appendix A. Most of these variables were collected from the County and City Data Book, 1972 and based upon the 1970 Census. This was not a wholly satisfactory situation since the Section 15 data were for 1978-79. In an attempt to compensate, several variables were collected from the Rand McNally Commercial Atlas and Marketing Guide, 1980. These variables included population and area for selected cities and counties as well as automobile ownership. The usefulness of this data was limited by the way Rand McNally calculated its area and population figures. Since the County and City Data Book had a closer fit in terms of measuring the extent of each transit service area, that data set was chosen.

Also contributing to the choice of the County and City Data Book was the availability of other variables which allowed for a more complete description of the transit service areas. These included income figures such as per capita income, and median family income as well as statistics on the age, sex and education level of the population. The unemployment rate and average manufacturing hourly and weekly earnings were also collected.

While the urbanized area data were extremely useful, some problems were encountered because not all transit systems in the Section 15 data set were included within urbanized areas. All, except the very small properties, could be matched with city data. The urbanized area data are preferable since it includes data on areas contiguous to the central city. This is a closer approximation to the service area for most transit properties. When the data were not available, city data were used. A dummy variable was introduced to adjust for the differences between urbanized area and city data. In the case of the small transit properties, the nearest city or urbanized area's data were used. This probably introduced a bias in the data, especially for the satellite communities around major cities such as New York, Chicago, and Philadelphia.

The currency of the demographic data will be improved when the 1980 Census data become available. However, the problem in matching transit service areas with urbanized areas will remain. Since it would be difficult to require transit properties to collect detailed demographic data, no easy solution is seen for this problem.

Additional data were available from surveys of each transit property published by UMTA.[8] It is recommended that this information be included in subsequent Section 15 reports rather than being collected separately. This information could have other policy applications and Section 15 provides a convenient means of requiring submission at little cost.

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[8]U.S. Dept. of Transportation, Urban Mass Transportation Administration, A directory of regularly scheduled, fixed route local public transportation service in urbanized areas over 50,000 population. (Washington, D.C.: U.S. Dept. of Transportation, Urban Mass Transportation Administration, Office of Planning, Management and Demonstration.) Annual.

Comparison with Supply, Demand and Cost Models

To assess the usefulness of the UMTA Section 15 transit data for research, econometric models estimated from previous data sets were replicated. Estimates were prepared for supply, demand and cost equations. Relationships were compared for magnitude, sign and significance. It was found that the 1978-79 Section 15 data can not be used to replicate previous studies. Incomplete returns together with the absence of variables reduce the value of the data set for research. However, replication of these studies provided an assessment of data accuracy and guidance to variables which might be included when the Section 15 requirement is revised.

Two econometric studies were selected for replication. Both had used data from carefully selected, but smaller, data sets to develop simultaneous equations for urban bus transit. Nelson developed equations for supply, demand and cost, using parameters estimated from two data sets on firms in urbanized areas: 51 transit firms in 1968 and 44 in 1960.[9] The 1968 results were chosen for replication in this study.

Veatch used 1970 data collected from 29 bus transit firms operating in small and medium sized cities.[10] Veatch was primarily interested in the environmental variables affecting cost and whether or not economies of scale were present, but he also estimated supply and demand equations. Replication of the equations has an advantage because he used environmental data from the 1970 Census which we also used for several variables.

Assessment of comparability of the coefficients in each data set is subjective. No tests were performed to determine whether the data sets used by Nelson, Veatch and that were available from Section 15 were samples from the same population or whether the coefficients in each study were equal. Differences in the magnitude of coefficients were

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[9]Gary R. Nelson, An econometric model of urban bus transit operations. (Unpublished PhD dissertation, Rice University, 1972.) Available from Xerox University Microfilms as #72-26457.

[10]James F. Veatch, Cost and demand for urban bus transit. (Unpublished PhD dissertation, University of Illinois at Champaign-Urbana.) Available from Xerox University Microfilms as #74-5723.

expected because of the changes that have occurred in transit demand during the last decade. The sign and significance of the variables are therefore more important to assessing the reliability of the Section 15 data than magnitude of coefficients.

Results from the regression studies of transit supply, demand and cost based upon the Section 15 data were reported as an interim report. The results were not useful other than providing an assessment of data reliability and therefore were not included in the final report. Copies of the interim report are available from the University of California, Irvine.[11]

CONCLUSION

One of the purposes of this research has been to evaluate the usefulness of the Section 15 data set for performance analysis. Severe difficulties were encountered as a result of missing data and because of the inability to obtain demographic data matched to respective transit service areas. These constraints limit the application of results and improvements are recommended.

The data from the Section 15 reports should be listed by case, that is, by transit property when recorded on tape. This would facilitate researchers engaged in cross-sectional analysis. Further, missing values should be consistently assigned some symbol, such as "-9.00" which cannot be confused with a valid entry.

Several improvements and additions to the variables would also be helpful. These include collecting route-based data such as route miles, annual revenue passengers and annual total passengers. Specification of ownership by type such as independent board or municipal council should be included. A standardized definition for state and local taxes and subsidies would eliminate the problems that now exist when definition of such items is left up to the individual transit property. Also the allocation of cost (Form 310) by revenue hours rather than by capacity

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[11] Shirley C. Anderson and G.J. Fielding, Comparison of supply, demand and cost models using UMTA Section 15 data. (Irvine, California: University of California, Institute of Transportation Studies, WP-81-4, 1981.)

mile would yield more comparable information. The inclusion of operating time, minimum weekly guarantee, spread time premium, shift premium, student training time, total time spent in transportation, total non-operating paid work time, and total operating time is crucial for analysis of labor costs. Inclusion of fare structure data, and total revenue passengers is necessary for valid analysis of subsidy effects. Inclusion of several demographic variables would also be most useful for future research. These should at least include service area in square miles and service area population.

The inaugural year, Section 15 data must be used with caution. Omissions, coding errors and practices, as well as larger than expected variance make the data set difficult to use for performance research. UMTA and TSC are aware of these deficiencies and have cautioned users about the data. They are also attempting to improve the data by validation programs so that future reports will be more accurate. Suggestions made in this chapter are a contribution to the improvement program. The statistical techniques discussed in the next two chapters demonstrate the kinds of analyses which can be used to analyze Section 15 data and the usefulness of the results for improving transit management and administration. These techniques will be even more helpful as the accuracy of the data improves.

CHAPTER II

DEVELOPMENT OF STANDARD PERFORMANCE INDICATORS

Performance indicators are important to transit management because of their relationship to goals and objectives. Goals represent the basic ends which a transit agency wishes to achieve; they set the framework for action. Objectives establish directives to carry out a program of action; they facilitate the definition of indicators by which the achievement of goals can be evaluated. Objectives are specific, observable, and achievable. Performance indicators are the quantitative measures of objectives which enable managers and policymakers to determine the current position of an agency and outline strategies to improve performance.

Availability of data collected pursuant to Section 15 of the Urban Mass Transportation Act of 1964, as amended, has improved the comparability of transit statistics. Now there is a uniform set of statistics required of all applicants for operating assistance and grants under Section 5 of the Act. Not only are the statistics carefully defined, but also the period of reporting and the method of gathering the information is prescribed. Valid comparisons between transit operators are now possible although differences in operating environments must be recognized. Comparative studies can be conducted within divisions of the same property, for the entire property over a period of time and between similar transit properties.

BACKGROUND WORK ON PERFORMANCE INDICATORS

The concept of transit performance evaluation and the development of performance indicators is not new. In 1958, the National Committee on Urban Transportation specified service standards, objectives, and measurement techniques.[1] This study originated many of the measures and standards used by transit today.

The problems of performance evaluation were the subject of a major study published by Anthony R. Tomazinis in 1975.[2] Tomazinis defined conceptual and methodological aspects of evaluating productivity, efficiency, and the quality of urban transportation systems and insisted that

measures of efficiency and the use of resources be separated from the measures of effectiveness in achieving ridership. Tomazinis drew upon the definitions of efficiency and effectiveness promulgated by the audit guidelines established by the General Accounting Office.[3]

Because of the limited availability of transit statistics, early applications of performance evaluation relied upon regional data. Adaptation of the theoretical work on performance evaluation to transit in California was accomplished by Fielding, et al.[4] Sinha, et al., used data from the American Public Transit Association (APTA) to establish the correlation among 16 indicators and extended comparative evaluation by using data for 29 Midwestern transit systems to demonstrate how systems could be classified by operating speed, coach operator wage rates and population of the urban area.[5]

Results published by both Fielding, et al., and Sinha, et al. were influential in the development of the current research, the former by outlining the conceptual framework, and the latter for demonstrating how this framework could be used to establish intercorrelations between indicators and how the correlation was increased by grouping similar transit operators.

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[1]National Committee on Urban Transportation, Measuring transit service. Procedure Manual, No. 8. (Chicago, Ill.: Public Administration Service, 1958.)

[2]Anthony R. Tomazinis, Productivity, efficiency, and quality in urban transportation systems. (Lexington, Mass.: D.C. Heath, Lexington, 1975.)

[3]U.S. General Accounting Office, Standards for audit of governmental organizations, programs, activities and functions. (Washington, D.C.: U.S. Government Printing Office, 1972.)

[4]Gordon J. Fielding, Roy E. Glauthier, & Charles A. Lave, Development of performance indicators for transit. Final report #UMTA-CA-11-0014-78-1. (Irvine, California: University of California, Institute of Transportation Studies, December 1977.) (NTIS #PB 278 678.)

[5]Kumares C. Sinha, David P. Jukins, & Oreste M. Bevilacqua, Stratification approach to evaluation of urban transportation performance. In Public transportation planning. (Transportation Research Record #761.) (Washington, D.C.: Transportation Research Board), pp. 20-27.

Three other contributions to performance methodology warrant discussion as antecedents. Dajani and Gilbert suggested the inclusion of indicators to assess the impact of transportation systems upon social and economic criteria and environmental quality.[6] Miller used Pennsylvania data to illustrate the importance of indicators which were administratively practical, politically acceptable and predictable for budget purposes.[7] Drosdat developed a framework to test the significance, data availability and consistency between generic indicators.[8]

The usefulness of the Section 15 data for performance evaluation was demonstrated in a study conducted for the State of Michigan by Holec, et al.[9] They used 1978-79 data to review the performance of individual properties against the comparison of other mid-sized Michigan transit systems and as a time series in which the performance of each system was assessed against itself. Their objective was to assist operators by identifying and suggesting reasons for the differences among systems by analyzing 47 indicators. Anderson has shown how this approach can be simplified by using a conceptual framework of performance concepts and factor analysis.[10]

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[6]Jarir S. Dajani & Gorman Gilbert, Measuring the performance of transit systems, Transportation Planning and Technology, 1978, 4(2), 97-103.

[7]James H. Miller, An evaluation of allocation methodologies for public transportation operating assistance, Transportation Journal, Fall 1979, 19(1), 40-49.

[8]Herbert A. Drosdat, Transit performance measures: Their significance in local funding. Final report #UMTA-WA-11-0005-RR-77-12. (Seattle, Washington: University of Washington, Depts. of Civil Engineering and Urban Planning, Urban Transportation Program, June 1977). (NTIS #PB 276 141).

[9]James M. Holec, Dianne S. Schwager, & Angel Fandalian, Use of Federal Section 15 data in transit performance evaluation: Michigan program. In Bus transit management and performance. (Transportation Research Record #746.) (Washington, D.C.: Transportation Research Board, 1980), pp. 36-38.

[10]Shirley C. Anderson, The Michigan transit performance evaluation process: Application to a U.S. sample. Transportation Research Forum. Proceedings of the Twenty-first Annual Meeting. (Oxford, Indiana: Richard B. Cross, 1980), pp. 94-103.

Because the Section 15 data were not available, Anderson used operating statistics published by APTA for 1969-73 to test whether the Michigan approach could be replicated with national data and whether it could be simplified. It was found that using the sum of each system's factor scores as an overall performance indicator eliminated tied rankings of systems, but the sum-of-individual-factor-scores was less accurate in representing the Michigan set of performance indicators than a smaller set of indicators based upon the performance concepts outlined by Fielding et al. In several respects, this research effort attempted to replicate Anderson's findings using the Section 15 national data base. It also provides the basis for a classification of transit properties and the evaluation of recent research applying performance criteria to transit management.

Several researchers have concentrated on developing methods to improve performance on specific factors of production. Meyer and Gomez-Ibanez suggested a number of strategies for improving performance.[11] These strategies fall into three major categories:

1) Alleviating peaking problems,

2) Discontinuing less-productive service, and

3) Tailoring service to distinctive markets.

Cherwony and Mundle developed methods for estimating the cost per hour of peak service.[12] Oram has shown ways in which this peak service can be "shed" to private providers of transit.[13] Chomitz and Lave have analyzed various labor rules which might be changed so as to reduce the

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[11]John R. Meyer and Jose A. Gomez-Ibanez, Improving urban mass transportation productivity. Final report #UMTA-MA-11-0026-77-1. (Cambridge, Mass: Harvard University, February 1977.) (NTIS #PB 266 920.)

[12]Walter Cherwony & Subhash R. Mundle, Peak-base cost allocation models. In Recent developments in bus transportation. (Transportation Research Record #663.) (Washington, D.C.: Transportation Research Board, 1978), pp. 52-56.

[13]Richard L. Oram, Peak period supplements: The contemporary economics of urban bus transport in the U.K. and U.S.A. Progress in Planning, 1978, 12(2), 89-103.

cost of providing peak-period transit.[14] Perry and Angle contend that improvement of the labor-management relationship is the key to improving service efficiency,[15] but Fielding, et al., who analyzed the impact of organization structure, failed to show any significant relationships between alternative organizational structure and transit performance.[16] Goldberg, et al. found that while many factors influence transit performance, management is the key to high performance and concluded management training and development should be emphasized.[17]

Current attention to transit performance is moving away from the organization as a whole and focusing on route performance. These research efforts were stimulated by the finding of Attanucci that no common method was being used to evaluate performance at the route level.[18] Sinha and

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[14]Kenneth M. Chomitz and Charles A. Lave, Part-time work rules, and transit costs. Final report #UMTA-CA-11-0018-1. (Irvine, Calif.: University of California, Institute of Transportation Studies and School of Social Sciences, January 1981.) (NTIS #PB 81-180 556.)

[15]James L. Perry, Harold L. Angle, & Mark E. Pittel, The impact of labor-management relations on productivity and efficiency in urban mass transit. Final report #DOT-RSPA-DPB-50/79/7. (Irvine, Calif.: University of California, Institute of Transportation Studies and Graduate School of Administration, March 1979.) (NTIS #PB 294 721.)

[16]Gordon J. Fielding, Lyman W. Porter, Michael J. Spendolini, William D. Todor, & Dan R. Dalton, The effect of organization size and structure on transit performance and employee satisfaction. Final report #UMTA-CA-11-0016-3. (Irvine, Calif.: University of California, Institute of Transportation Studies, School of Social Sciences, and Graduate School of Administration, December 1978.) (NTIS #PB 296 629.)

[17]Joel Goldberg, Marc Holzer, Roni Gallion, & Constance Zalk. Transit productivity: Improvement through management training and development. Final report #UMTA-NY-11-0019-79-1. New York, N.Y.: City University of New York, John Jay College of Criminal Justice, Center for Productive Public Management, June 1979.) (NTIS #PB 299 369.)

[18]John P. Attanucci, Leora Jaeger, & Jeff Becker, Bus service evaluation procedures: A review. Report #UMTA-MA-09-7001-79-1. (Special Studies in Transportation Planning.) (Washington, D.C.: U.S. Department of Transportation, Urban Mass Transportation Administration, Office of Planning Assistance, April 1979.) (NTIS #PB 296 314.)

Guenthner have developed a computerized model for the assessment of changes in bus operations to improve performance.[19] Wilson has developed a series of statistical algorithms to evaluate the performance of alternative route refinement strategies, as part of a program designed to improve short-range transit planning.[20]

Emphasis in transit performance research has shifted from the conceptual models of the initial research to the analysis of attributes of transit organizations and their operating environments. The most recent research has been on route performance. However, release of the Section 15 data enables researchers to both test the validity of earlier findings using a national data set, and calibrate models for the improvement of factor inputs.

STANDARD PERFORMANCE CONCEPTS

To aid the selection of standard performance concepts using Section 15 data, three categories of measures were established: cost efficiency, service effectiveness, and cost effectiveness (Figure ?-1). Efficiency relates to the labor, capital, and fuel used to produce transit service (inputs and outputs). Effectiveness measures the utilization (consumption) of transit output as well as transit's impact upon societal goals like reducing traffic congestion. Cost effectiveness measures integrate efficiency and effectiveness measures as when production costs are related with consumption, e.g., cost per passenger.

Candidate Statistics

Three types of statistics are available from the Section 15 data and Census reports to calculate the transit performance concepts; these are

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[19]Anil S. Bhandari & Kumares Sinha, Impact of short-term service changes on urban bus transit performance. In Bus and rural transit. (Transportation Research Record #718.) (Washington, D.C.: Transportation Research Board, 1979), pp. 12-18.

[20]Nigel H.M. Wilson, Bus service planning: Current practice and new approaches. Unpublished paper, Massachusetts Institute of Technology, Department of Civil Engineering, 1981.

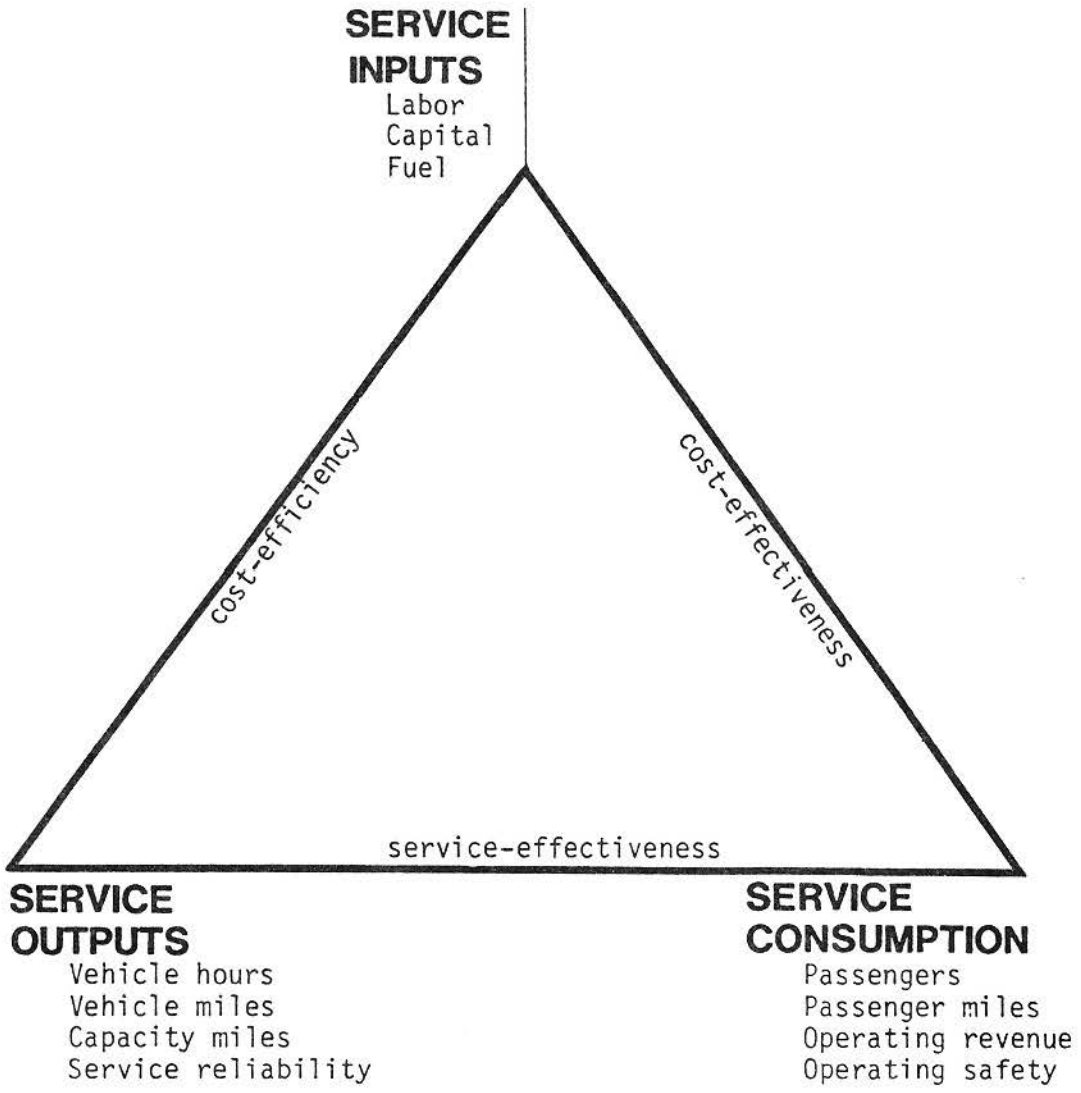

Fig. 2-1. Framework for Transit Performance Concepts

service input, service output, and service consumption statistics. Together, they can be used to monitor the costs of producing service and its utilization.

1) Service Input - the quantity of resources expended to produce transit service expressed in either monetary or non-monetary terms. Examples of service input statistics include:
   - operating cost (dollars expended for operations, maintenance and administration)
   - employee hours (total, operating, maintenance, administration)
   - capital investment (number vehicles, percent operating in peak)
   - energy consumption (fuel cost and volume)

2) Service Output - the quantity of service produced by a transit operator expressed in non-monetary terms. Examples of this type of statistic include:
   - vehicle hours (total and revenue hours)
   - vehicle miles (total and revenue miles)
   - capacity miles (total and revenue capacity miles)
   - service reliability (number of roadcalls)
   - service safety (number of preventable accidents)

3) Service Consumption - the amount of service used by the public may be expressed in either monetary or non-monetary terms. Examples include:
   - passengers (total, revenue, special groups)
   - passenger miles
   - operating revenue (total, passenger)

Performance Measures

The three categories of statistics yield three types of performance measures: cost efficiency, service effectiveness and cost effectiveness (Figure 2-1). A wide range of performance measures is possible. Holec, et al., used 47 for Michigan. Table 2-1 lists 60 performance measures which can be calculated using the Section 15 data. There are others, but a sufficient number have been listed to demonstrate their utility in transit management.

Cost efficiency measures the resources expended to produce transit service; service effectiveness measures the extent to which service provided is used; and cost effectiveness measures the service used against the resources expended.

In selecting performance measures, consideration was given to the availability and reliability of the data. Financial statistics are the most reliable. Passenger statistics are the least reliable, particularly passenger miles of travel statistics.

Census data were added to calculate the following measures for social effectiveness (RVH/POP, TPAS/POP, TPAS/ELD, TPAS/AUT) and for the public assistance (POP/OSUB and POP/TSUB). All demographic variables were either taken from the County and City Data Book, 1972 or from sources listed in Appendix A. The population figure (POP) is the total urbanized area population where that could be obtained; otherwise the most relevant city population was utilized. The variable for elderly (ELD) was the percent of population 65 years of age or older. The variable for automobile availability (AUT) was the percent of population with one or more automobiles. (Units for all performance measures are summarized in Appendix B.)

1972 data were the most recent available. However, it must be assumed that changes in these demographic variables have occurred between 1972 and 1979. This may account for some weakness in the results. After publication of the 1980 Census data researchers using Section 15 data should not have this difficulty.

Controllability was another consideration in selecting performance measures. It is an advantage if performance indicators reflect those aspects which are under the control of the transit managers. Generally, system assets (fixed facilities) and the system environment (service area and its characteristics) are more or less fixed and not under operator control in the short-run, whereas service input and output can be controlled to a greater degree. Of these, management has greatest control over service output (supply) as, theoretically, service input can be adjusted to provide whatever level of output is desired (although beyond marginal increases in service, system assets--buses--may become a limiting factor).

TABLE 2-1. PERFORMANCE MEASURES BY CONCEPT

COST EFFICIENCY MEASURES

Labor Efficiency

	Vehicle Hours per Employee	TVH/EMP
	Revenue Vehicle Hours per Operating Employee Hour	RVH/OEMP
	Vehicle Miles per Employee	TVM/EMP
	Peak Vehicles per Executive, Professional and Supervisory Employees	PVEH/ADM
	Peak Vehicles per Operating Personnel	PVEH/OP
	Peak Vehicles per Maintenance, Support and Servicing Personnel	PVEH/MNT

Vehicle Efficiency

	Vehicle Hours per Active Vehicle	TVH/AVEH
	Vehicle Hours per Peak Vehicle Requirement	TVH/PVEH
	Vehicle Miles per Active Vehicle	TVM/AVEH
	Vehicle Miles per Peak Vehicle Requirement	TVM/PVEH
	Revenue Vehicle Miles per Vehicle Miles	RVM/TVM
*	Revenue Capacity Miles per Vehicle Mile	RCM/TVM

Fuel Efficiency

	Revenue Vehicle Miles per Gallon Diesel	RVM/FUEL
	Vehicle Miles (Bus) per Gallon Diesel	TVM/FUEL
*	Revenue Capacity Miles (Bus) per Gallon Diesel	RCM/FUEL

Maintenance Efficiency

	Total Vehicle Miles per Maintenance Expense	TVEH/MEXP
	Vehicle Miles per Maintenance Employee	TVM/MNT
	1,000,000 Vehicle Miles per Roadcall	TVM/RCAL

Output per Dollar Cost

	Revenue Vehicle Hours per Operating Expense	RVH/OEXP
	Vehicle Miles per Operating Expense	TVM/OEXP
*	Revenue Capacity Miles per Operating Expense	RCM/OEXP
	Revenue Vehicle Hours per Total Labor and Fringe Expenses	RVH/TWG
	Revenue Vehicle Hours per Operations Labor and Fringe Expenses	RVH/OWAG
	Revenue Vehicle Hours per Vehicle Maintenance Labor and Fringe Expenses	RVH/VMWG
	Revenue Vehicle Hours per Admin. Labor and Fringe Expenses	RVH/ADWG

SERVICE EFFECTIVENESS MEASURES

Utilization of Service

	Passenger Trips per Revenue Vehicle Hour	TPAS/RVH
	Passenger Trips per Revenue Vehicle Mile	TPAS/RVM
	Passenger Trips per Peak Vehicle	TPAS/PVH
*	Passenger Miles per Vehicle Capacity Mile	PASM/RCM
*	Passenger Miles per Passenger	PASM/TPS

Social Effectiveness

	Revenue Vehicle Hours per Service Area Population	RVH/POP
	Passengers per Service Area Population	TPAS/POP
	Passengers per Elderly Population	TPAS/ELD
	Passengers per Autoless Population	TPAS/AUT
*	Frequency of Service	FREQ

Operating Safety

	1,000,000 vehicle Miles per Accident	TVM/ACC
	Revenue Vehicle Hours per Accident	RVH/ACC

Revenue Generation

	Passenger Revenue per Peak Vehicle	REV/PVEH
	Passenger Revenue per Revenue Vehicle Hour	REV/RVH
	Operating Revenue per Revenue Vehicle Hour	TREV/RVH
	Passenger Revenue per Passenger	REV/TPAS
*	Passenger Revenue per Vehicle Capacity Mile	REV/RCM

Public Assistance

*	Revenue Vehicle Hours per Local Capital and Operating Assistance	RVH/LSUB
*	Revenue Vehicle Hours per State Capital and Operating Assistance	RVH/SSUB
	Revenue Vehicle Hours per Total Operating Assistance	RVH/OSUB
	Revenue Vehicle Hours per Total Capital and Operating Assistance	RVH/OSUB
*	Passengers per Local Operating Assistance	TPAS/LOA
	Passengers per Total Operating and Capital Assistance	PAS/TSUB
	Passenger Revenue per Total Capital and Operating Assistance	REV/TSUB
	Urban Area Population per Total Operating Assistance	POP/OSUB
	Urban Area Population per Total Capital and Operating Assistance	POP/TSUB
	Passenger Revenue per Total Capital and Operating Assistance	REV/OSUB
	Passengers per Total Operating Assistance	PAS/OSUB

COST EFFECTIVENESS MEASURES

Service Consumption per Expense

	Passengers per Operating Expense	PAS/OEXP
*	Passenger Miles per Operating Expense	PASM/OEX
	Passengers per Total Labor and Fringe Benefits	PAS/TWAG
	Passengers per Gallon Diesel Fuel	PAS/FUEL
*	Passenger Miles per Total Expense	PASM/TEX

Revenue Generation per Expense

Ratio Operating Revenue to Operating Expense	REV/OEXP
Ratio Total Revenue to Total Expense	TREV/TEX

*Dropped because of missing values or inconsistent data.

Definitions for statistics are provided in the Urban Mass Transportation Industry Uniform System of Accounts and Records and Reporting System, January, 1977, Volume II.

Service input is slightly less controllable because the funds required to produce service are controlled by the agencies other than the operator, and because some costs remain constant despite marginal changes in service. Service consumption (demand) is more difficult to control because demand for transit is dependent upon the response of the public to stimuli such as disposable income, fares, and levels and quality of service.

Although the performance measures were limited by availability, reliability and controllability, the list of feasible measures is far more than transit managers can use when improving transit performance. Parts of a transit organization may use individual indicators but a smaller, representative set is required for system management.

REDUCTION TO PERFORMANCE CONCEPTS

Two important problems associated with performance evaluation must be considered. The first is the methodological problem of devising a complete and workable model of performance by categorizing performance objectives into concepts and utilizing uniform quantifiable measures of each concept. The 12 concepts used as a model in this respect are listed in Table 2-1 as the group headings of the sixty performance measures.

A second problem associated with use of performance indicators is the kind of data that needs to be collected under Section 15. If many indicators are desired, then transit agencies must submit lengthy reports. The resulting indicators may be confusing and will be difficult and costly to analyze. This project used current Section 15 data to analyze performance by finding a small, representative set from the 60 performance measures (listed in Table 2-1). The indicators, covering all important aspects of performance, are reduced to a conceptual model of performance. Then, using factor analysis on a set of indicators that is numerically balanced across concepts, the number of statistically independent dimensions of performance is determined. The most representative performance measures for each factor dimension constitute a small set that covers all independent dimensions of the much larger set.

Factor analysis is a general method for interpreting the underlying "sources" of variation in a data set.[21] Performance indicators that

show similar patterns of variance are grouped into one factor dimension. These statistically independent factor dimensions can be interpreted as performance concepts and used as a reduced set of performance indicators. Alternatively, as done in this project, the actual performance indicators most representative of each of the factor dimensions can be used as the reduced set and their standardized values can be summed to obtain a single performance measure. The four steps used in creating the single over-all measure of performance were:

1) Preliminary factor analysis to identify factors sufficient to describe the 12 dimensions of performance (Table 2-1). Performance measures for which reliable data could not be supplied or that did not load on any of the factors were deleted.

2) "R-mode" factor analysis, with varimax rotation, was carried out to identify the basic patterns of variance among a balanced set of 32 performance measures, using the Section 15 data. Nine dimensions, which accounted for 90% of the covariance, are labeled by performance concepts in Table 2-2 and described in more detail below.

