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METRO MOBILITY:
THE METRO-AREA
HANDICAPPED TRANSPORTATION
DEMONSTRATION

SIX MONTH REVIEW

prepared for
Minnesota Department of Transportation

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STATE OF MINNESOTA

by
Multisystems, Inc.

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The Metro Area Handicapped Transportation Project, a Mn/DOT paratransit demonstration project sponsored jointly with MTC and Metro Council, began operations on April 2, 1979. Because of the central role this project can play in meeting the mobility needs of the handicapped, it is important that it be monitored closely and evaluated, in order that the most effective overall service can be provided. This report documents the first six months of operation. Because of the short life of the project thus far, this document is intended as a preliminary evaluation only: it is recommended that a more complete evaluation be undertaken after the first full year of the project.

This report was prepared by Multisystems, Inc., which has been working with Mn/DOT on the Paratransit Demonstration Program since its inception. The opinions expressed here are solely those of Multisystems, and may not represent those of Mn/DOT, MTC, or the Metropolitan Council.

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EXECUTIVE SUMMARY

The Metro-Area Handicapped Transportation Demonstration Project, more commonly known as "Metro Mobility," is a joint Minnesota Department of Transportation (Mn/DOT), Metropolitan Transit Commission (MTC) and Metropolitan Council effort to develop a coordinated transportation program for the handicapped. The project was designed to provide transportation services to the handicapped and determine the most cost-effective manner of providing paratransit service. Furthermore, the project was designed to demonstrate the potential for: introducing economies through contracts with the private sector; coordinating public and private service along with elements of private service; and using different modes to service persons with different travel problems and needs.

The focus of the demonstration project is the Metro Mobility Transportation Center, which is designed to:

1. certify eligible handicapped persons;
2. receive trip requests and schedule passengers for a number of different providers; and
3. maintain records for monitoring and evaluation.

Initially, the Transportation Center, which is operated by the MTC under contract to Mn/DOT, was responsible for controlling MTC's Project Mobility, which now operates throughout Minneapolis and St. Paul, and a new shared-ride taxi service which operates in Minneapolis. All three Minneapolis taxicab companies have operating contracts with Mn/DOT. In November, 1979, service will be expanded to a number of inner suburbs, where it will be provided by a group of private (primarily non-profit) providers. That service will be expanded as new providers can be added to the network.

Metro Mobility began on April 2, 1979, when control of PM shifted to the new Transportation Center, and shared-ride taxi

service began. PM expanded throughout Minneapolis and St. Paul on July 14, 1979.

By mid-September, 1979, a total of 7257 persons had been certified as eligible to use Metro Mobility services. Of these, approximately 26% are wheelchair users, while an additional 42.6% use some other orthopedic aid. It is estimated that approximately 25% of eligible persons in the City of Minneapolis have been certified.

Ridership by the handicapped has increased from a pre-Metro Mobility PM level of 7051 (March, 1979) to 21,131 in September. Of this total, 42% represents shared-ride taxi users. PM ridership in September included 7846 passenger-trips in Minneapolis and 4443 in St. Paul.

As was planned, the taxi service and Project Mobility have served different segments of the handicapped community. In Minneapolis, where both services are available, 69% of PM's passengers use wheelchairs and 22% use an orthopedic device. 18% of PM users require an escort. On the other hand, only 8% of taxi passengers use wheelchairs, while 47% use orthopedic devices and 19% require an escort. In St. Paul, where no taxi service is available, only 32% of PM passengers are wheelchair users. Thus, the availability of taxi service has clearly enabled Project Mobility to focus on those persons with the most severe mobility problems; wheelchair users.

The shared-ride taxi service has proven to be significantly less expensive than Project Mobility (although up-to-date PM figures are not available). Over the first five months of service, the shared-ride taxi subsidy per trip amounted to \$5.01, with the cost decreasing as ridership increased. Approximately 55% of the cost was for taxi company reimbursement; the remainder covered administration, control, and marketing.

