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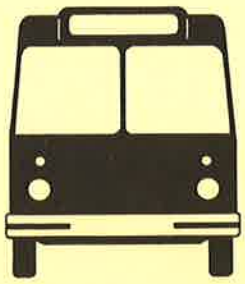
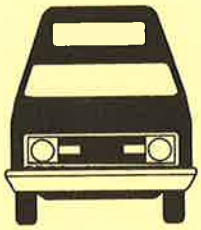


Small City Transit

MERCED, CALIFORNIA:

Dial-A-Ride Transit in an Agricultural Community



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U. S. DEPARTMENT OF TRANSPORTATION
Urban Mass Transportation Administration
Office of Service and Methods Demonstrations
Washington, D. C. 20590

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Preface

This document was prepared by the Transportation Systems Center (TSC) as part of the information dissemination function of the Office of Service and Methods Demonstrations, Urban Mass Transportation Administration. This case study is one of thirteen studies of public transit systems in small communities and is intended to serve as an information resource for other communities in the process of planning or considering public transportation.

The information presented in this document is based on a visit to the site, interviews and phone conversations with the principals involved, and operating records obtained during 1975. The authors gratefully acknowledge the cooperation of local officials and transit operators at all of the sites selected for study, and of the TSC staff in compiling the information gained from these studies and assisting in its interpretation.

MERCED, CALIFORNIA: Dial-A-Ride Transit In An Agricultural Community

"This is the first time in years that I've been able to travel on my own. I am free." This remark by an elderly rider typifies the enthusiastic reception to the recently-implemented public transportation system serving the residents of Merced, California. The Merced Transit System (MTS) is an application of the dial-a-ride concept which has been adopted in many small cities throughout the nation.

To use this service, a customer dials the central control number, gives his location, his destination, and how many people are in the party. Within about 20 minutes a 14-passenger Dodge Maxi-van equipped with air conditioning and stereo music arrives to provide a door-to-door trip to any point within the 10 sq. mile Merced city limits for a flat fare of 25 cents.

There are no fixed routes in Merced's Transit System. Between the hours of 7:15 a.m. and 5:15 p.m., Monday through Friday, the four vehicles that comprise the MTS fleet cruise within the city limits receiving ride requests from the control room and making appropriate tour deviations. MTS service has been particularly attractive among senior citizens, who account for about 25% of the ridership. Overall, youth and elderly patrons represent about half of the MTS ridership; college students and the general public account for the other half. With ridership exceeding 330 rides daily, MTS has been able to serve about 11 passengers for each vehicle hour of service, a higher productivity than some fixed-route operations. This performance is reflected in an operating cost of $0.84 per passenger trip, which is relatively low for a dial-a-ride operation.

The City of Merced is the county seat of Merced County, situated in the midst of the San Joaquin Valley (a major agricultural region in central California). With a population of about 30,000 in an agricultural/rural setting, Merced might seem an unlikely place for public transportation. Yet, demographically, Merced is similar to many small to medium-density cities. It has a downtown commercial area, two shopping malls, two medical complexes, and Merced College (which has an enrollment of 7,000). Figure 1 contains a map of the city. The residential areas of Merced are typical of many middle and lower-middle class American suburbs. Although the average family income in Merced is low for California, ($8,323 vs. a California average of $10,732) auto ownership is high and many families own two cars.

