

ANALYSIS OF
RURAL PUBLIC TRANSPORTATION IN TEXAS

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DISCLAIMER

The contents of this report reflect the views of the authors who are responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the Urban Mass Transportation Administration, the Federal Highway Administration, or the State Department of Highways and Public Transportation. The report does not constitute a standard, a specification, or a regulation.

ABSTRACT

Public transportation in rural areas and small cities is of increasing concern as various agencies compete for scarce public funds. Currently, ten Texas rural and small city transportation systems receive Section 18 funds. This report documents the findings and recommendations of the transit management evaluations performed on these ten transit systems. The purpose of the evaluations is to identify techniques for improving the efficiency and effectiveness of each transit system's operation.

SUMMARY OF FINDINGS AND RECOMMENDATIONS

The management performance evaluations of the ten rural and small city public transportation providers receiving Section 18 funds in Texas show the basics of good transportation systems to be in place. However, several significant problems in the areas of goals and objectives, fares, service standards, data collection and utilization, and marketing exist.

The recommendations that follow are intended to provide the Section 18 providers' governing boards and management with direction for improving the efficiency and effectiveness of the rural and the small city transit systems.

Goals and Objectives

Findings

None of the ten Section 18 providers in Texas possess a comprehensive set of goals and objectives which can be used to direct the system.

Recommendations

The governing bodies and management should develop a comprehensive set of goals and objectives for their systems. These should be specific, quantifiable and measureable. The systems should consider implementing a management by objectives approach in operating their systems.

Governing Bodies

Findings

Generally each of the systems has a governing body structured to be responsive to the area it serves. Each has basically done a good job in

directing the transportation system and in securing funds for the system's operations.

Recommendations

Each system should ensure that the membership of its governing body coincide with its service area. The boards should continue to secure funds for their systems and should initiate active fare schedules and collection procedures for their systems. They should consider adopting service standards appropriate to their transit systems.

Management and Organization

Findings

Generally the Section 18 program managers do a good job in structuring their systems to provide transportation services to their communities. They rely on communication with their riderships to obtain input to the systems' operations. Internal communication is often accomplished with staff meetings and daily personal contact. However, management is often so involved in daily operations (scheduling, driving, etc.) that they have no time to oversee the general direction of the system.

Recommendations

The managers should continue to rely on personal contact with their ridership and staffs for input on the systems' operations. This contact should be expanded to civic organizations and agencies. Scheduled staff meetings should be established and used as part of a management by objectives approach to their operations. The managers should appoint first-level supervisory personnel to supervise drivers and/or schedulers. This would afford managers

more time to plan and administer the activities of their systems. Management should provide written quarterly and annual reports to establish firm communication with their governing board.

Transportation Function

Findings

The ten systems provide a mix of fixed-route and demand-responsive services. Typically the demand-responsive systems provide limited fixed-route service for long-distance trips. Most of the systems have no service standards and no service monitoring, although the systems that have dispatchers do make periodic daily contact with the drivers. Only one system maintains data on passenger-miles and deadhead-mileages.

Recommendations

The systems should develop and implement service standards and service monitoring procedures. Consideration should be given to establishing a minimum load factor for trips to be made, especially long-distance trips. All of the systems should acquire and use two-way radio communication to facilitate dispatching, communication and service monitoring. Deadhead and passenger mileage data should be collected and used to evaluate and modify the service routes.

Data Needs

Findings

The ten systems collect a wealth of data, but few use the data to monitor, evaluate and modify their service.

Recommendations

All of systems should collect passenger counts, one-way passenger-trips, passenger-miles, deadhead-miles and hours, and percentage of "on-time" arrivals. Most of these data are readily available from the demand-responsive systems. On-board surveys would be needed to collect some of the data on fixed-route systems. Only the data which management intends to use to monitor, evaluate and modify its service should be collected.

Maintenance

Findings

Generally, the ten systems have effective vehicle maintenance procedures. Each has selected a maintenance facility appropriate to its service area. Records are maintained on a per vehicle basis in most of the systems. Some form of daily vehicle inspection is required by several of the systems. However, only one system provides a daily written form that provides a way for drivers to report mechanical problems to the maintenance facility.

Recommendations

Daily vehicle inspections should be required by all ten of the systems. The inspection form should include a list of items to be inspected and a space for reporting mechanical problems. Comprehensive preventative maintenance schedules should be developed and maintenance reports should be kept on a per vehicle basis. A vehicle cleaning schedule should be initiated for all of the systems. To reduce fuel costs, the systems should investigate the possibility of converting their vehicles to operating on propane. Regardless of the fuel used, credit lines at fuel stations should be maintained to

enable drivers to secure fuel without having to bear the expense out of their own pockets.

Purchasing

Findings

Only one system maintains a vehicle parts inventory and has established sound inventory procedures. All ten of the systems have defined purchasing procedures; however, their specificity varies. Some spell out dollar limits beyond which approval must be sought; others do not.

Recommendations

The systems should define purchasing policies and procedures clearly and write them down for distribution. The policies should contain the dollar amount(s) beyond which approval(s) must be obtained. They should also designate from whom the approvals must be obtained.

Finance and Accounting

Findings

The ten public transit systems develop and adopt annual budgets. Monthly financial reports are made by the systems. Some of the monthly reports include year to date expenditures. None of the systems perform financial forecasts. Almost all of the systems have annual audits performed. Eight systems do not collect fares. Those systems that do collect fares do not use locked fare boxes.

Recommendations

The adoption of an annual budget should continue and some financial forecasting should be developed. Monthly financial reports should continue to be prepared and at least quarterly written reports should be made to the governing body. The reports should contain year to date expenditures and line item balances. Consideration should be given to automating the accounting functions. The fare collection procedures need to be modified to include using locked fare boxes and money changers if exact fare is not required. A clerk, not the driver, should be responsible for counting the revenues and depositing the receipts on a daily basis. At least weekly, a written receipt for the fares should be provided to accounting. The policy of an annual out-of-house audit should continue.

Planning

Findings

All of the systems rely heavily upon primary data collected by their scheduling and dispatching personnel. However, few of them actually use the data for other than reporting requirements; even fewer use available secondary data to plan for their system. Two systems augment their data with surveys.

Recommendations

The systems should continue to utilize their scheduling and dispatching data for reporting and expand its use to include planning. All systems should obtain and use readily available secondary data from the Census, COG, et cetera.

The systems should investigate the use of college students for special planning and marketing studies.

Marketing

Findings

Two of the ten systems have developed comprehensive marketing plans. While several use brochures, public service announcements, posters and articles to publicize their services, these efforts are generally sporadic. Most of the systems have a general complaint procedure in which they counsel their drivers, but few have formal procedures to deal with customer complaints.

Recommendations

The systems should develop comprehensive marketing programs, especially as they seek to promote their images as "public transportation" providers rather than as "client restricted" providers. This program will also be important as the systems develop and collect fares. The program should maximize the use of free, public accessible media. The publicity should be geared to the general public and not to a client group. The systems should initiate procedures to deal with citizen complaints. Contact with the complainant as well as the driver should be parts of the procedure.

Safety and Training

Findings

While all of the systems offer some form of employee training, the content varies considerably. In the area of safety, most of the systems maintain accident reports in their offices. One system maintains an emergency procedures manual on board the vehicle as well as accident report forms.

Recommendations

All ten of the systems should offer employee training in the areas of Red Cross First Aid, cardiovascular pulmonary resuscitation (CPR), passenger assistance techniques for mobility impaired patrons, on-board vehicle training, driver courtesy instructions, and defensive driving. Consideration to establishing a "driver of the month" program should be given. Each system should develop emergency procedures manuals and accident report forms and maintain them on their vehicles. The larger systems should consider establishing an accident review board as the need arises. Copies of accident reports should continue to be maintained in the central office.

Personnel Function

Findings

Most of the ten systems have written job descriptions for their positions. All ten advertise position announcements in local newspaper and/or radio stations. Four also use Texas Employment Commission (TEC). The majority of the providers have formal employee evaluation procedures. Only one system uses union drivers. The majority of the systems have grievance procedures to settle employee grievances.

Recommendations

The ten systems should develop written job descriptions for all positions. Job advertising procedures should continue to include public media and TEC. Written employee evaluation procedures should be initiated for all of the systems. They should all develop and implement employee grievance procedures as well.

Implementation Statement

The intent of project 1069 has been to assist the Department in evaluating the rural and small urban area public transportation systems receiving Section 18 funds in Texas. The transit management evaluations apply techniques documented in the DOT publication Handbook for Management Performance Audits. The findings of this study indicate that the ten Section 18 providers would benefit from implementing the management techniques documented in the above-referenced DOT publication. Specifically, the study findings outline significant areas in which management tools and techniques can be implemented in the ten public transportation systems using Section 18 funds.

The potential benefits from implementing the study recommendations are substantial. These include an improvement in transit service, a reduction in operating costs, an increase in safety, a reduction in energy consumption and an increase in mobility for rural and small urban areas.

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STUDY ORIENTATION AND
OVERVIEW OF THE SECTION 18 TRANSPORTATION PROVIDERS IN TEXAS

As of May 1982, ten rural and small city transportation systems in Texas have received Section 18 funds. Each provides transportation services in ways responsive to the different service areas' needs, restraints and opportunities. The transportation providers operate under diverse governing and administrative structures, exhibit a variety of operating characteristics and use a number of funding sources in addition to the Section 18 funds. Table 1 presents characteristics of the system.

The ten rural and small urban transportation systems vary considerably in their administrative and governing body structures. Community action agencies operate four of the systems. Each of the community action agencies provided transportation services to their clientele prior to utilizing Section 18 funds. The agencies are Branzos Transit System, Central Plains Community Action Association, Community Council of South West Texas and San Patricio Community Action Agency.

The Lower Rio Grande Development Council, a council of governments, was a Section 147 Program prior to receiving Section 18 funds. This system contracts the transportation operations and maintenance with a private inter-city bus company.

Another system is a consortium of six subcontractors. This consortium, the Capital Area Rural Transportation System (CARTS), a former Section 147 Program, includes two community action agencies, two senior nutrition centers, a county department of human resources and an independent school district. The consortium hires a central administrative staff to provide support functions.

All six of the CARTS subcontractors are responsible to an executive board. The members on these boards include elected and appointed officials and citizens.

Two of the transit systems are outgrowths of senior nutrition programs. The two systems, Bosque County Senior Services and Freestone County Senior Supportive Services confine their operations to a one county area. One system answers to a board of directors composed of elected officials and the other reports to a county commissioners court.

One is a small city system comprised of a city department. The Cleburne City Council governs this system.

The tenth and youngest system is run by a nonprofit corporation called the Rolling Plains Technical Foundation in conjunction with the Rolling Plains Campus of Texas State Technical Institute (T.S.T.I.) in Sweetwater. This system tailored to transport T.S.T.I. students is governed by the T.S.T.I. Board of Regents.

While the first transportation provider in Texas actually received Section 18 funds in March 1980, the average years of operating experience for all ten of the Section 18 public transportation providers is six years. The range of transportation operating experience is from 9 months to 15 years. Thus, the majority of the Section 18 operators are phasing into the public transportation business after having previously served a particular clientele.

Together, the ten Section 18 providers have service areas of 31,157 square miles and cover 34 counties. One system covers a city and not the surrounding county. Together, the systems' service areas cover 1.6 million people. Figure 1 shows the service areas of the ten systems.

The average population density of the service areas is about 51 persons per square mile. However, this average density fails to reveal the range in population density over the individual service areas. On the high end of the

Table 1. Selected Characteristics of the Ten Section 18
Rural Transportation Systems in Texas

S E R V I C E A R E A

Transportation System	Counties Served	Population	Area (sq. miles)	Density persons/sq. mile
Bosque County Senior Service	Bosque	13,401	990	13.5
Brazos Valley Transit	Brazos, Burleson Grimes, Leon, Madison Robertson, Washington	176,375	5,110	34.5
Capital Area Rural Transportation System	Bastrop, Burnet, Caldwell, Fayette Hays, Lee, Travis	555,879	5,663	98.2
Central Plains Community Action Association	Hale	37,592	979	38.4
Cleburne	None - City of Cleburne	19,218	15.45	1,243.8
Community Council of Southwest Texas	Real, Kinney, Uvalde Dimmit, LaSalle Zavala, Edwards	57,769	9,007	6.4
Freestone County Senior Supportive Services	Freestone	14,830	865	17.1
Lower Rio Grande Development Council	Hidalgo, Cameron Willacy	510,404	3,030	168.5
San Patricio Community Action Agency	San Patricio, Aransas	72,273	960	75.3
Texas State Technical Institute - Sweetwater	Nolan, Fisher, Taylor Kent, Mitchell	144,415	4,538	31.8

Table 1 - Continued
 OPERATIONS *

Transportation System	Vehicles	Passenger Trips	Daily trips/vehicle	Monthly vehicle miles	Daily vehicle miles/vehicle
Bosque County Senior Services	3	1,044	16.6	5,205	32.6
Brazos Valley Transit	30 use 19	10,798	27.1	31,841	79.8
Capital Area Rural Transportation System	23	8,775	18.2	25,906	53.6
Central Plains Community Action Association	4	238	2.8	2,110	25.1
Cleburne	3	1,380	21.9	3,939	62.5
Community Council of Southwest Texas	14 use 10	770	3.7	9,489	45.2
Freestone County Senior Supportive Services	4	235	2.8	1,710	20.4
Lower Rio Grande Development Council	8	5,648	33.6	11,727	69.8
San Patricio Community Action Agency	10 use 9	2,192	11.6	16,035	84.8
Texas State Technical Institute - Sweetwater	3	471	7.5	3,383	53.7

*These operating data are based on the second quarter report (January through March 1982) to the State Department of Highways and Public Transportation, except for the Community Council of Southwest Texas, which are first quarter (October through December 1981) data.

range, one system has a service area of nearly 1,250 persons per square mile. On the low range, one system has an area with an average density of less than 7 persons per square mile.

Nine of the transportation operators offer demand-responsive service which usually requires an appointment reserved 24 hours in advance. One system provides a fixed-route service which approximates the operations of typical urban systems except the routes have longer headways and cover a three-county area.

Four of the systems provide both fixed-route and demand-responsive service. In these systems, the fixed-route service operates on a weekly rather than on a daily schedule. For example, one route may carry patrons to City A on Mondays, to City E on Wednesdays and to City K on Fridays. In each case the vehicle makes intermediate stops at smaller cities located on the route to the major center.

The transportation systems all operate Monday through Friday, generally from 8:00 a.m. to 5:00 p.m. Two begin service at 7:00 a.m.; one begins at 8:30 a.m. Two of the systems operate until 4:30 p.m.; one runs until 6:00 p.m.

Together, the ten systems make 31,500 passenger-trips and travel 111,300 vehicle-miles per month. Vehicle usage varies from system to system. One system makes less than three person-trips per vehicle daily and one makes as many as 34 person-trips for each vehicle it operates.

The ten providers' use of vehicles varies on a vehicle-mile basis as well as on a per passenger-trip basis. For the state as a whole, the average vehicle is driven 58 miles per day. The lowest daily vehicle mileage for any system on a per vehicle basis is 20 miles a day. One system has a daily per vehicle mileage which averages 85 miles.

Together the ten systems operate 102 vehicles, four of which are being sold. These vehicles have an average capacity of 12 seated patrons. Thirty percent of the vehicles have two-way radio equipment. Fifteen percent of them are equipped with wheelchair lifts and/or ramps.

On the average, the vehicles are four years old and have 74,000 miles on them. Nearly one half (48%) of the vehicles are Chevrolet or Dodge vans. The actual distribution of vehicles by manufacturer is shown in Appendix A. Appendix A also contains a complete vehicle inventory.

The total budget for these ten transportation systems exceeds \$2.9 million. Approximately 28 percent of the funds are dedicated for capital purchases. The remaining funds are to cover vehicle and administrative operations.

Not all of the \$2.9 million are Section 18 funds. The Texas rural and small city public transportation systems receive revenue from several federal, state and local sources. These sources include: Title XIX of the Social Security Act, Title III of the Older Americans Act, the Community Service Act, the Comprehensive Employment and Training Act; Texas Public Transportation funds; local revenues; donations; and passenger fares.

The Section 18 program provides an average of 53 percent of the non-capital costs of the rural and small city public transportation systems. The use of Section 18 funds varies, however, with some systems relying on the funds only for capital purchases while one relies on Section 18 funds for 68 percent of its noncapital costs.

Title III funds contribute 12 percent of the noncapital funds of the ten transportation systems. Again use of these funds varies by system, with some not using Title III funds, and some relying on them for up to 76 percent of their noncapital budget.

Title XIX funds contribute an average of 9 percent of the total non-capital cost of the ten systems in Texas. The use of these funds varies with some systems not using Title XIX funds at all, to one system relying on Title XIX funds for up to 21 percent of its noncapital budget.

Local cash revenues contribute 10 percent of the ten systems' non-capital budgets. These revenue sources include tax revenues, revenue-sharing funds, and cash contracts for service. This contribution varies from some systems receiving no cash contributions to one system receiving 19 percent of its noncapital budget.

Local in-kind revenues contribute 5 percent of the noncapital budgets. In-kind contributions include such things as vehicle storage areas, rental of space, volunteer labor and gasoline which are donated and not charged to the program. Again, in-kind contributions vary from some projects not using in-kind contributions up to a project showing 15 percent of its noncapital budget as in-kind contribution.

Passenger fares contribute only one percent of the total noncapital budget for the state's ten systems. Again fares' contribution to the individual budgets varies with most systems not receiving any revenues from fares to one system which recovers 47 percent of its noncapital costs from the farebox. Table 2 shows the specific breakdown of revenue sources for the total costs as well as the noncapital costs of the systems. This table also shows the relative contribution of each source to the noncapital costs of the systems. Finally, this table presents the systems' range of use of each revenue source.

Based upon quarterly reports submitted to the State Department of Highways and Public Transportation, operating costs per vehicle-mile and per passenger trip can be calculated. Table 3 shows these costs for each system.