3) The nine performance measures most statistically representative of each of the factor dimensions were chosen to make up the representative set of performance indicators.

4) The standard or "z" scores (defined as the variable value minus its mean and divided by its standard deviation) for each of the nine performance indicators was computed. This "z" score has the advantage that its mean is zero and standard deviation is 1, making it a standardized value. The sum of the "z" scores of the nine performance measures was computed for each transit system and the transit system's performance was ranked.

Chapter III explains the ranking procedure and alternative rankings in detail. This chapter concentrates on the use of factor analysis with a conceptual model of performance to produce a small, representative set of performance measures.

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[21]Andrew L. Comrey. A first course in factor analysis. (New York: Academic Press, 1973.)

Preliminary Factor Analysis

From the list of 60 performance indicators, twelve had to be deleted because of missing data or measurement error. (Deleted indicators are listed with an asterisk in Table 2-1). All performance measures using passenger mile data were deleted because fewer than 80 of the systems reported passenger miles. Performance measures using revenue capacity miles were also deleted because of both a high percentage of missing cases and because revenue capacity was defined inconsistently across systems. Many systems reported the same value for revenue vehicle miles and for revenue capacity miles; others reported a capacity figure that was ten or more times that of revenue vehicle miles. Another deletion was the frequency of service variable, which is computed using the number of "line miles." This variable appeared to be double counted for some systems. State and local assistance measures were deleted because there was no way of ascertaining whether the reported value of "0.0," meant no assistance or a missing value.

Means and standard deviations for all performance measures were calculated from data supplied by the 311 bus systems described in Chapter 1. (Appendix C) Exclusively demand-responsive bus systems were eliminated, but combined demand-responsive and fixed route systems were included.

Preliminary factor analysis was run on the remaining 48 variables in order to find the statistical relationship among all the performance measures. The correlation matrix is listed as Appendix D. The rotated factor matrix showed that eleven factors are sufficient to describe all twelve concepts. Although the eigenvalue of the eleventh factor was slightly greater than 1.0 there were no substantial loadings and only 2% additional variance was explained. Therefore, it appears that no more than ten factors are necessary to explain transit performance, as measured by the 48 indicators (Appendix E). One of the performance measures (RVM/TVM) was dropped from further analysis because it showed so little variance among systems that it cannot act as a discriminator of performance. PVEH/ADM was dropped because it did not load on any of the factors nor did it work to create a new factor with eigenvalue greater than one (Appendix C). This signified that the variable is either not a good

measure of performance or subject to measurement error. The measurement error occurred in the 1979 data set because purchased transportation (contract service) was recorded as an administration expense by many systems. This is unfortunate because PVEH/ADM is a useful measure when conducting performance audits.

Equalizing Performance Concepts

The next step in the analysis was to balance the input of logical concepts using approximately the same number of performance measures per concept. Although only two indicators were available for fuel and safety, three indicators were used for each of the other concepts. This approach of approximately equal weighting is appropriate when each concept is valued as equally important in measuring performance. However, the use of factor analysis and a small best set of indicators does not constrain the decision maker to an equal weighting of concepts. Results were also derived using two alternate sets of weights on the twelve concepts. The first alternative doubled the weight on the efficiency indicators; the second doubled the weight assigned to effectiveness indicators. The different outcomes could be used to explain classifications of transit systems in Chapter III. The same methodology could be tailored to the preferences of agencies evaluating the performance of transit systems.

The choice of two or three indicators for each concept was guided by the consistency and reliability of the data and the ability of the performance indicator to define a single concept (Table 2-2).

The public assistance measures based upon urban population were dropped in favor of others because the urban population measure is not consistently related to the service population. For example, the small bus systems in large cities could have the same urban population measure as the regional transportation authority for that city.

Of the remaining 48 performance indicators the three best statistical measures of each concept were chosen to represent the balanced set of three indicators per concept. It is desirable to create approximate equality of numbers of indicators per performance concept in order to allow equal conceptual weight in the analysis. The balanced set was

TABLE 2-2. VARIABLES USED IN ANALYSIS

COST EFFICIENCY MEASURES

Variable Number	Labor Efficiency
* 1	TVH/EMP
* 2	RVH/OEMP
3	TVM/EMP
* 4	PVEH/ADM
5	PVEH/OP
6	PVEH/MNT
	Vehicle Efficiency
7	TVH/AVEH
8	TVH/PVEH
* 9	TVM/AVEH
10	TVM/PVEH
*11	RVM/TVM
	Fuel Efficiency
12	RVM/FUEL
13	TVM/FUEL
	Maintenance Efficiency
14	TVEH/MEXP
15	TVM/MNT
*16	TVM/RCAL
	Output per Dollar Cost
17	RVH/OEXP
*18	TVM/OEXP
19	RVH/TWG
20	RVH/OWAG
*21	RVH/VMWG
*22	RVH/ADWG

SERVICE EFFECTIVENESS MEASURES

Variable Number	Utilization of Service
23	TPAS/RVH
24	TPAS/RVM
25	TPAS/PVH
	Social Effectiveness
26	RVH/POP
27	TPAS/POP
28	TPAS/ELD
*29	TPAS/AUT
	Operating Safety
30	TVM/ACC
31	RVH/ACC
	Revenue Generation
32	REV/PVEH
33	REV/RVH
34	TREV/RVH
*35	REV/TPAS
	Public Assistance
*36	RVH/TSUB
*37	POP/TSUB
*38	PAS/TSUB
*39	REV/TSUB
40	PAS/OSUB
*41	POP/OSUB
42	RVH/OSUB
43	REV/OSUB

COST EFFECTIVENESS MEASURES

Service Consumption per Expense

44	PAS/OEXP
45	PAS/TWAG
46	PAS/FUEL

Revenue Generation per Expense

47	REV/OEXP
48	TREV/TEX

*Deleted from initial set in order to form the balanced set of 32 indicator measures.

limited to three indicators per concept because several of the concepts had only three indicators available in the data set. For labor efficiency, TVH/EMP and RVH/OEMP were dropped because they have a slightly lower loading on any factor than TVM/EMP and PVEH/OP, and they are more related to output per dollar and revenue generation than to any other efficiency measures. The highest three vehicle efficiency measures were kept, dropping TVM/AVEH.

Both fuel efficiency measures were retained. One maintenance efficiency measure, TVM/RCAL, was dropped because it loaded only with population per subsidy. This may indicate reporting error or that TVM/RCAL is related to density of traffic. TVM/RCAL has a very large standard deviation, indicating great variance among systems. Further analysis of this measure is warranted because it is frequently used as an indicator of maintenance effectiveness.

The three output-per-dollar cost variables with the highest factor loadings and the smallest number of missing values reported were retained. All utilization of service and both operating safety variables, and the three best statistical measures of social effectiveness were retained.

Revenue generation is statistically related to three other concepts: output per dollar cost, revenue per subsidy dollar and passengers per subsidy dollar. Since REV/TPAS measures only average fare level rather than effectiveness in attracting passengers, it was dropped in favor of the other three revenue generation measures.

The many possible public assistance measures were reduced to three by dropping measures using the faulty "population" measure and by concentrating on operating assistance ratios. Operating assistance was felt to be less biased against new systems. The public assistance ratios included are RVH/OSUB, REV/OSUB and PAS/OSUB.

The three measures of service consumption per expense and the two measures of revenue generation per expense were also retained to complete the balanced set of performance measures. This set, which puts approximately equal weight on each of the performance concepts, was then factor analyzed to determine the number of statistically independent performance concepts. From these results, a small set of standard indicators was then drawn.

Results of the Factor Analysis of the Balanced Set of 32 Performance Measures

"R-mode" factor analysis, with varimax rotation was carried out to identify the basic patterns of variance among the balanced set of 32 performance measures. Nine factors explained 90 percent of the variance. The factors were well defined and in most cases represent only one concept. The exceptions are factors one, two, three, and seven (Table 2-3).

Factor one represents "output per dollar of cost" and to a lesser extent also represents "revenue generation." Revenue generation is strongly negatively related to revenue hours of service per dollar through the impact of differences of city density. High revenue generation is associated with operation in dense cities where high employee wage rates and slow average speed of operation result in low output per dollar of operating expense. Although this factor combines two performance concepts it differentiates urban bus systems from suburban and rural systems.

Factor two represents social utilization and closely associated measures of service consumption per dollar expense. The ratio of revenue generation to peak vehicles is associated with both factor one and two.

Factor three loads all of the vehicle efficiency measures and also one labor efficiency ratio: peak vehicle/operator. The remaining two labor efficiency measures are associated with both factors three and seven. Systems high in service per peak vehicle are also high in numbers of operators per peak vehicle. Thus the relationship between peak vehicles per operator and vehicle efficiency is negative.

Factor four measures fuel efficiency. The fifth is public assistance. Factor six is social effectiveness.

Factor seven loads the two maintenance efficiency ratios and two of the labor efficiency measures. Thus the labor efficiency measures used do not represent a separately measurable statistical construct but are closely related to the maintenance efficiency and vehicle efficiency factors. Because labor expense by function (Form 310) had many missing values, the information could not be used in the analysis. More accurate and complete listing of labor expense by function in future Section 15 reports, may provide better definition for labor efficiency measures than

Table 2-3
FACTOR ANALYSIS OF 32 PERFORMANCE VARIABLES

TABLE 3-3 FACTOR ANALYSIS OF 32 PERFORMANCE VARIABLES

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5	FACTOR 6	FACTOR 7	FACTOR 8	FACTOR 9
RVH/OWAG	.935	.000	.000	.000	.000	.000	.000	.000	.000
RVH/OEXP	.927	.000	.000	.000	.000	.000	.000	.000	.000
RVH/TWG	.924	.000	.000	.000	.000	.000	.000	.000	.000
TREV/RVH	-.807	.000	.000	.000	.000	.000	.000	.000	.000
REV/RVH	-.705	.000	.000	.000	.000	.000	.000	.000	.000
TPAS/RVM	.000	.889	.000	.000	.000	.000	.000	.000	.000
PAS1OEXP	.000	.887	.000	.000	.000	.000	.000	.000	.000
TPAS/PVH	.000	.877	.000	.000	.000	.000	.000	.000	.000
PAS/1WAG	.000	.866	.000	.000	.000	.000	.000	.000	.000
TPAS/RVH	.000	.859	.000	.000	.000	.000	.000	.000	.000
REV/PVEH	-.489	.502	.000	.000	.000	.000	.000	.000	.000
TVM/PVEH	.000	.000	.885	.000	.000	.000	.000	.000	.000
TVH/PVEH	.000	.000	.877	.000	.000	.000	.000	.000	.000
PVEH/OP	.000	.000	-.802	.000	.000	.000	.000	.000	.000
TVH/AVEH	.000	.000	.633	.000	.000	.000	.000	.000	.000
TVM/FUEL	.000	.000	.000	.987	.000	.000	.000	.000	.000
RVM/FUEL	.000	.000	.000	.986	.000	.000	.000	.000	.000
PAS/FUEL	.000	.000	.000	.958	.000	.000	.000	.000	.000
REV/OSUB	.000	.000	.000	.000	.989	.000	.000	.000	.000
PAS/OSUB	.000	.000	.000	.000	.978	.000	.000	.000	.000
RVH/OSUB	.000	.000	.000	.000	.977	.000	.000	.000	.000
RVH/POP	.000	.000	.000	.000	.000	.926	.000	.000	.000
TPAS/POP	.000	.000	.000	.000	.000	.865	.000	.000	.000
TPAS/ELD	.000	.000	.000	.000	.000	.851	.000	.000	.000
TVM/MNT	.000	.000	.000	.000	.000	.000	.934	.000	.000
PVEH/MNT	.000	.000	-.483	.000	.000	.000	.784	.000	.000
TVM/MEXP	.540	.000	.000	.000	.000	.000	.643	.000	.000
TVM/EMP	.000	.000	.497	.000	.000	.000	.643	.000	.000
REV/OEXP	.000	.000	.000	.000	.000	.000	.000	.960	.000
REV/TEX	.000	.000	.000	.000	.000	.000	.000	.933	.000
RVH/ACC	.000	.000	.000	.000	.000	.000	.000	.000	.944
TVM/ACC	.000	.000	.000	.000	.000	.000	.000	.000	.933
VP	5.217	4.667	3.606	3.052	3.011	2.677	2.623	2.036	1.948

THE ABOVE FACTOR LOADING MATRIX HAS BEEN REARRANGED SO THAT THE COLUMNS APPEAR IN DECREASING ORDER OF VARIANCE EXPLAINED BY FACTORS. THE ROWS HAVE BEEN REARRANGED SO THAT FOR EACH SUCCESSIVE FACTOR, LOADINGS GREATER THAN .5000 APPEAR FIRST. LOADINGS LESS THAN .4500 HAVE BEEN REPLACED BY ZERO.

those used in this research. Much more attention should be given to the definition and reporting of labor measures in Section 15, because they represent a critical aspect of performance.

Factor eight is defined by the passenger revenue/operating expense ratio and the total revenue total expense ratio. Factor nine represents the two safety performance indicators.

Set of Standard Indicators

A small set of nine performance indicators was created by using a single indicator to represent each of the statistically independent dimensions of performance variation. The best statistical and logical measure was chosen from the variables which had highest loadings on each factor.

The set consists of the following performance measures:

1. Revenue vehicle hours per operating expense (RVH/OEXP)
2. Total passengers per revenue vehicle mile (TPAS/RVM)
3. Total vehicle miles per peak vehicle (TVM/PVEH)
4. Total vehicle miles per gallons of fuel consumed (TVM/FUEL)
5. Passenger revenue per operating assistance (REV/OSUB)
6. Revenue vehicle hours per urban population (RVH/POP)
7. Total vehicle miles per maintenance employee (TVM/MNT)
8. Passenger revenue per operating expense (REV/OEXP)
9. Revenue vehicle hours per accident (RVH/ACC)

This standard set was used as the basis for ranking system performance and grouping performance into peer groups (Appendix F).

Alternate Standard Set

In order to show the differences which result from an alternate set of performance indicators, the following were chosen as an alternative set:

1. Revenue vehicle hours per total wage and fringe expense (RVH/TWG)
2. Total passengers per revenue vehicle hour (TPAS/RVH)
3. Total vehicle hours per peak vehicle (TVH/PVEH)
4. Total vehicle miles per gallon of fuel consumed (TVM/FUEL)
5. Passenger revenue per operating assistance (REV/OSUB)
6. Revenue vehicle hours per urban population (RVH/POP)

7. Peak vehicles per maintenance expense (TVEH/MEXP)
8. Passenger revenue per operating expense (REV/OEXP)
9. Total vehicle miles per accident (TVM/ACC)

The list of these performance indicator values are in Appendix G (ASUM1).

Evaluation of Missing Data and Quality of Data for Performance Measurement

The most obvious advantages of the Section 15 data are its breadth of coverage of large and small transit systems and its great depth of transit expense and public assistance information. Its disadvantages, relative to the APTA data base, relate to omission of important passenger, revenue and demographic data. Missing data also severely affected the quality of the research results. For example, in computing the ratio between revenue vehicle hours and operating expense, 69 of the 311 cases were found to have missing values.

The Transportation Systems Center applied data validation algorithms to the Section 15 data submitted by operators to check for internal consistency and apparent errors. Transit properties were contacted to resolve problems, but when errors could not be corrected, the data from these properties were excluded. However, unlikely data values remained; they were eliminated before analysis which further reduced the number of properties included in factor analysis. This is not surprising considering the size and complexity of the data set and the Transportation System Center had provided adequate warning about the use of the data.[22]

The following discussion of the data focuses on the number of missing values for each of the 48 performance indicators using the UCI edited data set. (Appendix C) Some of the difficulties encountered in using factor analysis to demonstrate the validity of the performance concepts were:

1) Values for the expense account by function (such as operators' wages in the operational function) were less frequently reported than the summary expenses because they were not required in the first year. There-

[22]U.S. Dept. of Transportation, Transportation Systems Center, National urban mass transportation statistics: First annual report

fore the missing values are higher for RVH/OPWG, RVH/VMWG and RVH/ADWG. About one third of the systems did not report data which would enable researchers to calculate these performance measures.

2) Passenger data were less often reported than either revenue or expenses. About 40 percent of the "per passenger" performance indicators is missing. Total passenger data were computed from the average daily, Saturday and Sunday values since no overall annual passenger count or estimate was reported. Annual passenger values could be obtained in the future by asking for this statistic. Judging by the inconsistency in the data many transit systems could not estimate their average Saturday or Sunday passenger load, whereas they have a good estimate of annual passengers.

3) Passenger mileage was reported by the minority of systems because it was not required for 1979. Over 70 percent of the values were missing in each of the performance indicators which used passenger miles.

4) The social effectiveness ratio uses urbanized area census data in the denominator. This was not only a poor proxy for the corresponding service area statistics but also one for which values were missing for over 40 percent of the transit systems.

The UCI research team attempted to obtain service area population and other service area statistics by post-card questionnaire. This effort was successful in achieving a response rate of nearly 50 percent. This is an indication that other relevant statistics are readily available from transit operators and could be requested in future years thereby improving the use of Section 15 in performance analysis. Although this information on service population is considered to be much more representative of transit environment than the urbanized area data obtained from the census, it was not used in computing the set of 60 performance ratios, because of the large number of missing cases.

Section 15 reporting system: Transit financial and operating data for fiscal years ending between July 1, 1978 and June 30, 1979. Prepared for the Urban Mass Transportation Administration, Office of Transportation Management as report #UMTA-MA-06-0107-81-1. (Washington, D.C.: U.S. Govt. Printing Office, May 1981), p. vi.

5) Public assistance was probably as well reported as the summary expense and revenue variables. However because the TSC data set recorded missing values as zero, there was no way of determining whether zero indicated valid data or a missing value.

In the original TSC data set, about one-quarter of the transit systems had missing values. The variables which had a higher proportion of missing values were of three types: passenger miles, peak vehicle and subcategories of expense data.

The Section 15 data for 1978-79 must be used with caution. For the inaugural year, the data provide satisfactory aggregate figures, but the performance of individual systems calculated, using the recommended set of performance indicators, must be interpreted, first for accuracy of representation and secondly for the effects of the operating environment. The data presented in this chapter and the subsequent chapter on transit typology should be used to guide future research rather than as the basis for definitive conclusions.

CHAPTER III
TYPOLOGY OF BUS TRANSIT SYSTEMS

Because there is no accepted classification of transit based upon either internal characteristics or demographic and environmental variables, comparisons among similar systems are impeded. Classification in the First Annual Report Section 15 Reporting System is based upon the number of active vehicles, but readers are cautioned about using this division as the basis for comparison between properties.[1] Several statistical techniques were used in an attempt to develop a better typology. These were not very successful, because missing data restricted the number of properties, and the larger-than-expected variance prevented almost half of the properties, for which complete data was available, from clustering into groups containing more than five systems.

The only successful classifications were those based upon the ranking of standardized values for the two sets of nine performance indicators and cluster analysis based upon four operating measures. For these classifications, an adjustment was made when data were missing on one or two variables for a property rather than eliminating it from analysis.

RANKING BY PERFORMANCE

Differences in performance across transit operators can be calculated from the standardized value or Z-score of each transit system on each of the nine performance indicators. The Z-score (standardized value) is calculated by subtracting the mean of a variable from the actual value associated with a particular system and dividing that difference by the standard deviation of the variable. The standardized value for a variable is particularly useful, because the mean of a standardized variable is zero and the standard deviation is one. The sign (positive or negative) of each Z-score indicates a value above or below the mean for each transit

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[1] U.S. Dept. of Transportation, National urban mass transportation statistics, 1981, p. vi.

operator on each of the performance indicators. And the size of the value indicates the distance from the mean for each case in standard deviation units.

In order to increase the number of cases used in the analysis, a standard imputation technique was used in the Z-score analysis. For all variables missing less than 30 percent of data, missing values were recoded to the mean of the variable which equals zero. Even with the imputation technique more than one-third of the 311 bus properties could not be included. Absence of data, particularly the ratio of total vehicle miles per peak vehicle (TVM/PVEH) and total passengers per revenue vehicle mile (TPAS/RVM), required deletion of many properties.

A ranking scale was developed on the Z-scores of each transit operator across the set of nine performance indicators. The scale was computed by summing the Z-scores for each transit system across the standardized values of the nine performance indicators. Thus, the ranking scale, called SUM1, indicated the overall performance of a system; a SUM1 positive value indicated overall performance above the mean, and a SUM1 negative value indicated overall performance below the mean.

Each of the nine performance indicators was given equal weight in calculating SUM1. This need not be so; if an agency wished to emphasize either the efficiency or effectiveness dimensions of performance, then the selected Z-score could be weighted more heavily and different rankings would result. Ranking is a simple, yet revealing technique for analyzing differences in transit performance across properties.

The same series of steps was followed to develop an alternative ranking variable (ASUM1). The Z-scores on the alternate set of indicators were summed in the same manner as used to calculate SUM1.

The final step in the analysis on ranking systems by performance was to use the computed sum value of the Z-scores (SUM1; ASUM1) as the overall measure of performance. Operating systems were then grouped by their distance from the mean of the overall measure (SUM1; ASUM1).

The mean and standard deviation of the SUM1 variable and the alternate ASUM1 variable were calculated. Six groups were created to indicate categories of overall deviation from the mean of SUM1 (Appendix F) and ASUM1 (Appendix G).

Group 1 includes those transit systems with a value on SUM1 that was greater than one standard deviation from the mean of SUM1; Group 2 includes those having a value on SUM1 between .5 and 1 standard deviation above the mean; Group 3 includes those having a value between the mean and .5 standard deviation above; Group 4 includes those having a value below the mean to .5 standard deviation below; Group 5 includes those having values between .5 and 1 standard deviation below the mean; Group 6 includes those having values below 1 standard deviation from the mean of SUM1.

Using this methodology, the overall performance of each system can be compared to the overall performance for all systems in terms of deviations from the mean overall performance. Systems falling into Group 1 generally are well above others on overall performance while systems falling into Group 6 are generally well below. Systems falling into Group 3 and Group 4 are slightly above and below the mean on overall system performance respectively.

TABLE 3-1. GROUPS BASED ON DEVIATION FROM MEAN OF SUM1

Group	Deviation from Mean	Number of Systems
1	above +1	14
2	between +.5 and +1	28
3	between mean and +.5	33
4	between mean and -.5	43
5	between -.5 and -1	21
6	below -1	16
Total number of systems in analysis		155

Appendix F lists the SUM1 values for each operating system in descending order and the unstandardized values for that system across the nine performance indicators. Operating systems are grouped into six categories of deviation from the mean of SUM1. The six groups are designated by the variable called BRVAR in the appendices. Comparable information for the alternate set of performance indicators (ASUM1) is presented in Appendix

G. When one or more scores on each set could not be calculated the SUM1 and ASUM1 scores are listed as 999.000 and the property is not ranked. The Z-scores are listed for each indicator when data was available.

EFFECT OF EXTERNAL VARIABLES ON PERFORMANCE

Differences in performance in the Section 15 data set have been illustrated using the ranking method. The question to be addressed next is whether external variables that affect performance can be identified using Section 15 data. Unfortunately the answer is negative with respect to demographic variables and other external variables which were available.

This result can be explained by lack of fit between demographic data based on urbanized areas and the transit service area. The differences between urban area characteristics, while not of great importance with respect to bus systems in medium sized urban places, is of great importance for large, metropolitan urban areas. Large urban areas contain both large regional as well as small municipal transit systems whose service area characteristics are quite different. This difference is not recognized when the researcher is forced to assign the same demographic data to each system.

Regression Analysis

Failure to establish significant relationships between transit performance and demographic and environmental variables was not unexpected. Attempts to use regression analysis (Chapter I) to explain transit demand were unsuccessful. Interest in these relationships is related to the findings of the previous research, discussed in Chapter II, and the prevalent hypothesis in the transit industry that performance cannot be compared across systems because of differences in operating environment.[2] No conclusive answers on environmental effects result from this research. In part, this occurs because of the inability to obtain demographic data on equivalent units. As the data may improve in the future, discussion of the methods of analysis attempted should assist other researchers.

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[2]American Public Transit Association, "Revised Policy Statement on Transit Performance," Passenger Transportation, February 17, 1979.

The procedure followed in attempting to link performance to demographic, environmental and organizational structure variables consisted of the following steps:

1) Thirty of the performance indicators, representing all nine performance dimensions, were each used as the dependent variables in regression analysis. The performance indicators were each regressed on combinations of demographic, environmental and organizational structure variables. One hundred and ten regression analyses were performed with very poor results in terms of explaning variance in performance. When using each of the labor efficiency measures as a dependent variable in regression analysis, the coefficient of determination (r^2) ranged from 0.00 to 0.15, and averaged about 0.05.[3] Similar results were obtained for vehicle, fuel and maintenance efficiency.

   Variance in output-per-expense variables was explained only slightly better by the demographic and organizational variables. The r^2 ranged from 0.03 to 0.26 and averaged about 0.16. Safety was not explained at all ($r^2 = 0.00$). The social effectiveness equations averaged an r^2 of 20 percent. Revenue generation equations averaged 0.15. The exception was revenue-per-peak-vehicle for which 50 percent of the variance was explained by the demographic variables. Variance explained for public assistance variables ranged from 0.00 to 20 percent. Results for the two cost effectiveness concepts were similarly inconclusive.

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[3]The coefficient of determination (r^2) is interpreted as the percentage of the variance of the dependent variable "explained" or "accounted for" by the regression on independent variables. The r^2 statistic is the squared value of the Pearson r coefficient in regression analysis.

These results were unexpected. Strong signficant relationships were expected based on the work of Nelson,[4] Veatch[5] and Anderson,[6] using APTA data and Giuliano's work, using California data sets.[7]

2) Given that the first step did not show that demographic variables explained any important amount of the performance the research was directed toward editing out data errors which might have biased the results. The Section 15 performance data were edited for outliers, defined as values that were beyond three standard deviations above or below the mean value. Regression of the edited performance variables on the demographic variables produced results as insignificant as those of the regressions on the unedited data.

3) It was suggested that unknown bias may have been introduced by the multi-modal systems through the arbitrary allocation of joint costs of producing bus and other transportation services on the Section 15 forms. Therefore, the multi-modal systems were removed and more regression analysis for single-mode operators with demographic variables were performed. The results of the regression analyses using single-mode systems were very similar to those using both single and multi-modal systems. Therefore, the multi-mode systems were returned to the data set and used in analysis.

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[4]Gary R. Nelson, An econometric model of urban bus transit operations. (Unpublished PhD dissertation, Rice University, 1972.) Available from Xerox University Microfilms as #72-26457.

[5]James F. Veatch, Cost and demand for urban bus transit. (Unpublished PhD dissertation, University of Illinois at Champaign-Urbana, 1973.) Available from Xerox University Microfilms as #74-5723.

[6]Shirley C. Anderson, The Michigan transit performance evaluation process: Application to a U.S. sample. Transportation Research Forum, Proceedings 21st Annual Meeting, 21, 1980, pp. 94-103.

[7]Genevieve Giuliano, Effects of environmental factors on the efficiency of public transit service. Transportation Research Record, 797, 1981, pp. 11-16.

4) The negative results obtained in steps 1-3 could not be accepted as conclusive for two reasons: Firstly, the census demographic variables misrepresented the service area characteristics of small suburban systems and secondly, the 1970 Census variables were outdated. These analyses should be repeated using the 1980 Census data and Section 15 reports for 1979-80.

Cluster Analysis Using Demographic Variables

Since the demographic variables did not provide a basis for classifying transit systems, an alternative approach to creating transit typology was attempted. Cluster analysis was used in an attempt to create a set of urban environment types for transit systems based upon demographic variables for each system.

Cluster analysis is a method for grouping a set of cases based on a clear measure of similarity or dissimilarity. The measure of dissimilarity used here is metric distance from the center of a multidimensional space defined by the cluster variables. The metric distance is found in the following way: each case is represented by the Z-score calculated for each variable. The cases are then located in a space with as many dimensions as there are variables. The Z-score values of each variable for a given case form the coordinates for that case. The distance between each case is determined by the formula (3.1)

$$(3.1) \qquad d_{ij} = \left\{ \sum_{k=1}^{p} \left[X_{ik} - X_{jk} \right]^r \right\}^{\frac{1}{r}} .$$

Cases which are closer to each other than they are to any other case are formed into a cluster. Clusters are characterized by their mean standardized values on each variable. Small clusters are joined together to form larger clusters based on their distance from each other. These clusters are then combined reiteratively until all cases are in a cluster and all clusters are united into one cluster.[8] The researcher chooses the set

[8]Mary Ann Hill, BMDP users digest. (Los Angeles, Calif.: University of California, Dept. of Biomathematics, 1979) p. 45 and p. 2M.

of clusters to be used based on the meaningfulness of the clusters, the utility of the sizes of the clusters and the comprehensiveness of the clustering schema produced.

Nine demographic variables were selected for the cluster analysis. The variables chosen were census variables that had shown the strongest relationships to the performance indicators in the regression equations. These variables were: urban population, urban density, per capita income, percent elderly population, percent with one or more auto, mean January temperature, average local area manufacturing wage, percent female and percent black population.

Since survey variables, such as service area and service area population, were available for only 50 percent of the systems, the cluster analysis was done using the the urban population variable (as supplied with the TSC data set) and urban area. These variables have a weaker relationship to the performance indicators. They are also less specific to the transit systems studied since transit systems serving different parts of a large urban area are characterized by the same urban population figures.

The cluster analysis for 209 systems with sufficient data did not reveal clear groupings that were inclusive of all cases while maintaining distinctive characteristics for each group. There were two large groups of about 70 operators each. These differed clearly from each other only in terms of mean January temperature and average manufacturing wage. Thus, the cluster with a low January temperature and high average manufacturing wage tended to be composed of systems in the northern midwest and the northeast. The other cluster which was characterized by a relatively high January temperature and low wages was composed of systems in the southeast and southern midwest reaching to California. On the other variables both groups were near the mean for the entire sample of 209 operators. Within each of these large clusters are small clusters of about five systems which were often groups that were in close geographical proximity.

The other 60 systems did not form any homogeneous groupings of more than 3-5 systems. These cases tend to be outliers on one or more

variables. For example, systems in the very large urban areas were not included in the two clusters discussed above.

Additional cluster analyses were attempted with smaller sets of demographic variables and with some operating variables which better reflected the service areas of the transit systems. The results were almost identical to those already presented. Since many of the smaller systems were inaccurately characterized by the population and size figures for urbanized areas, it was not possible to form homogeneous groups when using variables such as speed of service which more accurately represent the service areas. Average manufacturing wages and mean January temperature continued to dominate the formation of clusters.

CLUSTER ANALYSIS USING OPERATING MEASURES

Since it was known that the demographic variables were not fitting the actual service area characteristics very well, four operating statistics were selected which more closely represent the operating environment of transit systems. These were: number of active vehicles (AVEH); average speed (SPEED); ratio of peak-to-base vehicles (PEAK/OFF); and total vehicle miles (TVM). Standardized values (Z-scores) were used to represent the operating measures.