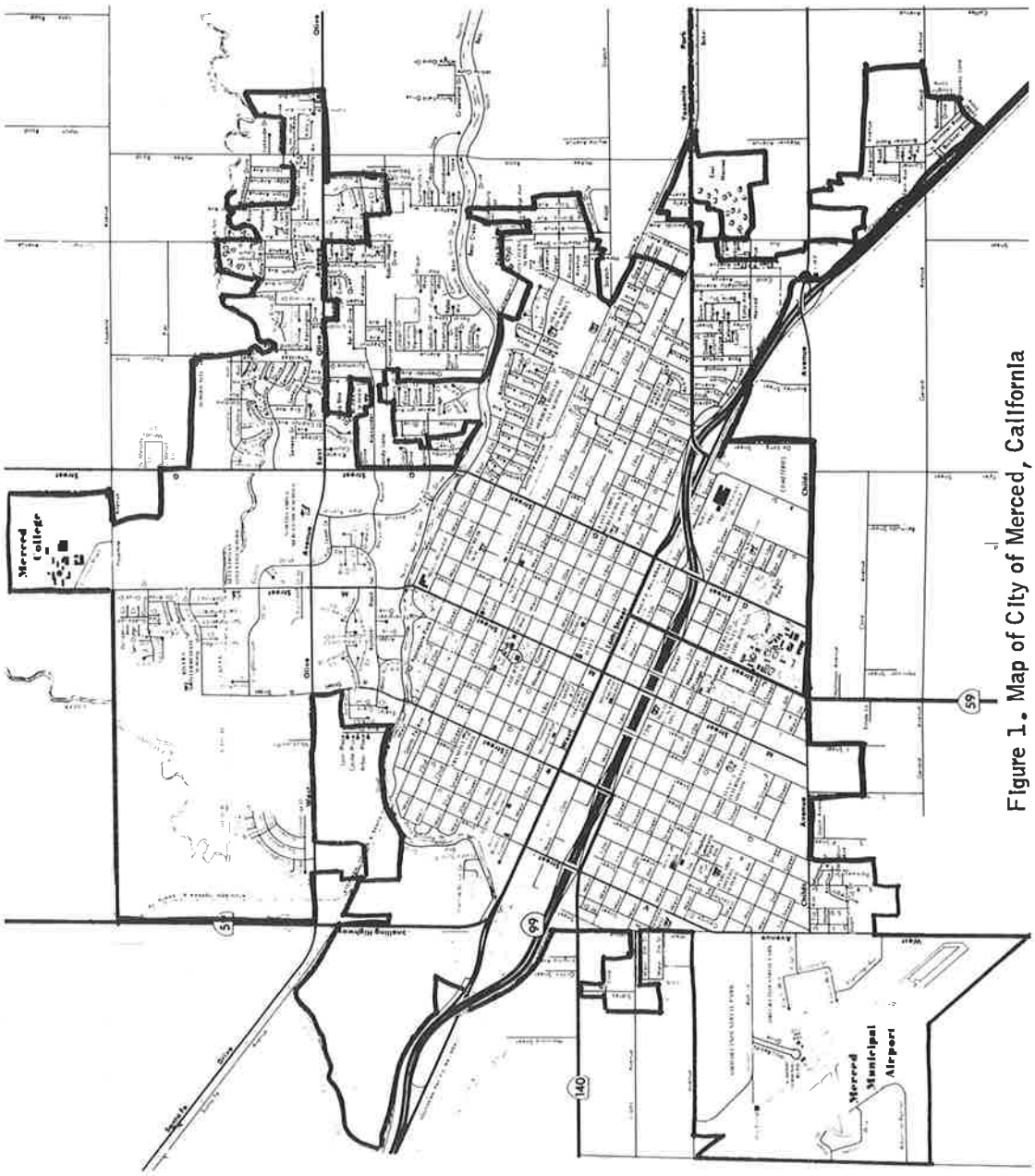

Figure 1. Map of City of Merced, California

Merced Transit employs a full-time staff of six. The operating and garage facilities are housed in a city corporate building. The operations supervisor and two controllers handle ride requests, coordinate scheduled subscription services, and communicate dispatching (Figure 2) assignments to the drivers. Three full-time drivers are employed and are augmented by five college students who serve on a part-time basis. One mechanic is responsible for maintaining the four-vehicle fleet. The staff are all city employees and are not unionized.

Merced Transit System characteristics are summarized at the end of the report. The MTS operation features a number of elements common to other dial-a-ride systems. Subscription service for regularly scheduled trips is available in the morning from 7:10 a.m. to 9:00 a.m., and during the afternoon from 4:00 p.m. to 5:15 p.m. The subscription service is utilized for school and work trips. Patrons can also take advantage of the advanced reservation feature. For instance, a ride can be reserved in the morning for an afternoon pick-up. Advanced reservation trips are given preferential treatment so that a customer can be assured of being able to meet scheduled appointments.

By far the most frequently used element of the MTS system is the demand responsive many-to-many service. Over 250 daily rides are of the spontaneous call-in variety. The heaviest demand for this service is between the hours of 11:00 a.m. and 4:30 p.m. MTS has set standards to insure consistent quality of service; a vehicle should arrive within 20 minutes of the ride request, and the in-vehicle travel time should be no more than three times the time it would take to make the same trip by auto.