Table 2. Summary of Revenue Sources for Texas Section 18 Programs

Source	Total Dollars	Dollars Spent on Operations	Percent of Dollars Spent on Operation by Source	Range of Percents by Source
Regular Fares	\$ 27,000	\$ 27,000	1	0 - 47
Donations	48,377	39,479	2	0 - 4
DOT - Section 18	1,817,798	1,127,074	53	0 - 80
HEW - Title XIX	213,285	183,016	9	0 - 21
HEW - Title III	254,322	249,953	12	0 - 76
HEW - Title IX	55,622	55,622	2	0 - 10
HEW - Title V	19,279	19,279	1	0 - 3
DOL - CETA	67,779	38,839	2	0 - 17
Community Services Administration	68,191	56,799	2	0 - 20
Other State Funds	25,810	22,300	1	0 - 4
Local Funds	268,751	210,867	10	0 - 19
Inkind	101,715	101,715	5	0 - 15
Total	\$2,967,929	\$2,131,943	100	

Table 3. Operating Cost Characteristics of the Ten Section 18 Rural Transportation Systems in Texas

Transportation System	Operating Budget ¹	Cost per Passenger Trip ²	Cost per Vehicle Mile ³
Bosque County Senior Service	\$ 44,475	\$ 3.55	\$ 0.71
Brazos Valley Transit	528,720	4.08	1.38
Capital Area Rural Transportation System	563,449	5.35	1.81
Central Plains Community Action Association	101,101	35.40	3.99
Cleburne	57,843	3.49	1.22
Community Council of Southwest Texas	210,357	22.77	1.85
Freestone County Senior Supportive Services	47,059	16.69	2.29
Lower Rio Grande Development Council ⁴	187,200	2.76	1.33
San Patricio Community Action Agency	256,937	9.77	1.34
Texas State Technical Institute - Sweetwater	134,823	23.85	3.32

¹Operating budget = Total budget - Capital expenditures

²Cost per Passenger Trip = Operating Budget ÷ Annual passenger trips

³Cost per Vehicle Mile = Operating Budget ÷ Annual mileage

⁴Lower Rio Grande Development Council provides only fixed route service.

(Annual passenger trips and annual mileage taken from Section 18 quarterly report.)

The mean cost per passenger trip is \$5.63. However, this cost ranges from \$2.76 per trip to \$35.40 per trip. The mean cost per vehicle-mile is \$1.60. This ranges from \$0.71 per mile to \$3.99 per mile. Compared to the operating statistics of other Section 18 programs across the nation, Texas' systems costs are on the high side of the averages presented in Tables 4 and 5, and they exhibit a wider range in costs than the systems presented on these two tables.

Table 4: Operating Statistics for Demand-Responsive Systems

System	Cost/ Veh-Mi (\$)	Cost/ Revenue (%)	Pass/ Veh-Hr	Cost/ Veh-Hr (\$)	Cost/ Pass-Trip (\$)
Nebraska: FY 80					
Hall County	1.09	115			1.46
York County	0.78	1114			2.91
Scotts Bluff Co.	0.68	1700			1.93
Adams County	0.99	413			1.64
Ohio: FY 80					
Average	1.18		3.06	14.42	7.20
Georgia: June 1981					
Dodge County	0.74		1.52	7.36	4.85
Newton County	1.29		0.90	25.39	28.11
Washington County	1.93		0.80	10.91	13.63
Atkinson County	1.20		10.44	24.41	2.34
Bartow County	0.45		0.41	8.15	19.92
Massachusetts: FY 80					
Cape Cod		424	3.4	19.70	5.85
Cape Ann		112	4.5	15.00	3.33
FOCA		1659	1.2	7.90	6.60
PVTA		4685	4.1	7.00	1.70
Iowa: FY 80					
Range		114- 2000	1.2- 6.6	2.20- 20.00	1.40- 4.40
North Carolina (75)					
CADA	0.29	139	3.60	8.78	2.44
Midwest 147 Projects (79-80) [In 1980 \$]		256- 1667	2.9- 7.6	13.51- 20.81	0.90- 2.72
18 Selected 147 Projects (77-78) [In 1980 \$]		417	2.6	17.17	2.14- 14.61

References: 1, 2, 3, 4, 5

Table 5: Operating Statistics for Fixed-Route Systems

System	Cost/ Veh-Mi (\$)	Cost/ Revenue (%)	Pass/ Veh-Hr	Cost/ Veh-Hr (\$)	Cost/ Pass-Trip (\$)
Ohio: FY 80 Average	2.17		16.55	22.37	1.37
Massachusetts: FY 80					
Cape Cod		702	8.4	26.20	3.12
GMTA		318	22.6	21.80	1.00
FOCA		1088	18.75	21.75	1.16
PVTA		6893	36.9	23.00	0.62
42 Michigan small urban and rural systems		313- 909	4.4-7	9.33- 15.31	1.31- 3.67
Nationwide for small urban and rural systems		100- 400	4-10	10.32- 18.06	1.93- 4.51
National 147 Figures		417	4.32	14.24	5.09

References: 1, 3



LITERATURE REVIEW

During the last fifteen years the transportation needs of rural and small urban America have been receiving increased attention. Government of all levels, human services agencies, and concerned citizens have been focusing on the mobility problem of those people with inadequate transportation in rural and small urban areas. Because many of the rural and small urban residents are without automobiles because of age, income or handicap, they are essentially transportation disadvantaged and lack the resources to reach activities which they need and to which they would like to go (6)*.

The increased interest and support for rural and small urban transportation disadvantaged has resulted in numerous public programs with funds exclusively for transportation or with a transportation component in them. The major federal programs include the Urban Mass Transportation Administration's Section 16(b)2 program, the now defunct Rural Public Transportation Demonstration Program (Section 147), and Section 18 of the Urban Mass Transportation Act. These last two have been administered by the Federal Highway Administration. The State Department of Highways and Public Transportation has administered all three programs in Texas.

The Section 16(b)2 Program

Section 16(b)2 of the Urban Mass Transportation Act of 1964 provides for federal funds for which only private nonprofit organizations are eligible to apply. Twenty percent matching funds must be furnished by the applicant from nonfederal sources. The funds may be used for capital purchases only. Private nonprofit organizations using Section 16(b)2 funds must provide service

*Denotes reference number listed at the end of main body of report.

within a recognized "urban area" as defined by the U.S. Bureau of Census. However, this does not prohibit operations in a rural area as long as the origin and/or destination is in an urban area.

The Section 147 Program

Section 147 of the Federal Aid Highway Act of 1973 authorized the Federal Highway Administration (FHWA) and the Urban Mass Transportation Administration (UMTA) to carry out demonstration projects to encourage the development, improvement, and use of public transportation systems for transporting passengers within and between rural and small urban areas.

The Section 18 Program

Section 18 of the Urban Mass Transportation Act is contained in the Surface Transportation Assistance Act of 1978. It followed the Section 147 Demonstration Program and established ongoing authority and funding for Federal assistance to rural transportation. It provided assistance to public transportation systems in rural and small urban areas (less than 50,000 population). Two major goals are intended to be accomplished with this program. These are to:

1. Provide a means of mobility to the transportation disadvantaged rural public; and to
2. Facilitate the coordination of categorical human service transportation.

While Texas currently has approximately \$12 million on unobligated Section 18 funds, the national outlook for the continuation of Section 18 is uncertain. At the time of this writing, three transit bills are before the Congress.

The administration's proposal, called the Transit Assistance Act of 1982, would make important changes in the structure of Federal transit assistance to phase out transit operating assistance by the end of fiscal year 1984 and to reduce federal participation in capital funds to 75 percent.

For the Small Community and Rural Formula Capital and Operating Grant Program the bill would authorize \$300 million for public transportation assistance in small communities and rural areas for fiscal year 1983 through fiscal year 1986. Under this proposal the current Section 18 program would be phased out so that all operating assistance would be phased out by the end of fiscal year 1984. At the same time, a new Section 21 would be authorized to provide a capital formula program for rural and small urban areas. These funds would be apportioned based on each State's share of the national non-urbanized and rural population. The Federal share in the Section 21 non-urbanized area capital formula program would be 75 percent (7).

Both the House and the Senate have their own draft bills. Both would provide for larger appropriations to the rural and small urban formula grants than the administration's bill. Both bills also provide for federal capital participation at 80 percent versus the administration's 75 percent. Both bills also would provide for the current federal participation in operating assistance (8).

While it is unclear what revisions to the Urban Mass Transportation Act of 1964 will be made, it is likely that some change to the current Section 18 will be made. Since the Texas rural and small city transportation systems rely on the Section 18 program for an average 53 percent of their noncapital budgets, significant changes in federal participation in operating assistance would have an effect of these systems.

Evaluation

Evaluation is a method of monitoring and measuring how well a system is doing. It provides a systematic means for checking on the internal management of a system, as well as measuring whether the system is meeting any goals that have been established for the operation. A good method of evaluation may also be used to help outline future actions to improve a system's operation and performance.

One system should not be compared to another unless all of the differences and/or similarities are taken into consideration. One must consider the local geographic and physical conditions, as well as the specific operational characteristics of each system, when comparisons are being made between them. The characteristics of the local population (i.e., population density, seasonal variations, and the types of persons which are going to be served), characteristics of the roadway network, and the exact nature of the community which is being served should be considered. Each system is different in the scale of operation, the age of the system, the utilization of volunteer and in-kind services, the influence of different labor arrangements, as well as the exact definitions used by each system when reporting data.

Work in Other States

In an effort to determine what work, if any, has been completed in evaluation techniques for rural public transportation systems, a survey was sent to each of the other 49 states on September 17, 1982. The survey, which was addressed to the Section 18 contact person in each respective state, asked if the state had undertaken a study of performance measures or evaluation techniques for rural public transportation. If the answer was "yes", the state was asked to forward a copy of their study.

Of the 49 states that were surveyed, 92 percent responded. Completed studies and tabulated operating statistics were obtained from seven states. Tables 4 and 5 show the results of a comparison of a sample from the supplied statistics. Table 4 shows the operating statistics for demand-responsive systems and Table 5 shows the same for fixed-route systems. By observation of the two tables, one can see that special care should be exercised when comparisons of rural transit systems are made. The statistics are scattered with respect to each other. One cannot easily draw any conclusions about these systems. Each should be studied more closely before any comparisons are attempted. It is likely that each system has different objectives, operates under different geographic and physical conditions, and has specific operational characteristics which make it different.

Selected Case Studies

Limited research has been performed on the rural transportation systems that currently exist in Iowa and North Carolina. Some information was found for other states, but the information was either inadequate or did not cover the specific subject area desired.

Rural transit in Iowa grew out of a need for transportation services for the transportation disadvantaged. This need caused the forming of 275 rural and special transit systems (9). The Iowa Department of Transportation devised a regional transit system concept which divided the state into sixteen transit districts. This coordination of efforts helped to eliminate duplicate expenses and services as well as the improvement of management, financing, local commitments, long-term continuity, and service. The coordination of the systems has allowed the extension of rural transit to more areas. This has resulted in a 10 percent decrease in overall expenses

and a 26 percent reduction in individual rider expenses. The reduction of the 275 agencies to 24 agencies has produced more tangible results than the previous combination of agencies produced (9). The system that has been developed in Iowa shows how the coordination of rural transit systems may aid in the development of a better operating system.

In North Carolina, the Choanoke Area Development Association (CADA) has operated rural paratransit services for the clients of local human service agencies since 1966. The private, nonprofit corporate entity, which is headquartered in Murfreesboro, North Carolina, started with one leased station wagon and now operates fifteen vans and minibuses carrying more than 7,000 passengers per month. According to Cook (8), it is one of the premier rural transit systems in the United States, both in terms of services provided and efficiency of operation. He concludes by saying that the CADA has successfully developed, implemented, and operated a coordinated human services system in a rural area. It is characterized by efficient management and effective utilization of its vehicles and drivers, and has significantly increased the mobility of low income, elderly, and handicapped residents of the Choanoke area.

STUDY PROCEDURE

The conduct and documentation of this study are strongly influenced by the Urban Mass Transportation Administration's (UMTA) publication, the Handbook for Management Performance Audits (10). This publication outlines the purpose and anticipated benefits of a transit management audit. The Handbook outlines the functional areas within a transit system and describes the tasks involved in each area. Guidelines for the actual conduct of a management audit are presented in the UMTA report. Finally, the Handbook illustrates an excellent format for presenting the findings of the management audit.

A transit management audit typically has two objectives. First, the audit can usually identify possible methods for improving the effectiveness and efficiency of a transit system's operation. Second, management evaluations demonstrate how well public funds are administered (10). The evaluation of the ten Section 18 transportation providers also furnishes an extensive data base on rural transit systems in Texas.

The intent of the study is to audit all of the Texas Section 18 systems using the same evaluation technique and covering the same topics for each system. To this end, an intensive questionnaire has been constructed from materials extracted primarily from the UMTA Handbook and the Department of Transportation (DOT) Technology Sharing Division publications, Elderly and Handicapped Transportation Services - Planning and Coordination Manual (11) and Rural Passenger Transportation (12). The questionnaire has been used as a guideline for conducting interviews with the Section 18 system management. These personal interviews have been conducted between February and May of 1982 (see Table 6 for visitation schedule). The data upon which recommendations

Table 6. Schedule of Visitations to Section 18 Providers

Dates	System
February 3, 4	Community Council of Southwest Texas
February 10, 11	Lower Rio Grande Valley Development Council
February 17, 18	Freestone County Senior Supportive Services
February 24, 25	San Patricio Community Action Agency
March 11, 12	Capital Area Rural Transportation System
March 24, 25	Brazos Valley Transit
March 31	Texas State Technical Institute - Sweetwater
April 6	Central Plains Community Action Association
April 22	Bosque County Senior Service
May 5	Cleburne

are made are the direct results from these personal interviews and from the grant applications submitted by each Section 18 provider.

Questions concerning the local governing body, management and organization, scheduling and dispatching, maintenance, safety and training, purchasing, accounting and finance, planning and marketing, and personnel policies have been asked of the transit management personnel. The same topics have been covered in all ten of the rural transit management evaluations.

The objective of asking the same questions is not, however, to facilitate the direct comparison between transit systems but is to ascertain data on the same topics for all ten systems. The data analysis and subsequent recommendations are based on comparisons with established, widely accepted, transit management principles.

The format of this report follows the example presented in the UMTA Handbook. Many of the accepted management principles delineated in the Handbook are incorporated in this report's recommendations as they relate to the ten rural systems in Texas.

This study's intent is that the ten Section 18 transportation systems will be able to improve their operations based on the recommendations contained in this report. As federal funds for social programs continue to decrease and transportation operating subsidies become more scarce, the need for more efficient management will become imperative.

LOCAL GOVERNING BODY

Most public transportation systems report to some form of governing body. In urban areas this is typically a city transit department answering to a city council or to a regional transit authority with jurisdiction over multiple political units.

In Texas the rural public transportation providers answer to a range of governing bodies. Four systems are governed by the executive boards of community action agencies; one is directed by an executive board of a council of governments; two are ruled by special boards; one is guided by a board of regents; one is ruled by a county commissioners court and one is directed by a city council.

Regardless of the form each takes, governing bodies of public transportation systems have five basic tasks to perform. These are 1) to establish goals and objectives for the system, 2) to resolve major issues, 3) to obtain revenues for the system, 4) to intermediate between the community and the system, and 5) to evaluate management of the system (10).

Establishing goals for the public transportation system is a key responsibility of a governing body. Broad general goals provide management the guidance and criteria upon which management can make decisions. The objectives of the public transportation system should follow directly from the goals and should provide specific direction for management to achieve the goals.

Another important role the governing body plays is resolving major policy issues. These policies, like objectives, give direction to the daily management of the system. Major issues typically include labor relations, service efficiency standards, and service pricing.

A third key role is the governing body's acting as intermediary between the transportation system and the public. Effective communication ensures that the goals, objectives and policies meet the community's needs within its financial resources.

The governing body must also obtain the revenue necessary for the system to operate. They regulate fares and approve grant applications for federal and state funding assistance.

A fifth important role of the governing body is to evaluate management. This consists of comparing management's performance to the system's goals and objectives. To do this the governing body requires information which usually comes from two sources -- reports from management and financial audits conducted by independent audit firms. A third source of information is management performance evaluations which provide detailed, impartial information about management's performance (10).

Findings

To evaluate the performance of the ten rural public transportation governing boards in Texas, a consideration of the five tasks defined above as roles an effective governing body should perform is given.

The members of the governing bodies are generally composed of a combination of elected officials (city council, county commissioners) and appointed representatives. Six boards are composed of both elected and appointed officials. Three are composed entirely of elected officials and one consists entirely of appointed officials. The average board size is eleven members. They range from 4 to 21 members. In general the boards' major constraint is the lack of time each member has to devote to public transportation because of their other responsibilities.

Determining the Goals and Objectives

None of the ten governing bodies of the rural transit systems has established a usable set of goals and objectives for its respective system. Nine of the systems do have written goals. One does not. However, three of the systems' goals exist only as they are generally outlined in the grant applications for Section 18 funds. The five which do have approved goals have very generally worded goals. One common goal is to provide transportation to a target group in the population such as to the elderly, the handicapped, the poor and/or their client group. A second common goal is to enhance the access of the rural population to services like medical and nutrition/grocery facilities and to urban areas.

Although nothing is wrong with these goals, by themselves they say very little about the desired performance of rural public transportation systems and these goals do not give management clear direction.

Seven of the systems have written objectives; three do not. Commonly, the objectives center on providing access to a target group of the population, to maximize transportation provided per dollar spent and to coordinate public transportation services. As with the goals, the objectives are fine; however, they provide very little guidance for decision-making by the transit management. None of the objectives is concise, measurable or quantifiable. Also some of the objectives as written are difficult to distinguish from the general goals, and do, in fact, overlap.

Resolving Major Issues

In most cases the governing boards have not been involved in major issues. Because the transportation systems' employees do not belong to unions, the boards have not had to negotiate labor contracts. In only one instance do the

drivers belong to unions and that part of the service is subcontracted. Similarly, since none of the systems has a specified service standard, the governing bodies have not been involved in resolving this issue.

Intermediating

Because of the heavy involvement of public elected officials and elected and appointed citizens on the governing bodies, the board members as a whole are active representatives of the public on their respective boards. In all cases the boards feel it is their role to communicate with the public. Nine of the boards rely on personal contact with the public to obtain information on what type of service the public wants. Only in one instance does the transit manager feel that this role is part of the responsibility of the transit management.