The resulting cluster analysis produced eight distinct groups which included 198 of the 209 systems for which sufficient data was available. Their characteristics (in terms of means of the standardized values) are presented in Table 3-2. A positive number means that a cluster is greater on the average than the sample as a whole. A negative number means that a cluster is lesser in a given characteristic than the whole sample. A value of one equals one standard deviation for the whole sample (209 systems) and the mean for each variable is zero.

The four larger clusters (6, 3, 8, 5) are the smaller systems in terms of both active vehicles and total vehicle miles. Cluster 6 tends to be bus systems in medium sized cities with an industrial economy or mid-sized systems within major metropolitan areas. The average speed is moderately low (-.302). Slightly above average, peak to base vehicle ratios indicate that these systems are oriented toward commuters.

TABLE 3-2 CLUSTER GROUPS BASED ON OPERATING MEASURES

Cluster	Number of Cases	Group Means for Standardized Values (SUM1)			
		AVEH	SPEED	PEAK/OFF PEAK	TVM
6	40	-.31	-.302	.185	-.319
3	36	-.109	1.520	-.220	-.018
8	52	-.352	-.893	-.170	-.350
5	26	-.282	.195	-.320	-.263
1	11	2.051	.739	-.139	2.028
2	8	.819	-.048	-.157	.647
4	17	-.136	-.588	.910	-.201
7	8	-.318	-.001	-1.870	-.299

Cluster 3 contains systems which have slightly below average number of active vehicles (-.109) and an average number of total vehicle miles. They are somewhat below average (-.220) in terms of the peak to base ratio but are by far the fastest group of systems in the sample (1.520). Speedier service is achieved because these systems operate primarily in mid-sized, metropolitan areas.

Cluster 8 systems are moderately below average in both total vehicle miles and active vehicles. They are also slightly below the norm in the peak to base vehicle ratio. This cluster of systems is distinguished by its very low speed (-.892), the lowest of any cluster.

Cluster 5 is also moderately below average in terms of active vehicles, total vehicle miles and the peak to base ratio. It differs from cluster 8 primarily in that it has a slightly above average speed.

Cluster 1 consists of large systems in metropolitan areas. In terms of active vehicles and total vehicle miles, they are more than two standard deviations above the sample mean. They are also the second fastest group of operators (.739) reflecting their extensive suburban

service area and the relative unimportance of the CBD as an employment area. The low peak to base ratio also reflects the structure of these urban areas. Their overall performance is also lower than Cluster 2.

Cluster 2 systems are the second largest, nearly one standard deviation above the norm. They differ from Cluster 1 by their lower operating cost per RVH and fewer passengers per RVM. They represent large metropolitan areas with high overall transit performance.

Cluster 4 systems are slightly below average in size but they have the highest values in terms of the peak to base ratio. They are also the lowest in terms of speed. A similar pattern in Cluster 6 suggests that there is a tradeoff between speed and peak hour service. Cluster 4 systems are found mostly in California and other western states.

Cluster 7 systems are also small and exactly average in speed. Their main characteristic is that they have a very low (-1.870) peak to base ratio because they operate a constant level of service throughout the day.

The eleven cases which did not fit into the cluster have quite distinctive characteristics. Three of them are very large transit systems, their group mean being more than six standard deviations above the mean for all systems on both active vehicles and total vehicle miles. They differ from Cluster 1, the other group of large northeastern cities, not only in that they are much larger, but also in the relationship between the other two variables. They are very low in terms of the peak to base ratio and only average in terms of speed.

Two other cases are unique in that they are very small in terms of active vehicles (-.4) and total vehicle miles (-.4) and exhibit the very highest (6.994) peak to off peak ratio, but somewhat low speeds. Several other cases are also oriented toward peak hour service within smaller urban areas, but they manage to maintain above average speeds. The two remaining systems are very negative on all four variables, because they have a small urban base and a rural orientation.

Appendix H lists the 209 systems for which sufficient data was available classified by cluster group. The cluster group number is listed to the left of the system identification code number. The SUM1 score as well as the performance score on each of the nine indicators is

listed for each transit system. The same calculation was completed for the ASUM1 score and the alternative set of performance indicators, but the results were not published.

Most of the systems which clustered into groups are moderately sized with a few very large systems in the northeast. Total vehicle miles and the active number of vehicles are directly proportional to each other for all groups of systems. Thus most clusters are groups of moderate sized systems which differ in the relationship between speed and the peak-to-base ratio. Systems with the highest peak-to-base ratio seem to trade off this characteristic with a lower operating speed. But the fastest systems are not necessarily characterized by a lower peak to base ratio. The cases not included in clusters are outliers in terms of size--either very large or very small--with wide variation in peak hour service.

Clear geographic areas identified with each cluster seldom occur and even then, only with exceptions. This differs from the clusters based on demographic variables. Thus a typology based upon operating characteristic may better reflect characteristics of the service areas than those based on demographic or environmental variables. Cluster analysis provides the basis for further analysis because it clearly divides the transit systems into exclusive groups with distinctive characteristics. The few cases which do not fit the typology are unique, and should be treated as such in performance analysis.

PERFORMANCE BY CLUSTER GROUPS

The eight groups of transit systems clustered by the four measures, active vehicles, vehicle miles operated, speed and peak to base ratio, provide an opportunity to examine performance across the nine dimensions chosen by factor analysis. Appendix H lists the 209 properties for which data was available, divided into the eight cluster groups. Cluster 9 are those properties which did not enter into any of the eight groups. The unnumbered clusters are those omitted because of missing values on the nine dimensions.

SUM1 provides an overall assessment of performance based upon scores on each of the nine dimensions of performance. If desired, the efficiency

and effectiveness dimensions of performance could be weighted unequally to reflect different policy objectives. A separate clustering could be based on different transit functions. For example, transit systems could be analyzed in terms of maintenance characteristics.

Availability of this type of performance analysis will improve comparative assessment of transit properties. Most transit managers choose peer groups against which they compare achievements. Cluster analysis provides an objective method for aggregating properties which are similar in several respects. The performance results of each system can then be analyzed across nine dimensions as well as against the clustered group mean.

Comparative analysis of transit performance which is required by the state programs in California, Minnesota and New York and proposed for Massachusetts and other states, will be aided by this technique. Using this method, local and state officials can cluster properties within a state into groups based upon attributes of performance, rather than relying on a criterion like "number of active vehicles" or on unproven relationships with environmental or demographic variables.

Because of the missing data and funding constraints, the cluster groupings were not statistically analyzed. This should be completed in subsequent years as Section 15 yields a more complete data base. Data for thirty percent of the 198 systems in the eight cluster groups were not available and more than one-third of the cases could not be included.

Comparison of Appendix H with Table 3-1 and Appendix C yields general conclusions about similar cluster groups. Groups 1 and 2 both contain the larger transit systems. Group 1 are larger than Group 2 and operate at higher average speed. However, Group 2 has a strongly positive SUM1 score (2.416) whereas Group 1 is slightly below the mean (-0.266). This reflects the above average performance of Group 2 systems on the efficiency measures: lower operating cost per hour and better mileage per peak vehicle and per maintenance employee. Cluster Groups 3, 5, 6 and 8, which are smaller in active vehicles and miles operated, differ in their overall performance scores. Groups 3 and 6 have SUM1 values below the mean whereas Groups 5 and 8 are above.

Caution is urged in the use of the group scores. Attention must be given to the number of valid properties (cases) in each group and the standard deviation listed at the end of each cluster group. For the 1978-79 data set, the method is more important than the results, because it indicates the performance analyses that can be conducted using future data sets.

CONCLUSION

Much more analysis of Section 15 data is required. Availability of a national data set compiled on a standard format provides a data base which can be analyzed using a range of statistical methods including factor analysis, cluster analysis and analysis of variance. Additional research is clearly warranted, because with more complete data, improved methods for transit management and administration could be tested.

Considerable effort was devoted to editing the 1978-79 data set and this limited the analyses conducted on the cluster groups. Funds intended for the analysis of performance variables were spent preparing the data. Therefore, the analytical section of the research had to be curtailed. Future research should devote more attention to the analysis of performance by groups based upon the inherent characteristics of performance, rather than those based upon environmental or demographic criteria. Refinement of the typology and a more critical evaluation of the performance of transit properties within each groups is warranted in future research.

APPENDIX A
SOURCE REFERENCES FOR DEMOGRAPHIC AND LOCALITY VARIABLES

Definitions of the demographic variable utilized in the cost, demand and supply regressions are listed below in alphabetical order. These variables were derived from various sources, including the County and City Data Book, 1972; Rand McNally, Commercial Atlas and Marketing Guide, 1980; the Urban Mass Transit Administration Transit Directory: from a survey conducted by the ITS researchers as well as from Section 15. Unless listed otherwise, the variables were obtained from the County and City Data Book.

Autos Per Capita:
Rand McNally registered automobile per Rand McNally county population

Average Fare:
Total Revenue per Annual Revenue Passenger, from Section 15

Miles Per Capita:
Total Vehicle Miles per Urban Area Population

Population per Highway Capacity:
Rand McNally county population per highway capacity

Percent Family Income Less Than $3,000:
percent of families in urbanized areas with income under $3,000 in tenths

Percent Family Income Greater Than $10,000:
percent of families in urbanized areas with income over $10,000 in tenths

Percent Urban Population Under 18:
percent of people in urbanized areas under the age of 18 in tenths

Percent Urban Population Over 65:
percent of people in urbanized areas 65 and older in tenths

Percent Urban Families with No Auto:
percent of families in urbanized areas with no automobile, in tenths

Urban Population:
population of urbanized areas in thousands

Urban Area:
Area of urbanized area in tenths of mile

Total Vehicle miles:
total miles travelled by vehicles in a transit system per year, in thousands

Percent Population Female:
percent of population in urbanized area that is female, tenths of percent

Population served:
population of area served by transit system in thousands, from ITS survey

Median Family Income:
median family income of families in urbanized areas

Intensity (miles):
Thousand vehicle miles per route mile.

Mean January Temperature:
mean temperatures of cities in January in degrees

Annual Revenue Passengers:
annual revenue passengers of transit system in thousands, from ITS survey

Total Passengers:
total number of unlimited passenger trips in thousands from Section 15

Public/Private Ownership:
variable denoting ownership 1 if public, 0 if private from UMTA Transit Directory

Federal Subsidy:
amount of federal subsidy (capital and/or operating) in dollars from Section 15

Average Age of Fleet:
age of vehicles in transit system fleet in years from Section 15

Top Operation Wage:
wage rate of top operation in tenth of cents, from ITS survey

Cost Per Vehicle Mile:
total cost without depreciation per vehicle mile, dollars per thousand miles

Cost Revenue Ratio:
total cost per total revenue

Speed:
total vehicle miles per total vehicle hours

Population Density:
urban area population per urban areas

Total Route Kilometers:
total route miles converted to kilometers times 1000

Vehicles per Total Vehicle Kilometers:
Active vehicles per total vehicle miles converted to kilometers times 1000

Intensity (Miles):
thousand vehicle miles per mile of route

APPENDIX B

UNITS FOR CALCULATING PERFORMANCE MEASURES

TVH/EMP	Total Vehicle Hours/# of Employees (FTE)
RVH/OEMP*	Revenue Vehicle Hours/# of Operating Employees (FTE)
TVM/EMP	Total Vehicle Miles (millions)/# of Employees (FTE)
PVEH/ADM	# of Vehicles/# of Admin Employees in 1000's
PVEH/OP*	# of Vehicles/Operating Employees in Millions
PVEH/MNT	# of Vehicles/# of Maintenance Employees
TVH/AVEH	Hours/# of Active Vehicles
TVH/PVEH	Hours/# of Peak Vehicles
TVM/AVEH	Miles/# of Active Vehicles
TVM/PVEH	Miles/# of Peak Vehicles
RVM/TVM	Revenue Vehicle Miles/Total Vehicle Miles in 1000's
RVM/FUEL	Revenue Vehicle Miles/Gallon Diesel in 100's
TVM/FUEL	Total Vehicle Miles/Gallons of Diesel Fuel in 100's
TVM/MEXP*	Total Vehicle Miles/Maintenance Expense in $1000's
TVM/MNT	Total Vehicle Miles/# Maintenance Employees (FTE)
TVM/RCAL*	Total Vehicle Miles (millions)/# of Road Calls
RVH/OEXP	Revenue Vehicle Hours/Operating Expense in $10,000
TVM/OEXP*	Total Vehicle Miles /Operating Expense in $10,000
RVH/TWG	Revenue Vehicle Hours/Total Labor & Fringe Expense in $10,000
RVH/OWAG	Revenue Vehicle Hours/Operator Labor & Fringe Expense in $10,000
RVH/VMWG	Revenue Vehicle Hours/Vehicle Maintenance Labor & Fringe Expense in $10,000
RVH/ADWG	Revenue Vehicle Hours/Admin. Labor & Fringe Expense in $10,000
TPAS/RVH	Passengers/Revenue Vehicle Hours in 100's
TPAS/RVM	Passengers/Revenue Vehicle Miles in 100's
TPAS/PVH	Passengers/# of Peak Vehicles
RVH/POP	Revenue Vehicle Hours/Population of Service Area
TPAS/POP	Passengers/Population of Urbanized Area
TPAS/ELD	Passengers/Population Over 65 Years of Age

TPAS/AUT	Passengers/Population of Urbanized Area without Autos
TVM/ACC	Total Vehicle Miles/# of Accidents
RVH/ACC	Revenue Vehicle Hours/# of Accidents
REV/PVEH	Passenger Revenue in $/# of Peak Vehicles
REV/RVH	Passenger Revenue in $/Revenue Vehicle Hours in 100's
TREV/RVH	Operating Revenue in $/Revenue Vehicle Hours in 100's
REV/TPAS	Passenger Revenue in $/Passengers in 1000's
RVH/TSUB	Revenue Vehicle Hours/Total Gov't Subsidy in $100's
PAS/TSUB	Passengers/Total Gov't Subsidy in $100's
POP/OSUB	Urbanized Area Population/Total Government Operating Subsidy $1,000
RVH/OSUB	Revenue Vehicle Hours/Total Gov't Op. Subsidy in $100's
REV/TSUB	Passenger Revenue in $/Total Gov't Subsidy in $100
PAS/OSUB	Passengers/Total Gov't Op. Sub in $1,000
PAS/OEXP	# Passengers/Op Expense in $10,000
PAS/TWAG	# Passengers/Total Labor & Fringe Expense in $10,000
PAS/FUEL	# Passengers/Gallons of Diesel Fuel
REV/OEXP	Operating Revenue/Operating Expense in $10,000
TREV/TEX	Total Revenue in $/Operating Expense in $10,000
POP/TSUB	Urbanized Area Population/Total Govt. Subsidy in $100's
REV/OSUB	Passenger Revenue in $/Total Govt. Operating Subsidy in $1000's

*Denotes that the UCI calculations differ from the TSC method for calculating performance indicators in the First Annual Report Section 15 Reporting System, op. cit. pp. 1-11 and 1-66.

APPENDIX C

MEAN AND STANDARD DEVIATIONS FOR 48 PERFORMANCE MEASURES

VARIABLE	CASES	MEAN	STD DEV
TVH1EMP	245	1183.73486328	532.773193359
RVH1OEMP	242	1630.54858398	498.841796875
TVM1EMP	251	15586.4570313	5335.98046875
PVEH1ADM	225	3246.69580078	1712.29223633
PVEH1OP	240	586304.687500	149973.562500
PVEH1MNT	231	2.24030780792	.923156261444
TVH1AVEH	245	2211.87915039	752.138916016
TVH1PVEH	209	3027.92504883	887.891357422
TVM1AVEH	252	29760.8867188	10938.8906250
TVM1PVEH	218	41740.5195313	16520.1445313
RVM1TVM	257	938.944580078	87.1201477051
RVM1FUEL	246	589.363281250	732.105224609
TVM1FUEL	244	603.748046875	692.582031250
TVM1MEXP	237	3499.35546875	1679.91259766
TVM1MNT	236	88731.0625000	42531.1992188
TVM1RCAL	241	5.63494014740	7.12055110931
RVH1OEXP	242	469.201416016	195.781250000
TVM1OEXP	250	6813.30859375	3324.75122070
RVH1TWG	228	678.259033203	291.016357422
RVH1OWAG	233	910.595703125	411.888427734
RVH1VMWG	196	4295.79687500	3517.60253906
RVH1ADWG	207	8468.06640625	5822.80859375
TPAS1RVH	178	2962.86523438	1648.59985352
TPAS1RVM	180	228.627151489	125.361389160
TPAS1PVH	171	86318.8750000	48920.3632813
RVH1POP	253	509.819824219	450.714111328
TPAS1POP	194	16.6356964111	18.0849914551
TPAS1ELD	175	185.429824829	186.780609131
TPAS1AUT	177	1101.82788086	1032.32519531
TVM1ACC	243	17257.1875000	10524.5585938
RVH1ACC	243	1271.58032227	843.169433594
REV1PVEH	245	23178.0625000	18701.8789063
REV1RVH	247	886.776611328	749.104736328
TREV1RVH	252	2745.86376953	2002.21508789
REV1TPAS	191	341.603759766	296.699951172
REV1OEXP	293	10443.7304688	2114.45092773
PAS1OEXP	189	12770.7890625	6006.77343750
PAS1TWAG	178	19005.6250000	9347.87109375
PAS1FUEL	187	22.1779632568	75.5642547607
REV1TEX	236	9134.47265625	1808.74560547
RVH1TSUB	238	7.45800495148	7.28179740906
POP1TSUB	282	983.887939453	4034.88208008
PAS1TSUB	179	182.346130371	136.861984253
REV1TSUB	279	93.4612426758	374.179687500
PAS1OSUB	192	3156.76440430	7245.59765625
POP1OSUB	298	36314.6523438	625888.562500
RVH1OSUB	250	122.765487671	316.458496094
REV1OSUB	294	1458.09936523	6965.40234375

APPENDIX D

CORRELATION MATRIX FOR 48 PERFORMANCE MEASURES

	TVH1EMP	RVH1DEMP	TVM1EMP	PVEH1ADM	PVEH1OP	PVEH1MNT	TVH1AVEH	TVH1PVEH	TVM1AVEH	TVM1PVEH
TVH1EMP	1.0000	.7751**	.6150**	.1135	.0579	.2701**	.4222**	.6261**	.2749**	.3474**
RVH1DEMP	.7751**	1.0000	.6674**	.1181	.2176**	.2394**	.4993**	.6400**	.3715**	.4126**
TVM1EMP	.6150**	.6674**	1.0000	.0649	.0094	.2879**	.3128**	.4917**	.5366**	.7262**
PVEH1ADM	.1135	.1181	.0649	1.0000	.3226**	.3318**	-.0728	-.1408	-.1636	-.2617**
PVEH1OP	.0579	.2176**	.0094	.3226**	1.0000	.4804**	-.1986*	-.5256**	-.2390**	-.5293**
PVEH1MNT	.2701**	.2394**	.2879**	.3318**	.4804**	1.0000	-.0095	-.2075*	.0281	-.1845*
TVH1AVEH	.4222**	.4993**	.3128**	-.0728	-.1986*	-.0095	1.0000	.7598**	.8315**	.4406**
TVH1PVEH	.6261**	.6400**	.4917**	-.1408	-.5256**	-.2075*	.7598**	1.0000	.5974**	.7261**
TVM1AVEH	.2749**	.3715**	.5366**	-.1636	-.2390**	.0281	.8315**	.5974**	1.0000	.7345**
TVM1PVEH	.3474**	.4126**	.7262**	-.2617**	-.5293**	-.1845*	.4406**	.7261**	.7345**	1.0000
RVM1TVM	.0046	.1792*	.0860	.0463	-.0864	-.0011	-.0912	.0474	-.0849	.0627
RVM1FUEL	.0567	.0844	.2292**	-.0311	-.0616	.1435	-.0924	.0171	.0077	.1882*
TVM1FUEL	.0589	.0736	.1903*	-.0395	-.0567	.1436	-.0242	.0130	.0697	.1811*
TVM1MEXP	.2651**	.4237**	.5794**	.0858	-.0560	.3484**	.2238**	.3061**	.3842**	.5010**
TVM1MNT	.3846**	.4319**	.7236**	.0858	.0207	.7009**	.2851**	.2861**	.4685**	.5261**
TVM1RCAL	.0121	.1171	.1571*	-.0230	-.0280	.1308	.0344	.0660	.1042	.2439**
RVH1DEXP	.6754**	.7187**	.5905**	.1801*	.0230	.2420**	.2839**	.4368**	.2951**	.4422**
TVM1DEXP	.3392**	.5144**	.6224**	.0580	-.0291	.1782*	.1467	.3533**	.3395**	.6059**
RVH1TWG	.6186**	.6770**	.5896**	.1872*	.0019	.2718**	.2575**	.3984**	.2697**	.4439**
RVH1DWAG	.5848**	.6203**	.5008**	.1239	.0420	.2669**	.2353**	.3730**	.3077**	.3450**
RVH1VMWG	.4014**	.3639**	.2909**	-.0046	-.0126	.2035*	.0965	.2167*	.1159	.2103*
RVH1ADWG	.5380**	.4462**	.2906**	.2139*	.0449	.0876	.1528	.2601**	.1179	.1887*
TPAS1RVH	-.2809**	-.3637**	-.3822**	-.1011	-.0527	-.2063*	.0472	-.1174	-.0691	-.2441*
TPAS1RVM	-.1189	-.1628	-.3659**	-.0010	.0574	-.1222	.0458	-.0375	-.1991*	-.3373**
TPAS1PVH	-.0218	.0854	-.1049	-.2049*	-.3891**	-.2258*	.3677**	.3560**	.1724	.1496
RVH1POP	.0574	.1587*	-.0200	-.0227	-.0323	-.0497	.3443**	.2413**	.2355**	.0095
TPAS1POP	-.1588	-.1328	-.2533**	-.0811	-.1634	-.1915*	.2293*	.0999	.1044	-.0942
TPAS1ELD	-.1527	-.1133	-.2428*	-.0968	-.1793	-.1889	.2142*	.1095	.1179	-.0716
TPAS1AUT	-.1298	-.0932	-.1749	-.0892	-.1756	-.1203	.2538**	.1307	.2298*	.0062
TVM1ACC	.2551**	.4746**	.4913**	-.0420	-.0214	.0525	.2347**	.2782**	.3463**	.4633**
RVH1ACC	.4618**	.4739**	.3927**	.0159	-.0451	.1899*	.2725**	.3109**	.2688**	.3663**
REV1PVEH	-.0197	-.0651	-.1356	-.1296	-.1657*	-.2598**	.1530	.1003	.0076	-.0174
REV1RVH	-.3988**	-.4984**	-.4427**	-.0115	.0506	-.1932*	-.2792**	-.4233**	-.2640**	-.3441**
TREV1RVH	-.4587**	-.6198**	-.4170**	-.0992	-.0712	-.2735**	-.4126**	-.4371**	-.3349**	-.2531**
REV1TPAS	-.0682	-.1964*	-.1340	.0840	.1468	.0615	-.1231	-.2707**	-.0690	-.1570
REV1OEXP	.0356	.0318	.1596*	-.0634	-.0004	-.1416	-.1141	.0494	-.0404	.0973
PAS1OEXP	.0202	.1739	.0246	.0232	.0571	.0229	.1892*	.1945*	.0774	-.0084
PAS1TWAG	.0860	.2049*	.1086	.0347	.1047	.0343	.1346	.1925	.0445	.0291
PAS1FUEL	-.0319	.0042	.0351	-.0585	-.0934	-.0962	-.0889	.1032	-.0577	.0895
REV1TEX	-.0454	-.0132	.0231	-.0832	-.1546	-.1860*	.0919	.1266	.1083	.0904
RVH1TSUB	.3871**	.2558**	.3338**	.1107	.1000	.1188	.1024	.0635	.1866*	.2008*
POP1TSUB	.0067	.0789	.1134	-.0640	.2555**	.1466	-.1147	-.0793	-.0855	.1164
PAS1TSUB	.0476	.1088	.0109	.0399	.1300	-.0046	.1754	.0533	.0701	-.0459
REV1TSUB	-.0505	.0156	.0806	.0520	.1245	-.0011	.0671	-.1215	.0523	-.0357
PAS1OSUB	-.0189	.0271	.0108	-.0565	-.0825	-.0262	.1909*	.1252	.1924*	.1014
POP1OSUB	.0086	.0885	.1221	-.0674	.1791*	.1431	-.0946	-.0792	-.0584	.1163
RVH1OSUB	.0741	.0917	.1320	-.0608	-.0774	-.0237	.1801*	.1470	.2110**	.1575
REV1OSUB	-.0558	.0090	.0717	-.0132	.0287	-.0387	.0992	-.0212	.1243	.0289

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	RVM1TVM	RVM1FUEL	TVM1FUEL	TVM1MEXP	TVM1MNT	TVM1RCAL	RVH1OEXP	TVM1OEXP	RVH1TWG	RVH1OWAG
TVH1EMP	.0046	.0567	.0589	.2651**	.3846**	.0121	.6754**	.3392**	.6186**	.5848**
RVH1OEMP	.1792*	.0844	.0736	.4237**	.4319**	.1171	.7187**	.5144**	.6770**	.6203**
TVM1EMP	.0860	.2292**	.1903*	.5794**	.7236**	.1571*	.5905**	.6224**	.5896**	.5008**
PVEH1ADM	.0463	-.0311	-.0395	.0858	.0858	-.0230	.1801*	.0580	.1872*	.1239
PVEH1OP	-.0864	-.0616	-.0567	-.0560	.0207	-.0280	.0230	-.0291	.0019	.0420
PVEH1MNT	-.0011	.1435	.1436	.3484**	.7009**	.1308	.2420**	.1782*	.2718**	.2669**
TVH1AVEH	-.0912	-.0924	-.0242	.2238**	.2851**	.0344	.2839**	.1467	.2575**	.2353**
TVH1PVEH	.0474	.0171	.0130	.3061**	.2861**	.0660	.4368**	.3533**	.3984**	.3730**
TVM1AVEH	-.0849	.0077	.0697	.3842**	.4685**	.1042	.2951**	.3395**	.2697**	.3077**
TVM1PVEH	.0627	.1882*	.1811*	.5010**	.5261**	.2439**	.4422**	.6059**	.4439**	.3450**
RVM1TVM	1.0000	.1162	.0349	.0617	.0626	.0402	.1699*	.0780	.1869*	.0691
RVM1FUEL	.1162	1.0000	.9953**	.1649*	.2048**	.1062	.1840*	.1851*	.1935*	.1735*
TVM1FUEL	.0349	.9953**	1.0000	.2116**	.2654**	.0738	.2269**	.2172**	.2320**	.2248**
TVM1MEXP	.0617	.1649*	.2116**	1.0000	.6209**	.0692	.6655**	.8071**	.6542**	.5883**
TVM1MNT	.0626	.2048**	.2654**	.6209**	1.0000	.2089**	.4491**	.4377**	.4689**	.3824**
TVM1RCAL	.0402	.1062	.0738	.0692	.2089**	1.0000	.0464	.1440	.0809	.0118
RVH1OEXP	.1699*	.1840*	.2269**	.6655**	.4491**	.0464	1.0000	.8126**	.9429**	.8745**
TVM1OEXP	.0780	.1851*	.2172**	.8071**	.4377**	.1440	.8126**	1.0000	.8138**	.7593**
RVH1TWG	.1869*	.1935*	.2320**	.6542**	.4689**	.0809	.9429**	.8138**	1.0000	.9537**
RVH1OWAG	.0691	.1735*	.2248**	.5883**	.3824**	.0118	.8745**	.7593**	.9537**	1.0000
RVH1VMWG	.0501	.0985	.1384	.4610**	.3426**	.0110	.5604**	.4672**	.5734**	.5076**
RVH1AIWG	.1573	.0965	.0836	.2497**	.0915	.0014	.5546**	.3264**	.4728**	.3777**
TPAS1RVH	-.1959*	.0081	.0243	-.4032**	-.2630**	-.1131	-.4876**	-.4327**	-.4845**	-.5070**
TPAS1RVM	-.2035*	.0438	-.0670	-.4324**	-.3156**	-.0735	-.3345**	-.4654**	-.3481**	-.3638**
TPAS1PVH	-.0846	-.0812	-.0756	-.2228*	-.1205	-.0767	-.1571	-.2971**	-.1206	-.1544
RVH1POP	.0239	-.1277	-.1093	.0464	-.0275	-.2331**	.0495	-.0831	-.0132	-.0123
TPAS1POP	-.1240	-.1512	-.1293	-.2230*	-.2201*	-.2276*	-.2307*	-.2754**	-.2543**	-.2409**
TPAS1ELD	-.1258	-.1498	-.1425	-.2268*	-.2335*	-.1815	-.2343*	-.2918**	-.2662**	-.2516**
TPAS1AUT	-.1329	-.1441	-.1381	-.2157*	-.1572	-.1886*	-.2082*	-.2788**	-.2167*	-.2017*
TVM1ACC	.0944	.1389	.1512	.3826**	.3733**	.1703*	.4092**	.4125**	.4533**	.4195**
RVH1ACC	.1189	.0976	.1177	.3395**	.4040**	.2361**	.4492**	.2985**	.4968**	.4768**
REV1PVEH	-.0735	-.1312	-.1269	-.3375**	-.2083*	.1169	-.2678**	-.3278**	-.3404**	-.3367**
REV1RVH	-.0955	-.1851*	-.1697*	-.4798**	-.3449**	.0705	-.5923**	-.5173**	-.5917**	-.5406**
TREV1RVH	.0040	-.0143	-.1307	-.4637**	-.3889**	-.0369	-.6964**	-.4765**	-.6566**	-.6081**
REV1TPAS	-.0611	-.1350	-.1085	-.1439	-.0798	.1368	-.1427	-.1349	-.2721**	-.2245*
REV1OEXP	.0337	.1506*	-.0340	-.0329	-.0969	.0233	-.0071	.0257	.0350	.0719
PAS1OEXP	-.0237	.1562	.0557	.1571	-.0220	-.0352	.2238*	.0987	.2834**	.1817*
PAS1TWAG	.0270	.2430**	.1262	.1967*	-.0200	-.0229	.2777**	.1721	.3842**	.2870**
PAS1FUEL	.0346	.8623**	.9119**	-.1291	-.0859	.0937	.1278	-.0791	.1619	.0935
REV1TEX	-.0533	.0011	-.1339	-.1200	-.0933	.0274	-.1617	-.2010*	-.1560	-.1720*
RVH1TSUB	-.0976	.0116	.0733	.2280**	.1713*	.2015*	.3568**	.3690**	.2605**	.3016**
POP1TSUB	.0292	-.0176	-.0154	.1103	.0698	.2461**	.0320	.0675	.1293	.1133
PAS1TSUB	-.1354	-.1367	-.1115	-.0981	-.0163	.1650	.0789	.0034	.0125	-.0157
REV1TSUB	-.0284	-.0383	-.0332	.0794	.0962	.0576	-.0559	.0676	-.0574	-.0220
PAS1OSUB	-.0125	-.0007	.0119	.0274	.0378	-.0135	.0257	.0082	.0149	.0213
POP1OSUB	.0343	-.0256	-.0254	.1059	.0748	.2399**	.0348	.0757	.1326	.1303
RVH1OSUB	.0139	.0155	.0296	.1421	.1274	-.0033	.0802	.1378	.0406	.0780
REV1OSUB	-.0233	-.0372	-.0307	.0828	.0938	.0430	-.0529	.0661	-.0607	-.0275