Operating data indicate that MTS is operating close to its service standards; waiting time is averaging 20.5 minutes and travel time is averaging 14.5 minutes. Of course, there is variation in the service provided depending on the demands placed on the system. Some riders have had to wait more than an hour for a vehicle while others have had a vehicle arrive within minutes after hanging up the phone. When a vehicle arrives for a pick-up, it signals and waits up to 30 seconds before departing. Drivers assist passengers who have difficulty boarding the vehicles. It is not unusual for a driver to assist an elderly patron from the front door to the inside of the vehicle (Figure 3 & 4).

Complaints from passengers occasionally arise when a vehicle misses a passenger or vice versa, or when a vehicle does not arrive at the scheduled pick-up time. When this occurs, MTS staff review the situation and contact the passenger with an explanation of what happened. Senior

Figure 2. Merced Transit System Control Room

Figure 3. Merced Transit Van: Driver Assisting Passenger

Figure 4. Merced Transit Van: Interior

citizens are given special attention and extra assurance that they will not be left stranded.

All passengers are charged $0.25 per trip except that children under 6 ride free when accompanied by a paying passenger. Ticket books containing 12 tickets are sold without a discount, i.e., $3.00 per book. A passenger who does not have exact change receives change in the form of ride tickets.

Historical Background

For a period of 10 years prior to 1974, Merced had no transportation alternative to the automobile except for the local Yellow Cab Company. In 1964 a private bus company that had been operating in the City of Merced for 21 years went out of business after sustaining seven straight years of losses. The transit operator terminated his bus service, alleging that increasing auto ownership and competition from the taxi service resulted in the demise of his business.

City leaders were convinced of the need for public transportation. Discussions had been held periodically by various organizations including the Community Action Agency and the Co-ordinating Council of the City of Merced on the subject of public transportation. A special census in 1972 revealed that the community considered public transportation as one of the top municipal priorities.

On July 20, 1970, the City of Merced granted a temporary franchise to the Yellow Cab Company to operate a dial-a-ride service using taxicabs on a shared-ride basis. Ridership was low and people complained about having to share a cab with other passengers. At fares averaging $1.00 per ride, the shared taxi apparently was too expensive for many of the citizens. The service was later discontinued, however, the city continued to explore an agreement whereby a taxi operator could provide service to the city under contract.

Interest in a public transportation program for the City of Merced increased with the passage of California Senate Bill 325 in 1972. This bill provides allocation of state gasoline tax revenues to California municipalities for the development and operation of public transportation systems. SB 325 gave Merced the financial incentive to experiment with a new public transportation system.

Local officials in Merced were aware of recently implemented demand-responsive transportation systems in other small communities. Because of problems with the taxi company's dial-a-ride program and the lack of any specific information or trends which could substantiate future

action, city leaders recommended that the public dial-a-ride service be operated on an experimental basis, particularly during the first year, and that the program be continually re-evaluated and improved to provide the most adequate service possible within the fiscal resources of the city.

In developing the new service, a major objective was to provide transit-dependent citizens with access to destinations such as stores, medical services, places of employment, schools, and the various social agencies. The system was designed to serve short trips with highly dispersed origins and destinations and low traveller volumes. Also, the service was to be provided at a cost that could be afforded by the transit-dependent residents of the city.

The city decided to contract out for the planning and the developing of the community dial-a-ride service which was to be turned over to the city as a "turnkey" operation. Quotations for this contract were submitted by two firms, the local taxi operator, and a consulting firm with experience in implementing dial-a-ride services. The consultant, (the low bidder,) was awarded the contract which included the development of dispatcing procedures, the specifications for the communications equipment, and the training of the city employees to operate the system.

Ms. "Pete" Hanson Alexander, a city employee for two years, was appointed operations supervisor of MTS. Working closely with the consultant. Ms. Alexander was instrumental in establishing service policy and training of the MTS staff.

Training of drivers and controllers began in March, 1974. During the start-up phase, free phones for service requests were installed at three locations - the college, and two shopping centers. Promotion of the new service was low-keyed until after the initial shakedown period. For example, brochures were not distributed until a month after service began. A major portion of the promotional effort was directed towards the southern third of the city, where a special census in 1972 revealed that citizens considered public transportation the most important governmental priority. Free publicity provided by the local media helped to minimize promotional costs. In fact, the advertising campaign was halted early because the initial demand was so great that the system became saturated much sooner than expected.