However in three cases, the representation of the governing body does not coincide with the service area of the system. In two, the service area exceeds the representation of the political units represented on the governing body. In the third case the governing body covers a geographic area which exceeds the transit service area.

The boards' relationship with the public transportation system's management is clearly defined in a majority of the cases. In seven systems the governing body hires the executive director of the agency who in turn hires the manager of the transportation system. Two systems have a variation on this relationship. One system designates a particular board member to hire the transit manager and the other board hires the transit manager. In one case the relationship between the governing body and the transit management is not clearly defined nor is it readily understandable by the public or the transit manager.

Communication between the governing body and the transit management is accomplished in all cases by periodic meetings. One meets twice per month, five meet monthly, one meets every other month, two meet quarterly and one meets as needed.

Evaluating Management

Of all the roles assigned to the governing board, it is evaluating management which shows the greatest variation in procedure and occurrence throughout the ten systems. Currently two boards evaluate management's performance through a formal evaluation procedure. Six perform an informal evaluation with three boards tying this into the annual budget process, two boards using monthly financial reports and one board chairman holds weekly meetings with the transit manager. Two governing boards do not evaluate management's performance.

Obtaining Funds

The three sources of revenue for the rural transportation systems are 1) revenue from operations, 2) federal and state grants for both capital and operating assistance, and 3) local tax funds and revenue sharing appropriated by the local political subdivision. This last is a viable source because in all except one case the governing bodies contain elected officials which represent a political, taxing authority. This one exception has members appointed by the governor and confirmed by the Texas legislature. Thus, these members have political influence in appropriation matters.

The pattern of securing funding for each system generally is that the governing body directs the agency's executive director to identify sources and prepare the grant application for State and federal assistance. The

board then reviews the grant and petitions the governmental agencies for transportation revenue. This is the general procedure for six of the systems. In two systems the board assigns the duty of funding obtainer to the transit manager, in one the board exercises both funding identification and securement roles and in one the board chairman identifies and secures the funds.

While each of the governing bodies has done a good job in ensuring adequate funds for the systems to operate, only one system relies on the fare-box revenues for a significant portion of their operating expenses. Three systems charge fares, two of them doing so for the first time in the late spring of 1982. Seven offer the service free of charge.

Recommendations

It is recommended that the governing bodies of the rural transit systems oversee the development of a comprehensive set of goals and objectives for the respective systems. The bodies could charge the transit management with the responsibility for drafting these goals and objectives. The governing bodies should be involved in developing the broad goals. The governing bodies should review the entire set of goals and objectives and formally adopt them.

Each governing body should use the goals and objectives it adopts as tools to evaluate their system's management. It should require periodic written reports on management's progress toward achieving the objectives. The boards should integrate this reporting into a formal periodic evaluation of management.

Also it is recommended that the governing bodies initiate fares to offset partially the increasing operating expenses of transportation systems and the decreasing availability of funding from federal grant programs.

Related to the issue of fares is the establishment of specified service

standards. The governing boards should consider the establishment of service standards appropriate to the type of service each provides.

Each governing body should include representatives from their entire service area. Steps should be taken to ensure that the representatives of the political subdivisions on the governing body coincide with the geographic area served by the public transportation system.

MANAGEMENT AND ORGANIZATION

The management of a public transportation system has the responsibility of coordinating its functional areas to achieve the goals and objectives of the transit system. Because management is responsible for directing the system toward its goals and objectives, it is management upon which performance evaluations are focused.

Management's responsibility can be divided into five major tasks. These are to 1) establish goals and objectives, 2) attain goals and objectives, 3) structure the organization to achieve its aims, 4) monitor the performance of the system, and 5) ensure effective internal and external communication (10).

The local governing body's role in formulating system goals has already been discussed briefly. Because these public transit systems rely on public subsidies for their operation, the systems must account for its expenditures. Unlike private industry, these Section 18 transit systems cannot rely on profit as an effective performance measure. However, they can rely on another measure -- service. Goals and objectives have proven to be effective measures to show the public, the governing body and management how the service is being performed (10). Management has a duty to help establish its system's goals and objectives. Once formulated, management must ensure that these goals and objectives are obtained.

Public agencies often use techniques developed by private business to improve the efficiency and effectiveness of their operations. One such technique is management by objectives (MBO). The reasoning behind MBO and the development of goals and objectives is that it does not make sense to allocate resources to a project without first stating the desired results of

the project. Stressing results, MBO can be an effective tool for public transportation systems (10).

Goals are the broad targets of an organization and require several actions to achieve them. Objectives, taken together as a concerted action, are the tools necessary to achieve these goals.

Objectives should be clear, concise and unambiguous. They should be consistent with the organization's goals. To insure effectiveness, objectives must be measurable and must be attainable within a specific time period with a reasonable level of effort.

The system's management should make particular departments and individuals responsible for achieving each objective. The system must then establish procedures and practical methods for achieving the objectives (10).

Departmental objectives are subsets of the agency's objectives. Most transit systems already have an implicit set of objectives for each department or area. However, since they are not written, they are not thought of as objectives. The key in writing them is to make the objectives clear, concise, attainable and measureable.

When objectives are measureable, it forces management to pursue their attainment. Measureability forces management to exceed, meet, or fall short of the bench mark. Monthly reports on objectives attainment help keep the departments and management on top of their objectives. Written quarterly reports to the governing body reinforces this direction of effort.

The purpose of any organization is the coordination of efforts necessary to satisfy a set of goals and objectives. This coordination requires the creation of specific job descriptions and the definition of responsibilities and authority associated with each job. In order to insure that goals and objectives are met, an organizational chart of hierarchy is usually developed.

A hierarchy defines the chain of command and will facilitate both internal communication and control (10).

Two approaches to hierarchical structure exist. A "tall" hierarchy has many levels of positions and characteristically many supervisory positions. The supervisors usually have only a few subordinates to manage. This type of organizational structure relies heavily on vertical communication and decision making is done primarily by top personnel only. Organizations that participate in highly specialized activities and that have predictable relationships within the organization usually function better with a "tall" hierarchy (13).

A "flat" hierarchy, by contrast, has a broad base with few supervisory personnel. Such an organization is more decentralized and decision making is less autocratic. The control function in a "flat" organization tends to be done by one person or a small number of people. A flatter hierarchy usually works best when the organization's activities involve much uncertainty (13).

Management uses information it receives from each functional area to monitor the public transportation system's progress toward attaining its objectives. Management can use these reports to evaluate its direction and level of its efforts in various areas and to make modifications as necessary. To monitor this performance, management must have sound data and analysis collection procedures. These data must be linked to the system's objectives (10).

Sound management depends upon effective communication with the public, the governing body and staff. In-house communication will help ensure that objectives are clear and information and efforts are focused appropriately.

Management must maintain sound communication with its governing body to keep them informed about the system's operation. Similarly, the governing

body must ensure that management's direction and levels of effort are geared toward the board's goals.

Both management and the governing body must communicate with the public to inform them of the system's operation. In turn the community must be able to convey its needs and opinions about the system to both management and the governing body to ensure appropriate service is being delivered.

Findings

All ten of the rural transit systems have been evaluated against the five tasks defined as tasks that efficient transit managers perform. The findings follow.

Organizational Structure

The organizational structure for all ten systems is hierarchical and tends to be "flat" rather than "tall". A typical organizational chart for six of the providers has many drivers and only one supervisory person (see Figure 2). The drivers, the secretary, and the bookkeeper report directly to the transportation director. In some cases the transportation director has multiple duties such as scheduling, dispatching, and book-keeping in addition to managerial activities.

The remaining four systems have added some supervisory control in the form of center coordinators, who also act as dispatchers (see Figure 3). For these systems the center coordinators supervise the drivers' activities and report directly to the transportation director. This organizational structure is generally found in areas with large service areas. Quite often the center coordinators is the first level of personnel to deal with patron complaints. In all ten systems the transportation director reports to the governing body

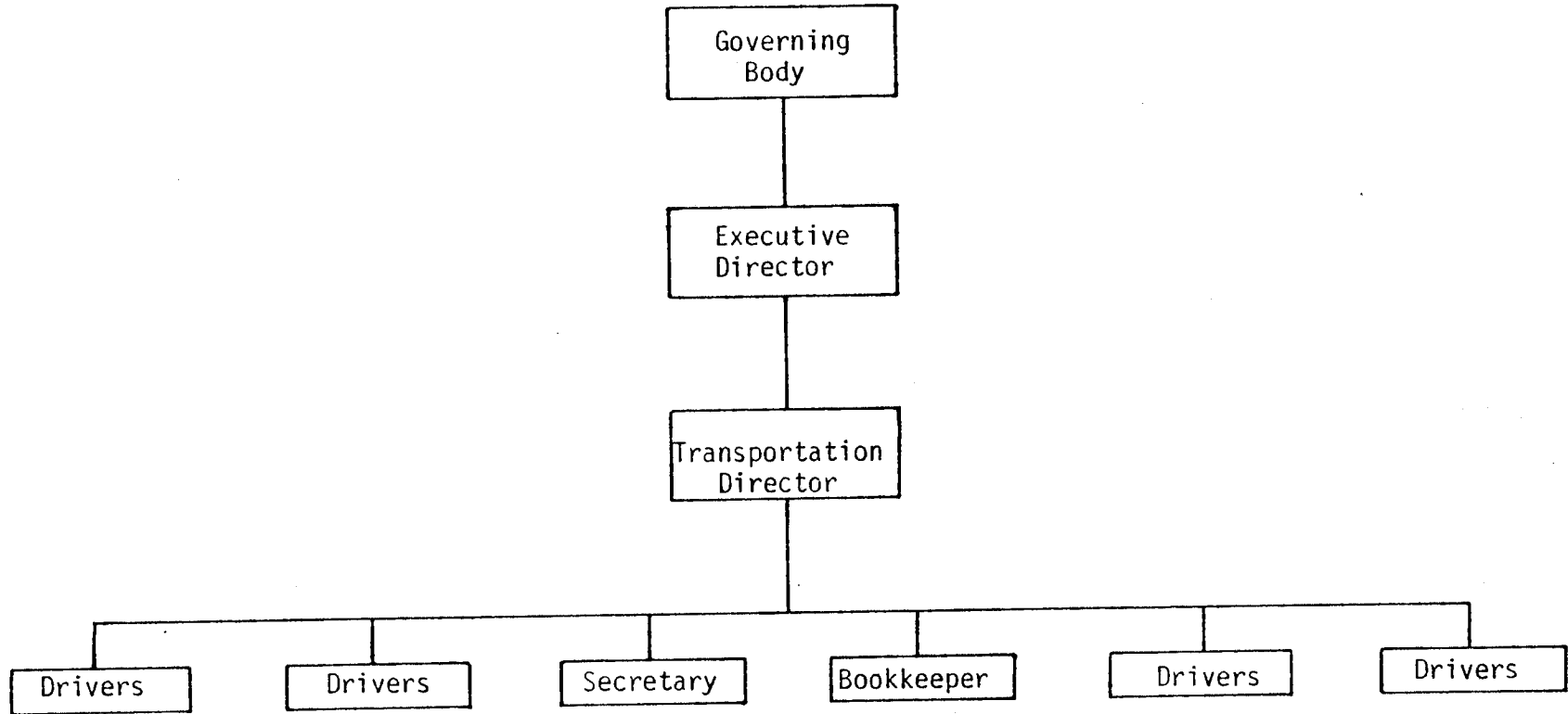


Figure 2. A Typical "Flat" Organizational Chart

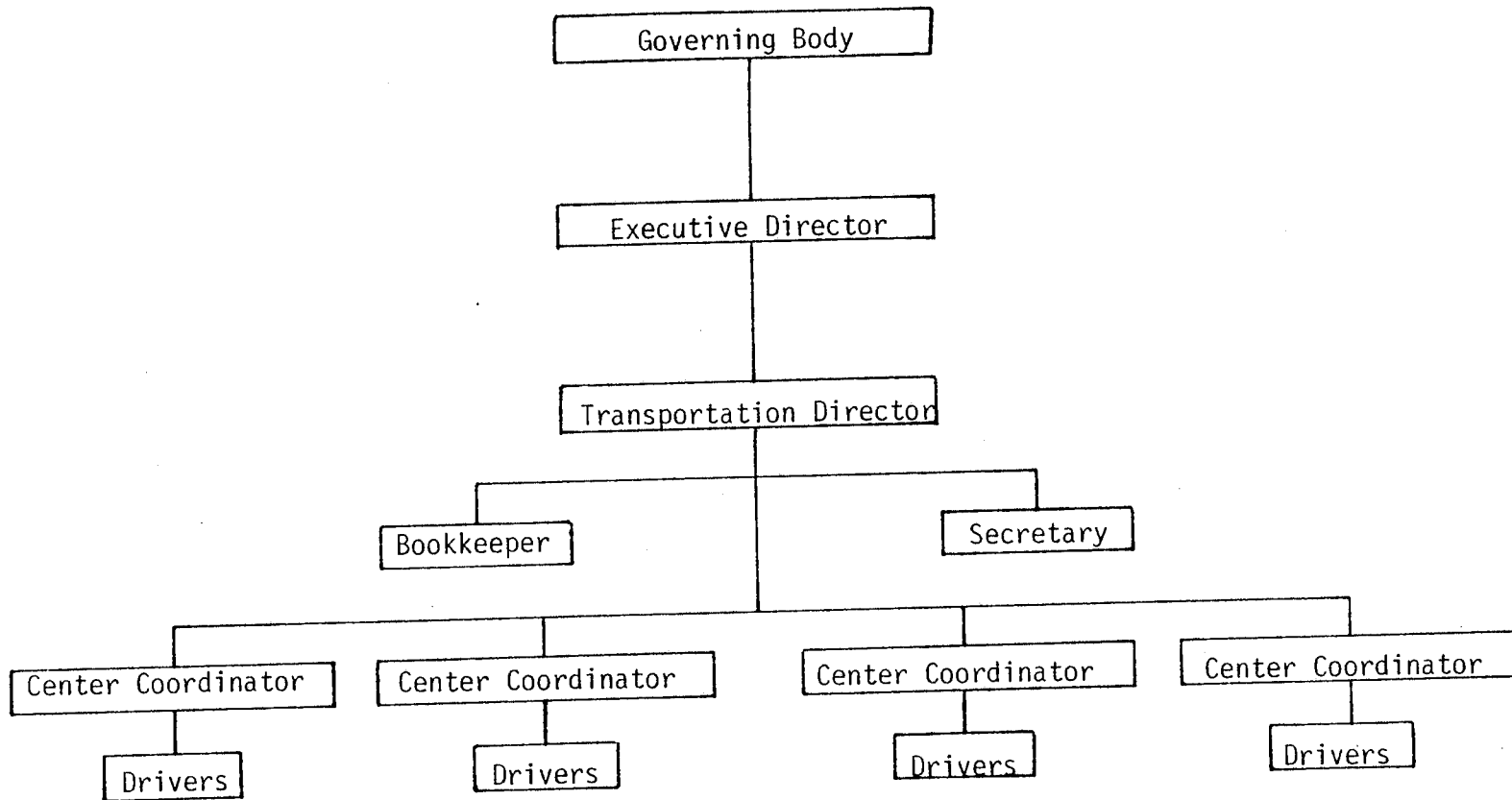


Figure 3. Organizational Chart with Additional Supervisory Personnel

and/or an executive director. The transportation director is responsible for the overall management of the transportation system. In the case of the very flat hierarchies, the transportation director does not have sufficient time to perform managerial and supervisory duties when day-to-day operational activities like scheduling, dispatching and attending to vehicle maintenance must be performed. The operational duties which tend to be very time consuming preempt the director's primary managerial role.

In four systems the manager of the transportation system has other non-transportation related duties to perform. Thus the time available to manage the system is very limited.

All ten of the Texas Section 18 providers have defined the following general positions in their hierarchies: transportation director, secretary, bookkeeper, scheduler/dispatcher, and drivers. Five of the systems employ center coordinators or operations managers who oversee part of the transportation service. Only one provider employs its own mechanics which are included in the transportation hierarchy. The average number of employees for each system is nine full-time employees, eight part-time employees and three volunteers. The payroll costs for these employees, as compared to the overall system's operating costs range between 35 and 72 percent of the operating cost for the ten Section 18 providers, with a mean of 58 percent. Thus, over half of the annual operating costs are for personnel costs, and this large expenditure requires good supervisory management.

Evaluation of Performance

To guarantee that reasonable progress is made toward satisfying the system's objectives and to maintain good internal control, management must review and evaluate the performance of the transit system. The review process

includes collecting daily and periodic information about the service being provided to the public and monitoring their employees as to the performance of their duties.

Six of the Section 18 providers monitor the performance of their employees and the performance of their system by maintaining daily and periodic log sheets. (See Appendix B for sample log sheets.) These logs are completed by drivers, schedulers and dispatchers. The data collected varies but typically includes origin/destination information; passenger counts, usually including passenger name; passenger classification; time of passenger pickup and/or passenger appointment time; and trip purpose. Summary information usually includes number of one-way passenger trips, vehicle mileage, fuel consumption, or other efficiency measures. The other rural transit systems collect some or all of the above information, but they do not use the data to evaluate system performance.

Half of the systems have measurable service standards for their drivers. Three standards define a specified number of minutes during which the driver will wait for a passenger to meet the vehicle for an appointed trip pickup. This ranges from 2 to 10 minutes. Three systems specify a time frame in which the pickup or destination is considered to be on time. This ranges from 5 to 30 minutes. One system specifies both a wait time and response time.

However, very little monitoring of actual service provision versus service standard is conducted. None of the standards is written; all of them exist implicitly. Part of the lack of monitoring is due to a lack of proper vehicle communication equipment. Part of it is due to a lack of time designated for this function.

Two-way radios provide an excellent opportunity to monitor driver performance. Three of the Section 18 providers have two-way radios in all of their vehicles and use the radios for demand-responsive dispatching and for monitoring their drivers. Two of the systems have radios in some but not all of their vehicles. Four providers have no radio equipment. One provider has radio equipment for their vehicles but the equipment is not in use.

Three rural transit systems rely solely on passenger complaints to monitor the quality of the service. Two systems evaluate their services on an ad hoc basis when developing the budgets for an entire agency in which transportation is but one component. This perfunctory evaluation allocates relative amounts of money to various programs, presumably with effective programs receiving more money.