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	RVM1VMWG	RVH1ADWG	TPAS1RVH	TPAS1RVM	TPAS1PVH	RVH1POP	TPAS1POP	TPAS1ELD	TPAS1AUT	TVM1ACC
TVH1EMP	.4014**	.5380**	-.2809**	-.1189	-.0218	.0574	-.1588	-.1527	-.1298	.2551**
RVH1OEMP	.3639**	.4462**	-.3637**	-.1628	.0854	.1587*	-.1328	-.1133	-.0932	.4746**
TVM1EMP	.2909**	.2906**	-.3822**	-.3659**	-.1049	-.0200	-.2533**	-.2428*	-.1749	.4913**
PVEH1ADM	-.0046	.2139*	-.1011	-.0010	-.2049*	-.0227	-.0811	-.0968	-.0892	-.0420
PVEH1OP	-.0126	.0449	-.0527	.0574	-.3891**	-.0323	-.1634	-.1793	-.1756	-.0214
PVEH1MNT	.2035*	.0876	-.2063*	-.1222	-.2258*	-.0497	-.1915*	-.1889	-.1203	.0525
TVH1AVEH	.0965	.1528	.0472	.0458	.3677**	.3443**	.2293*	.2142*	.2538**	.2347**
TVH1PVEH	.2167*	.2601**	-.1174	-.0375	.3560**	.2413**	.0999	.1095	.1307	.2782**
TVM1AVEH	.1159	.1179	-.0691	-.1991*	.1724	.2355**	.1044	.1179	.2298*	.3463**
TVM1PVEH	.2103*	.1887*	-.2441*	-.3373**	.1496	.0095	-.0942	-.0716	.0062	.4633**
RVM1TVM	.0501	.1573	-.1959*	-.2035*	-.0846	.0239	-.1240	-.1258	-.1329	.0944
RVM1FUEL	.0985	.0965	.0081	.0438	-.0812	-.1277	-.1512	-.1498	-.1441	.1389
TVM1FUEL	.1384	.0836	.0243	-.0670	-.0756	-.1093	-.1293	-.1425	-.1381	.1512
TVM1MEXP	.4610**	.2497**	-.4032**	-.4324**	-.2228*	.0464	-.2230*	-.2268*	-.2157*	.3826**
TVM1MNT	.3426**	.0915	-.2630**	-.3156**	-.1205	-.0275	-.2201*	-.2335*	-.1572	.3733**
TVM1RCAL	.0110	.0014	-.1131	-.0735	-.0767	-.2331**	-.2276*	-.1815	-.1886*	.1703*
RVH1OEXP	.5604**	.5546**	-.4876**	-.3345**	-.1571	.0495	-.2307*	-.2343*	-.2082*	.4092**
TVM1OEXP	.4672**	.3264**	-.4327**	-.4654**	-.2971**	-.0831	-.2754**	-.2918**	-.2788**	.4125**
RVH1TWG	.5734**	.4728**	-.4845**	-.3481**	-.1206	-.0132	-.2543**	-.2662**	-.2167*	.4533**
RVH1OWAG	.5076**	.3777**	-.5070**	-.3638**	-.1544	-.0123	-.2409**	-.2516**	-.2017*	.4195**
RVH1VMWG	1.0000	.4149**	-.2967**	-.1947	-.0918	.0443	-.1630	-.1081	-.1482	.2154*
RVH1ADWG	.4149**	1.0000	-.3875**	-.2460*	-.1863	.0609	-.2155*	-.2295*	-.2000*	.1591
TPAS1RVH	-.2967**	-.3875**	1.0000	.8774**	.7333**	.1494	.5386**	.5458**	.4410**	-.3218**
TPAS1RVM	-.1947	-.2460*	.8774**	1.0000	.7621**	.1623	.4770**	.5466**	.4455**	-.3413**
TPAS1PVH	-.0918	-.1863	.7333**	.7621**	1.0000	.2442**	.6082**	.6127**	.5226**	-.1326
RVH1POP	.0443	.0609	.1494	.1623	.2442**	1.0000	.7957**	.7180**	.7618**	-.1321
TPAS1POP	-.1630	-.2155*	.5386**	.4770**	.6082**	.7957**	1.0000	.9381**	.8918**	-.2339**
TPAS1ELD	-.1081	-.2295*	.5458**	.5466**	.6127**	.7180**	.9381**	1.0000	.9045**	-.2157*
TPAS1AUT	-.1482	-.2000*	.4410**	.4455**	.5226**	.7618**	.8918**	.9045**	1.0000	-.2062*
TVM1ACC	.2154*	.1591	-.3218**	-.3413**	-.1326	-.1321	-.2339**	-.2157*	-.2062*	1.0000
RVH1ACC	.2987**	.2590**	-.3168**	-.2427**	-.0611	-.1033	-.2015*	-.1783	-.1827	.8673**
REV1PVEH	-.1784	-.1172	.3363**	.2501**	.4816**	-.0864	.2229*	.2659**	.1016	-.0682
REV1RVH	-.3382**	-.3017**	.3752**	.3005**	.0639	-.2221**	.0537	.1179	.0119	-.2426**
TREV1RVH	-.4053**	-.4065**	.4862**	.2898**	.0147	-.1523*	.0929	.1089	.1117	-.2937**
REV1TPAS	-.1681	-.0161	-.2961**	-.3365**	-.4268**	-.1975*	-.2687**	-.2528**	-.3240**	-.0286
REV1OEXP	-.0386	-.0005	-.1093	.1495	-.1284	-.0089	-.0339	.0315	.1496	-.0545
PAS1OEXP	.1736	.1085	.5102**	.6252**	.5495**	.2045*	.3399**	.3542**	.3349**	-.0579
PAS1TWAG	.2135*	.1757	.4497**	.5719**	.4676**	.0951	.1797*	.1949*	.1871*	.0159
PAS1FUEL	-.0731	.0952	.0341	.1159	.0691	-.0636	-.0244	.0066	.0141	.0030
REV1TEX	-.1505	-.0298	.0601	.2409*	.0145	.1648*	.1487	.2004*	.3335**	-.0586
RVH1TSUB	.1395	.2966**	-.2851**	-.1958*	-.1642	-.1781*	-.2792**	-.2770**	-.2665**	.2117**
POP1TSUB	-.0355	.0139	-.0875	-.0265	-.0853	-.2436**	-.2601**	-.2806**	-.3015**	.1245
PAS1TSUB	-.0665	.0394	.3688**	.4453**	.3967**	-.0654	.1028	.1492	.1427	-.0212
REV1TSUB	-.0308	-.0583	-.1015	-.1114	-.0888	-.1406	-.1178	-.0891	-.1027	.1430
PAS1OSUB	.1444	-.0570	.0505	.0512	.1501	.1328	.1225	.1707	.2518**	.0360
POP1OSUB	-.0359	-.0072	-.0965	-.0410	-.0827	-.2535**	-.2675**	-.2797**	-.2981**	.1581*
RVH1OSUB	.1450	-.0123	-.1383	-.1351	-.0092	.0739	-.0190	.0206	.0906	.1415
REV1OSUB	-.0031	-.0747	-.0931	-.1094	-.0265	-.0830	-.0771	-.0381	-.0325	.1286

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	RVH1ACC	REV1PVEH	REV1RVH	TREV1RVH	REV1TPAS	REV1OEXP	PAS1OEXP	PAS1TWAG	PAS1FUEL	REV1TEX
TVH1EMP	.4618**	-.0197	-.3988**	-.4587**	-.0682	.0356	.0202	.0860	-.0319	-.0454
RVH1OEMP	.4739**	-.0651	-.4984**	-.6198**	-.1964*	.0318	.1739	.2049*	.0042	-.0132
TVM1EMP	.3927**	-.1356	-.4427**	-.4170**	-.1340	.1596*	.0246	.1086	.0351	.0231
PVEH1ADM	.0159	-.1296	-.0115	-.0992	.0840	-.0634	.0232	.0347	-.0585	-.0832
PVEH1OP	-.0451	-.1657*	.0506	-.0712	.1468	-.0004	.0571	.1047	-.0934	-.1546
PVEH1MNT	.1099*	-.2598**	-.1932*	-.2735**	.0615	-.1416	.0229	.0343	-.0962	-.1860*
TVH1AVEH	.2725**	.1530	-.2792**	-.4126**	-.1231	-.1141	.1892*	.1346	-.0889	.0919
TVH1PVEH	.3109**	.1003	-.4233**	-.4371**	-.2707**	.0494	.1945*	.1925	.1032	.1266
TVM1AVEH	.2688**	.0076	-.2640**	-.3349**	-.0690	-.0404	.0774	.0445	-.0577	.1083
TVM1PVEH	.3663**	-.0174	-.3441**	-.2531**	-.1570	.0973	-.0084	.0291	.0895	.0904
RVM1TVM	.1189	-.0735	-.0955	.0040	-.0611	.0337	-.0237	.0270	.0346	-.0533
RVM1FUEL	.0976	-.1312	-.1851*	-.0143	-.1350	.1506*	.1562	.2430**	.8623**	.0011
TVM1FUEL	.1177	-.1269	-.1697*	-.1307	-.1085	-.0340	.0557	.1262	.9119**	-.1339
TVM1MEXP	.3395**	-.3375**	-.4798**	-.4637**	-.1439	-.0329	.1571	.1967*	-.1291	-.1200
TVM1MNT	.4040**	-.2083*	-.3449**	-.3889**	-.0798	-.0969	-.0220	-.0200	-.0859	-.0933
TVM1RCAL	.2361**	.1169	.0705	-.0369	.1368	.0233	-.0352	-.0229	.0937	.0274
RVH1OEXP	.4492**	-.2678**	-.5923**	-.6964**	-.1427	-.0071	.2238*	.2777**	.1278	-.1617
TVM1OEXP	.2985**	-.3278**	-.5173**	-.4765**	-.1349	.0257	.0987	.1721	-.0791	-.2010*
RVH1TWG	.4968**	-.3404**	-.5917**	-.6566**	-.2721**	.0350	.2834**	.3842**	.1619	-.1560
RVH1OWAG	.4768**	-.3367**	-.5406**	-.6081**	-.2245*	.0719	.1817*	.2870**	.0935	-.1720*
RVH1VMWG	.2987**	-.1784	-.3382**	-.4053**	-.1681	-.0386	.1736	.2135*	-.0731	-.1505
RVH1ADWG	.2590**	-.1172	-.3017**	-.4065**	-.0161	-.0005	.1085	.1757	.0952	-.0298
TPAS1RVH	-.3168**	.3363**	.3752**	.4862**	-.2961**	-.1093	.5102**	.4497**	.0341	.0601
TPAS1RVM	-.2427**	.2501**	.3005**	.2898**	-.3365**	.1495	.6252**	.5719**	.1159	.2409*
TPAS1PVH	-.0611	.4816**	.0639	.0147	-.4268**	-.1284	.5495**	.4676**	.0691	.0145
RVH1POP	-.1033	-.0864	-.2221**	-.1523*	-.1975*	-.0089	.2045*	.0951	-.0636	.1648*
TPAS1POP	-.2015*	.2229*	.0537	.0929	-.2687**	-.0339	.3399**	.1797*	-.0244	.1487
TPAS1ELD	-.1783	.2659**	.1179	.1089	-.2528**	.0315	.3542**	.1949*	.0066	.2004*
TPAS1AUT	-.1827	.1016	.0119	.1117	-.3240**	.1496	.3349**	.1871*	.0141	.3335**
TVM1ACC	.8673**	-.0682	-.2426**	-.2937**	-.0286	-.0545	-.0579	.0159	.0030	-.0586
RVH1ACC	1.0000	-.0706	-.3034**	-.3679**	-.0653	-.0255	-.0116	.0571	.1879*	-.1121
REV1PVEH	-.0706	1.0000	.7110**	.1938*	.3356**	-.0987	-.0594	-.1193	-.0592	-.0613
REV1RVH	-.3034**	.7110**	1.0000	.6676**	.5702**	.0036	-.1511	-.2016*	-.1163	.0704
TREV1RVH	-.3679**	.1938*	.6676**	1.0000	.1659	.2610**	-.1502	-.1204	.1091	.2375**
REV1TPAS	-.0653	.3356**	.5702**	.1659	1.0000	-.1320	-.5765**	-.5571**	-.1498	-.1063
REV1OEXP	-.0255	-.0987	.0036	.2610**	-.1320	1.0000	.1634	.1973*	.3456**	.8437**
PAS1OEXP	-.0116	-.0594	-.1511	-.1502	-.5765**	.1634	1.0000	.9410**	.2006*	.1100
PAS1TWAG	.0571	-.1193	-.2016*	-.1204	-.5571**	.1973*	.9410**	1.0000	.2184*	.0810
PAS1FUEL	.1879*	-.0592	-.1163	.1091	-.1498	.3456**	.2006*	.2184*	1.0000	.2938**
REV1TEX	-.1121	-.0613	.0704	.2375**	-.1063	.8437**	.1100	.0810	.2938**	1.0000
RVH1TSUB	.1405	.2099*	.1305	-.2664**	.3453**	.0130	-.0965	-.0534	-.0861	-.0360
POP1TSUB	.1277	.0352	.1047	-.0052	.2245*	.0845	-.0698	-.0076	-.0383	.0035
PAS1TSUB	-.0647	.2903**	.3414**	-.0391	-.1424	.0315	.5232**	.4579**	-.0093	.0384
REV1TSUB	-.0071	.3787**	.2910**	.0203	.4725**	.0208	-.1500	-.1492	-.0454	.0857
PAS1OSUB	-.0035	.0550	.0757	-.0386	-.0527	-.0393	.0995	.0627	-.0127	-.0114
POP1OSUB	.1461	.0045	.1053	-.0115	.2268**	.0800	-.0735	-.0149	-.0429	-.0149
RVH1OSUB	.0586	.0274	.0368	-.0964	.0278	-.0265	-.0860	-.0935	-.0307	-.0290
REV1OSUB	-.0127	.0700	.2786**	.0146	.3398**	-.0115	-.1294	-.1380	-.0431	.0335

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	RVH1TSUB	POP1TSUB	PAS1TSUB	REV1TSUB	PAS1OSUB	POP1OSUB	RVH1OSUB	REV1OSUB
TVH1EMP	.3871**	.0067	.0476	-.0505	-.0189	.0086	.0741	-.0558
RVH1OEMP	.2558**	.0789	.1088	.0156	.0271	.0885	.0917	.0090
TVM1EMP	.3338**	.1134	.0109	.0806	.0108	.1221	.1320	.0717
PVEH1ADM	.1107	-.0640	.0399	.0520	-.0565	-.0674	-.0608	-.0132
PVEH1OP	.1000	.2555**	.1300	.1245	-.0825	.1791*	-.0774	.0287
PVEH1MNT	.1188	.1466	-.0046	-.0011	-.0262	.1431	-.0237	-.0387
TVH1AVEH	.1024	-.1147	.1754	.0671	.1909*	-.0946	.1801*	.0992
TVH1PVEH	.0635	-.0793	.0533	-.1215	.1252	-.0792	.1470	-.0212
TVM1AVEH	.1866*	-.0855	.0701	.0523	.1924*	-.0584	.2110**	.1243
TVM1PVEH	.2008*	.1164	-.0459	-.0357	.1014	.1163	.1575	.0289
RVM1TVM	-.0976	.0292	-.1354	-.0284	-.0125	.0343	.0139	-.0233
RVM1FUEL	.0116	-.0176	-.1367	-.0383	-.0007	-.0256	.0155	-.0372
TVM1FUEL	.0733	-.0154	-.1115	-.0332	.0119	-.0254	.0296	-.0307
TVM1MEXP	.2280**	.1103	-.0981	.0794	.0274	.1059	.1421	.0828
TVM1MNT	.1713*	.0698	-.0163	.0962	.0378	.0748	.1274	.0938
TVM1RCAL	.2015*	.2461**	.1650	.0576	-.0135	.2399**	-.0033	.0430
RVH1OEXP	.3568**	.0320	.0789	-.0559	.0257	.0348	.0802	-.0529
TVM1OEXP	.3690**	.0675	.0034	.0676	.0082	.0757	.1378	.0661
RVH1TWG	.2605**	.1293	.0125	-.0574	.0149	.1326	.0406	-.0607
RVH1OWAG	.3016**	.1133	-.0157	-.0220	.0213	.1303	.0780	-.0275
RVH1VMWG	.1395	-.0355	-.0665	-.0308	.1444	-.0359	.1450	-.0031
RVH1ADWG	.2966**	.0139	.0394	-.0583	-.0570	-.0072	-.0123	-.0747
TPAS1RVH	-.2851**	-.0875	.3688**	-.1015	.0505	-.0965	-.1383	-.0931
TPAS1RVM	-.1958*	-.0265	.4453**	-.1114	.0512	-.0410	-.1351	-.1094
TPAS1PVH	-.1642	-.0853	.3967**	-.0888	.1501	-.0827	-.0092	-.0265
RVH1POP	-.1781*	-.2436**	-.0654	-.1406	.1328	-.2535**	.0739	-.0830
TPAS1POP	-.2792**	-.2601**	.1028	-.1178	.1225	-.2675**	-.0190	-.0771
TPAS1ELD	-.2770**	-.2806**	.1492	-.0891	.1707	-.2797**	.0206	-.0381
TPAS1AUT	-.2665**	-.3015**	.1427	-.1027	.2518**	-.2981**	.0906	-.0325
TVM1ACC	.2117**	.1245	-.0212	.1430	.0360	.1581*	.1415	.1286
RVH1ACC	.1405	.1277	-.0647	-.0071	-.0035	.1461	.0586	-.0127
REV1PVEH	.2099*	.0352	.2903**	.3787**	.0550	.0045	.0274	.0700
REV1RVH	.1305	.1047	.3414**	.2910**	.0757	.1053	.0368	.2786**
TREV1RVH	-.2664**	-.0052	-.0391	.0203	-.0386	-.0115	-.0964	.0146
REV1TPAS	.3453**	.2245*	-.1424	.4725**	-.0527	.2268**	.0278	.3398**
REV1OEXP	.0130	.0845	.0315	.0208	-.0393	.0800	-.0265	-.0115
PAS1OEXP	-.0965	-.0698	.5232**	-.1500	.0995	-.0735	-.0860	-.1294
PAS1TWAG	-.0534	-.0076	.4579**	-.1492	.0627	-.0149	-.0935	-.1380
PAS1FUEL	-.0861	-.0383	-.0093	-.0454	-.0127	-.0429	-.0307	-.0431
REV1TEX	-.0360	.0035	.0384	.0857	-.0114	-.0149	-.0290	.0335
RVH1TSUB	1.0000	.2700**	.5070**	.7674**	.1195	.2687**	.2476**	.5932**
POP1TSUB	.2700**	1.0000	.3994**	.1119	.1049	.2105**	.0642	.1896**
PAS1TSUB	.5070**	.3994**	1.0000	.6396**	.1723	.3960**	.0624	.3311**
REV1TSUB	.7674**	.1119	.6396**	1.0000	.2209*	.0042	.5623**	.5183**
PAS1OSUB	.1195	.1049	.1723	.2209*	1.0000	.1122	.8910**	.4805**
POP1OSUB	.2687**	.2105**	.3960**	.0042	.1122	1.0000	.0686	.8419**
RVH1OSUB	.2476**	.0642	.0624	.5623**	.8910**	.0686	1.0000	.7644**
REV1OSUB	.5932**	.1896**	.3311**	.5183**	.4805**	.8419**	.7644**	1.0000

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APPENDIX E

FACTOR ANALYSIS OF 48 PERFORMANCE MEASURES

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5	FACTOR 6	FACTOR 7	FACTOR 8	FACTOR 9	FACTOR 10	FACTOR 11
RVH1DEXP	.930	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
RVH1TWG	.908	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
RVH1DWAG	.884	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
TREV1RVH	-.784	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
TVM1DEXP	.705	.000	.288	.000	.000	.318	.402	.000	.000	.000	.000
RVH1ADWG	.646	.000	.000	.000	.000	.000	-.283	.000	.000	.000	.000
REV1RVH	-.627	.000	-.275	.555	.000	.000	.000	.000	.000	.000	.000
RVH1DSUB	.626	.000	.000	.585	.000	.000	.000	.000	.000	.000	.000
RVH1DEMP	.608	.000	.350	.000	.000	.000	.000	.000	.380	.000	.000
TVH1EMP	.541	.000	.459	.000	.000	.000	.000	.000	.000	.000	.422
RVH1VMWG	.504	.000	.000	.000	.000	.363	.000	.000	.000	.000	-.395
PAS1FUEL	.000	.948	.000	.000	.000	.000	.000	.000	.000	.000	.000
TPAS1RVM	.000	.894	.000	.000	.000	.000	.000	.000	.000	.000	.000
PAS1DEXP	.290	.888	.000	.000	.000	.000	.000	.000	.000	.000	.000
TPAS1PVH	.000	.882	.364	.000	.000	.000	.000	.000	.000	.000	.000
TPAS1RVH	-.373	.864	.000	.000	.000	.000	.000	.000	.000	.000	.000
PAS1TWAG	.363	.858	.000	.000	.000	.000	.000	.000	.000	.000	.000
PAS1DSUB	.000	.804	.000	.432	.000	.000	.000	.000	.000	.000	.000
PAS1TSUB	.000	.692	.000	.567	.000	.000	.000	.000	.000	.000	.000
REV1TPAS	-.258	-.683	.000	.418	.000	.000	.000	.000	.000	.000	.000
TVM1PVEH	.310	.000	.819	.000	.000	.000	.000	.000	.000	.000	.000
TVM1PVEH	.000	.000	.792	.000	.000	.000	.465	.000	.000	.000	.000
TVM1AVEH	.319	.000	.780	.000	.000	.000	.000	.000	.000	.000	.000
TVM1AVEH	.000	.000	.770	.000	.000	.343	.000	.000	.000	.000	.000
PVEH1OP	.000	.000	-.639	.000	.000	.000	.000	.000	.000	.000	.598
TVM1EMP	.357	.000	.552	.000	.000	.522	.391	.000	.000	.000	.000
REV1TSUB	.000	.000	.000	.916	.000	.000	.000	.000	.000	.000	.000
REV1DSUB	.000	.000	.000	.884	.000	.000	.000	.000	.000	.000	.000
REV1PVEH	-.384	.283	.000	.672	.000	.000	.000	.000	.000	.000	.000
RVH1TSUB	.539	.000	.000	.655	.000	.000	.000	.000	.000	.000	.000
RVH1POP	.000	.000	.000	.000	.901	.000	.000	.000	.000	.000	.000
TPAS1ELD	.000	.447	.000	.000	.837	.000	.000	.000	.000	.000	.000
TPAS1POP	.000	.493	.000	.000	.815	.000	.000	.000	.000	.000	.000
TPAS1AUT	.000	.458	.000	.000	.785	.000	.000	.000	.000	.000	.000
TVM1MNT	.000	.000	.308	.000	.000	.876	.000	.000	.000	.000	.000
PVEH1MNT	.000	.000	-.310	.000	.000	.811	.000	.000	.000	.000	.000
TVM1MEXP	.498	.000	.000	.000	.000	.694	.000	.000	.000	.000	.000
TVM1FUEL	.263	.000	.000	.000	.000	.000	.890	.000	.000	.000	.000
RVM1FUEL	.285	.000	.000	.000	.000	.000	.856	.000	.000	.000	.000
POP1TSUB	.000	.000	.000	.000	.000	.000	.000	.927	.000	.000	.000
POP1DSUB	.000	.000	.000	.000	.000	.000	.000	.922	.000	.000	.000
TVM1KCAL	.000	.000	.000	.000	.000	.000	.000	.760	.000	.000	.000
RVH1ACC	.000	.000	.000	.000	.000	.000	.000	.000	.932	.000	.000
TVM1ACC	.000	.000	.000	.000	.000	.000	.000	.000	.861	.000	.000
REV1IEXP	.000	.000	.000	.000	.000	.000	.000	.000	.000	.953	.000
REV1TEX	.000	.000	.000	.000	.000	.000	.000	.000	.000	.928	.000
RVM1TVM	.000	.000	.000	.000	.000	.000	.000	.000	.374	-.255	-.611
PVFH1ADM	.000	.000	.000	.000	.000	.000	-.278	.000	.000	.000	.470
VP	7.747	7.455	4.516	4.130	3.344	2.916	2.858	2.594	2.232	2.161	1.721

01HE ABOVE FACTOR LOADING MATRIX HAS BEEN REARRANGED SO THAT THE COLUMNS APPEAR IN DECRE.SING ORDER OF VARIANCE EXPLAINED BY FACTORS. THE ROWS HAVE BEEN REARRANGED SO THAT FOR EACH SUCCESSIVE FACTOR, LOADINGS GREATER THAN .5000 APPEAR FIRST. LOADINGS LESS THAN .2500 HAVE BEEN REPLACED BY ZERO.

APPENDIX F

TRANSIT PROPERTIES GROUPED INTO CLASSES BY SUM1 Z-SCORES

Notes:

1) Property ID confidential

2) Properties with missing values not classified. Grouped at end with actual scores listed when available

3) Six groups defined based upon standard deviations above and below the mean.

4) Groups identified by BRVAR # left of ID code. At the end of each group is listed:
   V = Valid cases
   M = Mean
   S = Standard deviation
   M = Minimum value
   M = Maximum value

5) Group 9 (BRVAR 9 which continues as BRVAR) and with SUM1 = -999.000 are the unclassified cases (transit systems)

BRVAR 1

ID	SUM1	RVH10EXP	TPAS1RVM	TVM1PVEH	TVM1FUEL	REV10SUB	RVH1POP	TVM1MNT	RVH1ACC	REV10EXP
2052	13.638	1240.152	73.559	140221.69	1223.103	790	4.376	245388	4433.000	10000.121
9004	7.470	554.791	239.801	50662.855	396.995	254	436.888	241800	2748.571	13768.277
6034	5.887	1164.362	28.091	64428.000	2089.698	1404	512.256	103085	1560.000	10000.000
1041	5.597	339.343	119.751	47080.000	1180.656	640	85.869	244816	4433.000	9498.332
9002	4.738	379.356	445.589	52729.020	379.222	458	2707.529	81081	871.615	10101.289
2066	4.494	1224.656	75.874	90350.000	658.632	1963	38.855	-9	-9.000	10307.359
4027	4.241	-9.000	140.064	61261.199	596.965	687	527.394	167076	3072.284	10057.984
1008	4.205	402.026	291.155	30350.324	5012.844	344	647.083	107991	1143.643	10850.441
7	3.885	435.795	161.818	69149.563	848.799	17801	1625.105	103517	1339.077	9856.941
5008	3.827	514.650	399.482	44893.707	534.076	1210	1245.551	121171	1282.895	10002.633
5087	3.788	665.964	298.726	32786.000	4833.555	-9	3.950	109287	947.143	10000.027
8004	3.542	566.520	148.530	97695.000	837.685	155	468.000	-9	1748.843	9480.520
4022	3.064	370.743	280.715	40669.918	346.731	279	1698.190	52290	2105.286	12299.199
9013	2.958	220.117	203.493	61933.383	-9.000	83	722.379	42340	1175.613	20804.809
14	14	13	14	14	13	13	14	12	13	14
4669.64	5.09531	621.42107	207.61771	63157.904	1456.8431	2005.30	765.95892	134986.74	2066.2285	11216.281
3192.14	2.73722	354.37533	124.20452	29450.251	1609.2633	4777.55	789.01756	72991.89	1241.8285	2998.6242
7	2.958	220.117	28.091	30350.324	346.731	83	3.950	42340	871.615	9480.520
9013	13.638	1240.152	445.589	140221.69	5012.844	17801	2707.529	245388	4433.000	20804.809

BRVAR 2

ID	SUM1	RVH10EXP	TPAS1RVM	TVM1PVEH	TVM1FUEL	REV10SUB	RVH1POP	TVM1MNT	RVH1ACC	REV10EXP
9020	2.686	464.893	33.516	52137.191	524.704	339	1167.229	153153	1241.607	12284.188
4007	2.624	666.732	218.435	35162.945	376.115	546	770.079	121472	2388.817	10042.148
3013	2.506	561.320	398.610	32027.047	463.531	695	999.572	112095	1317.203	10102.703
6017	2.442	-9.000	145.062	33563.633	403.409	373	969.527	61329	4496.957	9916.500
8	2.385	-9.000	225.687	46330.910	411.045	1902	1553.457	112648	924.594	-9.000
1	2.350	363.915	268.429	41861.199	436.147	563	1480.401	89723	771.096	13151.023
9030	2.211	519.495	89.113	77102.563	646.134	231	321.636	130373	1647.112	10269.434
4034	2.144	441.092	340.267	53368.418	339.281	699	1364.313	83460	899.946	10025.078
2	1.981	491.681	220.760	38735.805	428.940	587	809.598	88949	2065.556	12155.539
4036	1.979	670.935	266.334	42412.500	403.789	775	697.332	61691	2360.348	10196.441
2025	1.962	448.973	332.023	42855.848	352.325	2906	11.403	122776	2717.766	10832.387
5006	1.955	709.325	196.272	49952.188	451.976	450	711.297	121976	1084.572	9937.051
4006	1.919	712.848	175.723	46908.332	388.988	539	793.824	62544	2408.422	10000.000
3018	1.840	580.482	173.228	46384.000	590.215	548	708.746	132526	1338.581	10359.926
9018	1.768	463.774	197.107	59537.109	502.611	461	594.786	133959	840.667	11361.766
4024	1.676	763.732	125.379	54134.969	435.901	1000	553.860	82379	1699.177	10635.320
6002	1.631	598.932	337.144	44748.203	356.832	320	794.256	98882	968.111	10076.605
4008	1.629	569.358	211.702	48412.664	496.538	649	931.621	99373	1122.483	10554.926
2040	1.617	412.516	67.139	59847.270	1032.354	8748	12.366	156743	1462.832	12161.270
9035	1.612	410.758	61.174	52756.363	510.234	395	306.066	283083	756.364	10097.141
3008	1.605	617.149	218.110	58817.473	419.285	598	1145.082	79824	571.268	10136.938
4025	1.555	656.649	273.255	47420.098	537.032	1876	917.406	70252	1088.609	10019.543
9008	1.506	450.455	529.304	40752.223	369.491	1225	32.266	145078	619.458	10797.969
8005	1.438	624.909	132.990	57899.109	519.991	376	482.248	130273	987.480	10504.918
3026	1.429	556.163	175.389	59431.270	-9.000	345	690.857	93392	1280.118	10181.848
2060	1.370	514.657	222.560	57791.371	411.379	461	1022.936	69187	1395.204	9864.070
3001	1.370	535.616	166.170	49782.242	490.683	628	1202.521	96189	1316.611	9383.770
6003	1.367	550.035	166.319	55734.000	491.213	267	371.638	51753	732.333	16027.563
28	28	26	28	28	27	28	28	28	28	27
4481.64	1.87709	552.16905	213.11421	49495.248	473.70900	1017.89	764.86861	108752.89	1446.5460	10780.595
2809.04	.40481	105.15393	107.16307	9722.2563	134.08954	1626.34	413.26207	45165.19	834.64748	1375.9532
1	1.367	363.915	33.516	32027.047	339.281	231	11.403	51753	571.268	9383.770
9035	2.686	763.732	529.304	77102.563	1032.354	8748	1553.457	283083	4496.957	16027.563