Start-up costs, financed entirely from SB 325 funds and the fare box, were budgeted at $110,000 for the first year's operation. This included the purchase of the four Dodge maxivans at a total cost of $43,000. By the time the four

vehicles arrived in June, Merced was ready to initiate its dial-a-ride service. On June 13, 1974, Merced commenced operating the new public transit system.

Operating Experience

Performance statistics compiled to date indicate that MTS is operating a relatively efficient dial-a-ride service. Since the initiation of service, ridership (see Figure 5) has risen steadily, increasing from a June, 1974 level of 138 rides per day to a present level of about 330 riders per day, (which approaches the capacity of the system). The growth in vehicle productivity is illustrated in Figure 6 and shows 3.8 passengers per vehicle hour during the first month's operation, to the current level of about 11.5 passengers per vehicle hour. This reflects the increasingly effective use of vehicles as well as ridership growth. Average tour length has decreased from 3.3 vehicle miles per passenger trip to 1.7 miles per passenger trip, a further indication of improvements in tour organization and dispatching efficiency. Improved service is evidenced by the reduction in average waiting time for a pick-up from 27 minutes to 21 minutes.

This steady improvement in performance has had a financial impact as well. MTS is now covering more than one-fourth of its operating costs through the fare box. The per-passenger subsidy from the state, measured as the difference between total operating costs and total fare revenues, has decreased from $1.13 to 59 cents. This subsidy has totalled $58,000 over the first eleven months of operation, and has been covered entirely by SB 325 funds. Table 1 contains an operating cost breakdown, revenues, and net costs for each of the first eleven months of operation.

The net cost per ride is low enough to be comparable to that of many fixed route systems. Moreover, it provides evidence that demand-responsive systems are not necessarily more expensive to operate than fixed route systems. Major factors in the low cost are the effective mix of part-time and full-time drivers and the relatively low maintenance costs. Table 2 contains a breakdown of maintenance costs by category for each month.

During the first year of operations, the local taxi cab company entered a suit against the City of Merced requesting compensation of $500,000 for losses due to allegedly unfair competition from a publicly subsidized city service. The city contends that they are not liable since the operator does not hold an exclusive franchise, and because they (the city) had tried to develop a satisfactory service agreement with the taxi company.