Communications

Good internal communication can be achieved through the use of staff meetings, memos, and newsletters. Nine of the rural transit systems use regular staff meetings to facilitate in-house communication. Eight of the systems also use daily and periodic contact with staff members. Two systems use newsletters to supplement their internal communication. Only one system relies solely on periodic visits as its communication mechanism.

In order to ensure that the governing body is aware of the process and progress of its transit system, strong lines of communication between management and its board should exist. Management can transmit information on both operations and finances in the form of periodic written or oral reports. Three of the Section 18 providers submit formal annual reports to their boards. Two of these systems also prepare written progress reports for their board.

One provider uses written monthly reports to its governing body, with no annual report made. The remaining six systems make periodic oral reports to the governing bodies' meetings.

To round out the transit system's communication function, the system must stay in touch with the population that it serves. Of the ten Section 18 providers, seven feel that it is management's responsibility to communicate with the service area. A common source of contact with the public is the van driver.

However, the majority of the transportation directors feel it is their personal responsibility to be in frequent contact with the population they serve. These directors meet with various municipal, service, and community organizations for input on the demand for transportation services and solicit opinions on the quality of service provided by their system. Only one of the rural transit operators feels that their governing body should be the sole source of contact with the public and that management does not need to do this.

Recommendations

All ten rural public transportation providers should consider implementing a management by objectives approach in operating their systems. This will not only provide clear direction to each system but also give measureable benchmarks against which progress can be measured and resources allocated. Management should recommend these to the governing bodies, and based upon input, establish objectives for itself and its departments. After establishing objectives, management should assign priorities to the objectives and allocate appropriate resources to each.

Management should also initiate a system in which departments report monthly to management on their progress in meeting their individually assigned objectives. Management should assess these reports and modify activities and resource allocations as indicated by the reports.

Quarterly, management should report the system's progress in meeting its objectives and goals. The governing body can thus redirect resources as necessary.

Annually, management should review its goals and objectives and make modifications or suggest new ones as appropriate. Management should also submit these goals and objectives annually to the governing body for its input and formal adoption.

The organizational structures of the Section 18 providers that lack transportation coordinators' positions should be modified to include first-level supervisory positions. In many cases no additional employees will be necessary. Certain existing employees can be designated as coordinators or dispatchers to fill the supervisory void. These personnel would supervise and monitor the drivers' activities and would report directly to the transportation director. The addition of supervisory personnel would free the transportation director from operational duties and allow the director more time to attend to the managerial and planning activities of the transit system. Supervisory personnel would also increase the internal control of the system and would enhance the enforcement of quantifiable service standards.

As a part of their MBO program, management should establish written service standards. These should include a standard for what can be considered an "on-time" arrival for drivers as well as specify how long a driver should wait for a patron who has scheduled an appointment.

All vehicles should have two-way radios and drivers should be required to check in on an established schedule. Drivers should be required to adhere to these service standards. Two-way radios would provide the mechanism for tighter internal control and enforceability of service standards.

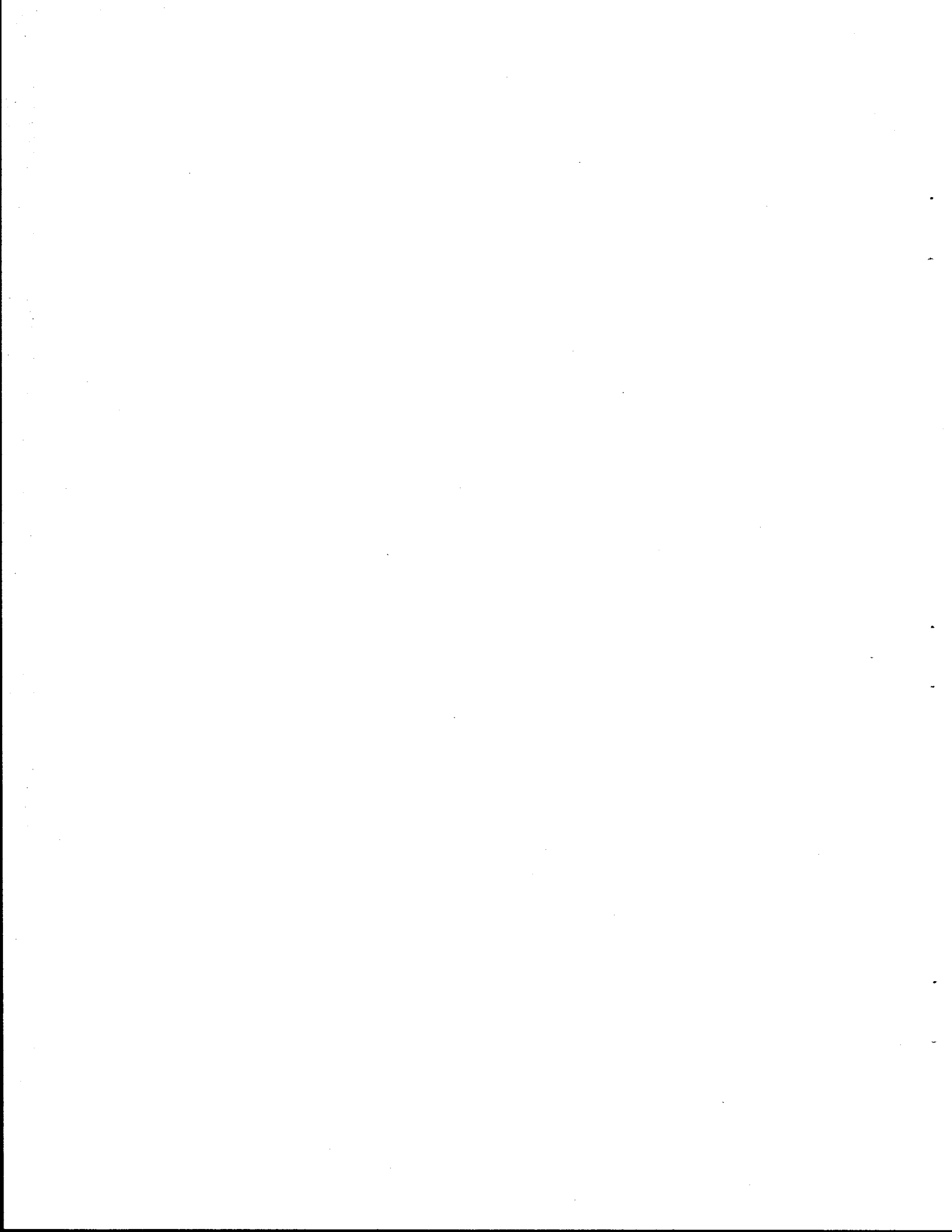
A great wealth of information is collected by most of the Section 18 providers. Unfortunately, a majority of the systems underutilize much of this information. In fact, the current underutilization may not justify the elaborate data collection process many of the systems now use. Management should establish a specific purpose for each item of information that is collected. This should be tied into the requirements of measurement determined by the objectives defined in the MBO process. The purpose of the data collected must be toward system evaluation and improved operations. Further recommendations on data inadequacies will be outlined in another section of this report.

Recognizing that most of the Section 18 providers use staff meetings to achieve internal communication, it is recommended that these meetings be used to conduct the management by objectives procedure. Progress on meeting the defined bench marks should serve as subject matter for these staff meetings. The holding of regular staff meetings should be continued. Those without these meetings should initiate them. To facilitate further daily communication and internal control, it is recommended that all systems install two-way radios in all of their vehicles. Radio communication can greatly improve demand responsive services and will be extremely helpful during emergency situations.

It is essential to the proper administration of a transit system that management keep its board informed as to the system's progress. It is recommended that management provide a written, quarterly report to its governing body that includes a summary of activities for the quarter, the amount of progress towards satisfying specific objectives, and the planned activities and progress for the following quarter. In addition, it is recommended that a formal, written, annual report be submitted to the board. Such an annual report should include a complete summary of the system's activities, a

financial and budgetary summary for the year, the identification of objectives that have been met and those still unsatisfied, and a detailed outline of the following year's activities and objectives.

It is encouraging that the majority of the rural transit managers take personal responsibility in contacting their service area population. However, too many providers rely strictly on customer complaints as their contact with the public. All of the transportation directors should take an active role in contacting agencies and organizations that would afford contact with citizen input and could attract potential riders. In doing this, management should coordinate its public relations efforts with its governing body so as to project the best image for the transit system.



TRANSPORTATION FUNCTION

The transportation function involves all aspects of scheduling, dispatching and actually running the transit vehicles. The reputation and ultimately the success of any transit operation depends on how reliable the transportation component of the system is on a daily basis. Consequently, the process of designing routes and schedules, dispatching vehicles, and monitoring daily operations must be oriented to providing prompt, courteous, and reliable service.

To ensure the proper orientation of operations, five essential tasks must be performed. These are: 1) designing the type of service to be provided by the system, 2) developing routes and schedules, 3) dispatching vehicles, 4) monitoring the transportation operations, and 5) handling emergency situations (10).

The types of transportation service that may be provided by rural transit systems include: fixed-route service, demand-responsive services, and a combination of fixed-route and demand-responsive service. Fixed-route systems provide limited transportation service between designated points on an established schedule. Demand-responsive service involves providing transportation for clients between various origins and destinations on an as needed basis. A demand-responsive system provides more flexible and inclusive transit service.

In deciding the scope and type of transit service to provide, the availability of taxi service within the service area should be assessed. Additionally, the use of third-party operators and contract transportation service should be evaluated.

As geographic boundaries and/or capacity constraints are practical necessities, capacity limits can be established by designating eligibility requirements for ridership. Eligibility may be in terms of geographic bounds, in terms of selected client groups, or in terms of both.

If fixed routes are to be established, routes should be designed to provide maximum accessibility to the traveling public at a minimum cost to the transit system. The location of routes should be based on either some form of demand estimation or previously collected origin and destination data or both. It is possible to integrate fixed routes with demand-responsive service. A fixed route may operate on a prearranged schedule but only when demand for the route exists.

Determining when and how often to provide fixed-route or demand-responsive service is the task assigned to scheduling. Good scheduling depends on establishing service standards in terms of headways for fixed-route and response time for demand-responsive systems. The number of hours or days of service should reflect the desire to maximize transit service within the constraints of cost, fleet size and condition, and geographic characteristics of the service area (10).

The dispatching of demand-responsive vehicles or replacement vehicles practically necessitate two-way radios for optimal operation. The dispatching function for demand-responsive systems usually involves receiving requests for transit service from clients and screening clients for eligibility. The peaking characteristics of demand-responsive systems are usually best known by the dispatchers. An effective method for maintaining or monitoring daily passenger counts is to require the dispatchers to keep this information.

In order to ensure that the best possible transportation service is

provided, transit systems must monitor their system's performance with respect to established schedules and standards. Monitoring may be accomplished by dispatchers checking on driver performance by two-way radio contact. Additionally, both drivers and dispatchers may be requested to maintain daily or other periodic log sheets that include passenger counts, origin/destination data, trip purpose, et cetera. At specified intervals, routes and schedules should be evaluated to determine their effectiveness. New routes and schedules should be designed as necessary.

Emergency situations can include mechanical breakdowns as well as accidents. Both situations usually require that a backup vehicle be dispatched. Prompt response to accidents and other emergency situations is greatly facilitated by two-way radios. Drivers who are adequately trained in emergency procedures improve the quality and safety of the transit service.

Findings

The ten Section 18 program participants in Texas were evaluated with respect to the five transportation function tasks. The findings follow.

Designing the Type of Service

Only one Section 18 system provides pure fixed-route service. One system offers fixed-route service during the peak periods and demand-responsive service during the off-peak hours. One system has established fixed routes; however, riders are asked to reserve their rides prior to departure times. A minimum load factor for completing a specific run is required by this system. Prior reservations by passengers facilitate the enforcement of the load factor standard. Four Section 18 systems offer demand-responsive service for local

trips and have established schedules for long-distance trips. Three systems offer demand-responsive service only. The usual time required to reserve a demand-responsive ride is 24 hours in advance of the trip time. Most systems are flexible about this time requirement.

Two rural transit systems subcontract their transportation services. Third-party operators are used by two other Section 18 providers for limited portions of their transit service. Six service areas have taxi service available as an alternative to the Section 18 systems.

Eligibility requirements for using the rural transit system varies. Four systems have residency requirements for eligibility. Three systems cater to client groups first and to the general public second in providing their demand-responsive service. Two systems have no eligibility requirements for their riders. The consortium of six subcontractors varies, with four subcontractors limiting their service by geographic area, and two subcontractors catering to client groups only.

Developing Routes and Schedules

The two systems that operate fixed-route service operate three and four routes respectively. One of these systems has only one a.m. and one p.m. run. The other system operates with 2 hour and 25 minute headways. The demand-responsive systems operate their service usually between 8:00 a.m. and 5:00 p.m., however, two systems begin service at 7:00 a.m. and one system extends service until 6:00 p.m.

Seven of the systems regularly review their schedules to determine if changes are necessary. Five of the Section 18 providers plan to expand their transit service. Two systems are considering establishing fixed routes to supplement their demand-responsive service. Three systems plan no changes

to their service and one system may decrease service if the demand is insufficient to justify the present service.

Several problems were cited as scheduling constraints by the Section 18 providers. Four systems stated that budgetary limits and/or fleet limitations hampered their scheduling efforts. The lack of two-way radios was cited by four systems as hindering both scheduling and dispatching. Three systems are hampered in their scheduling efforts to limit Section 18 services.

Dispatching Vehicles

For the nine systems that offer some form of demand responsive service the dispatching function includes the following duties: receive requests for trips, record information necessary to schedule trips, schedule trips, assign drivers, and dispatch vehicles. Four systems require that dispatchers screen riders for eligibility. For two systems the dispatcher maintains the passenger counts. The dispatchers for three systems directly supervise and monitor their drivers. The dispatchers for the fixed route systems supervise the replacement of vehicles when breakdowns or accidents occur.

Communication between dispatchers and drivers is accomplished by two-way radios by the four systems that have two-way radios. Driver telephone calls to dispatchers is the method used by five providers to maintain communication with their drivers. One system does not contact its driver during the hours of operation.

The peaking characteristics of the demand for transportation service varies considerably between the Section 18 providers. No real pattern exists for peak demand. Some systems experience very even demand throughout the day while others have definite a.m. and p.m. peaks.

Monitoring Transportation Operations

Five of the Section 18 providers have some form of service standards. Those systems that are demand-responsive have established a maximum time to wait for a client. One demand-responsive system specifies a response time standard. The fixed-route system has an "on time" arrival standard of ± 5 minutes. The remaining five systems have established no service standard for their transportation service.

None of the rural transportation systems in Texas monitor or collect information on the reliability of their service. That is, the percentage of "on time" arrivals is not kept. Additionally, only one system keeps a record of its deadhead mileage.

Only three systems have an organized procedure for monitoring their system's service and their drivers' performance. One system relies on its dispatchers to report to the director on system and driver performance on a daily basis. Reports are both written and oral. A "driver of the month" evaluation procedure is used to monitor one system with driver activities compared to established standards and the best performance rewarded.

The remaining seven systems rely on customer complaints, driver check ins, and ad hoc evaluations to monitor their systems. The person responsible for monitoring performance is usually the transportation director. Usually the director does not have sufficient time for detailed surveillance of the system on a daily basis.

The duties of the Section 18 drivers were fairly consistent throughout the ten Texas systems. Typically, driver duties include: driving vehicles and meeting established vehicle schedules; maintaining vehicle cleanliness; fueling vehicles and inspecting vehicles for maintenance problems; providing

passenger assistance; and completing driver and vehicle logs. Systems that charge fares also require drivers to collect money or passes.

Each of the ten rural transit systems requires its drivers and dispatchers to collect passenger and vehicle information on a regular basis. Those systems that provide demand responsive service collect at least the following data: passenger name, origin and destination of trip; and time of passenger appointment. Additionally, many systems collect passenger classification information, trip purpose, vehicle miles per trip, and total mileage. One system collects efficiency measurements such as miles per gallon and fuel per vehicle-mile. One of the fixed-route systems collects passenger-miles, vehicle-hours, route mileage, deadhead mileage, and seat-miles.

Recommendations

The type of service provided by each system must depend on the unique characteristics of their service area. The excellent mix of demand-responsive and fixed-route used by one provider could prove to be useful to other providers. This system has fixed routes but requires prior reservations by its riders for trips. Their operating costs are among the lowest in the state because they require a minimum number of passengers before making a run.

It is recommended that all Section 18 systems regularly review their routes and schedules. Demand changes and only regular evaluations will allow transit systems to respond to these changes promptly.

Seven systems do not use their dispatchers to coordinate and monitor their drivers, although the dispatcher is most suited to perform these tasks. As stated earlier in the text, all systems should have a full complement of two-way radios to facilitate dispatching, communication, and monitoring of service.

All Section 18 providers should establish service standards. The standards for demand-responsive service should include a maximum response time or, where distances are great, systems should estimate pickup times and expect drivers to arrive within a specified time span of the pickup times. All of the systems should record the percentage of vehicles that arrive on time. This percentage is a measure of the system's reliability.

Deadhead mileage should be recorded. Substantial cost reductions with minimal impact on service can be made by reducing deadhead mileage.

Passenger-miles should be collected. Accurate cost accounting may be facilitated when passenger-miles are known.

All of the rural transit systems should establish organized monitoring procedures. Simply relying on customer complaints for feedback on system and driver performance does not maximize the transit system's reliability or favorable public image.

DATA NEEDS

The primary purpose of any data collection effort by a transit system is to accumulate information on system performance with the intent of adjusting, revising, or otherwise fine-tuning the transit service within specified cost constraints. Data collection is typically expensive and time consuming. Therefore, the purpose for which the information will be used should be the guideline for the type and amount of data to collect. The magnitude of any data collection effort should be measured in terms of the increased system efficiency and/or the decreased system cost that is expected from changes resulting from the data analysis. The expected benefits from the data collection effort must be congruous with the cost of collecting and analyzing the information.

Findings

The ten Section 18 providers in Texas collect a tremendous amount of information about their patrons and their transit systems. Eight of the systems collect on a daily basis the following information: passenger origin and destination data; passenger names (passenger count); classification of riders; passenger pick up or appointment time; and vehicle mileage. Seven of the systems also collect trip purpose. Unfortunately, only one system records passenger trips in terms of one-way trips. For example, a trip from home to the doctor's office is categorized a medical trip. However, the return trip from the doctor's office to home is also considered a medical trip. Technically, the return trip is a home trip.