BRVAR 3	ID	SUM1	RVH1DEXP	TPAS1RVM	TVM1PVEH	TVM1FUEL	REV1DSUB	RVH1POP	TVM1MNT	RVH1ACC	REV1DEXP
	5022	1.325	628.547	59.589	34261.270	475.483	238	945.359	129431	962.706	12557.160
	3024	1.315	465.378	91.663	37050.000	388.277	618	897.982	93797	3208.511	10027.707
	5028	1.297	510.250	203.111	44590.000	504.432	97	793.100	-9	1331.871	11756.438
	3007	1.250	648.261	157.300	48019.309	455.137	545	666.679	92837	1657.397	10223.504
	6016	1.238	705.758	253.927	44000.000	341.890	418	394.637	71500	612.213	13765.066
	7015	1.234	-9.000	209.665	44484.762	417.074	439	466.107	157005	1304.815	-9.000
	1006	1.164	516.422	288.076	26560.602	420.314	207	1335.188	71812	1335.188	10828.980
	3010	1.141	441.061	271.745	40456.000	440.666	466	386.227	74919	3052.174	10021.418
	4003	1.114	464.970	331.922	43092.531	373.585	748	1064.002	88083	769.577	10446.887
	5066	1.082	186.907	653.606	43625.594	329.787	1142	1005.990	62602	676.156	9794.801
	3009	1.067	885.391	263.879	38402.000	715.454	5392	275.460	76804	989.857	10214.031
	4029	1.009	506.716	185.981	63182.793	487.635	290	612.685	96645	1171.539	10000.000
	7001	1.006	657.706	170.509	46421.141	510.026	505	827.564	118594	664.838	9871.840
	4012	.951	592.757	175.839	45562.398	404.384	447	930.873	107206	1016.800	10000.000
	3012	.938	591.798	172.508	45340.000	677.346	569	880.494	62044	1597.283	10258.832
	5027	.912	323.817	408.537	34884.387	390.359	365	1046.484	82199	475.387	12365.121
	3015	.868	549.640	249.606	36780.637	398.045	713	673.249	98873	1724.368	10036.145
	9005	.860	495.914	110.920	54998.664	605.479	197	364.673	109997	1898.000	10433.379
	3034	.857	308.201	497.521	32493.469	366.710	1059	1218.679	78939	770.407	9907.141
	4023	.821	482.805	329.348	46876.762	374.359	369	521.560	72919	1765.636	9993.273
	4004	.718	474.718	391.650	38370.965	389.899	582	725.879	82034	1063.791	10202.328
	9041	.686	440.748	357.411	53430.000	437.293	416	10.959	97145	1760.000	9862.043
	7002	.590	532.534	209.942	39275.531	415.715	526	858.602	102169	601.481	11712.063
	3025	.484	500.952	372.455	43834.266	374.497	587	502.417	67093	1332.416	10213.086
	9036	.444	-9.000	204.496	65854.625	413.967	204	91.718	122131	976.990	-9.000
	3019	.414	149.945	658.860	36056.219	321.275	644	872.385	44437	857.892	10763.539
	6001	.280	727.562	85.600	44722.867	894.627	231	437.666	-9	1208.435	10009.883
	3005	.241	374.107	250.850	52825.395	429.956	665	583.606	105651	1117.479	10040.309
	3014	.138	430.165	81.605	27808.918	395.704	686	576.911	70681	3968.345	10000.004
	3022	.111	299.264	312.012	43908.941	365.297	646	1397.517	78504	486.127	9996.059
	5057	.078	515.284	180.757	49085.918	616.871	181	323.584	-9	637.867	12524.609
	12	.036	264.211	145.899	61482.570	805.951	153	860.392	101865	1270.880	8813.605
	3020	-.021	-9.000	298.561	46202.000	454.789	620	-9.000	61603	-9.000	10577.027
V	33	33	30	33	33	33	33	32	30	32	31
M	4412.79	.77723	489.03969	261.68344	44058.805	466.43288	635.22	704.64467	89317.34	1320.8258	10555.364
S	2152.24	.42268	159.63461	144.65299	9090.3691	136.49800	887.52	335.98202	23757.41	799.29930	1046.8205
M	12	-.021	149.945	59.589	26560.602	321.275	97	10.959	44437	475.387	8813.605
M	9041	1.325	885.391	658.860	65854.625	894.627	5392	1397.517	157005	3968.345	13765.066

BRVAR 4	ID	SUM1	RVH1DEXP	TPAS1RVM	TVM1PVEH	TVM1FUEL	REV1DSUB	RVH1POP	TVM1MNT	RVH1ACC	REV1DEXP
	9023	-.116	439.272	262.509	47310.113	406.857	367	50.205	139623	739.464	10924.207
	7012	-.147	459.045	255.155	26307.664	459.235	418	558.283	105231	1575.294	10527.637
	4042	-.207	435.203	218.182	31958.527	421.374	1070	551.587	-9	2183.263	10000.000
	5030	-.211	-9.000	278.870	41616.000	-9.000	226	564.564	77287	936.000	-9.000
	5025	-.270	503.973	195.291	29682.898	484.805	489	1273.013	91332	615.818	10025.211
	5009	-.299	-9.000	211.972	23075.000	486.429	583	1199.711	75347	-9.000	10392.461
	3006	-.323	463.797	299.436	32779.613	347.815	1846	1125.601	72989	699.827	10002.969
	4040	-.378	486.241	70.670	38882.578	364.157	741	844.435	70079	2341.362	10020.129
	4038	-.381	649.719	46.863	59512.266	396.013	742	367.017	93967	1072.842	10145.715
	9019	-.412	306.480	202.678	51726.090	458.604	260	773.027	105664	1095.955	9420.535
	5084	-.431	392.777	89.520	52459.332	569.643	159	8.434	139892	1231.043	11470.746
	2018	-.470	424.909	290.212	29601.984	378.407	613	917.332	79931	1146.419	10094.965
	2002	-.517	511.843	251.990	33753.367	362.559	986	1043.900	71386	952.878	9534.594
	9021	-.564	233.467	427.075	51477.277	406.429	749	639.472	74940	394.387	10206.281
	3002	-.612	532.037	152.753	38515.578	576.585	451	381.972	66527	2133.734	9912.129
	3030	-.613	180.864	413.469	33963.004	350.471	811	1414.493	57199	657.190	9901.613
	2034	-.624	-9.000	324.740	26302.910	345.563	1876	-9.000	85464	-9.000	10553.129
	1016	-.629	487.667	243.662	33563.633	469.146	549	1087.814	59072	456.535	11048.441
	1055	-.667	477.542	117.326	36944.762	426.118	933	925.530	91707	1269.291	10008.223
	4033	-.670	455.572	45.576	68016.000	1017.594	158	110.427	72357	1228.500	10554.863
	9009	-.706	313.570	220.467	43510.113	-9.000	298	150.613	132031	-9.000	10199.914
	5011	-.743	525.398	367.998	23933.684	408.468	162	620.946	62723	270.381	12197.270
	5059	-.746	385.955	346.606	29618.586	411.005	353	626.786	71931	946.400	11142.453
	2013	-.750	379.151	368.866	36091.023	378.814	838	882.086	72182	539.625	9911.246
	6012	-.767	588.867	153.261	34171.426	620.702	344	262.531	59800	1485.714	11903.891
	6033	-.782	552.992	177.814	38178.832	505.044	453	547.058	89833	936.800	10234.691
	6004	-.841	433.820	276.721	35197.164	370.571	1310	638.131	96855	611.056	10558.641
	9039	-.910	416.058	289.197	41882.285	422.776	699	5.367	97725	1545.656	9962.492
	2029	-.960	461.714	485.906	31777.777	345.745	3369	5.775	65496	828.319	10970.289
	9042	-.988	444.448	224.587	36230.000	445.884	311	9.309	100211	1690.000	10729.285
	2007	-1.008	362.065	263.412	41852.926	425.735	840	46.873	59688	2381.406	10367.500
	9026	-1.012	253.150	295.690	57641.887	462.154	541	594.237	96756	388.482	9447.898
	5015	-1.056	180.274	540.279	35294.484	371.442	1506	703.104	53362	379.301	10820.602
	5039	-1.057	709.091	172.826	26664.855	1236.652	298	194.887	81154	668.744	10047.715
	4021	-1.085	166.315	177.983	47869.711	4028.469	-9	86.313	67018	347.579	8416.883
	5074	-1.109	398.565	141.622	52208.000	643.491	206	1.990	104416	835.250	11689.609
	5036	-1.233	342.298	197.362	45104.797	427.163	240	632.787	83527	1100.273	10078.309
	2043	-1.239	351.996	655.844	22208.332	283.287	2680	30.144	46348	891.496	10793.914
	9014	-1.271	193.511	363.573	43659.402	476.408	565	409.106	-9	626.345	10815.180
	5052	-1.296	406.748	204.969	42234.145	391.901	426	432.474	76960	1166.355	10696.371
	7014	-1.307	427.319	182.374	37024.000	414.442	587	366.064	148096	78.000	10934.613
	1001	-1.322	387.785	305.439	39015.754	433.423	580	549.434	80470	520.620	10334.043
	5031	-1.337	323.615	160.969	45787.609	407.937	433	890.680	74715	843.310	10517.645
V	43	43	40	43	43	41	42	42	41	40	42
M	4910.77	-.74571	411.12778	255.15614	38944.311	552.17840	739.74	536.27408	84177.73	995.27291	10417.007
S	2518.97	.35966	122.41820	125.55891	10223.609	582.01561	664.75	395.22829	23731.89	568.07456	692.57505
M	1001	-1.337	166.315	45.576	22208.332	283.287	158	1.990	46348	78.000	8416.883
M	9042	-.116	709.091	655.844	68016.000	4028.469	3369	1414.493	148096	2381.406	12197.270

PRVAR 5

ID	SUM1	RVH10EXP	TPAS1RVM	TVM1PVEH	TVM1FUEL	REV10SUB	RVH1POP	TVM1MNT	RVH1ACC	REV10EXP
7006	-1.479	294.267	334.859	36809.020	362.823	266	1019.180	60844	401.729	10082.609
9032	-1.484	358.017	189.695	40915.270	387.607	362	426.127	83584	1290.877	10652.570
7011	-1.582	484.010	209.644	30706.000	418.286	548	776.628	68236	834.557	10224.094
7009	-1.708	479.352	240.190	40357.777	493.613	245	253.045	41749	863.333	11729.574
4018	-1.760	394.299	260.431	38818.402	416.931	361	724.304	66892	518.942	10031.262
5056	-1.798	469.586	151.750	41876.000	562.797	448	460.406	85956	681.293	10016.711
11	-1.806	479.442	116.640	38235.293	516.623	189	555.484	101563	788.667	9601.977
2068	-1.814	290.370	216.341	50106.191	480.099	1728	-9.000	73120	808.347	10114.973
5082	-1.952	411.755	242.580	53101.215	395.552	-9	42.114	80673	616.070	10121.109
2004	-1.988	383.551	369.060	26816.590	361.676	1051	781.009	38895	718.577	10161.691
3031	-2.081	340.715	341.463	27875.207	453.331	671	441.472	62719	1114.993	9892.125
7005	-2.086	350.521	253.700	38143.227	382.846	455	608.121	68228	745.295	10028.633
5058	-2.112	404.208	204.652	35083.750	443.124	291	421.886	76373	1047.518	10139.098
4001	-2.165	367.143	170.282	39100.473	420.723	770	677.270	64081	1037.151	10000.004
5012	-2.204	385.956	286.720	33307.203	327.226	463	850.766	51796	385.943	10207.203
5080	-2.212	507.308	141.949	41976.355	422.673	481	40.271	105990	790.643	10014.242
1056	-2.226	450.679	50.774	39371.426	430.578	652	337.483	107377	1177.358	10011.238
5068	-2.282	489.903	180.892	44187.000	429.892	451	6.606	-9	985.689	9620.730
5061	-2.317	435.451	192.561	40112.000	341.997	286	418.846	63592	759.200	10611.422
5016	-2.326	-9.000	78.644	35976.957	435.848	1275	759.182	77724	618.317	-9.000
7010	-2.587	420.997	158.768	28340.000	394.087	719	675.855	83970	717.427	10000.000
V 21	21	20	21	21	21	20	20	20	21	20
M 4795.00	-1.99854	409.87648	209.12367	38153.112	422.77769	585.57	513.80271	73168.12	804.85370	10163.063
S 2229.62	.29935	64.51424	82.35606	6617.0994	57.35137	383.51	282.27045	18738.96	239.54699	444.20144
M 11	-2.587	290.370	50.774	26816.590	327.226	189	6.606	38895	385.943	9601.977
M 9032	-1.479	507.308	369.060	53101.215	562.797	1728	1019.180	107377	1290.877	11729.574

PRVAR 6

ID	SUM1	RVH10EXP	TPAS1RVM	TVM1PVEH	TVM1FUEL	REV10SUB	RVH1POP	TVM1MNT	RVH1ACC	REV10EXP
2067	-3.009	370.202	314.938	34248.500	374.053	1136	4.149	63228	755.461	10412.922
5045	-3.249	371.961	235.993	30880.988	411.383	1128	24.457	76345	698.792	10928.898
4002	-3.648	403.260	50.488	29361.840	338.824	692	648.560	92490	514.800	10023.410
2017	-3.652	601.377	24.763	30943.465	251.022	1282	82.112	77359	617.760	11525.387
6019	-4.088	492.436	104.517	48034.793	508.730	396	696.303	108078	828.464	2526.267
2044	-4.099	358.570	173.995	30173.684	308.655	4104	11.230	69702	401.766	11859.930
2041	-4.106	385.190	241.121	21903.027	281.864	15197	3.850	70863	499.200	11285.836
9016	-4.116	147.484	137.127	37755.016	500.015	1900	111.138	103896	628.727	10436.777
7016	-4.124	121.207	637.629	8175.141	164.207	248	6.466	-9	222.625	9337.121
4019	-4.734	432.868	56.138	33800.000	417.164	869	163.888	66765	491.892	10115.547
2042	-4.944	230.046	214.613	24232.000	295.711	4188	5.583	54313	830.092	11294.828
2059	-4.969	222.623	177.139	32311.430	377.618	12111	18.558	59316	869.271	10252.871
6015	-5.811	56.792	104.899	46800.000	516.712	1212	54.685	68640	140.833	10409.809
6024	-8.058	145.093	239.200	9648.887	92.380	1456	134.563	17368	384.927	10051.934
3027	-8.098	127.995	278.339	7916.000	69.187	304	73.920	10832	535.294	10016.289
9012	-8.500	104.037	227.253	9166.625	92.791	274	153.367	20952	289.365	9796.328
V 16	16	16	16	16	16	16	16	15	16	16
M 4466.56	-4.95040	285.69636	201.13454	27209.462	312.51977	2906.02	137.05181	64009.79	544.32923	10017.135
S 2491.31	1.76171	161.43933	144.54463	12894.526	147.81897	4396.24	216.35574	28978.67	220.86396	2112.2161
M 2017	-8.500	56.792	24.763	7916.000	69.187	248	3.850	10832	140.833	2526.267
M 9016	-3.009	601.377	637.629	48034.793	516.712	15197	696.303	108078	869.271	11859.930
V 155	155	145	155	155	151	152	152	146	150	150
M 4643.91	-.02387	457.38236	232.84428	42807.679	553.90298	1084.27	590.00507	90542.73	1167.0186	10509.133
S 2495.87	2.72457	182.43641	124.52356	15357.772	623.97725	2246.71	446.13407	39154.84	799.24294	1430.7517
M 1	-8.500	56.792	24.763	7916.000	69.187	83	1.990	10832	78.000	2526.267
M 9042	13.638	1240.152	658.860	140221.69	5012.844	17801	2707.529	283083	4496.957	20804.809

BRVAR 9 ID	SUM1	RVH1DEXP	TPAS1RVM	TVM1PVEH	TVM1FUEL	REV1DSUB	RVH1POP	TVM1MNT	RVH1ACC	REV1DEXP
3	-999.000	426.065	236.311	-9.000	534.867	410	726.546	94206	1150.438	10198.031
4	-999.000	508.782	108.985	-9.000	448.276	101	42.360	141267	2329.600	7607.719
5	-999.000	514.253	-9.000	47985.598	775.663	428	39.228	257066	4415.270	4861.699
6	-999.000	-9.000	-9.000	-9.000	-9.000	171	-9.000	-9	-9.000	12483.039
9	-999.000	582.511	-9.000	37412.266	871.478	163	952.913	108968	1612.000	10078.953
10	-999.000	-9.000	-9.000	-9.000	-9.000	878	-9.000	-9	-9.000	9552.551
1002	-999.000	-9.000	-9.000	-9.000	-9.000	653	-9.000	-9	-9.000	10282.238
1003	-999.000	17.217	-9.000	6896.145	89.181	278	146.262	6133	694.046	11831.262
1004	-999.000	359.912	248.525	-9.000	445.214	285	804.224	50978	950.032	10714.102
1005	-999.000	267.936	336.893	-9.000	4351.316	219	256.675	108333	1350.514	10995.313
1007	-999.000	-9.000	-9.000	-9.000	-9.000	511	-9.000	-9	-9.000	10691.652
1013	-999.000	577.863	-9.000	-9.000	538.980	312	193.170	79216	1289.600	10940.926
1014	-999.000	448.080	-9.000	42388.355	634.967	411	742.959	78862	1403.206	10587.480
1015	-999.000	-9.000	-9.000	-9.000	-9.000	1051	-9.000	-9	-9.000	10294.008
1042	-999.000	-9.000	-9.000	-9.000	-9.000	259	-9.000	-9	-9.000	10549.441
1043	-999.000	-9.000	-9.000	-9.000	-9.000	873	-9.000	-9	-9.000	10570.570
1048	-999.000	437.929	-9.000	30553.109	393.785	990	1051.180	92012	1195.110	10015.199
1062	-999.000	-9.000	-9.000	-9.000	-9.000	189	-9.000	-9	-9.000	10015.203
2001	-999.000	-9.000	-9.000	-9.000	-9.000	507	-9.000	-9	-9.000	9875.840
2003	-999.000	-9.000	-9.000	-9.000	-9.000	811	-9.000	-9	-9.000	10090.879
2006	-999.000	245.161	-9.000	22186.664	168.357	217	1.312	26624	-9.000	9999.988
2008	-999.000	93.263	-9.000	31650.813	348.170	2174	786.088	32452	1415.556	2236.234
2009	-999.000	572.662	332.208	-9.000	865.280	710	188.448	-9	3224.002	10491.723
2010	-999.000	467.664	-9.000	50648.000	446.631	182	129.178	-9	1473.333	9983.316
2012	-999.000	-9.000	-9.000	-9.000	-9.000	4244	-9.000	-9	-9.000	10993.234
2015	-999.000	598.108	-9.000	45851.000	745.030	322	72.657	73362	1872.000	8766.633
2016	-999.000	-9.000	51.256	-9.000	326.363	-9	42.715	79001	1147.714	10000.000
2019	-999.000	-9.000	-9.000	-9.000	-9.000	-9	-9.000	-9	-9.000	-9.000
2020	-999.000	-9.000	-9.000	-9.000	-9.000	-9	-9.000	-9	-9.000	-9.000
2021	-999.000	575.242	263.015	-9.000	498.898	743	406.243	63748	1382.415	10000.941
2022	-999.000	-9.000	-9.000	-9.000	-9.000	885	-9.000	-9	-9.000	-9.000
2024	-999.000	-9.000	-9.000	-9.000	-9.000	358	-9.000	-9	-9.000	11441.148
2026	-999.000	496.172	-9.000	-9.000	495.764	779	.279	-9	-9.000	9913.793
2027	-999.000	-9.000	-9.000	-9.000	-9.000	192	-9.000	-9	-9.000	1623.422
2031	-999.000	523.495	-9.000	-9.000	-9.000	473	.456	143312	-9.000	11604.301
2032	-999.000	-9.000	-9.000	-9.000	-9.000	32363328	-9.000	-9	-9.000	13335.070
2033	-999.000	-9.000	-9.000	-9.000	-9.000	-9	-9.000	-9	-9.000	-9.000
2035	-999.000	-9.000	-9.000	-9.000	-9.000	-9	-9.000	-9	-9.000	-9.000
2036	-999.000	518.325	-9.000	62521.332	570.710	727	.568	-9	3068.000	30331.773

BRVAR ID	SUM1	RVH1DEXP	TPAS1RVM	TVM1PVEH	TVM1FUEL	REV1DSUB	RVH1POP	TVM1MNT	RVH1ACC	REV1DEXP
2037	-999.000	-9.000	-9.000	-9.000	-9.000	-9	-9.000	-9	-9.000	-9.000
2038	-999.000	353.786	-9.000	38218.441	366.460	-9	36.866	49863	1376.682	10707.684
2039	-999.000	261.385	-9.000	25805.000	303.450	3123	12.642	37535	1226.826	10757.453
2043	-999.000	-9.000	-9.000	25257.141	327.316	1967	-9.000	49111	-9.000	11273.117
2046	-999.000	341.761	-9.000	30093.418	269.907	3359	23.990	44110	1345.343	10988.605
2047	-999.000	-9.000	-9.000	-9.000	-9.000	-9	-9.000	-9	-9.000	-9.000
2048	-999.000	391.461	-9.000	43272.125	436.900	841	799.307	65938	1673.750	10219.984
2049	-999.000	589.386	100.577	-9.000	555.868	678	1.851	81380	1428.762	10769.047
2050	-999.000	493.436	-9.000	39070.570	173.611	978	2.368	109398	3837.602	11083.164
2051	-999.000	528.355	-9.000	-9.000	497.320	372	2.483	92170	2236.000	10071.371
2055	-999.000	-9.000	-9.000	42408.887	424.037	1278	-9.000	95420	-9.000	10246.203
2056	-999.000	-9.000	-9.000	-9.000	-9.000	2755	-9.000	-9	-9.000	9942.699
2058	-999.000	311.413	-9.000	88060.813	498.137	4570	11.669	121646	2456.156	9776.766
2061	-999.000	-9.000	-9.000	-9.000	-9.000	566	-9.000	-9	-9.000	10208.906
2063	-999.000	-9.000	-9.000	-9.000	-9.000	458	-9.000	-9	-9.000	10675.730
2064	-999.000	461.510	137.454	-9.000	-9.000	741	.985	42553	1596.400	9974.590
2065	-999.000	510.792	-9.000	75634.000	570.371	222	16.107	-9	2990.002	9999.914
2069	-999.000	-9.000	-9.000	-9.000	-9.000	259	-9.000	-9	-9.000	10238.988
2070	-999.000	-9.000	-9.000	-9.000	-9.000	338	-9.000	-9	-9.000	10315.793
2071	-999.000	-9.000	-9.000	-9.000	-9.000	-9	-9.000	-9	-9.000	-9.000
2074	-999.000	455.973	320.661	-9.000	410.720	4492	3.529	98057	1217.021	10365.246
3003	-999.000	596.741	115.150	-9.000	1019.001	671	250.361	85627	1162.572	10000.035
3004	-999.000	498.415	-9.000	29684.480	450.132	534	622.807	90916	811.049	9972.457
3011	-999.000	336.339	-9.000	20304.867	359.240	179	435.479	58377	726.939	10363.152
3016	-999.000	-9.000	41.667	-9.000	-9.000	263	14.002	-9	-9.000	11313.375
3017	-999.000	1233.283	384.615	-9.000	-9.000	115	8.401	-9	-9.000	11502.734
3021	-999.000	-9.000	-9.000	-9.000	-9.000	1109	-9.000	-9	-9.000	10105.238
3028	-999.000	-9.000	-9.000	-9.000	-9.000	523	-9.000	-9	-9.000	9391.961
4005	-999.000	659.713	-9.000	27511.586	538.351	594	997.640	72531	2891.200	10000.000
4009	-999.000	49.281	-9.000	2816.667	38.978	410	25.457	3900	89.304	2944.296
4010	-999.000	-9.000	-9.000	-9.000	-9.000	386	-9.000	-9	-9.000	10037.246
4011	-999.000	527.033	-9.000	37353.332	428.462	527	365.101	149413	2628.000	9179.324
4014	-999.000	521.122	-9.000	-9.000	504.094	1914	176.198	82400	1938.182	8740.141
4015	-999.000	414.435	-9.000	40599.000	406.213	518	241.040	64958	1762.000	10460.688
4017	-999.000	467.861	-9.000	44964.539	368.135	538	739.886	92427	922.188	10011.887
4026	-999.000	732.447	-9.000	-9.000	1072.049	653	184.629	98592	2574.000	5177.395
4030	-999.000	448.503	-9.000	34321.676	331.775	427	927.808	88664	462.762	9999.727
4032	-999.000	723.469	140.343	-9.000	764.123	488	767.521	110783	1281.159	10103.484
4035	-999.000	-9.000	-9.000	-9.000	-9.000	954	-9.000	-9	-9.000	10049.863
4039	-999.000	565.287	-9.000	-9.000	354.146	704	398.434	83571	1060.688	10882.406
4043	-999.000	529.388	-9.000	42106.578	405.788	763	365.470	68700	1035.428	10299.488
4044	-999.000	155.905	-9.000	8703.258	83.861	1254	132.074	18951	181.743	10271.637

BRVAR	ID	SUM1	RVH10EXP	TPAS1RVM	TVM1PVEH	TVM1FUEL	REV10SUB	RVH1POP	TVM1MNT	RVH1ACC	REV10EXP
	5001	-999.000	640.972	-9.000	33943.000	572.503	473	447.611	116376	1525.790	10222.063
	5002	-999.000	737.061	-9.000	63317.645	531.963	516	591.673	153771	1697.511	10377.348
	5003	-999.000	733.999	-9.000	29503.258	530.351	234	802.260	144834	1145.763	6335.094
	5004	-999.000	-9.000	-9.000	-9.000	-9.000	354	-9.000	-9	-9.000	10003.348
	5005	-999.000	-9.000	-9.000	31382.824	381.112	668	1493.509	113628	1069.171	-9.000
	5007	-999.000	532.855	-9.000	19750.250	806.441	239	170.637	52667	814.069	10000.000
	5010	-999.000	101.749	-9.000	-9.000	89.027	571	92.068	28615	128.133	10076.297
	5013	-999.000	-9.000	-9.000	-9.000	-9.000	207	-9.000	-9	-9.000	10000.000
	5017	-999.000	111.363	-9.000	32941.211	405.438	955	121.899	51765	580.667	12907.723
	5018	-999.000	-9.000	-9.000	-9.000	-9.000	300	-9.000	-9	-9.000	10518.270
	5019	-999.000	743.024	-9.000	-9.000	2700.621	365	32.749	282620	1497.600	10413.094
	5020	-999.000	-9.000	-9.000	-9.000	-9.000	272	-9.000	-9	-9.000	10438.648
	5021	-999.000	402.548	-9.000	46670.000	544.162	655	144.154	62227	1369.333	10168.547
	5023	-999.000	-9.000	-9.000	-9.000	-9.000	486	-9.000	-9	-9.000	9555.914
	5024	-999.000	21.476	-9.000	1797.193	27.145	136	17.353	3659	66.641	11230.691
	5026	-999.000	-9.000	-9.000	-9.000	-9.000	-9	-9.000	-9	-9.000	-9.000
	5033	-999.000	288.547	-9.000	39049.055	454.359	268	325.000	92807	828.985	10047.813
	5034	-999.000	455.556	169.894	-9.000	556.942	254	412.971	94043	1118.896	10209.469
	5035	-999.000	569.903	-9.000	37588.570	452.951	212	702.643	110555	763.286	11662.289
	5037	-999.000	-9.000	-9.000	-9.000	-9.000	152	-9.000	-9	-9.000	10707.242
	5041	-999.000	509.120	-9.000	-9.000	-9.000	176	475.515	60783	913.714	7786.914
	5043	-999.000	820.052	171.800	-9.000	-9.000	877	427.019	121109	2028.001	10162.918
	5044	-999.000	594.685	-9.000	37221.051	417.684	684	829.011	117867	715.249	10214.133
	5047	-999.000	674.901	103.199	-9.000	912.610	354	855.776	131656	1079.709	10040.695
	5050	-999.000	-9.000	-9.000	-9.000	-9.000	1475	-9.000	-9	-9.000	10474.223
	5051	-999.000	-9.000	-9.000	-9.000	-9.000	327	-9.000	-9	-9.000	10683.055
	5053	-999.000	880.170	-9.000	46866.855	831.984	340	616.997	82017	1848.889	10000.000
	5055	-999.000	324.748	-9.000	32552.000	524.299	329	19.681	81380	507.000	9999.918
	5060	-999.000	477.557	-9.000	47775.762	440.745	374	1203.979	120324	1015.967	11877.246
	5063	-999.000	586.308	217.450	-9.000	4919.363	339	267.906	154960	-9.000	10019.910
	5065	-999.000	553.225	-9.000	-9.000	1665.680	146	25.895	49504	-9.000	11583.473
	5073	-999.000	-9.000	-9.000	-9.000	-9.000	101497	-9.000	-9	-9.000	9936.117
	5075	-999.000	-9.000	-9.000	-9.000	-9.000	181	-9.000	-9	-9.000	9986.340
	5077	-999.000	-9.000	-9.000	-9.000	-9.000	387	-9.000	-9	-9.000	10512.945
	5086	-999.000	112.900	-9.000	10003.332	96.433	573	11.485	17733	312.210	10039.078
	5090	-999.000	657.789	81.915	-9.000	868.576	130	314.952	33800	2221.819	10484.355
	5091	-999.000	-9.000	-9.000	-9.000	-9.000	857	-9.000	-9	-9.000	10084.305
	6005	-999.000	409.981	28.986	-9.000	483.236	58045	102.665	163091	1527.067	10457.922
	6007	-999.000	507.824	-9.000	34154.543	372.797	569	300.119	105460	1020.925	10196.688
	6009	-999.000	160.801	-9.000	9889.750	138.771	1378	239.269	9890	230.082	10134.512
	6010	-999.000	823.043	-9.000	40612.000	3959.622	287	535.465	127218	1747.652	10494.324
	6011	-999.000	-9.000	-9.000	-9.000	-9.000	-9	-9.000	-9	-9.000	-9.000