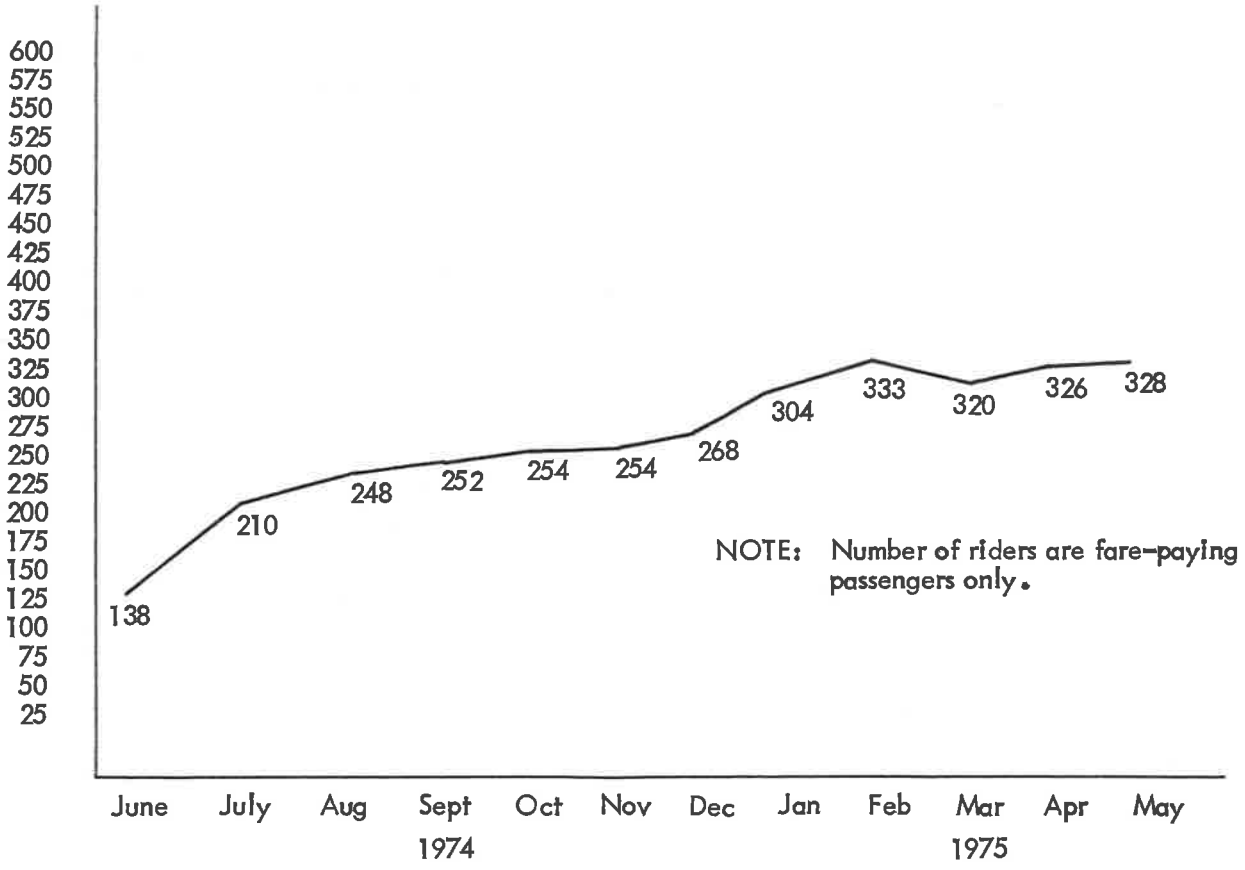

Figure 5. Merced Transit System Ridership Growth (Average Ridership Per Day)