Four of the rural transit systems monitor their systems by summarizing expense and revenue information. Two systems gather efficiency measures such

as miles per gallon, miles per vehicle trip, fuel cost per mile, and maintenance cost per mile.

Only one system collects trip miles, passenger-trips, deadhead miles, seat-miles, passenger-miles, and vehicle-hours. This is the system which subcontracts service with a private intercity transit system. Another system that provides demand-responsive service records passenger "no shows."

Five of the Section 18 providers use their data to report to their boards and funding agencies. Reporting purposes is the only use for data collected by one of these systems. Three systems use the information to adjust and revise routes and schedules. Another four systems simply monitor their service by reviewing the data collected. These systems give no indication that the monitoring results in revisions of service. Three systems use the data collected to monitor the cost of their transit services. One system uses the data as a tool for evaluating employees.

Recommendations

As stated earlier, a great wealth of information about the rural transit systems of Texas is collected. Unfortunately, much of the data is under-utilized.

Data that should be collected by all rural transit system includes: passenger counts; one-way passenger-trips; passenger-miles; deadhead miles and hours; and percentage of "on time" arrivals. Demand-responsive systems usually can collect origin and destination information, trip purpose, and pickup time fairly easily on a daily basis. Fixed-route systems should conduct on-board surveys periodically to obtain origin and destination information and trip purpose information.

Each piece of information collected has a specific purpose. Daily

passenger counts can be used to monitor demand, evaluate marketing programs, evaluate and adjust existing routes and schedules, and determine the need for increasing or decreasing service. The combination of one-way passenger-trips, passenger-miles and deadhead-miles can be used in calculating cost accounting statistics. Actual cost per passenger-trip or per passenger-mile can be valuable information when establishing a fare structure or when charging agencies for contract transportation services. Additionally, average trip length can only be calculated if passenger-trips and passenger-miles are known. Average trip length and cost per passenger-mile are necessary to calculate accurately the cost of providing the transportation service. Comparisons of system costs to taxi services or third-party operator services are more representative if cost per passenger-mile is known. The decision to use or not use third-party operators should be based on these comparisons.

The ratio of deadhead to total vehicle miles is an important efficiency measure. Deadhead-miles are defined as any distance travelled without passengers. Reductions in deadhead-mileage and hours can produce significant reductions in overall transit cost. The knowledge of the amount and distribution of deadhead mileage can serve as a basis for restructuring routes and schedules to decrease wasted miles and time. Demand-responsive systems can decrease deadhead mileage by dispatching their vehicles from different locations and by constructing more efficient demand-responsive runs.

The percentage of "on time" arrivals is one of the best measures of a transit system's reliability. Reliability tells the transit system's patrons that the bus or van will be at a given place at a given time. Reliability means that riders arrive at work or the doctor's office on time. If the percentage of "on time" arrivals is low, patronage will decrease. Conversely,

a high percentage of "on time" arrivals is one of the best marketing tools a public transportation system can have.

The reasons for low "on time" arrivals can vary. Routes may be too long to complete within the established schedule. Drivers may not be allotted sufficient time during their tours to attend to personal needs, and therefore do not remain on schedule. Conversely, the system may employ drivers who do not attempt to meet their schedules. Geographic conditions like poor roads, low water crossings, or railroad crossings and traffic congestion during peak periods may also contribute to low "on time" arrival percentages. Revisions to existing routes, schedules, and personnel policies can be made in order to increase the percentage of "on time" arrivals.

Passenger origin and destination information and the peaking characteristics of demand are important factors in the design of routes and schedules. Systems that currently do not operate fixed routes can use this information as a base for constructing fixed routes which are generally less expensive to operate. Demand distribution and trip purposes can be used to establish when and how often to offer transit service.

Fixed-route systems need to evaluate their routes and schedules periodically. On-board surveys that include questions about origins and destinations, trip purposes, reasons for using the transit service, and likes and dislikes about the transit service can be extremely valuable in maintaining high ridership figures. If the surveys so indicate, routes and schedules can be revised to meet more accurately the demands of the transit riders.

MAINTENANCE

A public transportation system's service is only as good as its maintenance program. This program is more than the upkeep of vehicles. It is also a marketing tool. For example, regular preventative maintenance reduces breakdowns and thereby minimizes service delays and passenger inconvenience (10). Similarly, clean vehicles look good and make service attractive.

The maintenance function should be organized so that it reduces costs, attracts riders and increases safety. Inefficient preventative maintenance can increase repair costs, necessitate vehicle purchases before the useful life of the vehicle is reached, decrease revenue from fares because of ridership losses caused by unnecessary breakdowns and service delays, and contribute to accidents.

The public transportation's maintenance functions have three tasks. These are 1) maintaining vehicles and equipment, 2) performing preventative maintenance, and 3) maintaining records.

Public transportation systems must care for their equipment properly to promote its longevity (10). This includes checks for fuel and other fluid levels, tire air pressure, vehicle cleanliness, etc. The implementation of this task can be measured not only by an analysis of the inspection procedures used but also by the actual on-road vehicle breakdown experience by the transportation providers.

Preventative maintenance is the regular upkeep of vehicles and equipment that helps avoid breakdowns and potential service disruptions. A sound program should provide for regular vehicle inspections, periodic servicings and replacement of parts, as necessary. A good program should also include frequent communication between drivers and maintenance personnel. Because

drivers may discover small problems which may develop into serious mechanical problems, it is essential that each public transportation system have a way for drivers to communicate mechanical problems to maintenance personnel (10).

Proper maintenance requires extensive record keeping on the amount of fuel and fluids each bus consumes. Records on the amount of time and vehicle-miles that elapse between specific preventative maintenance actions must also be maintained.

Findings

In evaluating the performance of the ten rural public transportation systems a consideration of the three tasks defined above as roles efficient maintenance function fulfill follows.

Maintaining Vehicles and Equipment

Three of the transit systems have their own facilities for vehicle maintenance. Six properties rely on private or other quasi-public facilities to maintain their vehicles. One subcontracts this function to a private transit property. Of the six that use private or quasi-public facilities, four use private service stations, one uses the vocational program of a community college and one, a consortium of six subcontractors, uses a combination of private service facilities and county public works yards for maintenance.

Six of the rural public transportation providers rely on private filling stations for their fuel. Three use both their own fuel facilities as well as private service stations for fuel. One provider subcontracts all vehicle operations to a private transit company. One of the systems which has its own fuel facilities purchases propane fuel from a private company.

Two of this system's three vehicles use propane fuel in addition to its regular gasoline fuel.

Six of the transportation providers check fluid levels daily. The other four providers perform this function on a varied schedule--two at the time of the fuel fill-up, one at the oil change and one periodically.

Four systems make their inspections first thing in the morning. Four systems inspect the vehicles at the time of the fuel fill up. Two systems inspect their vehicles on a varied schedule, based upon their vehicles locations.

The comprehensiveness of the inspection varies by providers. All ten systems check fluid levels and tire pressure. Five check for vehicle cleanliness. Three check the windshield and mirrors. Two systems include horn operations, lights, safety equipment, brakes and engine operation in their inspections. The other items covered by one system include insurance papers, wheelchair lifts, belts, fuses, heater/air conditioners, clutches, windshield wipers, hoses, batteries and radios.

While the thoroughness of their daily inspection vary considerably, the incidence of road calls is generally infrequent for all ten providers. Two systems average two road calls per month, one averages one per month, one averages a call every two months, two have one per quarter, one has one every four months, one has one every six months, one averages one per year and one system has not experienced a breakdown on the road. The experience of the consortium varies with two subcontractors averaging one per month, one having one road call per quarter, two experiencing none and one not answering. The average on-road vehicle breakdown is nearly nine times per year.

The responsibility of who dispatches a replacement vehicle when an on-road vehicle breakdown occurs is well-defined for all ten providers. Six assign this responsibility to the program manager. One system assigns this job to

the operations manager and one to the center coordinator, both of whom answer to the program manager. Two providers leave this responsibility to their subcontractors.

Like vehicle inspection, the schedules for vehicle cleaning also vary. Unlike in urban areas, nearly all of the rural public transportation systems rely on their drivers for this task. Either through their own work or by arranging with a private facility, drivers in nine of the ten providers assume the responsibility for vehicle cleaning. In one program, the program manager oversees this task. Four of the systems clean their vehicles weekly; four clean theirs every two weeks and one does this monthly. Of the six subcontractors in the consortium, two clean their vehicles weekly and four do this as needed.

Interestingly, six of the transit systems report having no particular maintenance problems with a piece of equipment or part of a vehicle. Of the four providers mentioning maintenance problems, none of the four complaints is the same. One reports steering problems, one reports radio communication problems; for one it is the wheelchair lift, and for one it is air conditioning.

Preventative Maintenance

Preventative maintenance the second major task, is performed to some degree by eight of the systems. One system has no preventative maintenance. Four of the subcontractors in the consortium have preventative maintenance programs; two do not.

For those systems with preventative maintenance programs, all eight have periodic oil changes. The remaining preventative maintenance varies: four cover spark plug, air and oil filter and transmission filter changes. The remaining items like fuses, u-joints, cooling system, points, PCV valve, tires

and brakes are reported to be covered by at most, three of the providers.

Record Keeping

The third major task of maintenance is record keeping. Nine of the providers require their drivers to report (monthly or daily) on fuel consumption and vehicle mileage. One system has a daily written procedure in which the driver can report daily service needs to maintenance. One system provides for this written input on a monthly form. One system reports vehicle hours of usage; the remaining nine systems do not.

Records are kept on a per vehicle basis for nine of the systems. One system keeps records by the month the work is performed, rather than on a per vehicle basis. Eight of the providers keep the records at the public transportation manager's office. One system which has its own service center, maintains its records at the maintenance center. Of the six member consortium, five keep the records at their individual offices; one does not keep maintenance records.

Recommendations

While the maintenance facilities each of the ten public transportation systems use vary, each facility appears to be an appropriate choice for maintenance. Those properties located near a vocational program at a community college may want to investigate using their facilities and students for routine maintenance.

Regardless of the type of facility that is used for maintenance, each provider should have a daily checklist of items to be inspected. This should include fuel and fluid levels, tire air pressure, battery, lights, brakes, windshield wipers, horn, mirrors, emergency equipment, air conditioner and/or heater/defroster and wheelchair lift. A sample checklist is shown in Appendix B.

The ten rural transit systems appear to be doing a good job in obtaining sources for fuel. Nine systems use private service stations or a combination of their own pumps and private stations. A line of credit should be established between the fuel station and service provider so that drivers do not have to purchase fuel from their own resources and then be reimbursed by the agency. Each system should schedule fuel fill ups at a designated time, either the first thing in the morning or at the end of the day. Midday breaks for fill ups could disrupt efficient vehicle scheduling.

The nine transportation systems using gasoline and/or diesel-powered vehicles may consider converting their vehicles to propane fuel. The one provider which uses propane reports that, using two 19-person capacity minibuses and traveling an average of 4,000 miles per month, the L.P. conversion would pay for itself in nine months. (This is based on regular gasoline costing \$1.14 per gallon versus \$.68 per gallon of liquid propane.)

Since the cleanliness of vehicles is a valuable marketing tool for increasing ridership, each rural system should adopt a schedule for vehicle interior and exterior cleaning. Each system should consider adopting a daily interior cleaning procedure and a weekly exterior washing schedule.

All the public transportation systems should consider adopting a comprehensive preventative maintenance program. Items to be covered should include, as a minimum, periodic changes of all fluid levels including transmission, u-joints, shock absorbers, air pollution control devices, filters, brakes, tires, hoses, batteries, and belts and other items as specified by the manufacturer. An example of a preventative maintenance log is in Appendix B.

Comprehensive record keeping on the routine and preventative maintenance should be developed. A maintenance schedule for each vehicle should be kept

to include the date of service, mileage, type of service, location of service provision and date of next service. Thus historical records on vehicle service will be established and should be maintained at the managements' central offices.

Defect reporting procedures should be developed by each system's management. Drivers should be required to report mechanical problems in writing to management on a daily basis. A sample of such a daily report form is shown in Appendix B.



PURCHASING

Rural transit systems, because of their small size, usually do not delegate purchasing duties to a separate department. The purchasing function revolves primarily around the acquisition of new vehicles and the maintenance of the vehicle fleet. Because of public nature of the funding for the Texas rural transit systems, it is essential that proper policies and procedures for purchasing be developed and adhered to at all times.

The purchasing role of a rural transit system involves two tasks:

1) maintaining an appropriate inventory for the system, and 2) defining and carrying out the purchasing procedure for the system.

If a rural transit system maintains an active inventory, the inventory usually consists of replacement parts used by the maintenance personnel. Day-to-day conduct of this inventory system is delegated to maintenance personnel. However, the transportation director or his immediate subordinate may administer the overall inventory and reordering process.

The purchasing policies and procedures of a rural transit system should be designed to afford the maximum accountability to the public, because the system uses taxpayer's dollars. These policies should be written and should clarify the dollar amounts that require approval and competitive bidding. The authority to purchase or make decisions on accepting bids should be clearly defined in writing (10).

Findings

All ten of the rural transit systems have been evaluated with respect to the two tasks defined as proper roles of the purchasing function. The findings follow.

Maintaining Inventory

Only one of the Texas Section 18 providers owns and operates a maintenance facility. Consequently, this system is the only one to have a policy for maintaining an inventory of parts and equipment. The operations manager is responsible for determining the site and content of the system's inventory. The system keeps good stock records and every item that is used is recorded and subtracted from the inventory. All items are inventoried quarterly in order to verify their records. One problem that this system has encountered is the lack of adequate storage space. The system is presently leading additional space and intend to purchase a new maintenance facility with more storage space.

One other Section 18 system maintains a limited inventory of vehicle tires. The provider who subcontracts the entire transit operation relies on the contractor to maintain an appropriate inventory. All other systems use private garages or other local facilities for maintenance and have no need to maintain an inventory of parts.

Purchasing Procedure

All ten of the Texas Section 18 providers have a defined purchasing procedure. Some procedures are more rigorous than others. In general, the procedures follow the chain of command with lower echelon personnel authorized to make minor purchases and higher echelon personnel purchasing more substantial items. The dollar amounts that require prior approval vary from system to system. One system requires all purchases to be approved by the ranking supervisor. Another provider does not have a specified dollar amount but does discuss large purchases with their top personnel. The other systems' procedures vary from over \$50 to over \$250 purchases that need approval. Usually, drivers are

permitted to purchase fuel. Other items are purchased by supervisory personnel or the transportation director.

The consortium handles purchasing differently than the other nine systems. Each subcontractor is allotted an annual budget for purchasing equipment. If their needs exceed their budget, the executive director for the consortium administers the overruns.

Because the Section 18 program is administered by an agency of the State of Texas, all purchases are documented using the State of Texas Form 132. This form provides adequate purchasing records and all Section 18 providers use this form.

Recommendations

The one system that maintains an inventory uses sound inventory procedures. It keeps good records and verifies its records with periodic inventory. Other systems should pattern their inventory procedures accordingly should they need to store materials or parts.

Purchasing procedures and policies should be clearly defined and preferably written. These policies should include specific dollar amounts of purchases that must be approved and the person or persons who must approve purchases. Strict purchasing procedures and good purchasing records make accountability to funding sources easier.



FINANCE AND ACCOUNTING

Finance and accounting are separate yet closely related functions. Finance deals with planning to secure the resources needed to meet organizational goals and objectives. Accounting supplements the finance function by providing information about how the organization is using its financial resources. Information from accounting helps management to oversee operations and to evaluate progress toward meeting goals and objectives (10).

The functions of finance and accounting of public transportation systems are similar to those of private business except for one thing - public subsidies. Because few transit systems recover all their operating and capital costs from fare box revenue, public subsidies are used. These include grants from public sources - federal, state and local (10).

The ten rural public transportation systems in Texas have finance and accounting functions which cover four tasks. These include 1) budgeting, 2) accounting for revenues, 3) monitoring expenditures and 4) complying with reporting requirements.

A budget is the basic financial plan of any organization. It translates the organization's goals and objectives into fiscal terms. As a public system, transit systems must be able to justify their expenditures. Using the budget, management can monitor both the internal efficiency of resource allocations and the external effectiveness of such allocations (10). The last is usually measured by ridership.

Accounting for revenue includes tabulating the receipts and fares collected. It also covers sound revenue collection methods and internal control over revenues received.

Monitoring expenditures means keeping track of funds spent based on an

annual budget. It also means management should be able to determine its expenditures to date as well as the percentage of the annual allocation that has been spent by line item.

Finally, accounting and finance include fulfilling the reporting requirements established by the funding source(s). In the case of the Section 18 program, the state requires a quarterly report to be filed. Information on the report includes passenger trips, vehicle operations, system revenues, system expenses and comments.

Findings

The ten rural public transportation systems will be evaluated based on the four tasks described as roles to be filled by the finance and accounting functions.

Budgeting

All ten of the rural transit systems have annual operating budgets. The annual budgeting process is well-defined and understood by the transportation manager in almost all cases. Three of the systems follow the general procedure of budget development from the lower to upper levels of the organizational hierarchy. In this process the transit manager develops the budget for the executive director who submits it to the governing body for adoption. Three of the other systems follow the procedure using a circular flow in the organizational structure. In this the executive director develops the budget, submits it to the transit manager for input, revises it and submits it to the governing board for approval. Two transit providers have a more direct budgeting procedure. In this the transit manager submits the budget directly to the governing board or its chairman for approval. In one system another

department, the finance office, establishes the budgeting level. Then the transit manager develops the line item budget and submits it to the executive director who submits it to the governing body for approval. In the consortium, the individual subcontractors develop individual budgets and submit them to the central administration for compilation and submittal to the governing body. They in turn approve the budget.

As a function of the budgeting process, half of the systems' executive directors initiate the budgeting procedures. In the other half the transit managers initiate the process.

Nine of the systems' budgets receive a preliminary review. Five of the systems' executive directors perform the review. The governing body reviews the preliminary budget in one system and the board's chairman performs the review in one system. In the consortium, the central bookkeeper reviews the preliminary budget. Officers of the school system review the preliminary budget in one system.