BRVAR	ID	SUM1	RVH10EXP	TPAS1RVM	TVM1PVEH	TVM1FUEL	REV10SUB	RVH1POP	TVM1MNT	RVH1ACC	REV10EXP
	6014	-999.000	99.083	-9.000	-9.000	-9.000	739	36.559	7126	384.800	10358.531
	6018	-999.000	-9.000	-9.000	-9.000	-9.000	310	-9.000	-9	-9.000	10045.660
	6021	-999.000	559.980	-9.000	57444.172	433.565	8757	76.562	134818	566.400	11337.004
	6022	-999.000	623.373	-9.000	38290.906	388.573	919	437.740	68303	1560.000	10071.406
	6023	-999.000	1003.815	237.433	-9.000	-9.000	326	347.609	-9	3835.001	12136.023
	6026	-999.000	738.129	-9.000	-9.000	1254.491	491	549.471	65686	2163.653	10000.000
	6029	-999.000	449.449	-9.000	48932.000	395.339	414	65.045	62913	601.500	16464.633
	6030	-999.000	-9.000	-9.000	-9.000	-9.000	700	-9.000	-9	-9.000	12975.246
	6032	-999.000	379.426	-9.000	35872.512	357.025	1275	1385.743	44020	798.029	10377.684
	6035	-999.000	679.366	-9.000	-9.000	1063.794	1118	203.600	102626	2837.715	7548.445
	6037	-999.000	230.647	-9.000	12604.797	196.263	329	67.560	-9	308.286	10080.164
	6038	-999.000	919.842	-9.000	37665.332	326.050	472	585.251	112996	-9.000	10000.000
	7003	-999.000	523.535	-9.000	60493.332	1110.853	123	692.105	41880	1555.186	10658.918
	7007	-999.000	243.016	599.113	-9.000	-9.000	30	13.287	35152	884.000	23181.402
	7008	-999.000	-9.000	-9.000	-9.000	-9.000	548	-9.000	-9	-9.000	10193.598
	7013	-999.000	-9.000	-9.000	31200.000	692.072	341	-9.000	104000	-9.000	10101.469
	8001	-999.000	458.921	128.773	-9.000	-9.000	98	1556.283	-9	1209.063	12594.426
	8002	-999.000	812.991	-9.000	-9.000	-9.000	547	302.398	-9	1748.000	10076.668
	8003	-999.000	571.938	-9.000	-9.000	-9.000	416	212.894	-9	1645.091	6597.168
	8006	-999.000	319.513	-9.000	45809.523	423.575	1745	1371.856	71259	667.329	12073.234
	8007	-999.000	621.360	-9.000	46360.363	1196.846	486	342.304	101993	841.905	10000.000
	9003	-999.000	-9.000	-9.000	-9.000	-9.000	2627	-9.000	-9	-9.000	9726.215
	9006	-999.000	589.251	311.927	-9.000	502.638	318	2326.527	-9	1191.667	13852.262
	9007	-999.000	-9.000	-9.000	-9.000	-9.000	230	-9.000	-9	-9.000	10000.000
	9010	-999.000	357.217	-9.000	72375.313	550.962	303	8.045	-9	839.800	10013.965
	9015	-999.000	-9.000	-9.000	37972.840	329.384	456	507.326	31187	797.151	-9.000
	9017	-999.000	531.550	193.876	-9.000	978.254	155	446.507	-9	3044.364	11407.113
	9022	-999.000	-9.000	-9.000	-9.000	1771.089	115	-9.000	136500	-9.000	10320.234
	9027	-999.000	417.053	-9.000	60242.000	381.194	230	1071.239	90792	891.570	11712.762
	9028	-999.000	556.398	-9.000	46879.730	518.700	222	17.948	119186	3574.135	10060.523
	9029	-999.000	-9.000	-9.000	-9.000	-9.000	-9	-9.000	-9	-9.000	-9.000
	9033	-999.000	444.206	-9.000	54746.066	426.419	366	948.027	105922	1290.370	10016.465
	9043	-999.000	274.976	-9.000	108056.00	1185.891	-9	1.961	108056	2047.500	8237.332
U	156	0	97	25	63	93	143	101	90	93	143
M	4104.87	M	486.86924	202.48101	39114.966	684.67923	228162.24	389.14529	85792.21	1440.2284	10375.126
S	2405.94	M	213.94838	129.94882	18960.554	788.32055	2706219.5	432.31464	47586.09	888.21673	2652.6366
M	3	M	17.217	28.986	1797.193	27.145	30	.279	3659	66.641	1623.422
M	9043	M	1233.283	599.113	108056.00	4919.363	32363328	2326.527	282620	4415.270	30331.773
V	156	0	97	25	63	93	143	101	90	93	143
M	4104.87	M	486.86924	202.48101	39114.966	684.67923	228162.24	389.14529	85792.21	1440.2284	10375.126
S	2405.94	M	213.94838	129.94882	18960.554	788.32055	2706219.5	432.31464	47586.09	888.21673	2652.6366
M	3	M	17.217	28.986	1797.193	27.145	30	.279	3659	66.641	1623.422
M	9043	M	1233.283	599.113	108056.00	4919.363	32363328	2326.527	282620	4415.270	30331.7 3

APPENDIX G

TRANSIT PROPERTIES GROUPED INTO CLASSES BY ASUM 1 Z-SCORES

Notes: See Appendix F.

ABRVAR 1

ID	ASUM1	RVH1TWG	TPAS1RVH	TVH1PVEH	TVM1FUEL	REV10SUB	RVH1POP	PVEH1MNT	TVM1ACC	REV10EXP
9004	6.893	745.380	3256.757	3664.762	396.995	254	436.888	4.773	37997.145	13768.277
1008	5.312	643.923	3703.125	2351.895	5012.844	344	647.083	3.558	15957.387	10850.441
5087	4.290	931.929	3448.236	2849.600	4833.555	-9	3.950	3.333	11709.285	10000.027
9002	3.912	536.466	5621.941	3574.065	379.222	458	2707.529	1.538	11751.695	10101.289
5008	3.255	618.331	5140.000	3383.948	534.076	1210	1245.551	2.699	17019.738	10002.633
9013	3.140	376.507	3019.967	4181.297	-9.000	83	722.379	.684	18481.711	20804.809
4007	3.070	977.657	2493.514	3080.316	376.115	546	770.079	3.455	27269.230	10042.148
7	2.959	543.142	2365.326	4613.438	848.799	17801	1625.105	1.497	20458.465	9856.941
3013	2.886	799.141	4103.473	2982.159	463.531	695	999.572	3.500	15170.707	10102.703
4022	2.784	384.789	3773.890	2917.073	346.731	279	1698.190	1.286	31727.703	12299.199
8	2.361	-9.000	3173.998	3301.401	411.045	1902	1553.457	2.431	14507.656	-9.000
5028	2.280	960.416	2754.787	3131.143	504.432	97	793.100	-9.000	20137.422	11756.438
4036	2.231	1066.480	2989.368	3575.000	403.789	775	697.332	1.455	29504.352	10196.441
4023	2.200	1121.724	3964.525	3828.190	374.359	369	521.560	1.556	22373.000	9993.273
2060	2.086	698.042	2258.613	5952.469	411.379	461	1022.936	1.197	14663.480	9864.070
1	2.076	447.348	3597.095	3046.488	436.147	563	1480.401	2.143	11323.832	13151.023
2025	2.060	677.877	4022.763	3516.377	352.325	2906	11.403	2.865	33402.359	10832.387
V 17	17	16	17	17	16	16	17	16	17	16
M 3903.06	3.16436	720.57201	3511.0223	3526.4482	1005.3341	1796.48	996.26552	2.37304	20791.480	11476.381
S 2997.39	1.30904	237.41269	909.16514	820.54691	1534.3740	4330.55	675.27345	1.13506	8295.2817	2779.5107
M 1	2.060	376.507	2258.613	2351.895	346.731	83	3.950	.684	11323.832	9856.941
M 9013	6.893	1121.724	5621.941	5952.469	5012.844	17801	2707.529	4.773	37997.145	20804.809

ABRVAR 2

ID	ASUM1	RVH1TWG	TPAS1RVH	TVH1PVEH	TVM1FUEL	REV10SUB	RVH1POP	PVEH1MNT	TVM1ACC	REV10EXP
5006	2.050	1046.134	2353.674	4229.332	451.976	450	711.297	2.442	13623.324	9937.051
2040	2.037	655.114	1678.464	2393.891	1032.354	8748	12.366	2.619	48052.586	12161.270
4006	1.956	1060.330	2161.592	3813.333	388.988	539	793.824	1.333	29626.324	10000.000
2	1.917	661.371	2490.909	3153.548	428.940	587	809.598	2.296	26684.664	12155.539
9020	1.835	615.605	522.073	3339.064	524.704	339	1167.229	2.938	20085.641	12284.188
6001	1.775	1465.847	1193.358	3137.333	894.627	231	437.666	-9.000	17500.262	10009.883
3018	1.628	782.700	2752.005	2950.133	590.215	548	708.746	2.857	22443.871	10359.926
3024	1.589	689.184	900.827	3770.000	388.277	618	897.982	2.532	31531.922	10027.707
5022	1.565	782.377	752.639	2712.565	475.483	238	945.359	3.778	12159.531	12557.160
4008	1.549	869.090	3069.808	3338.667	496.538	649	931.621	2.053	16276.672	10554.926
9008	1.502	658.579	6600.266	3089.618	369.491	1225	32.266	3.560	8337.809	10797.969
6002	1.470	886.993	3850.619	3640.000	356.832	320	794.256	2.210	12166.563	10076.605
6034	1.464	-9.000	462.667	3900.000	2089.698	1404	512.256	1.600	25771.199	10000.000
4024	1.445	1087.982	1992.529	3479.543	435.901	1000	553.860	1.522	27863.590	10635.320
6003	1.425	770.723	2421.302	4012.000	491.213	267	371.638	.929	13417.445	16027.563
3010	1.423	568.211	3633.333	3068.000	440.666	466	386.227	1.852	43973.934	10021.418
6016	1.416	1094.473	3163.307	3532.000	341.890	418	394.637	1.625	7626.664	13765.066
4034	1.407	585.563	3987.500	3980.861	339.281	699	1364.313	1.564	12064.898	10025.078
3008	1.384	931.440	3004.744	4269.473	419.285	598	1145.082	1.357	7869.941	10136.938
1006	1.372	-9.000	2969.253	2523.068	420.314	207	1335.188	2.704	14578.375	10828.980
9035	1.350	668.227	904.445	3545.454	510.234	395	306.066	5.366	11723.637	10097.141
3026	1.293	844.908	2547.431	4174.180	-9.000	345	690.857	1.571	19227.762	10181.848
1041	1.269	553.366	2044.722	2728.000	1180.656	640	85.869	5.200	-9.000	9498.332
3009	1.267	1312.442	2924.954	3464.500	715.454	5392	275.460	2.000	10972.000	10214.031
4025	1.223	891.555	3221.080	3862.300	537.032	1876	917.406	1.481	13744.957	10019.543
3007	1.216	946.426	1782.470	3837.241	455.137	545	666.679	1.933	22104.125	10223.504
9030	1.193	751.875	1621.506	4425.590	646.134	231	321.636	1.691	30643.344	10269.434
7015	1.159	-9.000	2657.564	3355.238	417.074	439	466.107	3.529	17299.629	-9.000
5027	1.125	429.035	5565.711	2548.190	390.359	365	1046.484	2.356	7623.984	12365.121
3001	1.079	737.735	2334.531	3510.456	490.683	628	1202.521	1.932	19705.473	9383.770
9014	1.043	225.405	8035.742	2982.461	476.408	565	409.106	-9.000	15821.219	10815.180
7012	1.010	677.873	2736.603	2350.833	459.235	418	558.283	4.000	18570.121	10527.637
3012	.994	879.640	2274.079	3390.000	677.346	569	880.494	1.368	22242.270	10258.832
3034	.981	380.654	5905.629	2737.437	366.710	1059	1218.679	2.429	11182.227	9907.141
V 34	34	31	34	34	33	34	34	32	33	33
M 4664.12	1.42382	790.67272	2779.9217	3389.5385	566.64037	970.99	686.79584	2.39461	19167.150	10791.639
S 2460.78	.29594	259.46412	1685.6886	566.16806	334.25063	1640.78	370.07944	1.07220	9740.4998	1375.5794
M 2	.981	225.405	462.667	2350.833	339.281	207	12.366	.929	7623.984	9383.770
M 9035	2.050	1465.847	8035.742	4425.590	2089.698	8748	1364.313	5.366	48052.586	16027.563

ABRVAR 3

ID	ASUM1	RVH1TWG	TPAS1RVH	TVH1PVEH	TVH1FUEL	REV1OSUB	RVH1POP	PVEH1MNT	TVM1ACC	REV1OEXP
4012	.956	855.031	2270.417	3539.900	404.384	447	930.873	2.353	14019.199	10000.000
3015	.953	726.190	3029.359	3099.200	398.045	713	673.249	2.688	21138.301	10036.145
9005	.917	896.072	1576.941	3631.333	605.479	197	364.673	2.000	27499.340	10433.379
4004	.841	636.330	5423.543	2821.839	389.899	582	725.879	2.138	15549.020	10202.328
4003	.839	597.397	4548.188	3146.000	373.585	748	1044.002	2.044	10890.488	10446.887
9018	.824	666.235	3339.926	3299.111	502.611	461	594.786	2.250	16237.391	11361.766
9041	.688	651.104	4047.273	4758.000	437.293	416	10.959	1.818	20550.000	9862.043
4021	.650	242.350	8351.180	943.428	4028.469	-9	86.313	1.400	17636.207	8416.883
3014	.643	591.411	933.620	2406.492	395.704	686	576.911	2.542	48467.004	10000.004
4029	.569	682.378	2751.659	4413.848	487.635	290	612.685	1.530	18305.297	10000.000
7002	.528	707.972	2791.971	2953.532	415.715	526	858.602	2.601	8616.000	11712.063
8005	.519	850.056	1958.504	3821.037	519.991	376	482.248	2.250	15632.758	10504.918
7001	.398	954.506	2163.759	3191.314	510.026	505	827.564	2.555	8506.492	9871.840
5066	.383	216.288	7903.152	3256.983	329.787	1142	1005.990	1.435	9349.590	9794.801
5030	.356	-9.000	3389.953	3912.000	-9.000	226	564.564	1.857	11510.809	-9.000
6007	.351	731.975	3694.471	3013.636	372.797	569	300.117	3.088	15103.520	10196.688
3025	.318	683.297	4695.234	3516.933	374.497	587	502.417	1.531	17078.285	10213.086
3005	.274	526.003	3933.333	3590.476	429.956	665	583.606	2.000	19071.437	10040.309
4042	.238	570.570	3270.186	2283.974	421.374	1070	551.587	-9.000	35131.723	10000.000
5057	.183	717.350	2507.126	3533.920	616.871	181	323.584	-9.000	9089.984	12524.609
5025	.126	639.060	2457.603	2359.500	484.805	489	1273.013	3.077	8302.906	10025.211
3019	.004	257.887	6388.867	3702.829	321.275	644	872.385	1.232	8976.578	10763.539
6012	-.029	1010.392	2350.000	2228.571	620.702	344	262.531	1.750	22780.953	11903.891
5015	-.072	262.650	8032.828	2948.031	371.442	1506	703.104	1.512	6169.004	10820.602
9021	-.078	297.596	6942.160	3724.398	406.429	749	639.472	1.456	7261.027	10206.281
2018	-.079	558.213	3511.151	2523.972	378.407	613	917.332	2.700	14260.090	10094.965
9009	-.096	700.139	3368.536	2756.295	-9.000	298	150.613	3.034	-9.000	10199.914
V 27	27	26	27	27	25	26	27	25	26	26
M 5389.67	.41505	624.17125	3912.2571	3162.0946	583.88717	578.10	609.59485	2.11363	16428.215	10370.467
S 2236.99	.34804	218.36771	2024.5569	763.12935	722.49464	302.01	306.55566	.56450	9376.4063	797.95792
M 2018	-.096	216.288	933.620	943.428	321.275	181	10.959	1.232	6169.004	8416.883
M 9041	.956	1010.392	8351.180	4758.000	4028.469	1506	1273.013	3.088	48467.004	12524.609

ABRVAR 4

ID	ASUM1	RVH1TWG	TPAS1RVH	TVH1PVEH	TVM1FUEL	REV1OSUB	RVH1POP	PVEH1MNT	TVM1ACC	REV1OEXP
3022	-.159	376.036	4073.062	3363.593	365.297	646	1397.517	1.788	6345.988	9996.059
3006	-.293	603.734	3201.941	2997.940	347.815	1846	1125.601	2.227	8170.441	10002.969
9039	-.304	752.907	3717.285	3264.857	422.776	699	5.367	2.333	20219.035	9962.492
4040	-.343	682.986	952.395	2885.161	364.157	741	844.435	1.802	31553.930	10020.129
9023	-.373	602.680	3434.145	3601.752	406.857	367	50.205	2.951	10096.160	10924.207
9036	-.453	-9.000	3068.568	4069.255	413.967	204	91.718	1.855	17135.636	-9.000
3030	-.477	241.049	5124.188	2743.438	350.471	811	1414.493	1.684	10002.586	9901.613
1016	-.513	717.771	3103.139	2635.454	469.146	549	1087.814	1.760	5814.172	11048.441
5059	-.516	472.705	4092.858	2577.059	411.005	353	626.786	2.429	12587.898	11142.453
6033	-.519	806.915	2450.897	2801.500	505.044	453	547.058	2.353	14096.797	10234.691
1055	-.531	645.531	1411.693	3070.476	426.118	933	925.530	2.482	15272.441	10008.223
12	-.569	377.623	2511.729	3550.857	805.951	153	860.392	1.657	22953.492	8813.605
4038	-.608	1049.924	684.099	4076.800	396.013	742	367.017	1.579	15661.121	10145.715
3002	-.613	711.204	1974.005	3369.052	576.585	451	381.972	1.727	24393.199	9912.129
2002	-.621	648.589	3050.476	2804.043	362.559	986	1043.900	2.115	11652.195	9534.594
6004	-.664	554.841	3887.875	2506.587	370.571	1310	638.131	2.752	9768.598	10558.641
5011	-.720	681.981	3137.127	2447.421	408.468	162	620.946	2.621	3242.353	12197.270
9019	-.784	425.581	3106.890	3141.163	458.604	260	773.027	2.043	19903.555	9420.535
2013	-.806	496.677	4369.039	3041.312	378.814	838	882.086	2.000	6939.168	9911.246
2007	-.870	450.475	3025.532	3612.544	425.735	840	46.873	1.426	32800.109	10367.500
5084	-.905	585.607	1837.099	2502.500	569.643	159	8.434	2.667	27370.086	11470.746
9032	-1.023	585.907	2789.046	2815.636	387.607	362	426.127	2.043	20529.418	10652.570
7014	-1.027	640.130	3071.721	2198.182	414.442	587	366.064	4.000	1313.755	10934.613
5031	-1.041	432.552	1713.850	4256.637	407.937	433	890.680	1.632	9871.688	10517.645
9026	-1.114	293.929	4872.207	4041.396	462.154	541	594.237	1.679	7389.984	9447.898
11	-1.167	845.451	1602.198	2783.529	516.623	189	555.484	2.656	10833.332	9601.977
V 26	26	25	26	26	26	26	26	26	26	25
M 4679.42	-.65429	587.31149	2933.1948	3121.4671	439.39832	600.65	637.38051	2.16382	14458.352	10269.118
S 3010.37	.27452	182.92030	1138.1322	564.88585	96.79558	390.10	408.22609	.56402	8406.9942	735.41786
M 11	-1.167	241.049	684.099	2198.182	347.815	153	5.367	1.426	1313.755	8813.605
M 9039	-.159	1049.924	5124.188	4256.637	805.951	1846	1414.493	4.000	32800.109	12197.270

ABRVAR 5	ID	ASUM1	RVH1TWG	TPAS1RVH	TVH1PVEH	TVM1FUEL	REV10SUB	RVH1POP	PVEH1MNT	TVM1ACC	REV10EXP
	5074	-1.256	630.386	2147.471	3562.000	643.491	206	1.990	2.000	13052.000	11689.609
	7011	-1.312	673.711	2453.627	2631.200	418.286	548	776.628	2.222	10067.539	10224.094
	2029	-1.317	665.836	4022.222	3466.667	345.745	3369	5.775	2.061	7592.918	10970.289
	5052	-1.445	560.530	2750.000	3081.951	391.901	426	432.474	1.822	16183.176	10696.371
	4033	-1.476	664.843	774.074	3993.600	1017.594	158	110.427	1.064	21255.000	10554.863
	5036	-1.481	445.317	2688.865	3293.333	427.163	240	632.787	1.852	15376.637	10078.309
	5039	-1.591	-9.000	2109.224	2054.000	1236.652	298	194.887	3.043	8681.578	10047.715
	7006	-1.596	395.483	4221.555	2816.357	362.823	266	1019.180	1.653	6041.086	10082.609
	1001	-1.703	468.044	3963.439	2836.364	433.423	580	549.434	2.063	7672.941	10334.043
	5068	-1.718	872.889	2737.985	2772.250	429.892	451	6.606	-9.000	15710.934	9620.730
	7010	-1.737	585.190	1814.496	2535.000	394.087	719	675.855	2.963	9407.469	10000.000
	3031	-1.782	429.856	4330.582	2228.938	453.331	671	441.472	2.250	15359.809	9892.125
	5080	-1.785	698.557	1681.961	3596.752	422.673	481	40.271	2.525	12396.523	10014.242
	7009	-1.809	643.128	2538.224	3746.889	493.613	245	253.045	1.034	9313.332	11729.574
	4018	-1.941	513.511	3463.890	2920.891	416.931	361	724.304	1.723	7259.641	10031.262
	5056	-1.962	672.944	2178.245	2917.333	562.797	448	460.406	2.053	9779.422	10016.711
	2043	-1.964	474.003	5375.199	2815.313	283.287	2680	30.144	2.087	7781.020	10793.914
	5058	-1.999	544.377	2488.876	2851.875	443.124	291	421.886	2.177	13526.266	10139.098
	4001	-2.059	572.103	2594.231	2566.508	420.723	770	677.270	1.639	15800.879	10000.004
	2068	-2.066	374.387	3414.321	3180.504	480.099	1728	-9.000	1.459	14844.805	10114.973
	5061	-2.134	679.553	2404.733	3212.000	341.997	286	418.846	1.585	9481.016	10611.422
	5016	-2.158	-9.000	1014.392	2753.502	435.848	1275	759.182	2.160	8493.527	-9.000
	2008	-2.177	109.397	8663.258	4680.313	348.170	2174	786.088	1.025	11682.668	2236.234
	7005	-2.197	461.367	3574.186	2707.071	382.846	455	608.121	1.789	10776.840	10028.633
	1056	-2.257	597.014	672.750	2971.428	430.578	652	337.483	2.727	15600.000	10011.238
V	25	25	23	25	25	25	25	24	24	25	24
M	4434.76	-1.79688	553.58376	2963.1122	3047.6815	480.68296	791.11	431.85670	1.95740	11725.481	9996.5859
S	1889.12	.30306	152.99662	1643.2188	567.53199	209.68881	829.50	298.57649	.53619	3789.2580	1734.9086
M	1001	-2.257	109.397	672.750	2054.000	283.287	158	1.990	1.025	6041.086	2236.234
M	7011	-1.256	872.889	8663.258	4680.313	1236.652	3369	1019.180	3.043	21255.000	11729.574

ABRVAR 6	ID	ASUM1	RVH1TWG	TPAS1RVH	TVH1PVEH	TVM1FUEL	REV10SUB	RVH1POP	PVEH1MNT	TVM1ACC	REV10EXP
	5012	-2.373	505.453	3709.615	2574.354	327.226	463	850.766	1.555	4993.359	10207.203
	5045	-2.379	523.113	3131.729	2595.326	411.383	1128	24.457	2.472	11695.352	10928.898
	5082	-2.382	564.627	3271.883	3795.342	395.552	-9	42.114	1.519	9139.422	10121.109
	2004	-2.457	453.870	4059.094	2430.667	361.676	1051	781.009	1.450	7970.043	10161.691
	2067	-2.524	602.665	3515.469	3130.833	374.053	1136	4.149	1.846	9235.551	10412.922
	2017	-3.099	969.032	364.310	2104.267	251.022	1282	82.112	2.500	9283.039	11525.387
	2044	-3.227	569.180	2102.857	2736.842	308.655	4104	11.230	2.310	5062.250	11859.930
	4002	-3.232	550.799	755.892	1961.143	338.824	692	648.560	3.150	7707.480	10023.410
	2041	-3.279	604.602	2150.000	1890.909	281.864	15197	3.850	3.235	5782.398	11285.836
	7016	-3.560	238.376	10364.965	884.000	164.207	248	6.466	-9.000	3576.627	9337.121
	9016	-3.720	198.419	3031.626	1737.357	500.015	1900	111.138	2.752	16017.281	10436.777
	6019	-4.353	710.051	1414.487	3456.762	508.730	396	696.303	2.250	12104.766	2526.267
	2042	-4.382	349.062	2759.138	1568.000	295.711	4188	5.583	2.241	14450.273	11294.828
	4019	-4.465	614.149	733.000	2665.000	417.164	869	163.888	1.975	7308.105	10115.547
	2059	-4.490	311.775	3006.345	1868.442	377.618	12111	18.558	1.836	17743.273	10252.871
	9012	-5.346	144.227	2681.395	2864.875	92.791	274	153.367	2.286	3450.965	9796.328
	6024	-7.571	194.405	3172.653	712.978	92.380	1456	134.565	1.800	5295.121	10051.934
	3027	-8.029	257.584	2929.714	760.000	69.187	304	73.920	1.368	6053.410	10016.289
V	18	18	18	18	18	18	17	18	17	18	18
M	4308.22	-3.93700	464.52168	2953.0096	2207.6164	309.33656	2752.86	211.77964	2.14981	8714.9287	10019.686
S	2388.59	1.65731	215.09777	2135.7445	880.77254	131.82136	4301.48	299.79688	.56041	4208.5942	1982.7992
M	2004	-8.029	144.227	364.310	712.978	69.187	248	3.850	1.368	3450.965	2526.267
M	9016	-2.373	969.032	10364.965	3795.342	508.730	15197	850.766	3.235	17743.273	11859.930
V	147	147	139	147	147	143	144	146	140	145	142
M	4629.49	-.13190	633.41772	3151.9095	3113.3181	548.18983	1104.04	599.28165	2.19443	15441.570	10467.456
S	2497.08	2.18390	237.21425	1683.2189	766.69754	638.20795	2304.61	442.24513	.78458	8701.2046	1622.7795
M	1	-8.029	109.397	364.310	712.978	69.187	83	1.990	.684	1313.755	2236.234
M	9041	6.893	1465.847	10364.965	5952.469	5012.844	17801	2707.529	5.366	48467.004	20804.809

A B R V A R 9	ID	ASUM1	RVH1TWO	TPAS1RVH	TVH1PVEH	TVH1FUEL	REV10SUB	RVH1POP	PVEH1MNT	TVH1ACC	REV10EXP
	3	-999.000	529.529	3179.057	-9.000	534.867	410	726.546	-9.000	15476.684	10198.031
	4	-999.000	743.045	1313.988	-9.000	448.276	101	42.360	-9.000	28253.340	7607.719
	5	-999.000	731.166	-9.000	3376.533	775.663	428	39.228	5.357	-9.000	4861.699
	6	-999.000	-9.000	-9.000	-9.000	-9.000	171	-9.000	-9.000	-9.000	12483.039
	9	-999.000	755.481	-9.000	3102.667	871.478	163	952.913	2.913	20406.691	10078.953
	10	-999.000	-9.000	-9.000	-9.000	-9.000	878	-9.000	5.000	-9.000	9552.551
	1002	-999.000	-9.000	-9.000	-9.000	-9.000	653	-9.000	1.611	-9.000	10282.238
	1003	-999.000	23.897	-9.000	543.182	89.181	278	146.262	.889	10017.301	11831.262
	1004	-999.000	488.396	3022.894	-9.000	445.214	285	804.224	-9.000	11652.125	10714.102
	1005	-999.000	679.686	3817.382	-9.000	4331.316	219	258.675	-9.000	18571.430	10995.313
	1007	-999.000	-9.000	-9.000	-9.000	-9.000	511	-9.000	4.500	-9.000	10691.652
	1013	-999.000	1020.792	-9.000	-9.000	538.980	312	193.170	-9.000	17163.469	10940.926
	1014	-999.000	680.101	-9.000	3610.286	634.967	411	742.959	1.860	18120.215	10587.480
	1015	-999.000	-9.000	-9.000	-9.000	-9.000	1051	-9.000	2.500	-9.000	10294.008
	1042	-999.000	-9.000	-9.000	-9.000	-9.000	259	-9.000	-9.000	-9.000	10549.441
	1043	-999.000	-9.000	-9.000	-9.000	-9.000	873	-9.000	2.182	-9.000	10570.570
	1048	-999.000	591.110	-9.000	2338.756	393.785	990	1051.180	3.012	15612.715	10015.199
	1062	-999.000	-9.000	-9.000	-9.000	-9.000	189	-9.000	2.500	-9.000	10015.203
	2001	-999.000	-9.000	-9.000	-9.000	-9.000	507	-9.000	-9.000	-9.000	9875.840
	2003	-999.000	-9.000	-9.000	-9.000	-9.000	811	-9.000	2.632	-9.000	10090.879
	2006	-999.000	-9.000	-9.000	3544.667	168.357	217	1.312	1.200	33280.000	9999.988
	2009	-999.000	1218.167	4125.805	-9.000	865.280	710	188.448	-9.000	40360.004	10491.723
	2010	-999.000	-9.000	-9.000	3536.000	446.631	182	129.178	-9.000	28137.781	9983.316
	2012	-999.000	-9.000	-9.000	-9.000	-9.000	4244	-9.000	-9.000	-9.000	10993.234
	2015	-999.000	753.212	-9.000	3926.000	745.030	322	72.657	1.600	26200.574	8766.633
	2016	-999.000	-9.000	997.087	-9.000	326.363	-9	42.715	-9.000	22571.715	10000.000
	2019	-999.000	-9.000	-9.000	-9.000	-9.000	-9	-9.000	-9.000	-9.000	-9.000
	2020	-999.000	-9.000	-9.000	-9.000	-9.000	-9	-9.000	-9.000	-9.000	-9.000
	2021	-999.000	708.059	3087.296	-9.000	498.898	743	406.243	-9.000	16237.738	10000.941
	2022	-999.000	-9.000	-9.000	-9.000	-9.000	885	-9.000	6.000	-9.000	-9.000
	2024	-999.000	-9.000	-9.000	-9.000	-9.000	358	-9.000	3.125	-9.000	11441.148
	2026	-999.000	-9.000	-9.000	-9.000	495.764	779	.279	-9.000	-9.000	9913.793
	2027	-999.000	-9.000	-9.000	-9.000	-9.000	192	-9.000	3.333	-9.000	1623.422
	2031	-999.000	1110.059	-9.000	-9.000	-9.000	473	.456	-9.000	-9.000	11604.301
	2032	-999.000	-9.000	-9.000	-9.000	-9.000	32363328	-9.000	-9.000	-9.000	13335.070
	2033	-999.000	-9.000	-9.000	-9.000	-9.000	-9	-9.000	-9.000	-9.000	-9.000
	2034	-999.000	-9.000	-9.000	-9.000	345.563	1876	-9.000	3.249	8600.633	10553.129
	2035	-999.000	-9.000	-9.000	-9.000	-9.000	-9	-9.000	-9.000	-9.000	-9.000