The only significant problem with the project experienced to date has been the relatively inefficient performance of the

Transportation Center. This has resulted in two deficiencies: poor service quality, and higher than necessary costs.

The request-taking process has deteriorated to the point where passengers are kept on hold for an average of eight minutes during peak periods. Passengers have great difficulty getting through to the Transportation Center. This extremely poor level of service has placed an artificial constraint on ridership levels, and is causing some passengers to seek alternative means of transportation.

Second of all, the Transportation Center staff is not yet making maximum use of the shared-ride component of the demonstration. Despite significant improvement over initial performance, (following some special training), the schedulers could still reduce tour cost by at least 4%.

The inefficiencies in the Transportation Center are one factor in the fairly high administrative/control cost. Over the first five months of the project, control costs of \$2.27 per passenger represented 42% of total costs (45% of net costs) of the taxi service. By month five, increasing ridership had decreased this percentage, but it still represents 34.9% of the total costs. Further reductions should be possible. Thus, while the current total taxi cost per passenger of over \$5.00 is approximately 10% higher than the corresponding cost of exclusive-ride taxi service, there is clear potential for reducing the cost below the level of exclusive-ride. The key is improved performance of the Transportation Center itself. The key to that, in turn, is improved management and supervision. Specific recommendations for improving the operation are included in the body of this report.

In summary, the results thus far suggest that Metro Mobility is on its way to meeting many of its objectives. Ridership by the handicapped has been increased by over 200% and is increasing further. The shared-ride taxi service has operated smoothly and indicated that public/private sector coordination (as well as coordination between segments of the

public sector) is possible, and that economies can be achieved through contracts with the private sector. The project has also indicated that different services can be used to meet the needs of persons with different travel problems. If the operating efficiency of the Transportation Center can be improved, the overall services should go a long way towards meeting the needs of the handicapped community. As such, the project could also become the prime component of an interim service which meets the federal government's "504" accessibility guidelines.