All ten of the systems' budgets must receive approval by the funding source - the State. Six require comment by the A-05 review agency. Nine systems require formal approval and/or adoption by their governing boards. One requires approval by the State Legislative Budget Board, the Texas House of Representatives, Texas Senate and Texas Governor.

Accounting for Revenue

Although three systems have fare structures, only two systems actually charge fares. Seven systems do not charge fares for rides. The two systems which actively charge fares have dissimilar fare collection procedures. Drivers accept exact fares in one system. In another system drivers make change. One system which covers seven counties requires drivers to keep a locked fare box on board and each driver must note any fare charges on his/her pick up

sheet. Fares charged on this system vary. Daily the drivers tally the receipts and deposit them in a designated bank.

Another system which operates in the city limits requires to charge all riders one fare or show a monthly pass. While having both fare boxes and coin changers, drivers do not use them. Instead they use bank deposit bags. Daily, the drivers turn the receipts over to the finance department. This department deposits the receipts each day.

Monitoring Expenditures

Five of the systems have an accounting system which provides for monthly bill paying. Four systems pay invoices as they are received. One system pays invoices on a weekly basis.

In all ten cases, accounting reports expenditures on a monthly basis to the transit manager. However, only in four of the systems does this report include year-to-date expenditures, percentage spent to-date and/or unexpended funds on a line item basis.

Two systems use a computer to report financial information. One uses an in-house computer; one purchases this service from a private accounting firm. Eight of the systems perform their accounting functions by manual methods.

Eight of the systems have annual audits of their systems. One has an audit every two years. One does not have established auditing procedures but plans to initiate one this year. The eight annual audits are performed by outside independent auditing firms. One system uses state auditors for their biennial audit. Seven of the systems have had audits performed by their funding sources. These are usually auditors from the Department of Human Resources or the State Department of Highways and Public Transportation.

Complying with Reporting Requirements

The State Department of Highways and Public Transportation initiated reporting requirements for the Section 18 Program recipients in September 1982. Nine of the ten transit systems have reported for the second quarter 1982. One has not transmitted the second quarter report but did complete the first quarter report. A copy of the State's reporting form is in Appendix C.

All ten systems report passenger data, revenue and expenditure data and write comments as appropriate. However, one system fails to include the passengers that ride the demand-responsive part of the system in the quarterly report.

Most of the systems have difficulty in calculating vehicle hours of usage that are required on the report. One system maintains vehicle hour information; nine do not.

Recommendations

The adoption of an annual budget by the governing bodies of the systems should continue. The budget development procedures appear appropriate for the systems. However, where the service is subcontracted, the budgeting should initiate from the executive director down to the subcontractors rather than from the subcontractors up.

As the funding for federal and state operating grants grows increasingly scarce, the annual budgeting procedure should be expanded to include some form of financial forecasting. This financial forecasting, which is required on an annual basis for urban transit systems receiving federal transit operating and capital assistance, should include the identification of alternative funding sources. This type of budgeting procedure would provide for cost-efficient operating and capital plans by the transit properties.

Fare collection and control procedures should be modified in both systems collecting fares. Locked fare boxes should be used to minimize theft risks. Coin changers, if change is to be made, should be used also to minimize theft and counting errors. Drivers should place the locked fare boxes in a secure location, such as a vault, in the evenings. The following morning, a clerk in a finance department of service center should open the fare box and count the revenue and check it against the passenger count. This clerk should be responsible for depositing the fares at the bank each day. The central office's finance/accounting personnel should be provided the deposit slip and revenue information on a daily or weekly basis depending upon the size of the service area.

The eight systems that have no fare schedule established or which do not actively charge fares should initiate one in the near future.

The monthly accounting reports of expenses to the transit management should continue. Consideration should be given to computerizing the accounting functions of the eight systems which presently use manual methods.

The six systems which do not report year-to-date expenses, percentage of each line item expended, and unexpended line item balance should consider reporting this information. This information could assist management in making performance reports to the governing bodies and in maintaining operations within the established budget.

The auditing schedules of each of the nine systems is good. The system without an active audit policy should implement an annual audit for its own operation and for its six subcontractors.

The transit systems should continue to gather data to fulfill reporting requirements. The nine systems which do not collect data on vehicle hours of

operation should initiate data collection procedures. All passengers carried on the vehicles should be reported on the quarterly report.



PLANNING

Planning is a systematic process whereby steps are taken to secure an end result. In transit, planning would include developing service geared toward meeting the transportation needs of the community. To achieve this, the public's needs would have to be defined, alternative service provisions evaluated, and a preferred alternative selected and implemented.

The rural transportation systems' planning functions can be divided into 1) planning and 2) research. Planning can be more specifically defined as the activity which defines and orders a series of steps necessary to accomplish a specific result.

Research covers two areas: operational research and marketing research. The former is conducted to assist management in evaluating the effectiveness of the system's operations, i.e., its schedules, routes, etc. The latter delves into the market the system serves. Data include demographic characteristics of users and non-users, trip purposes of both groups, major passenger generators and passengers' origins and destinations (10).

Findings

The ten rural public transportation systems in Texas have been evaluated with respect to the planning functions defined above.

Planning

Nine of the systems conduct their planning functions using in-house resources. One system, the central office of the consortium, does not claim to perform planning functions for its system. Three systems supplement their in-house capabilities with the services of a consultant. Four receive

assistance from the regional council of governments. One reports assistance from its funding source and one receives help from the staff of a city government.

Research

All nine systems rely heavily on the data collected by scheduling and dispatching for their planning data. Two systems augment these data with surveys.

Seven systems do not avail themselves of secondary data sources. Three systems use demographic and economic data from secondary sources. Two of these also use housing data.

Three of the systems actually use their operational data to restructure routes and schedules based on trip patterns and levels. The six remaining systems rely on the data for reporting requirements. One also uses the data as part of its employee evaluation measures.

While nine of the systems use scheduling information as a primary data source, three of these systems actually use these data and supplement it with economic and demographic data to define their markets. One system uses college students to conduct marketing surveys, one of which was developed to establish shopping trip patterns in its service area.

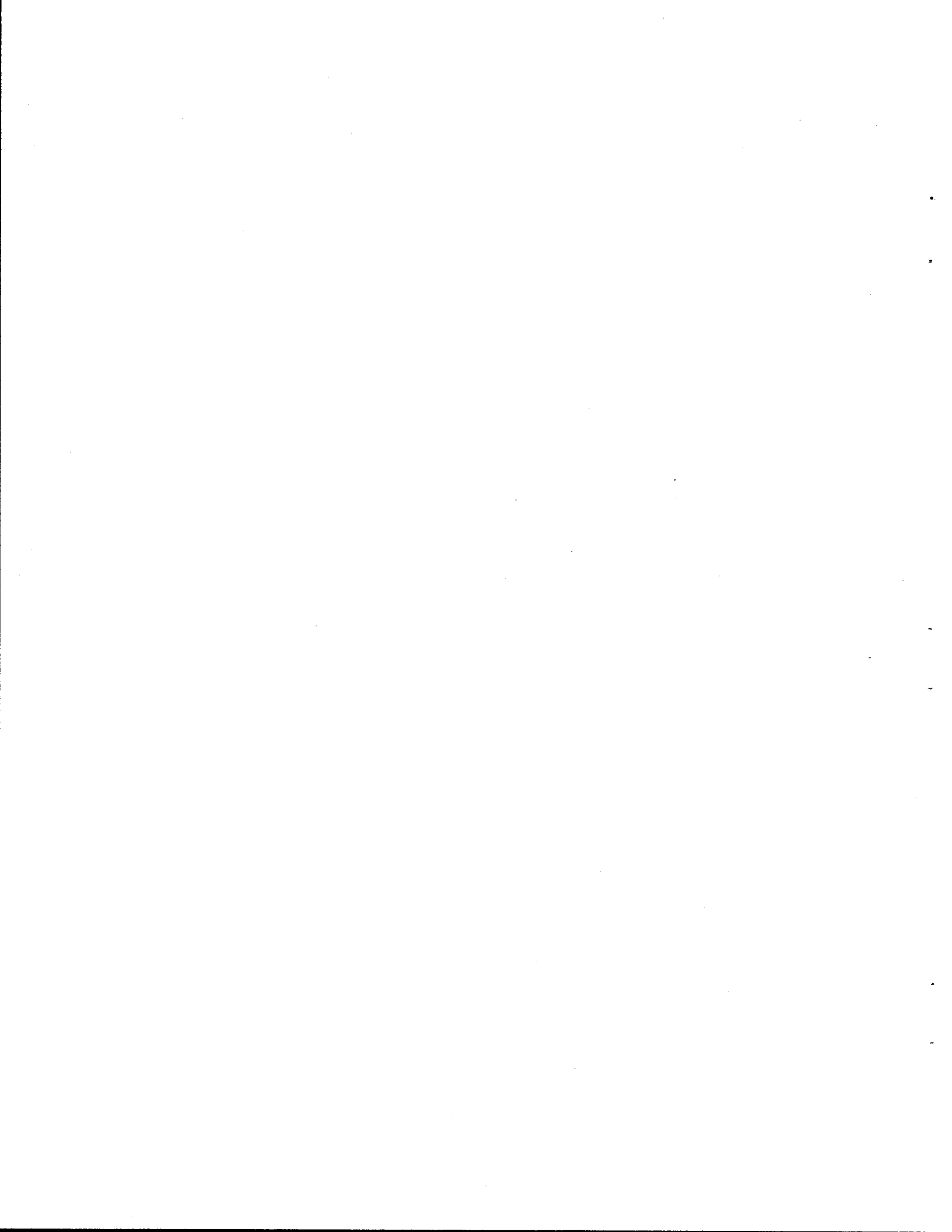
Recommendations

All ten systems should continue to collect scheduling and dispatching data for planning purposes. Not only does this source provide operational research information but also market research data. The central office of the consortium should conduct planning functions for its system.

For systems not receiving planning assistance from their council of governments, the systems may request this help. Specifically the COG's could provide secondary information to the systems. This information should include demographic, economic and housing information. Each COG should have ready access to these data for each system's service area. These data can serve to augment the marketing research.

The six systems which currently use their scheduling/dispatching information strictly for reporting to their governing bodies and the state or for costs alone should expand the use of these data. The information on trip origins and destinations and on temporal travel patterns can provide the basis for decisions on service changes. For example, demand-responsive systems may want to run certain high demand corridors as limited fixed-routes. Without these data, operational decisions cannot be made on a sound basis.

The success of one system in using college students to conduct special research projects suggests that the other nine systems should contact area colleges and universities to propose student conducted projects. Often universities will offer course credit for such a student participation.



MARKETING

The marketing function of a transit system is the primary mechanism that the system has for attracting new riders. Although reliable service is the main reason why people start (and continue) to ride the bus, it is the promotional campaigns that inform potential riders about the transit service. Successful marketing programs must have reliable transit service as their foundations. Good marketing and reliable service complement one another.

The role of marketing within a transit system can be divided into four tasks: 1) developing a marketing program, 2) developing a fare structure, 3) publicity, and 4) handling complaints.

A sound marketing program must be based on information gathered about the characteristics of the transit service area and the service area population. Geographic characteristics and traffic congestion that might hinder reliable bus service should be taken into account. Demographic data and travel habits of both rider and nonrider population must be known. These data should be used to structure dependable transit service. A comprehensive marketing program can be designed that advertises the transit system.

The development and implementation of a fare structure must go hand in hand with the transit system's marketing program. When fares are initiated or increased, ridership usually decreases by some quantity. This decrease in demand can sometimes be reversed as patrons adjust to the new fare. A good marketing approach coupled with, perhaps, improvements in service can help to offset any decreases in ridership. To further foster goodwill, fares should be easy to collect. Monthly passes at decreased cost or special fares for client groups also ease the transition to a new fare structure.

The implementation phase of any marketing program is the actual dissemination of information to the public. Publicity for a transit system may be accomplished by the use of poster campaigns, television, radio and newspaper advertisements, interviews and news releases, and information and referral services for various organizations. In the case of fixed route service, widespread distribution of printed bus schedules does much to publicize the transit service.

An important part of a transit system's public image is determined by the manner in which customer complaints are handled. Although it is impractical to tailor transit service to every individual wishing to use the service, a positive attitude in resolving customer problems can bolster a good public image (10).

Findings

The ten rural transit systems have been evaluated with respect to the four tasks considered within the role of the marketing function. The findings follow.

Marketing Program

Two Section 18 systems have developed comprehensive marketing programs, formulated from data collected in their respective service areas. The overall objective of these programs is to inform the service area population about the transit services. One system has further refined its marketing objectives to include measurable objectives such as increasing the number of home-based work trips and increasing the number of off-peak trips. Both systems have conducted user surveys to determine user characteristics.

Seven systems have generalized marketing programs that are primarily

designed to rid the rural transit systems of their social service image. Beyond this concern, little additional marketing research or programming exists. One Section 18 provider has no marketing program at all.

Fare Structure

Only one rural transit system has been charging fares for an extended period of time. Its fare for a one-way passenger trip is \$1.50. This figure covers approximately 40 percent of the true cost of providing a passenger trip (see Table 3). Annually, this system generates approximately \$27,000 in revenue from the fare box. This system also uses a promotional monthly pass that costs \$27.50 for up to 50 rides. Citizens aged sixty-two or older can purchase the pass for \$15 a month.

During the study year, two other systems adopted a fare structure. One of the systems has actually begun to collect fares and it collected \$1300 the first month that fares were collected. The second does not actively charge fares. The remaining seven Section 18 systems provide their transit service free of charge to passengers.

Publicity

The focus of the marketing efforts of six of the Section 18 providers is informing the general public about the transit service. The other four systems either do not have marketing programs or their marketing efforts are directed at client groups such as the elderly or the handicapped.

The actual publicity for the rural transit systems takes many forms. Six of the systems take advantage of time available for public service announcements on radio or television and space available in newspapers for advertisement and articles. Six of the providers use poster campaigns and

flyers in public places to advertise their service. Three systems make use of the information and referral services of client oriented service groups. Other approaches for informing the public about the transit service include presentations to Commissioner's Courts, Chambers of Commerce, and social service agencies. Calling news conferences and granting interviews are also used to promote rural transit.

Prior to initiating its new fare structure, one Section 18 system launched a publicity campaign designed to educate its riders about the new fares. A major focus for this publicity campaign was to instruct system drivers about the need for the fare structure. The system felt its best opportunity to inform its riders of the need for having a fare system was through system van drivers. This approach proved successful and the transition to charging fares was smooth.

Handling Complaints

Nine of the rural transit systems have defined policies for accepting and resolving customer complaints. The consortium has no formal policy concerning complaints; it expects each subcontractor to deal with complaints appropriately.

For those systems with very flat organizational structures, the transportation director or executive director personally handles all complaints. Usually, the driver is called in and the problem is discussed and resolved. In the systems that employ supervisory personnel in addition to the director, the coordinator or operations manager first deals with customer complaints. If a satisfactory solution cannot be found by the coordinator, the transportation director is consulted. Two systems contact the person lodging the complaint. The problem between the driver and the passenger is then resolved.

Recommendations

Since only two systems formally conduct marketing research and use this information to design promotional strategies, it is recommended that the other Section 18 providers initiate a comprehensive marketing program. Many of the systems already collect valuable information about their riders. Unfortunately, this information is not used to develop ways to increase demand.

The seven Section 18 systems that do not charge fares should consider implementing a fare structure. As operating subsidies become more scarce, the need for patrons to pay for the transit service will become increasingly larger. Additionally, those systems that do charge fares will need to extract more of their operating budgets from the fare box.

Whether fares are being increased or being collected for the first time, the rural transit systems will need to rely heavily on marketing to sell their new fare structures. The use of drivers as the primary marketing contact is an excellent idea. If the drivers are able to explain the needs for higher fares, transit riders are more likely to accept the fare increase.

Several of the rural transit systems make use of many of the publicity approaches. Those providers who do not use all of the opportunities to promote their service should investigate the alternatives available to them. Public information spots and news releases are effective ways of promoting transit service. Posters and brochures that clearly identify the times and types of service should be widely distributed in public places. Advertising strictly to client groups will do little to eliminate the social service image that some systems have acquired.

Many of the Section 18 providers indicate that counseling their drivers is their only action in dealing with customer complaints. A more positive approach, taken by two of the systems, would be to contact the complainant

concerning the problem. Such an approach would afford the transit management with personalized information about their service area population. Additionally, personal contact could enhance the transit system's public image.

SAFETY AND TRAINING

Public transportation systems should have formal training programs for their employees. It is especially important to train new drivers and to reinforce the training of experienced drivers. Transit systems should also enforce safe practices for its employees, passengers and the general public. The safety and training function covers two tasks. These are 1) training drivers and other employees, and 2) promoting safety (10).

Transit systems should offer driver training programs. This training should emphasize defensive driving and the driver's role as a public relations person for the transit system. Often the public's only contact with the transportation system is contact with the driver, therefore drivers thus must serve passengers courteously to project a favorable image of the system to the public.

The driver training should also cover actual driving of the vehicles. These vehicles are often large and bulky and drivers will require experience in maneuvering the vehicle and operating any special equipment on the vehicle.

The importance of the safe operation of a public transportation system almost goes without saying. The system is responsible for the safe conduct of its passengers, employees and the public. Employees must be aware of, and training should include, proper emergency procedures and accident reporting requirements, as well as being able to identify potentially hazardous situations.

Findings

The ten rural transit systems have been evaluated using the two tasks defined as proper roles of the safety and training function. The findings follow.

Employee Training

Seven of the rural transit systems offer employee training programs. Two do not. In the consortium, five offer training and one does not.

The components of employee training programs vary from system to system with no component being common to all of the programs.

Two systems offer additional driver training classes. Both offer vehicle orientation instructions which include actual vehicle driving in addition, one teaches radio communications and preventative maintenance to its drivers.

Driver courtesy instructions are provided by four of the systems. Five do not include this aspect of formal driver training. One subcontracts operations to a private transit company and leaves this matter to the subcontractor.

One provider also held an employee training session to market its system. When fares were initiated this past spring, drivers received training in the fare structure, collection procedures, etc. It also included the reasoning behind the fare so each driver could answer patrons' questions effectively.

Safety

Four of the systems require defensive driving classes for their employees. In the consortium, four require the class; two do not.