A B R V A R	ID	ASUM1	RVH1TWO	TPAS1RVH	TVH1PVEH	TVH1FUEL	REV10SUB	RVH1POP	PVEH1MNT	TVH1ACC	REV10EXP
	2036	-999.000	1095.088	-9.000	3068.000	570.710	727	.568	-9.000	-9.000	30331.773
	2037	-999.000	-9.000	-9.000	-9.000	-9.000	-9	-9.000	-9.000	-9.000	-9.000
	2038	-999.000	458.936	-9.000	3646.228	366.460	-9	36.866	1.305	14706.176	10707.684
	2039	-999.000	343.889	-9.000	2658.500	303.450	3123	12.642	1.455	12361.676	10757.453
	2045	-999.000	-9.000	-9.000	-9.000	327.316	1967	-9.000	1.944	7305.785	11273.117
	2046	-999.000	432.906	-9.000	3702.206	269.907	3359	23.990	1.466	11141.852	10988.605
	2047	-999.000	-9.000	-9.000	-9.000	-9.000	-9	-9.000	-9.000	-9.000	-9.000
	2048	-999.000	516.047	-9.000	3378.375	436.900	841	799.307	1.524	21636.063	10219.984
	2049	-999.000	817.301	1600.001	-9.000	555.868	678	1.851	-9.000	23251.434	10769.047
	2050	-999.000	840.891	-9.000	2741.143	173.611	978	2.368	2.800	54698.805	11083.164
	2051	-999.000	853.638	-9.000	-9.000	497.320	372	2.483	-9.000	30723.336	10071.371
	2052	-999.000	1758.996	1017.962	-9.000	1223.103	790	4.376	1.750	61347.035	10000.121
	2055	-999.000	-9.000	-9.000	-9.000	424.037	1278	-9.000	2.250	21204.445	10246.203
	2056	-999.000	-9.000	-9.000	-9.000	-9.000	2755	-9.000	.667	-9.000	9942.699
	2058	-999.000	557.594	-9.000	4252.695	498.137	4570	11.669	1.381	52607.809	9776.766
	2061	-999.000	-9.000	-9.000	-9.000	-9.000	566	-9.000	1.200	-9.000	10208.906
	2063	-999.000	-9.000	-9.000	1716.000	-9.000	458	-9.000	1.600	-9.000	10675.730
	2064	-999.000	703.703	2198.371	-9.000	-9.000	741	.985	-9.000	25532.008	9974.590
	2065	-999.000	789.731	-9.000	4212.000	570.371	222	16.107	-9.000	-9.000	9999.914
	2066	-999.000	-9.000	507.184	-9.000	658.632	1963	38.855	-9.000	36443.695	10307.359
	2069	-999.000	-9.000	-9.000	-9.000	-9.000	259	-9.000	-9.000	-9.000	10238.988
	2070	-999.000	-9.000	-9.000	-9.000	-9.000	338	-9.000	-9.000	-9.000	10315.793
	2071	-999.000	-9.000	-9.000	-9.000	-9.000	-9	-9.000	-9.000	-9.000	-9.000
	2074	-999.000	693.771	3527.273	-9.000	410.720	4492	3.529	-9.000	14604.254	10365.246
	3003	-999.000	813.524	1762.939	-9.000	1019.001	671	250.361	-9.000	18348.570	10000.035
	3004	-999.000	753.168	-9.000	2012.964	450.132	534	622.807	3.063	11960.250	9972.457
	3011	-999.000	530.600	-9.000	1634.609	359.240	179	435.479	2.875	9530.855	10363.152
	3016	-999.000	-9.000	400.000	-9.000	-9.000	263	14.002	-9.000	-9.000	11313.375
	3017	-999.000	-9.000	3333.336	-9.000	-9.000	115	8.401	-9.000	-9.000	11502.734
	3020	-999.000	-9.000	-9.000	3445.000	454.789	620	-9.000	1.333	23101.000	10577.027
	3021	-999.000	-9.000	-9.000	-9.000	-9.000	1109	-9.000	1.500	-9.000	10105.238
	3028	-999.000	-9.000	-9.000	-9.000	-9.000	523	-9.000	4.667	-9.000	9391.961
	4005	-999.000	883.732	-9.000	2492.414	538.351	594	997.640	2.636	31913.441	10000.000
	4009	-999.000	74.365	-9.000	228.222	38.978	410	25.457	1.385	1102.174	2944.296
	4010	-999.000	-9.000	-9.000	-9.000	-9.000	386	-9.000	1.515	-9.000	10037.246
	4011	-999.000	1117.855	-9.000	2847.000	428.462	527	365.101	4.000	34480.004	9179.324
	4014	-999.000	1087.877	-9.000	-9.000	504.094	1914	176.198	-9.000	38952.730	8740.141
	4015	-999.000	641.508	-9.000	2951.000	406.213	518	241.040	1.600	24984.000	10460.688
	4017	-999.000	684.194	-9.000	3225.405	368.135	538	739.886	2.056	12997.563	10011.887
	4026	-999.000	1202.078	-9.000	-9.000	1072.049	653	184.629	-9.000	41080.016	5177.395
	4027	-999.000	-9.000	705.814	-9.000	596.965	687	527.394	2.727	21621.605	10057.984

ABRVAR	ID	ASUM1	RVH1TWG	TPAS1RVH	TVH1PVEH	TVH1FUEL	REV1DSUB	RVH1POP	PVEH1MNT	TVH1ACC	REV1DEXP
	4030	-999.000	759.297	-9.000	2189.032	331.775	427	927.808	2.583	7654.473	9999.727
	4032	-999.000	1223.116	1923.529	-9.000	764.123	488	767.521	-9.000	18463.770	10103.484
	4035	-999.000	-9.000	-9.000	-9.000	-9.000	954	-9.000	-9.000	-9.000	10049.863
	4039	-999.000	973.603	-9.000	-9.000	354.146	704	398.434	-9.000	12580.645	10882.404
	4043	-999.000	775.334	-9.000	3192.129	405.788	763	365.470	1.632	14344.000	10299.488
	4044	-999.000	239.131	-9.000	679.852	83.861	1254	132.074	2.177	2326.614	10271.637
	5001	-999.000	890.931	-9.000	2569.667	572.503	473	447.611	3.429	21437.688	10222.063
	5002	-999.000	-9.000	-9.000	4493.410	531.963	516	591.673	2.429	23920.004	10377.348
	5003	-999.000	997.587	-9.000	2746.370	530.351	234	802.260	4.909	13501.492	6335.094
	5004	-999.000	-9.000	-9.000	-9.000	-9.000	354	-9.000	1.385	-9.000	10003.348
	5005	-999.000	-9.000	-9.000	2558.317	381.112	668	1493.509	3.621	13777.824	-9.000
	5007	-999.000	-9.000	-9.000	1595.750	806.441	239	170.637	2.667	10896.688	10000.000
	5009	-999.000	-9.000	1175.781	-9.000	486.429	583	1199.711	3.265	52742.867	10392.461
	5010	-999.000	137.275	-9.000	-9.000	89.027	571	92.068	-9.000	1760.934	10076.297
	5013	-999.000	-9.000	-9.000	-9.000	-9.000	207	-9.000	.833	-9.000	10000.000
	5017	-999.000	144.778	-9.000	2611.030	405.438	955	121.899	1.571	7549.027	12907.723
	5018	-999.000	-9.000	-9.000	-9.000	-9.000	300	-9.000	3.667	-9.000	10518.270
	5019	-999.000	1131.260	-9.000	-9.000	2700.621	365	32.749	-9.000	22609.605	10413.094
	5020	-999.000	-9.000	-9.000	-9.000	-9.000	272	-9.000	2.500	-9.000	10438.648
	5021	-999.000	513.496	-9.000	3354.000	544.162	655	144.154	1.333	20742.227	10168.547
	5023	-999.000	-9.000	-9.000	-9.000	-9.000	486	-9.000	1.667	-9.000	9555.914
	5024	-999.000	27.115	-9.000	184.281	27.145	136	17.353	2.036	994.563	11230.691
	5026	-999.000	-9.000	-9.000	-9.000	-9.000	-9	-9.000	-9.000	-9.000	-9.000
	5033	-999.000	393.308	-9.000	2158.490	454.359	268	325.000	2.377	14997.102	10047.813
	5034	-999.000	-9.000	2314.263	-9.000	556.942	254	412.971	-9.000	15241.379	10209.469
	5035	-999.000	796.080	-9.000	3090.286	452.951	212	702.643	2.941	9397.141	11662.289
	5037	-999.000	-9.000	-9.000	-9.000	-9.000	152	-9.000	-9.000	-9.000	10707.242
	5041	-999.000	813.701	-9.000	-9.000	-9.000	176	475.515	-9.000	15919.430	7786.914
	5043	-999.000	1080.843	2411.368	-9.000	-9.000	877	427.019	-9.000	28662.410	10162.918
	5044	-999.000	796.700	-9.000	3275.088	417.684	684	829.011	3.167	8128.734	10214.133
	5047	-999.000	959.072	1460.596	-9.000	912.610	354	855.776	-9.000	15359.344	10040.695
	5050	-999.000	-9.000	-9.000	-9.000	-9.000	1475	-9.000	-9.000	-9.000	10474.223
	5051	-999.000	-9.000	-9.000	-9.000	-9.000	327	-9.000	-9.000	-9.000	10683.055
	5053	-999.000	1234.330	-9.000	3751.428	831.984	340	616.997	1.750	24301.340	10000.000
	5055	-999.000	570.857	-9.000	1785.333	524.299	329	19.681	2.500	12207.000	9999.918
	5060	-999.000	684.060	-9.000	3627.765	440.745	374	1203.979	2.519	13650.219	11877.246
	5063	-999.000	806.068	2700.000	-9.000	4919.363	339	267.906	-9.000	-9.000	10019.910
	5065	-999.000	896.690	-9.000	-9.000	1665.680	146	25.895	-9.000	-9.000	11583.473
	5073	-999.000	-9.000	-9.000	-9.000	-9.000	101497	-9.000	-9.000	-9.000	9936.117
	5075	-999.000	-9.000	-9.000	-9.000	-9.000	181	-9.000	-9.000	-9.000	9986.340
	5077	-999.000	-9.000	-9.000	-9.000	-9.000	387	-9.000	-9.000	-9.000	10512.945

ABRVAR	ID	ASUM1	RVH1TWG	TPAS1RVH	TVH1PVEH	TVH1FUEL	REV1DSUB	RVH1POP	PVEH1MNT	TVH1ACC	REV1DEXP
	5086	-999.000	146.922	-9.000	992.000	96.433	573	11.485	1.773	3158.949	10039.078
	5090	-999.000	-9.000	819.149	-9.000	868.576	130	314.952	-9.000	21509.094	10484.355
	5091	-999.000	-9.000	-9.000	-9.000	-9.000	857	-9.000	3.286	-9.000	10084.305
	6005	-999.000	588.673	756.716	-9.000	483.236	58045	102.665	-9.000	39866.680	10457.922
	6009	-999.000	267.481	-9.000	1101.750	138.771	1378	239.269	1.000	2167.616	10134.512
	6010	-999.000	1363.656	-9.000	3144.000	3959.622	287	535.465	3.133	22954.609	10494.324
	6011	-999.000	-9.000	-9.000	-9.000	-9.000	-9	-9.000	-9.000	-9.000	-9.000
	6014	-999.000	149.807	-9.000	-9.000	-9.000	739	36.559	-9.000	3848.002	10358.531
	6015	-999.000	95.081	-9.000	307.273	516.712	1212	54.685	1.467	21450.000	10409.809
	6017	-999.000	-9.000	434.782	-9.000	403.409	373	969.527	1.827	14768.000	9916.500
	6018	-999.000	-9.000	-9.000	-9.000	-9.000	310	-9.000	-9.000	-9.000	10045.660
	6021	-999.000	845.751	-9.000	3443.304	433.565	8757	76.562	2.347	10163.199	11337.004
	6022	-999.000	898.399	-9.000	3309.091	388.573	919	437.740	1.784	18051.430	10071.406
	6023	-999.000	1429.791	2257.628	-9.000	-9.000	326	347.609	1.552	-9.000	12136.023
	6026	-999.000	1134.328	-9.000	-9.000	1254.491	491	549.471	-9.000	28559.313	10000.000
	6029	-999.000	680.613	-9.000	3475.333	395.339	414	65.045	1.286	8469.000	16464.633
	6030	-999.000	-9.000	-9.000	-9.000	-9.000	700	-9.000	1.000	-9.000	12975.246
	6032	-999.000	553.918	-9.000	3488.764	357.025	1275	1385.743	1.227	8205.566	10377.684
	6035	-999.000	1151.483	-9.000	-9.000	1063.794	1118	203.600	-9.000	41050.301	7548.445
	6037	-999.000	359.508	-9.000	863.200	196.263	329	67.560	-9.000	4501.711	10080.164
	6038	-999.000	1594.323	-9.000	3908.667	326.050	472	585.251	3.000	-9.000	10000.000
	7003	-999.000	708.977	-9.000	4714.664	1110.853	123	692.105	.692	20164.449	10658.918
	7007	-999.000	421.228	-9.000	-9.000	-9.000	30	13.287	-9.000	17576.000	23181.402
	7008	-999.000	-9.000	-9.000	-9.000	-9.000	548	-9.000	-9.000	-9.000	10193.598
	7013	-999.000	-9.000	-9.000	-9.000	692.072	341	-9.000	3.333	-9.000	10101.469
	8001	-999.000	641.715	2501.846	-9.000	-9.000	98	1556.283	1.408	-9.000	12596.426
	8002	-999.000	1416.806	-9.000	1800.000	-9.000	547	302.398	4.483	-9.000	10076.668
	8003	-999.000	-9.000	-9.000	-9.000	-9.000	416	212.894	-9.000	25456.371	6597.168
	8004	-999.000	1010.692	1613.146	-9.000	837.685	155	468.000	-9.000	20567.371	9480.520
	8006	-999.000	429.972	-9.000	3239.682	423.575	1745	1371.856	1.556	10723.641	12073.234
	8007	-999.000	852.106	-9.000	3266.545	1196.846	486	342.304	2.200	12142.000	10000.000
	9003	-999.000	-9.000	-9.000	-9.000	-9.000	2627	-9.000	-9.000	-9.000	9726.215
	9006	-999.000	943.408	4121.211	-9.000	502.638	318	2326.527	-9.000	16250.000	13852.262
	9007	-999.000	-9.000	-9.000	-9.000	-9.000	230	-9.000	2.250	-9.000	10000.000
	9010	-999.000	582.979	-9.000	3810.444	550.962	303	8.045	-9.000	16284.449	10013.965
	9015	-999.000	-9.000	-9.000	3705.095	329.384	456	507.326	.821	8169.852	-9.000
	9017	-999.000	894.667	2251.553	-9.000	978.254	155	446.507	-9.000	35889.453	11407.113
	9022	-999.000	-9.000	-9.000	-9.000	1771.089	115	-9.000	-9.000	26634.152	10320.234
	9027	-999.000	630.368	-9.000	4217.621	381.194	230	1071.239	1.507	14107.305	11712.762
	9028	-999.000	875.368	-9.000	3605.333	518.700	222	17.948	2.542	46879.746	10060.523
	9029	-999.000	-9.000	-9.000	-9.000	-9.000	-9	-9.000	-9.000	-9.000	-9.000
	9033	-999.000	701.161	-9.000	3457.708	426.419	366	948.027	1.935	22557.406	10016.465
	9042	-999.000	700.125	2721.338	-9.000	445.884	311	9.309	2.766	20477.828	10729.285
	9043	-999.000	-9.000	-9.000	3276.000	1185.891	-9	1.961	1.000	-9.000	8237.332
V	164	0	89	31	62	101	151	107	91	98	151
M	4144.09	M	748.29239	2066.4289	2825.4605	682.40963	216112.77	387.75069	2.31088	19943.561	10421.419
S	2414.81	M	349.40488	1114.2890	1105.4358	759.31212	2633560.9	435.13149	1.10402	12317.892	2495.3813
M	3	M	23.897	400.000	184.281	27.145	30	.279	.667	994.563	1623.422
M	9043	M	1758.996	4125.805	4714.664	4919.363	32363328	2326.527	6.000	61347.035	30331.773
V	164	0	89	31	62	101	151	107	91	98	151
M	4144.09	M	748.29239	2066.4289	2825.4605	682.40963	216112.77	387.75069	2.31088	19943.561	10421.419
S	2414.81	M	349.40488	1114.2890	1105.4358	759.31212	2633560.9	435.13149	1.10402	12317.892	2495.3813
M	3	M	23.897	400.000	184.281	27.145	30	.279	.667	994.563	1623.422
M	9043	M	1758.996	4125.805	4714.664	4919.363	32363328	2326.527	6.000	61347.035	30331.773

APPENDIX H

TRANSIT PERFORMANCE BY CLUSTER GROUPS

Notes:

1) Groups listed by CLUSTER # left of ID column. At end of each group column is listed:
   V = Valid cases
   M = Mean
   S = Standard deviation
   M = Minimum value
   M = Maximum value
2) Eight clusters are defined. CLUSTER 9 are those that did not enter any group. Unnumbered CLUSTER lists properties with missing values which were not assigned a SUM 1 value.

CLUSTER 1	ID	SUM1	RVH1OEXP	TPAS1RVM	TVM1PVEH	TVM1FUEL	REV1OSUB	RVH1POP	TVM1MNT	RVH1ACC	REV1OEXP
	1	2.350	363.915	268.429	41861.199	436.147	563	1480.401	89723	771.096	13151.023
	5027	.912	323.817	408.537	34884.387	390.359	365	1046.484	82199	475.387	12365.121
	3034	.857	308.201	497.521	32493.469	366.710	1059	1218.679	78939	770.407	9907.141
	3019	.414	149.945	658.860	36056.219	321.275	644	872.385	44437	857.892	10763.539
	3022	.111	299.264	312.012	43908.941	365.297	646	1397.517	78504	486.127	9996.059
	3030	-.613	180.864	413.469	33963.004	350.471	811	1414.493	57199	657.190	9901.613
	5015	-1.056	180.274	540.279	35294.484	371.442	1506	703.104	53362	379.301	10820.602
	9014	-1.271	193.511	363.573	43659.402	476.408	565	409.106	-9	626.345	10815.180
	5031	-1.337	323.615	160.969	45787.609	407.937	433	890.680	74715	843.310	10517.645
	7006	-1.479	294.267	334.859	36809.020	362.823	266	1019.180	60844	401.729	10082.609
	2068	-1.814	290.370	216.341	50106.191	480.099	1728	-9.000	73120	808.347	10114.973
N	11	11	11	11	11	11	11	10	10	11	11
MEAN	4115.18	-.26602	264.36758	379.53180	39529.448	393.54268	780.56	1045.2030	69304.15	643.37564	10766.864
SD	2463.65	1.29868	73.36292	146.05890	5763.4322	51.39926	468.20	342.55006	14510.95	180.89034	1062.1241
MIN	1	-1.814	149.945	160.969	32493.469	321.275	266	409.106	44437	379.301	9901.613
MAX	9014	2.350	363.915	658.860	50106.191	480.099	1728	1480.401	89723	857.892	13151.023

CLUSTER 2	ID	SUM1	RVH1OEXP	TPAS1RVM	TVM1PVEH	TVM1FUEL	REV1OSUB	RVH1POP	TVM1MNT	RVH1ACC	REV1OEXP
	9002	4.738	379.356	445.589	52729.020	379.222	458	2707.529	81081	871.615	10101.289
	5008	3.827	514.650	399.482	44893.707	534.076	1210	1245.551	121171	1282.895	10002.633
	8	2.385	-9.000	225.687	46330.910	411.045	1902	1553.457	112648	924.594	-9.000
	4034	2.144	441.092	340.267	53368.418	339.281	699	1364.313	83460	899.946	10025.078
	2007	-1.008	362.065	263.412	41852.926	425.735	840	46.873	59688	2381.406	10367.500
	6032	-999.000	379.426	-9.000	35872.512	357.025	1275	1385.743	44020	798.029	10377.684
	8006	-999.000	319.513	-9.000	45809.523	423.575	1745	1371.856	71259	667.329	12073.234
	9015	-999.000	-9.000	-9.000	37972.840	329.384	456	507.326	31187	797.151	-9.000
N	8	5	6	5	8	8	8	8	8	8	6
MEAN	5389.00	2.41687	399.35018	334.88725	44853.732	399.91803	1073.07	1272.8310	75564.04	1077.8707	10491.236
SD	3291.51	2.18991	68.69850	91.50082	6263.6258	65.75747	554.37	779.90362	31128.70	556.08188	792.34064
MIN	8	-1.008	319.513	225.687	35872.512	329.384	456	46.873	31187	667.329	10002.633
MAX	9015	4.738	514.650	445.589	53368.418	534.076	1902	2707.529	121171	2381.406	12073.234

CLUSTER 3	ID	SUM1	RVH1OEXP	TPAS1RVM	TVM1PVEH	TVM1FUEL	REV1OSUB	RVH1POP	TVM1MNT	RVH1ACC	REV1OEXP
	3013	2.506	561.320	398.610	32027.047	463.531	695	999.572	112095	1317.203	10102.703
	4003	1.114	464.970	331.922	43092.531	373.585	748	1064.002	88083	769.577	10446.887
	4004	.718	474.718	391.650	38370.965	389.899	582	725.879	82034	1063.791	10202.328
	7002	.590	532.534	209.942	39275.531	415.715	526	858.602	102169	601.481	11712.063
	4042	-.207	435.203	218.182	31958.527	421.374	1070	551.587	-9	2183.263	10000.000
	5025	-.270	503.973	195.291	29682.898	484.805	489	1273.013	91332	615.818	10025.211
	3006	-.323	463.797	299.436	32779.613	347.815	1846	1125.601	72989	699.827	10002.969
	4040	-.378	486.241	70.670	38882.578	364.157	741	844.435	70079	2341.362	10020.129
	2018	-.470	424.909	290.212	29601.984	378.407	613	917.332	79931	1146.419	10094.965
	5011	-.743	525.398	367.998	23933.684	408.468	162	620.946	62723	270.381	12197.270
	2013	-.750	379.151	368.866	36091.023	378.814	838	882.086	72182	539.625	9911.246
	6004	-.841	433.820	276.721	35197.164	370.571	1310	638.131	96855	611.056	10558.641
	2043	-1.239	351.996	655.844	22208.332	283.287	2680	30.144	46348	891.496	10793.914
	4018	-1.760	394.299	260.431	38818.402	416.931	361	724.304	66892	518.942	10031.262
	2004	-1.988	383.551	369.060	26816.590	361.676	1051	781.009	38895	718.577	10161.691
	7005	-2.086	350.521	253.700	38143.227	382.846	455	608.121	68228	745.295	10028.633
	4001	-2.165	367.143	170.282	39100.473	420.723	770	677.270	64081	1037.151	10000.004
	5012	-2.204	385.956	286.720	33307.203	327.226	463	850.766	51796	385.943	10207.203
	5080	-2.212	507.308	141.949	41976.355	422.673	481	40.271	105990	790.643	10014.242
	5016	-2.326	-9.000	78.644	35976.957	435.848	1275	759.182	77724	618.317	-9.000
	7010	-2.587	420.997	158.768	28340.000	394.087	719	675.855	83970	717.427	10000.000
	7016	-4.124	121.207	637.629	8175.141	164.207	248	6.466	-9	222.625	9337.121
	4019	-4.734	432.868	56.138	33800.000	417.164	869	163.888	66765	491.892	10115.547
	2059	-4.969	222.623	177.139	32311.430	377.618	12111	18.558	59316	869.271	10252.871
	1003	-999.000	17.217	-9.000	6896.145	89.181	278	146.262	6133	694.046	11831.262
	1048	-999.000	437.929	-9.000	30553.109	393.785	990	1051.180	92012	1195.110	10015.199
	2038	-999.000	353.786	-9.000	38218.441	366.460	-9	36.866	49863	1376.682	10707.684
	2039	-999.000	261.385	-9.000	25805.000	303.450	3123	12.642	37535	1226.826	10757.453
	3004	-999.000	498.415	-9.000	29684.480	450.132	534	622.807	90916	811.049	9972.457
	3011	-999.000	336.339	-9.000	20304.867	359.240	179	435.479	58377	726.939	10363.152
	5003	-999.000	733.999	-9.000	29503.258	530.351	234	802.260	144834	1145.763	6335.094
	5005	-999.000	-9.000	-9.000	31382.824	381.112	668	1493.509	113628	1069.171	-9.000
	5007	-999.000	532.855	-9.000	19750.250	806.441	239	170.637	52667	814.069	10000.000
	5017	-999.000	111.363	-9.000	32941.211	405.438	955	121.899	51765	580.667	12907.723
	5024	-999.000	21.476	-9.000	1797.193	27.145	136	17.353	3659	66.641	11230.691
	5055	-999.000	324.748	-9.000	32552.000	524.299	329	19.681	81380	507.000	9999.918
N	36	24	34	24	36	36	35	36	34	36	34
MEAN	4047.72	-1.31038	389.82395	277.74189	30257.123	384.40161	1107.66	576.87761	71860.14	843.92625	10304.045
SD	1694.02	1.78366	152.19812	151.83030	9469.7851	123.95519	2021.22	417.69047	28786.63	462.73466	1020.6549
MIN	1003	-4.969	17.217	56.138	1797.193	27.145	136	6.466	3659	66.641	6335.094
MAX	7016	2.506	733.999	655.844	43092.531	806.441	12111	1493.509	144834	2341.362	12907.723

CLUSTER 4	ID	SUM1	RVH1OEXP	TPAS1RVM	TVM1PVEH	TVM1FUEL	REV1OSUB	RVH1POP	TVM1MNT	RVH1ACC	REV1OEXP
	6034	5.887	1164.362	28.091	64428.000	2089.698	1404	512.256	103085	1560.000	10000.000
	1041	5.597	339.343	119.751	47080.000	1180.656	640	85.869	244816	4433.000	9498.332
	9013	2.958	220.117	203.493	61933.383	-9.000	83	722.379	42340	1175.613	20804.609
	9030	2.211	519.495	89.113	77102.563	646.134	231	321.636	130373	1647.112	10269.434
	9018	1.768	463.774	197.107	59537.109	502.611	461	594.786	133959	840.667	11361.766
	9036	.444	-9.000	204.696	65854.625	413.967	204	91.718	122131	976.990	-9.000
	12	.036	264.211	145.899	61482.570	805.951	153	860.392	101865	1270.880	8813.605
	9019	-.412	306.480	202.678	51726.090	458.604	260	773.027	105664	1095.955	9420.535
	4033	-.670	455.572	45.576	68016.000	1017.594	158	110.427	72357	1228.500	10554.863
	9009	-.706	313.570	220.467	43510.113	-9.000	298	150.613	132031	-9.000	10199.914
	9026	-1.012	253.150	295.690	57641.887	462.154	541	594.237	96756	388.482	9447.898
	7014	-1.307	427.319	182.374	37024.000	414.442	587	366.064	148096	78.000	10934.613
	2036	-999.000	518.325	-9.000	62521.332	570.710	727	.568	-9	3068.000	30331.773
	2065	-999.000	510.792	-9.000	75634.000	570.371	222	16.107	-9	2990.002	9995.914
	5033	-999.000	288.547	-9.000	39049.055	454.359	268	325.000	92807	828.985	10047.813
	6021	-999.000	559.980	-9.000	57444.172	433.565	8757	76.562	134818	566.400	11337.004
	9010	-999.000	357.217	-9.000	72375.313	550.962	303	8.045	-9	839.800	10013.965
N	17	12	16	12	17	15	17	17	14	16	16
MEAN	6202.94	1.23289	435.14093	161.24472	58962.365	704.78517	899.83	329.98150	118649.77	1436.7741	12064.765
STD	3257.19	2.49648	222.86767	78.02930	11959.943	445.70671	2049.30	293.45001	45922.49	1136.0967	5592.5607
MIN	12	-1.307	220.117	28.091	37024.000	413.967	83	.568	42340	78.000	8813.605
MAX	9036	5.887	1164.362	295.690	77102.563	2089.698	8757	860.392	244816	4433.000	30331.773

CLUSTER 5	ID	SUM1	RVH1OEXP	TPAS1RVM	TVM1PVEH	TVM1FUEL	REV1OSUB	RVH1POP	TVM1MNT	RVH1ACC	REV1OEXP
	1008	4.205	402.026	291.155	30350.324	5012.844	344	647.083	107991	1143.643	10850.441
	5087	3.788	665.964	298.726	32786.000	4833.555	-9	3.950	109287	947.143	10000.027
	4007	2.624	666.732	218.435	35162.945	376.115	546	770.079	121472	2388.817	10042.148
	2	1.981	491.681	220.760	38735.805	428.940	587	809.598	88949	2065.556	12155.539
	2025	1.962	448.973	332.023	42855.848	352.325	2906	11.403	122776	2717.766	10832.387
	6002	1.631	598.932	337.144	44748.203	356.832	320	794.256	98882	968.111	10076.605
	4008	1.629	569.358	211.702	48412.664	496.538	649	931.621	99373	1122.483	10554.926
	1006	1.164	516.422	288.076	26560.602	420.314	207	1335.188	71812	1335.188	10828.980
	3015	.868	549.640	249.606	36780.637	398.045	713	673.249	98873	1724.368	10036.145
	3014	.138	430.165	81.605	27808.918	395.704	686	576.911	70681	3968.345	10000.004
	7012	-.147	459.045	255.155	26307.664	459.235	418	558.283	105231	1575.294	10527.637
	2002	-.517	511.843	251.990	33753.367	362.559	986	1043.900	71386	952.878	9534.594
	1055	-.667	477.542	117.326	36944.762	426.118	933	925.530	91707	1269.291	10008.223
	5059	-.746	385.955	346.606	29618.586	411.005	353	626.786	71931	946.400	11142.453
	1001	-1.322	387.785	305.439	39015.754	433.423	580	549.434	80470	520.620	10334.043
	7011	-1.582	484.010	209.644	30706.000	418.286	548	776.628	68236	834.557	10224.094
	3031	-2.081	340.715	341.463	27875.207	453.331	671	441.472	62719	1114.993	9892.125
	2067	-3.009	370.202	314.938	34248.500	374.053	1136	4.149	63228	755.461	10412.922
	5045	-3.249	371.961	235.993	30880.988	411.383	1128	24.457	76345	698.792	10928.898
	2041	-4.106	385.190	241.121	21903.027	281.864	15197	3.850	70863	499.200	11285.836
	9	-999.000	582.511	-9.000	37412.266	871.478	163	952.913	108968	1612.000	10078.953
	4005	-999.000	659.713	-9.000	27511.586	538.351	594	997.640	72531	2891.200	10000.000
	5001	-999.000	640.972	-9.000	33943.000	572.503	473	447.611	116376	1525.790	10222.063
	5044	-999.000	594.685	-9.000	37221.051	417.684	684	829.011	117867	715.249	10214.133
	6007	-999.000	507.824	-9.000	34154.543	372.797	569	300.119	105460	1020.925	10196.688
	6029	-999.000	449.449	-9.000	48932.000	395.339	414	65.045	62913	601.500	16464.633
N	26	20	26	20	26	26	25	26	26	26	26
MEAN	3484.35	.12807	498.04988	257.44537	34408.856	779.63925	1272.18	580.77560	89858.57	1381.3680	10647.865
STD	2140.04	2.29594	100.69098	70.68504	6756.2362	1224.7415	2948.11	379.56702	20304.15	831.12698	1307.6025
MIN	2	-4.106	340.715	81.605	21903.027	281.864	163	3.850	62719	499.200	9534.594
MAX	7012	4.205	666.732	346.606	48932.000	5012.844	15197	1335.188	122776	3968.345	16464.633