CHAPTER 1

INTRODUCTION

1.1 Project Background

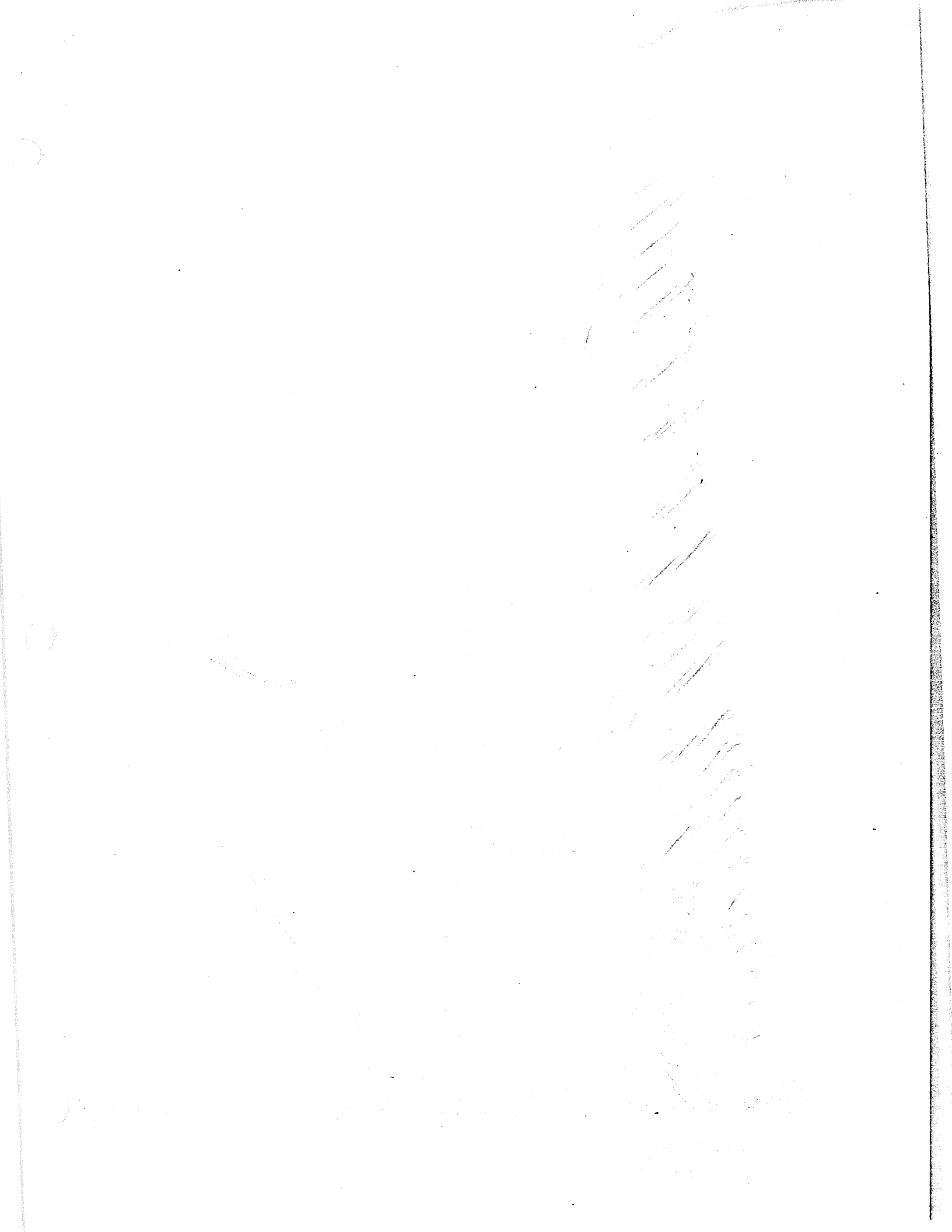
The Metro-Area Handicapped Demonstration Project is a major element in the joint Minnesota Department of Transportation (Mn/DOT), Metropolitan Transit Commission (MTC), and Metropolitan Council commitment to develop a coordinated transportation program which: "discourages the further fragmentation of services and unnecessary duplication of efforts." The proposed project, which is composed of three major elements, was designed to meet the following Mn/DOT Paratransit Demonstration Program objectives:

1. To provide transportation services for persons who because of age or incapacity are unable to drive a private automobile or use existing modes of public transit.
2. To determine the most effective manner of providing paratransit services.

The first element and major focus of the proposed demonstration is the implementation of the "Metro Mobility Transportation Center" as a mechanism for coordinating handicapped transportation services. The specific functions of the control center are to:

1. certify eligible handicapped persons;
2. receive and match trip requests with the appropriate participating transportation providers and develop passenger tours; and
3. maintain records for reimbursement, evaluation, and future plans and improvements.

Initially, the Transportation Center has been responsible for developing passenger tours for two services: Project Mobility and the "Metropolitan Shared-Ride Taxi Service." The



latter is a new service initiated as the second element of the overall demonstration. This project has been designed to complement Project Mobility and allow additional service for the handicapped, through the "purchase" of shared-ride service from participating taxi companies. The project is intended to demonstrate the following innovative concepts:

1. The introduction of economies through public sector contracts with private transportation providers.
2. The coordination and cooperation of different taxicab companies.
3. The coordination of private taxi companies with a component of a public transit system, including integration of control functions.
4. The use of different service modes to serve handicapped persons with different travel problems and needs.

The concept of centralized control for this project, with control effected by the public sector, is intended to ensure that the maximum efficiencies are achieved in the scheduling of vehicles.