One transit provider had a "driver of the month program" to give recognition to the outstanding driver. Because of budgetary constraints, this program was discontinued.

Because certain users of public transportation have physical and/or mental mobility limitations, these people require special assistance to board,

ide and leave the vehicle. Five of the systems offer passenger assistance techniques classes for their drivers, four do not. In the consortium, five offer the class and one does not.

Only six of the systems have their employees take Red Cross First Aid classes. Three do not. In the consortium, only four offer the classes. In addition, four of the systems offer cardio-vascular pulmonary resuscitation (CPR) classes. In the consortium, half offer CPR and half do not.

When accidents do occur, procedures for proper actions need to be clearly defined. One system maintains a procedures manual on each vehicle; eight do not. The other provider subcontracts the vehicle operations to a private transit company and leaves this up to the subcontractor. One system also keeps vehicle accident reports forms on board the vehicle. Eight of the systems maintain copies of accident reports in their central offices. Two of the offices do not maintain accident records.

One system forms an accident review board composed of members of such departments as police, public works, legal, etc. to act as a fact finding body. The board also determines what appropriate measures, if any, should have been taken to prevent the accident.

Recommendations

All ten of the rural public transportation systems should initiate comprehensive employee training programs. This comprehensive program should encompass Red Cross First Aid, defensive driving, CPR, passenger assistance techniques and on-board vehicle training. Refresher courses in defensive driving should be offered by all of the systems. Six of the systems should include courtesy instructions for their drivers. The four which presently offer this should continue to do so.

The ten systems should consider implementing a "driver of the month" program to promote driver safety and courtesy. The smaller systems may consider requesting the regional council of governments to implement an area-wide program in order to create a larger pool of drivers from which to select winners.

The eight systems which maintain accident records in their central offices should continue to do so. The two which do not maintain these records should initiate this procedure. This could prove especially valuable to the consortium in that if a history of low accident occurrence could be developed it could be used to reduce the insurance rates for the entire fleet.

The larger transit systems with fleets of more than four vehicles should consider establishing an accident review board to be called together as needed. This board should serve as a fact-finding body as well as a body to recommend possible preventative measures.

The nine systems should consider developing and maintaining an emergency procedures manual for use by the drivers on each vehicle. The one system which has initiated this procedure should continue this requirement, as they appear to be doing a good job.

PERSONNEL FUNCTION

An organization whose primary output is service cannot afford to overlook the value of its employees. It is the responsibility of the personnel function to ensure that the organization recognizes the value of its human resources. When employers do not value their employees appropriately, the attitude that employees project to the public can be less than desirable. As drivers and office personnel have daily contact with the public, the attitude and image that they project can make or break a transit system.

The personnel function of a rural transit system involves three tasks: 1) defining and filling positions, 2) evaluating the performance of its employees, and 3) participating in employee relations.

Job descriptions must be developed in such a way that the responsibilities and qualifications for each position are clear. An organization's chain of command should be reinforced by job descriptions. Well-developed job descriptions provide management with usable guidelines for screening and hiring personnel. Additionally, management must adhere to the equal employment opportunity and Title VII regulations when advertising and interviewing for vacated positions.

In order to make accurate decisions about employee training, promotions and/or dismissals, management must conduct periodic reviews of employee progress and performance. Employee evaluation should be done in reference to the accomplishment of specified departmental and individual objectives. The development of quantifiable goals and objectives will enhance the employee evaluation process.

The personnel function is responsible for ensuring that agreements

between management and its employees are honored. Although the personnel function is not responsible for designing or negotiating agreement or grievance procedures, it may take an active role in administering both (10).

Findings

The ten rural transit systems have been evaluated based on the three tasks considered as the proper roles for the personnel function. The findings follow.

Defining and Filling Positions

Three of the Texas Section 18 providers do not have written job descriptions. Five of the systems have developed good job descriptions that define employee responsibilities. One system has only some of their positions defined. The consortium varies with four of its subcontractors having written descriptions and two not having such job descriptions. The central administration of the consortium does have job descriptions. The systems that do not have written job descriptions rely on the transportation directors to describe the job responsibilities to employees.

When positions are vacated, all ten of the Section 18 providers advertise position announcements in local newspapers and/or radio stations. Three of the systems look first to their existing staff members to fill open positions and then advertise for employees. Four of the systems utilize the Texas Employment Commission (TEC) services in finding new employees. Three providers look to the Department of Labor's CETA program for new employees.

Evaluating Employee Performance

The majority, six providers, of the Section 18 systems does have a formal employee evaluation procedure. The procedures usually involve a probationary period for new employees where evaluations are conducted on a prescribed schedule - 30 days, 90 days, then annually. Tenured employees receive evaluations either every six months or annually. Three systems have no formal review or evaluation of employee performance. The consortium varies with one-half of the subcontractors having evaluation procedures and one-half does not review employee performance. The administrative staff for the consortium does have a probationary period for new employees.

Employee Relations

Only one Section 18 system has unionized employees. These employees work for a subcontractor and have a collective bargaining agreement with the subcontractor. In addition, the Section 18 provider has a grievance procedure for all employees not covered by the collective bargaining agreement. The other nine systems do not employ union labor. Of these nine, six providers have formal grievance procedures for deciding issues between management and its employees. One system has an informal procedure for settling disputes. The consortium's administrative branch has a formal grievance procedure; however, it is unknown how each subcontractor handles disputes.

If length of time employed is a measure of employee satisfaction with their job and with management, the overall Section 18 employee satisfaction should be high. The average tenure of Section 18 employees through the State exceeds two years. The range of longevity is from four months to four years.

Recommendations

All of the Section 18 transit systems should develop written job descriptions for all positions. These descriptions should specify all responsibilities of each job and the minimum qualifications necessary to fulfill the responsibilities.

The advertising for vacated positions by each of the Section 18 providers is generally very good. Those systems that do not use the TEC office services should consider placing future position announcements with their offices. However, as transit systems can more evenly distribute operating costs between several funding sources by using CETA employees, whenever CETA employees are available and can be used, they should be used.

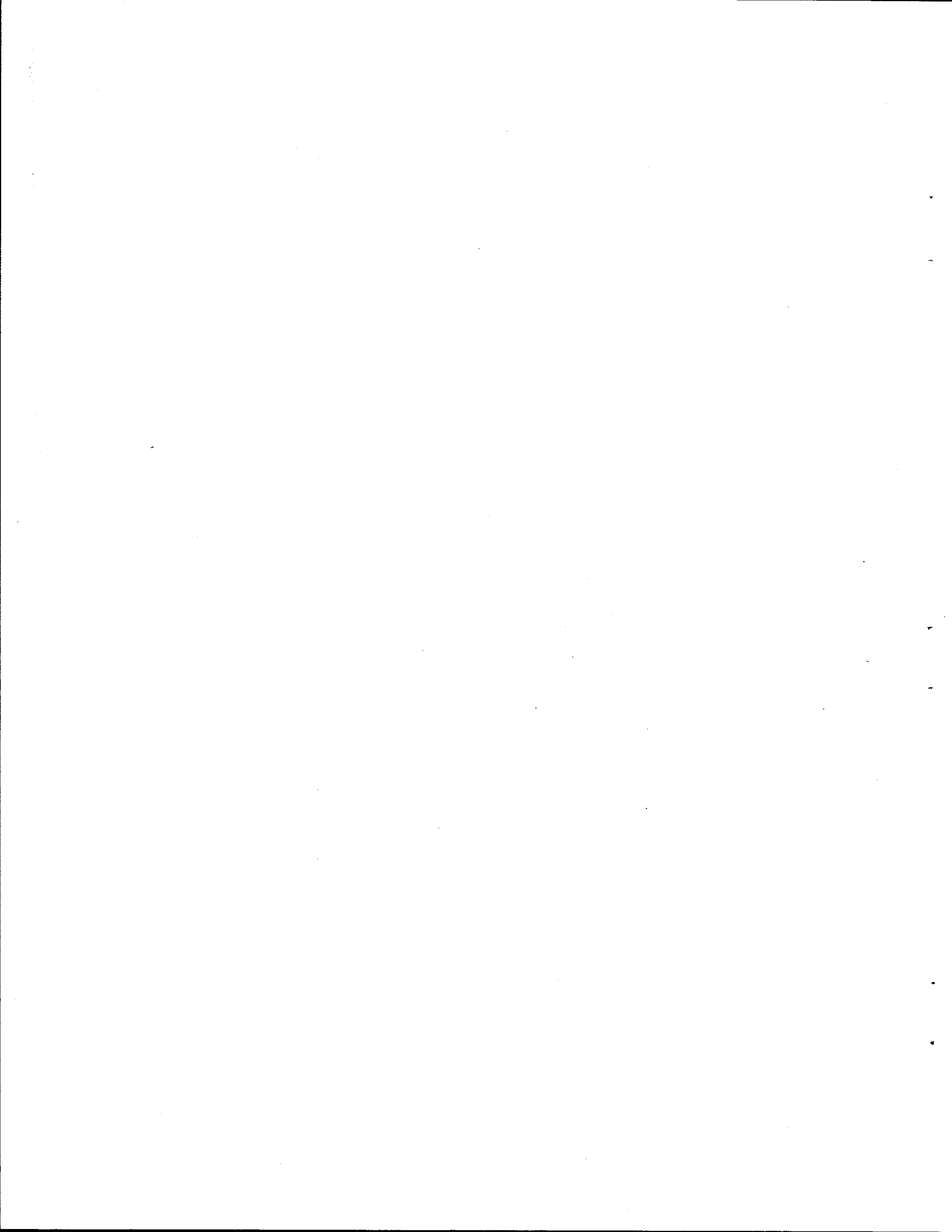
It is essential to the efficient management of any organization that formal employee evaluation procedures be developed. Those systems that presently have such procedures should continue the practice. Formal reviews of employees should be initiated by the three systems that do not have employee evaluations. The evaluation of employees should be based on predetermined criteria such as safety, reliability, and courtesy. Also, the evaluations should be tied to quantifiable, organizational and departmental objectives. Favorable performances should be rewarded. Evaluations tied strictly to customer complaints tend to be negative in orientation and can foster poor performance in the future.

The institution of a formal grievance procedure would benefit both transit management and transit employees. A grievance procedure provides the mechanism for necessary communication between management and labor at times when communication can be strained or nonexistent. Those systems that have not initiated a grievance procedure should consider developing one.

CONCLUSION

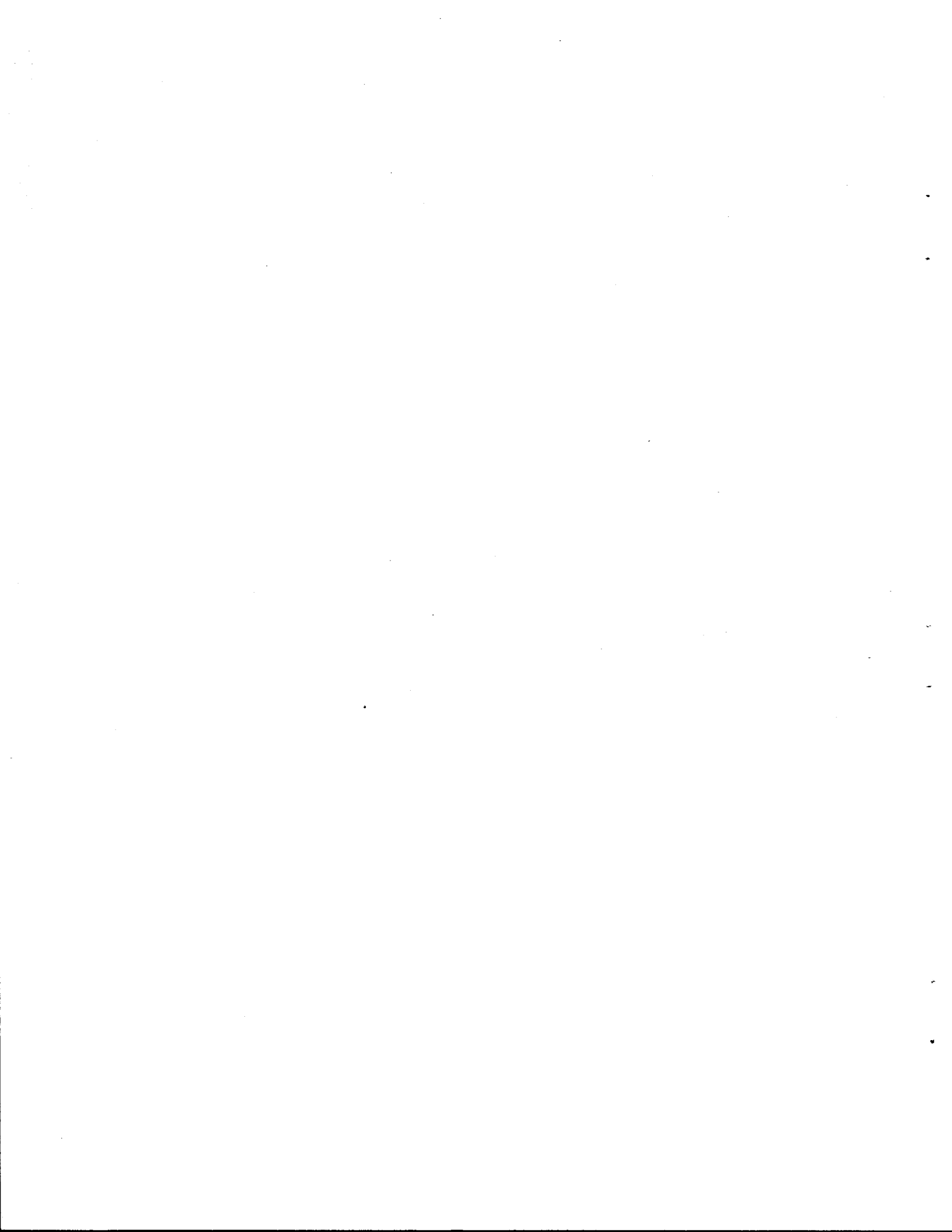
The results of the management performance evaluations of the ten rural and small city public transportation systems receiving Section 18 funds in Texas show the basics of good transportation systems to be in place. However, several significant problems in major areas exist. These problems center on the areas of goals and objectives, fares, service standards, data collection and utilization and marketing.

The findings and recommendations that have been made in this report are intended to provide direction to the governing boards and management of the ten rural and small city systems receiving Section 18 funds in Texas. Implementing the recommendations made in the report should help each system improve its efficiency and effectiveness.



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APPENDIX A

Vehicle Inventory

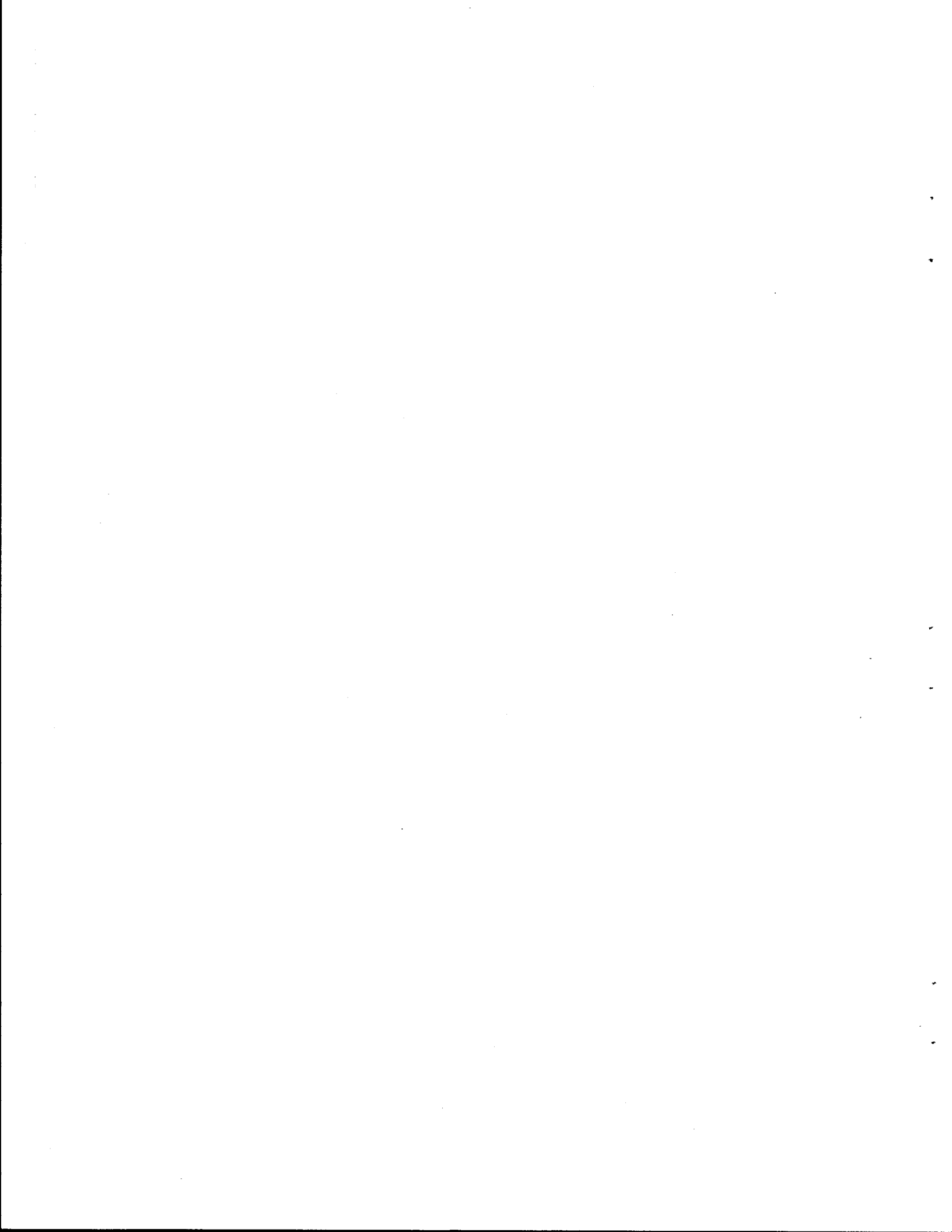


Table 7. Distribution of Vehicle Manufacturers
for the Section 18 Providers in Texas

Manufacturer	Number	Percent
Chevrolet	26	25
Dodge	24	23
Not Specified	18	18
Ford	17	17
Thomas	9	9
Plymouth	2	2
Checker	2	2
GMC	1	1
International	1	1
Superior	1	1
Taylor	1	1
Total	102	100

Table 8. Summary Vehicle Inventory
for Section 18 Providers in Texas
(As of May 1982)

Number	Year	Type Vehicle	Capacity	Radio Equipped	Wheelchair Lift Equipped	Average Mileage	Other Notes
3	1982	Van	11	Yes	No		New
1	1982	Van	11	Yes	Yes		New
3	1981	Thomas Minibus	16	Yes	No	7,283	
6	1981	Thomas Minibus	16	No	No	7,283	
1	1981	International Bus	44	Yes	Yes	15,389	a/c*
1	1981	Superior Bus	18	Yes	Yes	2,620	a/c
1	1981	Taylor Bus	14	Yes	Yes	1,653	a/c
5	1981	Dodge Van	12-15	No	No	50,535	
1	1981	Chev. Van	12	No	No	21,400	a/c
2	1980	Van	12	No	No	28,795	a/c
1	1980	Van	8	No	Yes	18,953	a/c
1	1980	Van	5	No	No	20,133	a/c
6	1980	Chev. Van	12	Yes	No	50,875	
1	1980	Chev. Bus	19	Yes	No	41,006	a/c
1	1980	Chev. Bus	15	Yes	Yes	30,752	a/c
1	1980	Checker	8	Yes	No	33,756	a/c
1	1980	Ford Sup.Wag.	16	No	No	100,000	
1	1979	Van	12	No	No	86,624	a/c
2	1979	Dodge Van	8-12	Yes	No	34,283	a/c
1	1979	Dodge Van	9	No	Yes	21,000	a/c
2	1979	Dodge Van	8-15	No	No	41,323	a/c

*a/c means it has air conditioning.