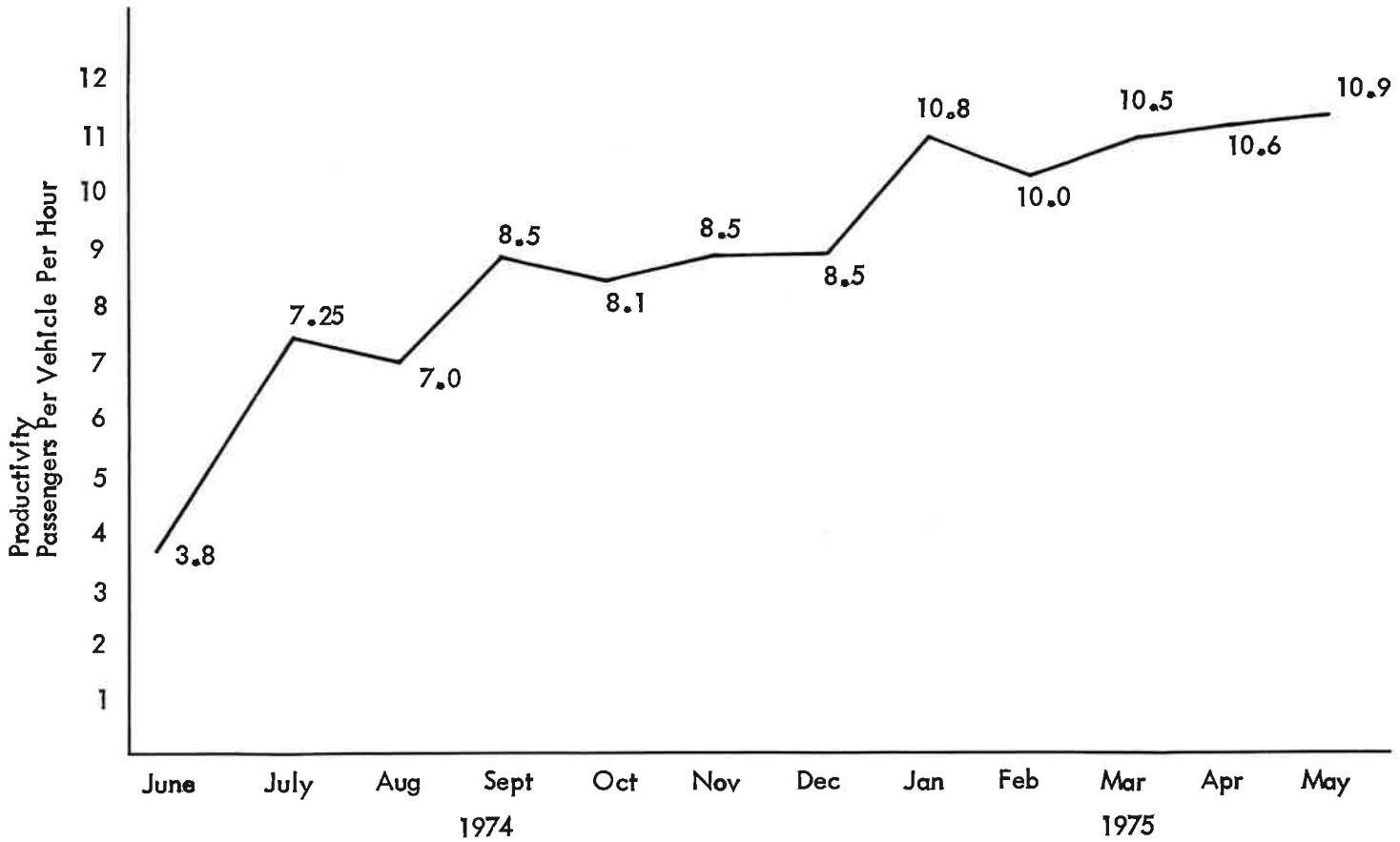

Figure 6. Vehicle Productivity (Monthly Averages)

TABLE 1. MERCED TRANSIT SYSTEM (JULY 1974 THROUGH MAY 1975 OPERATING COSTS

	Total Revenue	Maintenance Costs	Labor Costs	Over Head*	Total Costs	Net Costs	Total Riders	Net Cost Per Ride
July	$1,174.50	$1,401.37	$4,516.37	$500.00	$6,417.74	$5,243.24	4,622	$ 1.13
August	1,364.25	902.82	4,792.16	500.00	6,194.98	4,830.73	5,449	.87
September	1,234.50	1,220.81	4,665.15	500.00	6,385.96	5,151.46	5,046	1.02
October	1,557.00	1,161.61	4,673.44	500.00	6,335.05	4,778.05	5,844	.82
November	1,217.50	1,653.16	4,506.58	500.00	6,659.74	5,442.24	5,074	1.07
December	1,417.00	1,239.60	6,975.98	500.00	8,715.58	7,298.58	5,638	1.29
January	1,786.75	1,953.92	3,936.26	500.00	6,390.18	4,603.43	6,699	.69
February	1,609.25	1,836.55	4,121.98	500.00	8,067.78	6,459.53	6,675	.96
March	1,674.00	1,899.33	4,160.15	500.00	6,559.48	4,885.48	6,736	.72
April	1,773.75	1,954.11	4,063.17	500.00	6,517.28	4,743.53	7,183	.66
May	1,876.00	1,852.54	4,118.77	500.00	6,471.31	4,595.31	6,892	.67

*Overhead = Telephones $180.00
Radios 50.00
Driver Sup. 100.00
Misc. 170.00

$500.00

TABLE 2. MAINTENANCE COST BREAKDOWNS (JULY 1974 THROUGH MAY 1975)

Month	Total Costs	Tires	Fuel	Oil	Maintenance Labor	Parts	Outside Maintenance	Cost Per Mile	Cost Per Ride
July	$1,401.37	$ ϕ	$594.16	$12.00	$392.97	$116.67	$285.56	$.14	$.30
August	902.82	ϕ	661.76	7.20	225.91	7.95	ϕ	.085	.165
September	1,220.21	ϕ	679.36	8.40	418.51	108.54	6.00	.126	.24
October	1,161.61	ϕ	710.63	17.60	406.71	26.67	ϕ	.108	.198
November	1,653.16	ϕ	613.06	9.75	467.58	145.38	417.39*	.16	.32
December	1,239.60	111.98	640.79	13.20	425.07	48.57	ϕ	.118	.22
January	1,953.92	473.60	737.77	14.40	462.70	178.92	86.53	.157	.29
February	1,836.55	151.00	700.15	14.40	718.82	239.68	12.50	.161	.28
March	1,899.33	127.30	786.66	21.60	736.85	226.92	ϕ	.147	.28
April	1,954.11	136.50	819.64	25.20	745.64	227.13	ϕ	.176	.27
May	1,852.34	179.50	778.86	14.40	705.83	107.28	66.67	.165	.26

*Transmission Repair

The major difficulty facing MTS today would seem to be an excess demand for its services. Daily ridership has stabilized at about 330 rides per day. However, this is more a result of supply constraints than demand saturation. On days when everything is running smoothly, the system serves between 380 and 410 trips in a day. On the average, one vehicle is out of service two to three hours a day for maintenance work. MTS borrows the Park Department station wagon, if it is available, to augment its vehicle fleet as needed. This vehicle, which is equipped with a two-way radio, is used to service advanced reservation trips because of their preferential status.