The Metro Mobility Transportation Center, which is operated by the Metropolitan Transit Commission under contract to Mn/DOT, will also interface with the third element of the overall demonstration, "Coordinated Private Provider Handicapped Service." This project is aimed at determining the effectiveness of utilizing other private for-profit and private non-profit providers to serve the handicapped. Metro Mobility Transportation Center will receive and screen all calls for service, and trips in areas served by these carriers will be scheduled by a staff member assigned specifically for that purpose. This element of the project has not yet been implemented, and will not be considered further in this analysis.

These three demonstration elements have also been integrated with another paratransit demonstration:

Paratransit Consumer Outreach Project," which is aimed at encouraging handicapped persons to utilize available transportation services.

The overall demonstration, which has become known simply as "Metro Mobility," has taken on greater importance since its initiation. The final Federal Department of Transportation "Section 504" regulations requiring that transit systems be made fully accessible, also require an interim service to be provided (at least) until such time as the fixed route service is made accessible. Metro Mobility, if it is successful, may serve as that interim service.

1.2 Description of the Services

Project Mobility (PM) is a service that has been operated by the Metropolitan Transit Commission since 1976. PM uses lift equipped vehicles to transport eligible handicapped persons door-to-door within the designated service area. Eligibility classifications adopted under the Metro Mobility project are shown in Table 1.1. Passengers are charged 35¢ per trip and are able to bring along up to 3 (non-eligible) companions. (The first companion is charged 35¢, while additional companions are charged \$1.00.) Service was initially provided in a target area near downtown Minneapolis, which was expanded in July 1978 but still limited to a portion of the city. Service is now provided throughout Minneapolis and St. Paul. Passengers must request service at least two hours in advance. This service feature is somewhat unique, since most similar systems required 24-hour advance notice. This is extremely important, since it is likely that 24-hour advance notice service will not qualify as acceptable interim service under 504 guidelines.

The shared-ride taxi service is virtually identical from the passengers' point of view, with the exception that the vehicles are different and service is limited to six-mile trips within the city of Minneapolis. The service is operated by all

Table 1.1

Handicap Classification Scheme

Classification	Vehicle Type		
	Ambulance	Vehicles With Lifts or Ramps	Autos, Vans and Taxis
Persons requiring an ambulance type vehicle with life support equipment and operators trained to administer this equipment or offer personal assistance which is necessary	10 *		
Persons using a wheelchair, require an accessible type vehicle and do not need an escort		21	
Persons using a wheelchair, require an accessible type vehicle and require an escort		22	
Persons using an orthopedic device, require an accessible type vehicle but do not need an escort		23	
Persons using an orthopedic device, require an accessible type vehicle and require an escort		24	
Persons using a wheelchair, are able to use an auto, van or taxi (with or without driver assistance getting in and out of the vehicle) and do not require an escort			31
Persons using a wheelchair, are able to use an auto, van or taxi and require an escort			32
Persons using an orthopedic device, are able to use an auto, van or taxi (with or without driver assistance getting in and out of the vehicle) and do not require an escort			33
Persons using an orthopedic device, are able to use an auto, van or taxi and require an escort			34
Persons who do not require an orthopedic device, are able to use an auto, van or taxi and do not require an escort			35
Persons who do not require an orthopedic device, are able to use an auto, van or taxi and require an escort			36
Nonhandicapped elderly residing more than 1/4 mile from fixed route transit			37 *
Elderly persons that are unable to walk to a bus stop closer than 1/4 mile			38 **

* Persons in this category are not being certified

** Persons in this category are no longer being certified

three Minneapolis taxi-cab companies under contract to Mn/DOT. Tours (i.e., the stops associated with a group of passengers) are transmitted to the taxi companies on a rotating basis in proportion to the number of taxicab licenses held.