CLUSTER	ID	SUM1	RVH10EXP	TPAS1RVM	TVM1PVEH	TVM1FUEL	REV10SUB	RVH1POP	TVM1MNT	RVH1ACC	REV10EXP
6											
	3018	1.840	580.482	173.228	46384.000	590.215	548	708.746	132526	1338.581	10359.926
	9008	1.506	450.455	529.304	40752.223	369.491	1225	32.266	145078	619.458	10797.969
	8005	1.438	624.909	132.990	57899.109	519.991	376	482.248	130273	987.480	10504.918
	3001	1.370	535.616	166.170	49782.242	490.683	628	1202.521	96189	1316.611	9383.770
	6003	1.367	550.035	166.319	55734.000	494.213	267	371.638	51753	732.333	16027.563
	5028	1.297	510.250	203.111	44590.000	504.432	97	793.100	-9	1331.871	11756.438
	7015	1.234	-9.000	209.665	44484.762	417.074	439	466.107	157005	1304.815	-9.000
	3010	1.141	441.061	271.745	40456.000	440.666	466	386.227	74919	3052.174	10021.418
	7001	1.006	657.706	170.509	46421.141	510.026	505	827.564	118594	664.838	9871.840
	6001	.280	727.562	85.600	44722.887	894.627	231	437.666	-9	1208.435	10009.883
	3005	.241	374.107	250.850	52825.395	429.956	665	583.606	105651	1117.479	10040.309
	5057	.078	515.284	180.757	49085.918	616.871	181	323.584	-9	637.867	12524.609
	9023	-.116	439.272	262.509	47310.113	406.857	367	50.205	139623	739.464	10924.707
	6012	-.767	588.867	153.261	34171.426	620.702	344	262.531	59800	1485.714	11903.891
	6033	-.782	552.992	177.814	38178.832	505.044	453	547.058	89833	936.800	10234.691
	9039	-.910	416.058	289.197	41882.285	422.776	699	5.367	97725	1545.656	9962.492
	5039	-1.057	709.091	172.826	26664.855	1236.652	298	194.887	81154	668.744	10047.715
	5074	-1.109	398.565	141.622	52208.000	643.491	206	1.990	104416	835.250	11689.609
	5036	-1.233	342.298	197.362	45104.797	427.163	240	632.787	83527	1100.273	10078.309
	5052	-1.296	406.748	204.969	42234.145	391.901	426	432.474	76960	1166.355	10696.371
	9032	-1.484	358.017	189.695	40915.270	387.607	362	426.127	83584	1290.877	10652.570
	5056	-1.798	469.586	151.750	41876.000	562.797	448	460.406	85956	681.293	10016.711
	11	-1.806	479.442	116.640	38235.293	516.623	189	555.484	101563	788.667	9601.977
	5082	-1.952	411.755	242.580	53101.215	395.552	-9	42.114	80673	616.070	10121.109
	1056	-2.226	450.679	50.774	39371.426	430.578	652	337.483	107377	1177.358	10011.238
	5068	-2.282	489.903	180.892	44187.000	429.892	451	6.606	-9	985.689	9620.730
	4002	-3.648	403.260	50.488	29361.840	338.824	692	648.560	92490	514.800	10023.410
	2017	-3.652	601.377	24.763	30943.465	251.022	1282	82.112	77359	617.760	11525.387
	2042	-4.944	230.046	214.613	24232.000	295.711	4188	5.583	54313	830.092	11294.828
	6024	-8.058	145.093	239.200	9648.887	92.380	1456	134.565	17368	384.927	10051.934
	5	-999.000	514.253	-9.000	47985.598	775.663	428	39.228	257066	4415.270	4861.699
	2050	-999.000	493.436	-9.000	39070.570	173.611	978	2.368	109398	3837.602	11083.164
	4011	-999.000	527.033	-9.000	37353.332	428.462	527	365.101	149413	2628.000	9179.324
	4015	-999.000	414.435	-9.000	40599.000	406.213	518	241.040	64958	1762.000	10460.688
	4017	-999.000	467.861	-9.000	44964.539	368.135	538	739.886	92427	922.188	10011.887
	4043	-999.000	529.388	-9.000	42106.578	405.788	763	365.470	68700	1035.428	10299.488
	4044	-999.000	155.905	-9.000	8703.258	83.861	1254	132.074	18951	181.743	10271.637
	8007	-999.000	621.360	-9.000	46360.363	1196.846	486	342.304	101993	841.905	10000.000
	9027	-999.000	417.053	-9.000	60242.000	381.194	230	1071.239	90792	891.570	11712.762
	9033	-999.000	444.206	-9.000	54746.066	426.419	366	948.027	105922	1290.370	10016.465
		40	30	39	30	40	40	39	40	36	40	39
		5077.55	-.87734	472.96016	186.70670	41872.396	481.92526	627.37	392.20873	97370.18	1212.6951	10457.439
		2489.59	2.19961	126.56793	91.00018	10953.427	228.78124	667.04	312.08705	41872.70	863.37238	1481.5653
	0	5	-8.058	145.093	24.763	8703.258	83.861	97	1.990	17368	181.743	4861.699
	0	9039	1.840	727.562	529.304	60242.000	1236.652	4188	1202.521	257066	4415.270	16027.563

CLUSTER	ID	SUM1	RVH10EXP	TPAS1RVM	TVM1PVEH	TVM1FUEL	REV10SUB	RVH1POP	TVM1MNT	RVH1ACC	REV10EXP
7											
	2066	4.494	1224.656	75.874	90350.000	658.632	1963	38.855	-9	-9.000	10307.359
	4027	4.241	-9.000	140.064	61261.199	596.965	687	527.394	167076	3072.284	10057.984
	6017	2.442	-9.000	145.062	33563.633	403.409	373	969.527	61329	4496.957	9916.500
	2029	-.960	461.714	485.906	31777.777	345.745	3369	5.775	65496	828.319	10970.289
	9042	-.988	444.448	224.587	36230.000	445.884	311	9.309	100211	1690.000	10729.285
	9012	-8.500	104.037	227.253	9166.625	92.791	274	153.367	20952	289.365	9796.328
	2006	-999.000	245.161	-9.000	22186.664	168.357	217	1.312	26624	-9.000	9999.988
	2046	-999.000	341.761	-9.000	30093.418	269.907	3359	23.990	44110	1345.343	10988.605
		8	6	6	6	8	8	8	8	7	6	8
		4536.63	.12152	470.29604	216.45773	39328.665	372.71127	1319.11	216.19122	69399.65	1953.7112	10345.792
		3111.68	4.86233	392.72025	143.86256	25278.315	196.30481	1383.41	352.53079	50640.65	1561.7630	484.08462
	0	2006	-8.500	104.037	75.874	9166.625	92.791	217	1.312	20952	289.365	9796.328
	0	2042	4.494	1224.656	485.906	90350.000	658.632	3369	969.527	167076	4496.957	10988.605

CLUSTER	SUM1	RVH1OEXP	TPAS1KVM	TVM1PVEH	TVM1FUEL	REV1OSUB	RVH1POP	TVM1MNT	RVH1ACC	REV1OEXP
9004	7.470	554.791	239.801	50662.855	396.995	254	436.888	241800	2748.571	13768.277
7	3.885	435.795	161.818	69149.563	848.799	17801	1625.105	103517	1339.077	9856.941
9020	2.686	464.893	33.516	52137.191	524.704	339	1167.229	153153	1241.607	12284.188
4036	1.979	670.935	266.334	42412.500	403.789	775	697.332	61691	2360.348	10196.441
5006	1.955	709.325	196.272	49952.188	451.976	450	711.297	121976	1084.572	9937.051
4006	1.919	712.848	175.723	46908.332	388.988	539	793.824	62544	2408.422	10000.000
4024	1.676	763.732	125.379	54134.969	435.901	1000	553.860	82379	1699.177	10635.320
9035	1.612	410.758	61.174	52756.363	510.234	395	306.066	283083	756.364	10097.141
3008	1.605	617.149	218.110	58817.473	419.285	598	1145.082	79824	571.268	10136.938
4025	1.555	656.649	273.255	47420.098	537.032	1876	917.406	70252	1088.609	10019.543
3026	1.429	556.163	175.389	59431.270	-9.000	345	690.857	93392	1280.118	10181.848
2060	1.370	514.657	222.560	57791.371	411.379	461	1022.936	69187	1395.204	9864.070
3024	1.315	465.378	91.663	37050.000	388.277	618	897.982	93797	3208.511	10027.707
3007	1.250	648.261	157.300	48019.309	455.137	545	666.679	92837	1657.397	10223.504
6016	1.238	705.758	253.927	44000.000	341.890	418	394.637	71500	612.213	13765.066
3009	1.067	885.391	263.879	38402.000	715.454	5392	275.460	76804	989.857	10214.031
4029	1.009	506.716	185.981	63182.793	487.635	290	612.685	96645	1171.539	10000.000
4012	.951	592.757	175.839	45562.398	404.384	447	930.873	107206	1016.800	10000.000
3012	.938	591.798	172.508	45340.000	677.346	569	880.494	62044	1597.283	10258.832
9005	.860	495.914	110.920	54998.664	605.479	197	364.673	109997	1898.000	10433.379
4023	.821	482.805	329.348	46876.762	374.359	369	521.560	72919	1765.636	9993.273
9041	.686	440.748	357.411	53430.000	437.293	416	10.959	97145	1760.000	9862.043
3025	.484	500.952	372.455	43834.266	374.497	587	502.417	67093	1332.416	10213.086
3029	-.021	-9.000	298.561	46202.000	454.789	620	-9.000	61603	-9.000	10577.027
5036	-.211	-9.000	278.870	41616.000	-9.000	226	564.564	77287	936.000	-9.000
4038	-.381	649.719	46.863	59512.266	396.013	242	367.017	93967	1072.842	10145.715
3002	-.612	532.037	150.703	38515.578	576.585	451	381.979	66527	2133.734	9912.129
1016	-.629	487.667	243.662	33663.633	469.146	549	1087.814	59072	404.535	11048.441
7009	-1.708	479.352	240.190	40357.777	493.613	245	253.045	41749	863.333	11729.524
5058	-2.112	404.208	204.652	35083.750	443.124	291	421.886	76373	1047.518	10139.098
5061	-2.317	435.451	192.561	40112.000	341.997	286	418.846	63592	759.200	10611.422
6019	-4.088	492.436	104.517	48034.793	508.730	396	696.303	108078	828.464	2526.267
2044	-4.099	358.570	173.995	30173.684	308.655	4104	11.230	69702	401.766	11859.930
3027	-8.098	127.995	278.339	7916.000	69.187	304	73.920	10832	535.264	10016.289
1014	-999.000	448.080	-9.000	42388.355	634.967	411	742.959	78862	1403.206	10587.480
2010	-999.000	467.664	-9.000	50648.000	446.631	182	129.178	-9	1473.333	9983.316
2048	-999.000	391.461	-9.000	43272.125	436.900	841	799.307	65938	1673.750	10219.984
4009	-999.000	49.281	-9.000	2816.667	38.978	410	25.457	3900	89.304	2944.296
4030	-999.000	448.503	-9.000	34321.676	331.775	427	927.808	88664	462.762	9999.727
5002	-999.000	737.061	-9.000	63317.645	531.963	516	591.673	153771	1697.511	10377.348
5021	-999.000	402.548	-9.000	46670.000	544.162	655	144.154	62227	1369.333	10168.547
5035	-999.000	569.903	-9.000	37588.570	452.951	212	702.643	110555	763.286	11662.289
5053	-999.000	880.170	-9.000	46866.855	831.984	340	616.997	82017	1848.889	10000.000
5060	-999.000	477.557	-9.000	47775.762	440.745	374	1203.979	120324	1015.967	11877.246
5086	-999.000	112.900	-9.000	10003.332	96.433	573	11.485	17733	312.210	10039.078
6009	-999.000	160.801	-9.000	9889.750	138.771	1378	239.269	9890	230.082	10134.512
6010	-999.000	823.043	-9.000	40612.000	3959.622	287	535.465	127218	1747.652	10494.324
6022	-999.000	623.373	-9.000	38290.906	388.573	919	437.740	68303	1560.000	10071.406
6037	-999.000	230.647	-9.000	12604.797	196.263	329	67.560	-9	308.286	10080.164
6038	-999.000	919.842	-9.000	37665.332	326.050	422	585.251	112996	-9.000	10000.000
7003	-999.000	523.535	-9.000	60493.332	1110.853	123	692.105	41880	1555.186	10658.918
9028	-999.000	556.398	-9.000	46879.730	518.700	222	17.948	119186	3574.135	10060.523
52	34	50	34	52	50	52	51	50	50	51
4640.37	.45539	523.48752	201.04490	43374.282	521.57980	991.65	566.15437	87260.68	1302.0513	10193.995
2197.83	2.58487	187.51800	83.44689	14178.337	529.77562	2536.87	361.11643	48421.01	733.93341	1755.8281
7	-8.098	49.281	33.516	2816.667	38.978	123	10.959	3900	89.304	2526.267
9041	7.470	919.842	372.455	69149.563	3959.622	17801	1625.105	283083	3574.135	13768.277
198	142	188	142	198	194	195	196	185	193	191
4599.93	-.10591	456.97505	234.74936	40529.740	518.28278	970.45	553.08100	86985.82	1193.2333	10533.582
2448.58	2.49162	176.23920	119.76479	13850.848	559.36722	2013.67	435.55402	40219.16	816.64746	2110.8292
1	-8.500	17.217	24.763	1797.193	22.145	83	.568	3659	66.641	2526.267
9042	7.470	1224.656	658.860	90350.000	5012.844	17801	2707.529	283083	4496.907	30331.773

CLUSTER #	ID	SUM1	RVH1DEXF	TPAS1RVM	TVM1PVEH	TVM1FUEL	REV1OSUB	RVH1POP	TVM1MNT	RVH1ACC	REV1DEXF
	8004	3.542	566.520	148.530	97695.000	837.685	155	468.000	-9	1748.843	9480.520
	2040	1.617	412.516	67.139	59847.270	1032.354	8748	12.366	156743	1462.832	12161.270
	5066	1.082	186.907	653.606	43625.594	329.787	1142	1005.990	62602	676.156	9794.801
	5084	-.431	392.777	89.520	52459.332	569.643	159	8.434	139892	1231.043	11470.746
	9021	-.564	233.467	427.075	51477.277	406.429	749	639.472	74940	394.387	10206.281
	4021	-1.085	166.315	177.983	47869.711	4028.469	-9	86.313	67018	347.579	8416.883
	9016	-4.116	147.484	137.127	37755.016	500.015	1900	111.138	103896	628.727	10436.777
	2008	-999.000	93.263	-9.000	31650.813	348.170	2174	786.088	32452	1415.556	2236.234
	2015	-999.000	598.108	-9.000	45851.000	745.030	322	72.657	73362	1872.000	8766.633
	2058	-999.000	311.413	-9.000	88060.813	498.137	4570	11.669	121646	2456.156	9776.766
	9043	-999.000	274.976	-9.000	108056.00	1185.891	-9	1.961	108056	2047.500	8237.332
	11	7	11	7	11	11	9	11	10	11	11
	5216.00	.00638	307.61332	242.99717	60395.257	952.87365	2213.23	291.28060	94060.51	1298.2527	9180.3856
	3056.18	2.41354	168.04077	216.53538	25611.481	1057.7146	2821.19	367.43078	38577.06	709.62766	2597.1210
	2008	-4.116	93.263	67.139	31650.813	329.787	155	1.961	32452	347.579	2236.234
	9043	3.542	598.108	653.606	108056.00	4028.469	8748	1005.990	156743	2456.156	12161.270
	11	7	11	7	11	11	9	11	10	11	11
	5216.00	.00638	307.61332	242.99717	60395.257	952.87365	2213.23	291.28060	94060.51	1298.2527	9180.3856
	3056.18	2.41354	168.04077	216.53538	25611.481	1057.7146	2821.19	367.43078	38577.06	709.62766	2597.1210
	2008	-4.116	93.263	67.139	31650.813	329.787	155	1.961	32452	347.579	2236.234
	9043	3.542	598.108	653.606	108056.00	4028.469	8748	1005.990	156743	2456.156	12161.270

CLUSTER #	ID	SUM1	RVH1DEXF	TPAS1RVM	TVM1PVEH	TVM1FUEL	REV1OSUB	RVH1POP	TVM1MNT	RVH1ACC	REV1DEXF
	2052	13.638	1240.152	73.559	140221.69	1223.103	790	4.376	245388	4433.000	10000.121
	4022	3.064	370.743	280.715	40669.918	346.731	279	1698.190	52290	2105.286	12299.199
	5022	1.325	628.547	59.589	34261.270	475.483	238	945.359	129431	962.706	12557.160
	5009	-.299	-9.000	211.972	23075.000	486.429	583	1199.711	75347	-9.000	10392.461
	2034	-.624	-9.000	324.740	26302.910	345.563	1876	-9.000	85464	-9.000	10553.129
	6015	-5.811	56.792	104.899	46800.000	516.712	1212	54.685	68640	140.833	10409.809
	3	-999.000	426.065	236.311	-9.000	534.867	410	726.546	94206	1150.438	10198.031
	4	-999.000	508.782	108.985	-9.000	448.276	101	42.360	141267	2329.600	7607.719
	6	-999.000	-9.000	-9.000	-9.000	-9.000	171	-9.000	-9	-9.000	12483.039
	10	-999.000	-9.000	-9.000	-9.000	-9.000	878	-9.000	-9	-9.000	9552.551
	1002	-999.000	-9.000	-9.000	-9.000	-9.000	653	-9.000	-9	-9.000	10282.238
	1004	-999.000	359.912	248.525	-9.000	445.214	285	804.224	50978	950.032	10714.102
	1005	-999.000	267.936	336.893	-9.000	4351.316	219	258.675	108333	1350.514	10995.313
	1007	-999.000	-9.000	-9.000	-9.000	-9.000	511	-9.000	-9	-9.000	10691.652
	1013	-999.000	577.863	-9.000	-9.000	538.980	312	193.170	79216	1289.600	10940.926
	1015	-999.000	-9.000	-9.000	-9.000	-9.000	1051	-9.000	-9	-9.000	10294.008
	1042	-999.000	-9.000	-9.000	-9.000	-9.000	259	-9.000	-9	-9.000	10549.441
	1043	-999.000	-9.000	-9.000	-9.000	-9.000	873	-9.000	-9	-9.000	10570.570
	1062	-999.000	-9.000	-9.000	-9.000	-9.000	189	-9.000	-9	-9.000	10015.203
	2001	-999.000	-9.000	-9.000	-9.000	-9.000	507	-9.000	-9	-9.000	9875.840
	2003	-999.000	-9.000	-9.000	-9.000	-9.000	811	-9.000	-9	-9.000	10090.879
	2009	-999.000	572.662	332.208	-9.000	865.280	710	188.448	-9	3224.002	10491.723
	2012	-999.000	-9.000	-9.000	-9.000	-9.000	4244	-9.000	-9	-9.000	10993.234
	2016	-999.000	-9.000	51.256	-9.000	326.363	-9	42.715	79001	1147.714	10000.000
	2019	-999.000	-9.000	-9.000	-9.000	-9.000	-9	-9.000	-9	-9.000	-9.000
	2020	-999.000	-9.000	-9.000	-9.000	-9.000	-9	-9.000	-9	-9.000	-9.000
	2021	-999.000	575.242	263.015	-9.000	498.898	743	406.243	63748	1382.415	10000.941
	2023	-999.000	-9.000	-9.000	-9.000	-9.000	885	-9.000	-9	-9.000	-9.000
	2024	-999.000	-9.000	-9.000	-9.000	-9.000	358	-9.000	-9	-9.000	11441.148
	2026	-999.000	496.172	-9.000	-9.000	495.764	779	.279	-9	-9.000	9913.293
	2027	-999.000	-9.000	-9.000	-9.000	-9.000	192	-9.000	-9	-9.000	1623.422
	2031	-999.000	523.495	-9.000	-9.000	-9.000	473	.456	143312	-9.000	11604.301
	2032	-999.000	-9.000	-9.000	-9.000	-9.000	32363328	-9.000	-9	-9.000	13335.070
	2033	-999.000	-9.000	-9.000	-9.000	-9.000	-9	-9.000	-9	-9.000	-9.000
	2035	-999.000	-9.000	-9.000	-9.000	-9.000	-9	-9.000	-9	-9.000	-9.000
	2037	-999.000	-9.000	-9.000	-9.000	-9.000	-9	-9.000	-9	-9.000	-9.000
	2045	-999.000	-9.000	-9.000	252-57.141	327.316	1967	-9.000	49111	-9.000	11273.117

CLUSTER ID	SUM1	RVH10EXP	TPAS1RVM	TVM1PVEH	TVM1FUEL	REV10SUB	RVH1POP	TVM1MNT	RVH1ACC	REV10EXP
2047	-999.000	-9.000	-9.000	-9.000	-9.000	-9	-9.000	-9	-9.000	-9.000
2049	-999.000	589.386	100.577	-9.000	555.868	678	1.851	81380	1428.762	10769.047
2051	-999.000	528.355	-9.000	-9.000	497.320	372	2.483	92170	2236.000	10071.371
2055	-999.000	-9.000	-9.000	42408.887	424.037	1278	-9.000	95420	-9.000	10246.203
2056	-999.000	-9.000	-9.000	-9.000	-9.000	2755	-9.000	-9	-9.000	9942.699
2061	-999.000	-9.000	-9.000	-9.000	-9.000	566	-9.000	-9	-9.000	10208.906
2063	-999.000	-9.000	-9.000	-9.000	-9.000	458	-9.000	-9	-9.000	10675.730
2064	-999.000	461.510	137.454	-9.000	-9.000	741	.985	42553	1596.400	9974.590
2069	-999.000	-9.000	-9.000	-9.000	-9.000	259	-9.000	-9	-9.000	10238.988
2070	-999.000	-9.000	-9.000	-9.000	-9.000	338	-9.000	-9	-9.000	10315.793
2071	-999.000	-9.000	-9.000	-9.000	-9.000	-9	-9.000	-9	-9.000	-9.000
2074	-999.000	455.973	320.661	-9.000	410.720	4492	3.529	98057	1217.021	10365.246
3003	-999.000	596.741	115.150	-9.000	1019.001	671	250.361	85627	1162.572	10000.035
3016	-999.000	-9.000	41.667	-9.000	-9.000	263	14.002	-9	-9.000	11313.375
3017	-999.000	1233.283	384.615	-9.000	-9.000	115	8.401	-9	-9.000	11502.734
3021	-999.000	-9.000	-9.000	-9.000	-9.000	1109	-9.000	-9	-9.000	10105.238
3028	-999.000	-9.000	-9.000	-9.000	-9.000	523	-9.000	-9	-9.000	9391.961
4010	-999.000	-9.000	-9.000	-9.000	-9.000	386	-9.000	-9	-9.000	10037.246
4014	-999.000	521.122	-9.000	-9.000	504.094	1914	176.198	82400	1938.182	8740.141
4026	-999.000	732.447	-9.000	-9.000	1072.049	653	184.629	98592	2574.000	5177.395
4032	-999.000	723.469	140.343	-9.000	764.123	488	767.521	110783	1281.159	10103.484
4035	-999.000	-9.000	-9.000	-9.000	-9.000	954	-9.000	-9	-9.000	10049.863
4039	-999.000	565.287	-9.000	-9.000	354.146	704	398.434	83571	1060.688	10882.406
5004	-999.000	-9.000	-9.000	-9.000	-9.000	354	-9.000	-9	-9.000	10003.348
5010	-999.000	101.749	-9.000	-9.000	89.027	571	92.068	28615	128.133	10076.297
5013	-999.000	-9.000	-9.000	-9.000	-9.000	207	-9.000	-9	-9.000	10000.000
5018	-999.000	-9.000	-9.000	-9.000	-9.000	300	-9.000	-9	-9.000	10518.270
5019	-999.000	743.024	-9.000	-9.000	2700.621	365	32.749	282620	1497.600	10413.094
5020	-999.000	-9.000	-9.000	-9.000	-9.000	272	-9.000	-9	-9.000	10438.648
5023	-999.000	-9.000	-9.000	-9.000	-9.000	486	-9.000	-9	-9.000	9555.914
5026	-999.000	-9.000	-9.000	-9.000	-9.000	-9	-9.000	-9	-9.000	-9.000
5034	-999.000	455.556	169.894	-9.000	556.942	254	412.971	94043	1118.896	10209.469
5037	-999.000	-9.000	-9.000	-9.000	-9.000	152	-9.000	-9	-9.000	10707.242
5041	-999.000	509.120	-9.000	-9.000	-9.000	176	475.515	60783	913.714	7786.914
5043	-999.000	820.052	171.800	-9.000	-9.000	877	427.019	121109	2028.001	10162.918
5047	-999.000	674.901	103.199	-9.000	912.610	354	855.776	131656	1079.709	10040.695
5050	-999.000	-9.000	-9.000	-9.000	-9.000	1475	-9.000	-9	-9.000	10474.223
5051	-999.000	-9.000	-9.000	-9.000	-9.000	327	-9.000	-9	-9.000	10683.055
5063	-999.000	586.308	217.450	-9.000	4919.363	339	267.906	154960	-9.000	10019.910
5067	-999.000	553.225	-9.000	-9.000	1665.680	146	25.895	49504	-9.000	11583.473

CLUSTER ID	SUM1	RVH10EXP	TPAS1RVM	TVM1PVEH	TVM1FUEL	REV10SUB	RVH1POP	TVM1MNT	RVH1ACC	REV10EXP
5073	-999.000	-9.000	-9.000	-9.000	-9.000	101497	-9.000	-9	-9.000	9936.117
5075	-999.000	-9.000	-9.000	-9.000	-9.000	181	-9.000	-9	-9.000	9986.340
5077	-999.000	-9.000	-9.000	-9.000	-9.000	387	-9.000	-9	-9.000	10512.945
5090	-999.000	657.789	81.915	-9.000	868.576	130	314.952	33800	2221.819	10484.355
5091	-999.000	-9.000	-9.000	-9.000	-9.000	857	-9.000	-9	-9.000	10084.305
6005	-999.000	409.981	28.986	-9.000	483.236	58045	102.665	163091	1527.067	10457.922
6011	-999.000	-9.000	-9.000	-9.000	-9.000	-9	-9.000	-9	-9.000	-9.000
6014	-999.000	99.083	-9.000	-9.000	-9.000	739	36.559	7126	384.800	10358.531
6018	-999.000	-9.000	-9.000	-9.000	-9.000	310	-9.000	-9	-9.000	10045.660
6023	-999.000	1003.815	237.433	-9.000	-9.000	326	347.609	-9	3835.001	12136.023
6026	-999.000	738.129	-9.000	-9.000	1254.491	491	549.471	65686	2163.653	10000.000
6030	-999.000	-9.000	-9.000	-9.000	-9.000	700	-9.000	-9	-9.000	12975.246
6035	-999.000	679.366	-9.000	-9.000	1063.794	1118	203.600	102626	2837.715	7548.445
7007	-999.000	243.016	599.113	-9.000	-9.000	30	13.287	35152	884.000	23181.402
7008	-999.000	-9.000	-9.000	-9.000	-9.000	548	-9.000	-9	-9.000	10193.598
7013	-999.000	-9.000	-9.000	31200.000	692.072	341	-9.000	104000	9.000	10101.469
H001	-999.000	458.921	128.773	-9.000	-9.000	98	1556.283	-9	1209.063	12596.426
H002	-999.000	812.991	-9.000	-9.000	-9.000	547	302.398	-9	1748.000	10076.668
H003	-999.000	571.938	-9.000	-9.000	-9.000	416	212.894	-9	1445.091	6597.168
9003	-999.000	-9.000	-9.000	-9.000	-9.000	2627	-9.000	-9	9.000	9226.215
9006	-999.000	589.251	311.922	-9.000	502.638	318	2326.527	-9	1191.667	13852.242
9007	-999.000	-9.000	-9.000	-9.000	-9.000	230	-9.000	-9	-9.000	10000.000
9017	-999.000	541.550	193.826	-9.000	978.254	155	446.502	-9	3644.364	11407.113
9022	-999.000	-9.000	-9.000	-9.000	1771.089	115	-9.000	136500	-9.000	10320.234
9029	-999.000	9.000	-9.000	-9.000	9.000	-9	-9.000	-9	-9.000	-9.000
	102	6	43	31	9	39	91	46	41	39	91
	3843.18	1.88233	563.99309	197.33866	45577.424	930.41149	358049.05	377.74963	95306.24	1651.7748	10407.852
	2350.42	6.48264	241.28855	125.45652	36432.644	1000.8498	3392365.0	497.87483	52783.13	919.57172	2033.8130
	3	-5.811	56.792	28.986	23075.000	89.027	30	.279	7126	128.133	1623.422
	9029	13.638	1240.152	599.113	140221.69	4919.363	32363328	2326.527	282620	4433.000	23181.402
	102	6	43	31	9	39	91	46	41	39	91
	3843.18	1.88233	563.99309	197.33866	45577.424	930.41149	358049.05	377.74963	95306.24	1651.7748	10407.852
	2350.42	6.48264	241.28855	125.45652	36432.644	1000.8498	3392365.0	497.87483	52783.13	919.57172	2033.8130
	3	-5.811	56.792	28.986	23075.000	89.027	30	.279	7126	128.133	1623.422
	9029	13.638	1240.152	599.113	140221.69	4919.363	32363328	2326.527	282620	4433.000	23181.402