Table 8 - Continued

Number	Year	Type Vehicle	Capacity	Radio Equipped	Wheelchair Lift Equipped	Average Mileage	Other Notes
1	1979	Dodge Van	8	Yes	Yes	36,303	a/c
1	1979	Chev. Van	14	Yes	No	53,110	a/c
1	1979	Chev. Van	14	No	No	62,092	a/c
1	1979	GMC Van	12	No	No	62,775	a/c
2	1979	Station Wagon	6	No	No	74,662	a/c
1	1979	Sedan	6	No	No	30,300	a/c
2	1978	Van	15	No	No	141,657	a/c
4	1978	Dodge Van	8-15	No	No	61,829	a/c
2	1978	Dodge Van	15	Yes	No	64,346	a/c
1	1978	Ply. Van	15	No	No	84,150	a/c
1	1978	Ford Van	6	No	No	90,989	a/c
3	1977	Van	8	No	No	110,536	a/c
2	1977	Dodge Van	12-16	No	No	86,892	a/c
1	1977	Dodge Van	10	Yes	No	68,262	a/c
1	1977	Checker	7	Yes	No	82,533	a/c
1	1976	Van	12	No	Yes	235,918	
5	1976	Chev. Van	12	No	No	150,044	Two will be sold.
6	1976	Chev. Minibus	16	No	No	150,000	a/c
2	1976	Chev. Minibus	16	No	Yes	150,000	a/c
3	1976	Ford Van	10	Yes	Yes	185,869	
1	1976	Ford Van	15	Yes	Yes	88,000	a/c
1	1976	Ford Van	8	No	No	46,000	a/c

Table 8 - Continued

Number	Year	Type Vehicle	Capacity	Radio Equipped	Wheelchair Lift Equipped	Average Mileage	Other Notes	
1	1976	Ford Van	10	No	Yes	68,400	This will be sold	
1	1976	Dodge Van	12	No	No	106,559		
5	1976	Ford St. Wag.	5	No	No	100,000		
2	1975	Dodge Van	15	No	No	111,836		
1	1975	Ply. Van	15	No	No	107,489		a/c
1	1975	Chev. Van	8	No	No	115,864		a/c
1	1975	Ford Bus	12-15	No	No	100,000		
1	1975	Ford St.Wag.	5	No	No	100,000		
2	1974	Ford Bus	12-15	No	No	100,000		
1	1974	Chev. Van	12-15	No	No	100,000		
1	1974	Dodge Van	12	No	No	108,713	This will be sold.	

APPENDIX B

Sample Logs



DRIVER _____

TRANSPORTATION LOG

MONTH _____ DATE _____ YEAR _____

VEHICLE I.D.# _____

CLIENT'S INFORMATION

	60+	DHR	HDC	OTHER	DESTINATION	APPT TIME	TRIP PURPOSE					ONE WAYS	NO SHOWS	ESCORTS	COMMENTS
							M	E	N	SR	S				
NAME: ADDRESS: CITY: PHONE: MED.#															
NAME: ADDRESS: CITY: PHONE: MED.#															
NAME: ADDRESS: CITY: PHONE: MED.#															
NAME: ADDRESS: CITY: PHONE: MED.#															
NAME: ADDRESS: CITY: PHONE: MED.#															
NAME: ADDRESS: CITY: PHONE: MED.#															

101

VEHICLE DATA

ENDING MILEAGE _____
 BEGINNING MILEAGE _____
 TOTAL MILEAGE _____

SYSTEM DATA

ESCORTS _____
 NO SHOWS _____
 ONE WAYS _____

MEDICAL TRIPS

ELDERLY _____
 MEDICAID _____
 GEN. PUB. _____

OTHER TRANS

RECREATION _____
 SHOPPING _____
 NUTRITION _____
 INF. REF. _____

Source: San Patricio Community Action Agency

✓ WEEKLY
 X MONTHLY
 *DAILY

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	NOTES
OIL*																																
TIRE INSPECTION*																																
BRAKES*																																
GAS*																																
WINDSHIELD WIPERS & WASHERS*																																
HEADLIGHTS*																																
BACK-UP LIGHTS*																																
TAIL LIGHTS*																																
INDICATOR LIGHTS*																																
ADJUST MIRRORS*																																
CLEAN INTERIOR*																																
HORN*																																
TIRE INFLATION ✓																																
BATTERY ✓																																
TRANSMISSION ✓																																
HEATER/AIR CONDITIONER ✓																																
CLEAN WINDOWS ✓																																
SAFETY BELTS ✓																																
AIR CLEANER X																																
FUSES X																																
WASH CAR X																																
COOLING SYSTEM X																																

Source: Central Plains Community Action Association

MONTHLY VEHICLE MAINTENANCE CHECKLIST

Vehicle No. _____

Month _____

Beginning Mileage _____

Ending Mileage _____

Item	M	T	W	TH	F	M	T	W	TH	F	M	T	W	TH	F	M	T	W	TH	F	
1. Clean - Inside																					
2. Clean - Outside																					
3. Brakes - Service																					
4. Brakes - Parking																					
5. Steering Gear (power steering fluid)																					
6. Tires (check spare)																					
7. Engine (oil, battery and water)																					
8. Exhaust System																					
9. Clutch																					
10. Transmission (check fluid)																					
11. Windshield Wipers																					
12. Defroster																					
13. Horn																					
14. Rear View Mirrors																					
15. Cab: glass, doors, etc.																					
16. Lights and Reflectors																					
17. Emergency Equipment (first aid kit jack flares)																					

Source: Bosque County Senior Services

MONTHLY VEHICLE MAINTENANCE CHECKLIST

Vehicle No. _____

Month _____

Beginning Mileage _____ Ending Mileage _____

Item	M	T	W	TH	F	M	T	W	TH	F	M	T	W	TH	F	M	T	W	TH	F	
19. Accident Report Forms																					
20. Fuel																					
21. Wheelchair Lift Equip.																					
22. Other																					
23.																					
24.																					
25.																					

Source: Bosque County Senior Services

Vehicle _____

VEHICLE MAINTENANCE RECORD

ROUTINE REPLACEMENT ITEMS

Change Oil, Oil Filter, and Air Cleaner 6000 mi. or 6 mo.		Change Plugs 12000 miles		Change Points, PCV Valve, Gas Filter 24000 miles		Change Trans, Oil and Filter, Chassis Lube 36000 miles		Other		Service or Notes
Miles	Date	Miles	Date	Miles	Date	Miles	Date	Miles	Date	
		XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX			
				XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX			
		XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX			
						XXXXXXXXXX	XXXXXXXXXX			
		XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX			
				XXXXXXXXXX	XXXXXXXXXX					
		XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX			
						XXXXXXXXXX	XXXXXXXXXX			
		XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX			
				XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX			
		XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX			

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Source: Bosque County Senior Services

DAILY CHECK LIST FOR CLETRAN BUS

To be completed each morning before leaving the Service Center.

1. Check all fluid levels OIL _____
 WATER _____
 TRANSMISSION _____
 BRAKES _____
 STEERING _____
 2. Check battery _____
 3. Check air in tires _____
 4. Check radio transmission _____
 5. Check lights _____
 6. Check gas and L. P. levels _____
-

Items to be reported to Service Center for repair:

Driver: _____

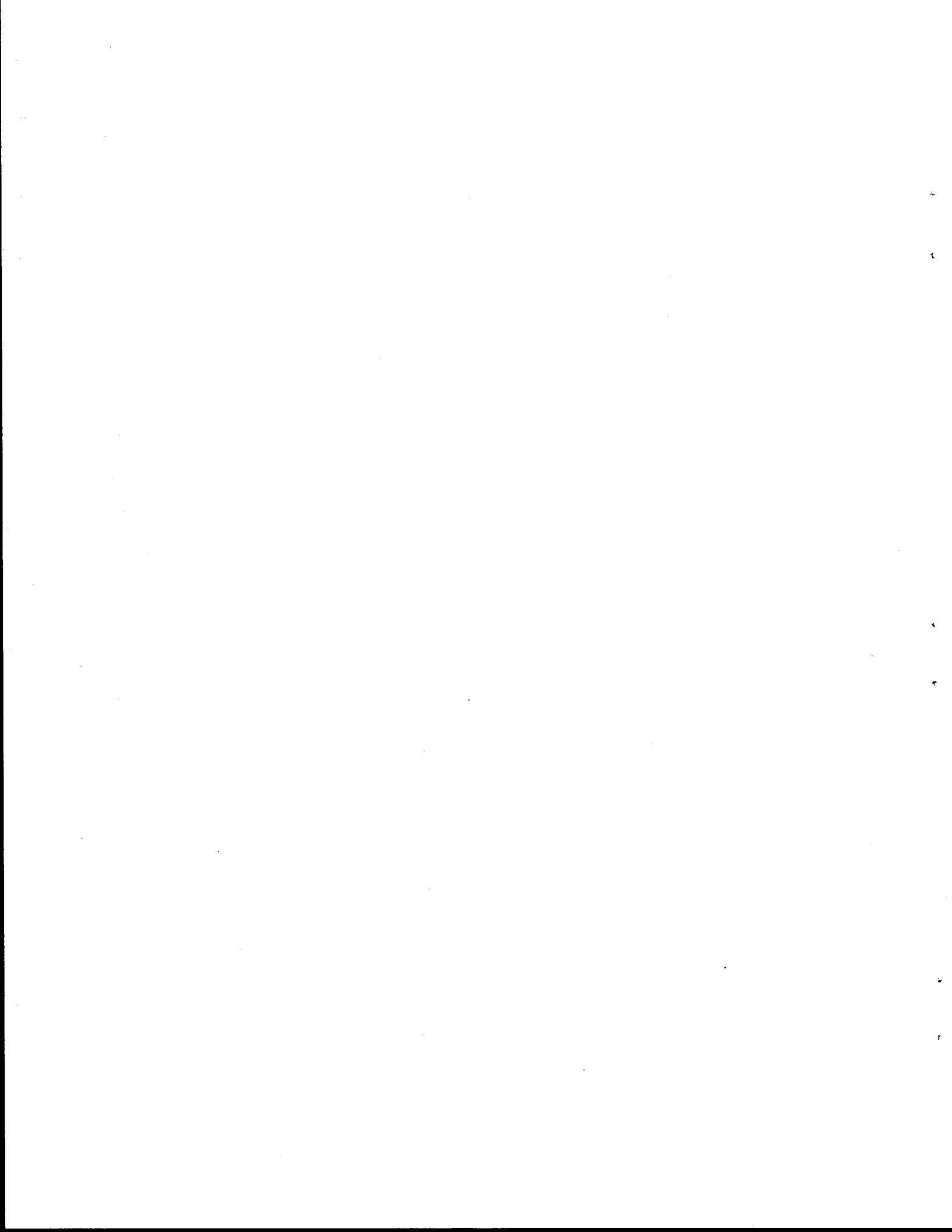
Date: _____

Vehicle: _____

Source: City of Cleburne

APPENDIX C

Section 18 Quarterly Report



SECTION 18 GRANT PROGRAM

INSTRUCTIONS FOR COMPLETING QUARTERLY REPORTING FORM

1. Insert calendar quarter/year in upper righthand corner. Quarters are January-March, April-June, July-September, October-December.
2. Insert Grantee's name.
3. Indicate the number of one-way passenger trips provided to persons in each of the categories listed. A one-way passenger trip is recorded every time a person enters a vehicle. For example, a person boards a vehicle at his home and rides to the courthouse where he gets off the vehicle (1 trip). The same individual later rides from the courthouse to the grocery store where he again gets off the vehicle (1 trip). Later, the same person boards the vehicle and returns to his home (1 trip). The total number of one-way trips recorded in the case of this example would be three (3).

The driver should not be included in the passenger counts. Non-subsidized persons are those riders whose trips are not paid for by another grant such as Title III or Title XIX. Each passenger should be identified in a single category. For example, a handicapped person would always be reported in that category even if he is also elderly and/or low-income. Young persons would be listed in the "youth" category unless they are handicapped. Elderly persons would be reported in the "elderly" classification unless they are handicapped. The driver (or other person responsible for collecting this information) should use his judgment in deciding if a passenger should be included in the "youth" or "elderly" categories rather than asking the person's age. For the purpose of this report, a low-income is not considered a handicap. The "other" category, which should be explained on the reverse side of the form, would include subsidized persons who do not belong to any of the groups listed above.

4. Indicate the total number of vehicles operated by the Grantee, including those available to the system through subcontracts. This entry should not show only those vehicles purchased with Section 18 funds. Enter the total vehicle miles travelled during the quarter (including miles when there are no passengers on board).

The last two entries under item #2 are designed to show what part of the vehicle fleet was not in operation during the reporting period. To calculate the "Hours-Maximum" figure, multiply the number of vehicles by the proposed hours of service per day by the total in-service days during the quarter. For example:

$$2 \text{ vehicles} \times 6 \text{ hours/day} \times 65 \text{ days/quarter} = \underline{780 \text{ hours}}$$

The same method would be used to determine the "Days-Maximum" figure:

$$2 \text{ vehicles} \times 65 \text{ days/quarter} = \underline{130 \text{ days}}$$

The final entry should indicate the actual hours and days of vehicle service and may be determined by subtracting the number of vehicle hours and vehicle days when equipment was out of service from the maximum totals shown above. For example, if one of the two vehicles used in the example above was in the shop for repairs for 12 days during the quarter, the "Hours/Days-Actual" entry would be calculated as follows:

$$\begin{array}{r} 1 \text{ vehicle} \times 6 \text{ hours/day} \times 12 \text{ days/quarter} = 72 \text{ hours} \\ 780 \text{ hours} - 72 \text{ hours} = \underline{708 \text{ hours}} \end{array}$$

$$\begin{array}{r} 1 \text{ vehicle} \times 12 \text{ days/quarter} = 12 \text{ days} \\ 130 \text{ days} - 12 \text{ days/quarter} = \underline{118 \text{ days}} \end{array}$$

5. List the revenue received during the quarter including grants, charter revenue, contract income, in-kind donations and passenger fares or donations. In-kind donations must be assigned a dollar value. "Other" entries should be explained on the reverse. SYSTEM REVENUES MUST AT LEAST EQUAL REPORTED EXPENSES.
6. List the quarterly expenses for the appropriate categories. These entries should not be confined to only those costs which are paid by the Section 18 program. In-kind services such as volunteer drivers or donated office space must be assigned a dollar value. "Other" entries such as insurance premiums should be detailed on the reverse.

Annual expenses, such as license fees or insurance premiums, should be adjusted to reflect the cost per quarter. For example, if the annual cost of insurance is \$3,000 for 2 vehicles, that figure would be divided by 4 to determine the quarterly expense.

$$\$3,000 \div 4 = \$750$$

7. "Comments" would include major service changes during the quarter, a brief description of any accidents or other problems encountered, etc. If service is not provided for the full three months of the quarter, that can be explained in this space.

SAMPLE

SECTION 18 GRANT PROGRAM

QUARTERLY REPORTING FORM

Grantee: Midville Transportation Agency

1. Passenger Classification:

Non-Subsidized	225
Elderly	306
Handicapped	45
Youth	6
Low Income	69
Other*	120
TOTAL	771

2. Vehicle Operations:

No. of Vehicles	2
Miles	1,368
Hours/Days-Maximum	780/130
Hours/Days-Actual	708/118

3. System Revenues:

Fares/Donations	\$ 178.50
Title XIX	4,500.00
City	3,750.00
County	1,500.00
In-Kind	815.43
Section 18	13,109.73
TOTAL	\$23,853.66

4. Expenses:

Capital	\$0
Administrative	
Personnel	\$ 7,000.56
Office Expenses	3,195.00
Other*	787.50
Sub-Total	\$10,983.06

Operating	
Drivers Salaries	\$ 5,626.56
Dispatcher's Salary	3,750.00
Fuel and Oil	2,504.19
Maintenance and Repairs	979.35
Other*	10.50
Sub-total	\$12,870.60

TOTAL EXPENSES \$23,853.66

5. Comments: (Include any major changes during the quarter.)

Subscription services being planned. Minor accident 6/12/81 involving bus and private car. Fender damage on bus repaired for \$76.28.

1. Local bank pays for transportation for employees due to shortage of parking spaces at bank building and as a fuel conservation measure.

4. Other administrative costs:

Vehicle insurance	\$750.00	(\$3,000 annual)
Travel expense	<u>37.50</u>	
	\$787.50	

Other operating costs:

License fees	\$10.50	(\$42.00 annual)
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