During periods of heavy usage, usually between 11:00 a.m. and 4:30 p.m., when demands exceed capacity, some requests must be deferred. The caller is switched to an automatic answering service whenever the system is overloaded. At times a caller will be deferred for an hour or two as the staff concentrates on handling previously scheduled ride requests. Waiting times are also affected by system overloading with some passengers having to wait over an hour for a pick-up. This is obviously a source of frustration for MTS patrons.

In order to serve a latent demand estimated at between 700 and 1,000 riders per day, MTS plans to expand its capacity by acquiring four additional vehicles. One of these vehicles would be equipped with a wheelchair lift to accomodate handicapped riders. About five partially handicapped riders presently use MTS on a regular basis. Merced has submitted a capital grant request to UMTA for the purchase of four vehicles, expansion of the garage facilities, bus shelters, and signs. Approval of this request is pending UMTA certification of Merced's Transportation Development Plan. It is expected that with a fleet of eight vehicles, MTS could handle the current and potential demands for its dial-a-ride service.

Dial-a-ride has already had a dramatic impact on the lives of some of Merced's residents, providing them a sense of freedom that they did not have before. This sense of personal independence is especially important to the elderly and handicapped users, whose mobility had been severely limited before MTS began operation. One driver related a story of a tearful elderly rider who hugged her in appreciation for the service provided.

The employees tell of a "family" atmosphere among members of the staff, which apparently extends to the community it serves. Last Christmas, for instance, the drivers voted among themselves the best customers of the dial-a-ride service. (The idea was to reward those customers who use the system regularly and to do something

nice for some of the riders at Christmas.) Each of the four winners was presented with a book of 12 ride tickets.

For those Merced residents who do not have access to or are unable to drive an automobile, MTS has provided a level of mobility previously unattainable. Many of these residents had been literally stranded at home, either because they could not afford the cost of a taxi or were reluctant to inconvenience friends or relatives for a ride. Riders are using the service to do their shopping, get to school and work, schedule medical appointments, attend club and city meetings, attend sporting events, as well as for many other individual purposes. MTS would seem to be a clear demonstration of the importance of public transportation to those without automobiles in an auto-dominated community.

SUMMARY OF MERCED TRANSIT SYSTEM CHARACTERISTICS

DEMOGRAPHICS

Population in service area: 30,000
Population density: 3,000 persons per square mile
Median household income: $8,300 per year
Cars owned per household: 2
Percent carless households: N/A
Percent transit dependant: N/A
Average distance to service: N/A

COVERAGE AND SERVICE

Service area: 10 square miles
Time of service: 7:15 AM-5:15 PM, Mon-Fri
Average wait: 21 minutes
Number, types & average capacity of vehicles: 4 vans
Number of vehicles in service: 4

COST AND PRODUCTIVITY

Operating cost per year: $80,000
Vehicle miles per full service day: N/A
Vehicle hours per day: N/A
Driver hours per day: N/A
Operating cost per vehicle hour: $9.70
Operating cost per vehicle mile: N/A
Operating cost per passenger trip: $0.84
Passengers per vehicle hour: 11.5
Passengers per vehicle mile: N/A
Driver wage rate per hour: $3.75

REVENUE AND SUBSIDY:

Fares: $0.25
Revenue per passenger: $0.25
Subsidy per passenger: $0.59
Operating ratio: 3.4
Lease or buy vehicles: Buy
Funding: N/A

	Capital	Planning/evaluations
federal	-	-
state	-	-
local	-	-
total	65,000 (Capital)	

RIDERSHIP

Average Passengers per day: n/a
Average Passengers per weekday: 330
Ridership growth rate: Multiply by 2 in 1 year and at capacity.
Ridership composition: 34% under 21 years, 23% over 50
Trip purpose: 35% school, 26% work, 14% shopping