The taxi-cab companies are reimbursed on a tour by tour basis, with the tour cost calculated to approximate meter rates. The service area is divided into half-mile zones. The cost of a trip was initially established as:

- a 75¢ "flag drop" charge at the time the first scheduled passenger is picked up
- 40¢ for each zone, including the first zone travelled through in the course of the tour (equivalent to a 80¢-per-mile rate plus 10¢ wait time for each mile)
- 25¢ for each pickup stop after the first (based on a 2-minute wait time)

The above figures were increased to 85¢, 50¢, and 30¢ respectively when taxi fares were increased in July, 1979. The reimbursement is set at the above cost less fares received. The taxi companies maintain records on trips taken, while the Transportation Center maintains their own records as a check.

PM and shared-ride taxi service are provided between 6 AM and 1 AM on weekdays, and 8 AM and 1 AM on weekends.

The Metro Mobility Transportation Center is operated by the Metropolitan Transit Commission under contract to Mn/DOT. Direction for the project comes from the Policy Management Board, consisting of representatives from Mn/DOT, MTC, Metro Council, and the handicapped community.

1.3 The Project Since its Inception

The Metro Mobility Transportation Center (MMTC) opened for operation on Monday, April 2, 1979, following a 2-week training session. The facility is located in the Midway area of St. Paul, convenient to both cities, and has been made fully accessible to the handicapped. When Metro Mobility operations began, Project Mobility control staff had shifted from the PM

(Nicollet) garage to the MMTC. PM dispatchers who communicated with vehicles remained at Nicollet, and the control staff there continued to schedule and dispatch Community Transit Service in White Bear Lake. Additional staff joined the MMCC, and shared-ride taxi service began on April 2.

Metro Mobility was initially staffed by a Project Manager and Assistant Project Manager, the latter having previously served as a PM dispatcher; two PM dispatchers who shifted over; eight "transit information representatives" who handled both call-taking and scheduling (two of these persons were formerly employed as MTC information operators); and a certifications secretary who has been fulfilling that function for PM. Initially, 5 of the staff members (including the certifications secretary) were handicapped. That number subsequently decreased, but currently 4 staff members are handicapped individuals.

The first significant change in Metro Mobility operations came on July 14, 1979, when PM was expanded to all of Minneapolis and St. Paul. The second major change occurred on September 4, 1979, when all PM control functions (plus those for White Bear Lake) were moved into the MMCC. At this time, the transportation center was rearranged such that call-taking takes place in one room while scheduling and dispatching functions take place in another room.

The next major change is scheduled to take place in November, when the first two components of the private provider network are scheduled to begin operation. CENTS (Center for Non Traditional Studies) will provide service in the north-western and western suburbs, while Handicapped and Senior Citizen Transportation Service will provide service in the southwestern area. As noted earlier, calls for service in these areas will be transferred to a dispatcher who will be assigned solely to those services.

With this overview in mind, the results of the first six months of operation are summarized in the following chapters.

CHAPTER 2

OVERALL RESULTS

2.1 Certification

MTC began the process of recertifying users of PM (from an older 3-level PM classification to the more disaggregate classification illustrated in the previous chapter) and certifying new potential users a few months prior to the initiation of Metro Mobility.

Certification by handicapped classification for both Minneapolis and St. Paul (including some suburbanites) is shown in Table 2.1.* Of the total of 7257 persons certified by mid-September, 1084 live in St. Paul, and most of the remainder are located in Minneapolis. The cumulative number of persons recertified by the end of each month is illustrated in Figure 2.1.

As can be seen from Figure 2.1, certification did not begin to pick up rapidly until June, 1979. This is in large part a result of slowness in both marketing and processing certification requests. In June, 1979, Metro Mobility added a full-time secretary to support the certification secretary. This enabled the Transportation Center to catch up on the backlog, and the certification process is currently going fairly smoothly. In addition, a person involved in the Outreach Demonstration now assists in the certification one day per week.

While the present record-keeping system makes it somewhat difficult to separate classification by city or town,** we would estimate that approximately 5800 certified persons are from Minneapolis. Based on reports of last year which

* An intentional decision was made not to certify anyone in the 37 category.

** We would strongly recommend that record-keeping practices be changed such that totals by community and classification can be developed easily.

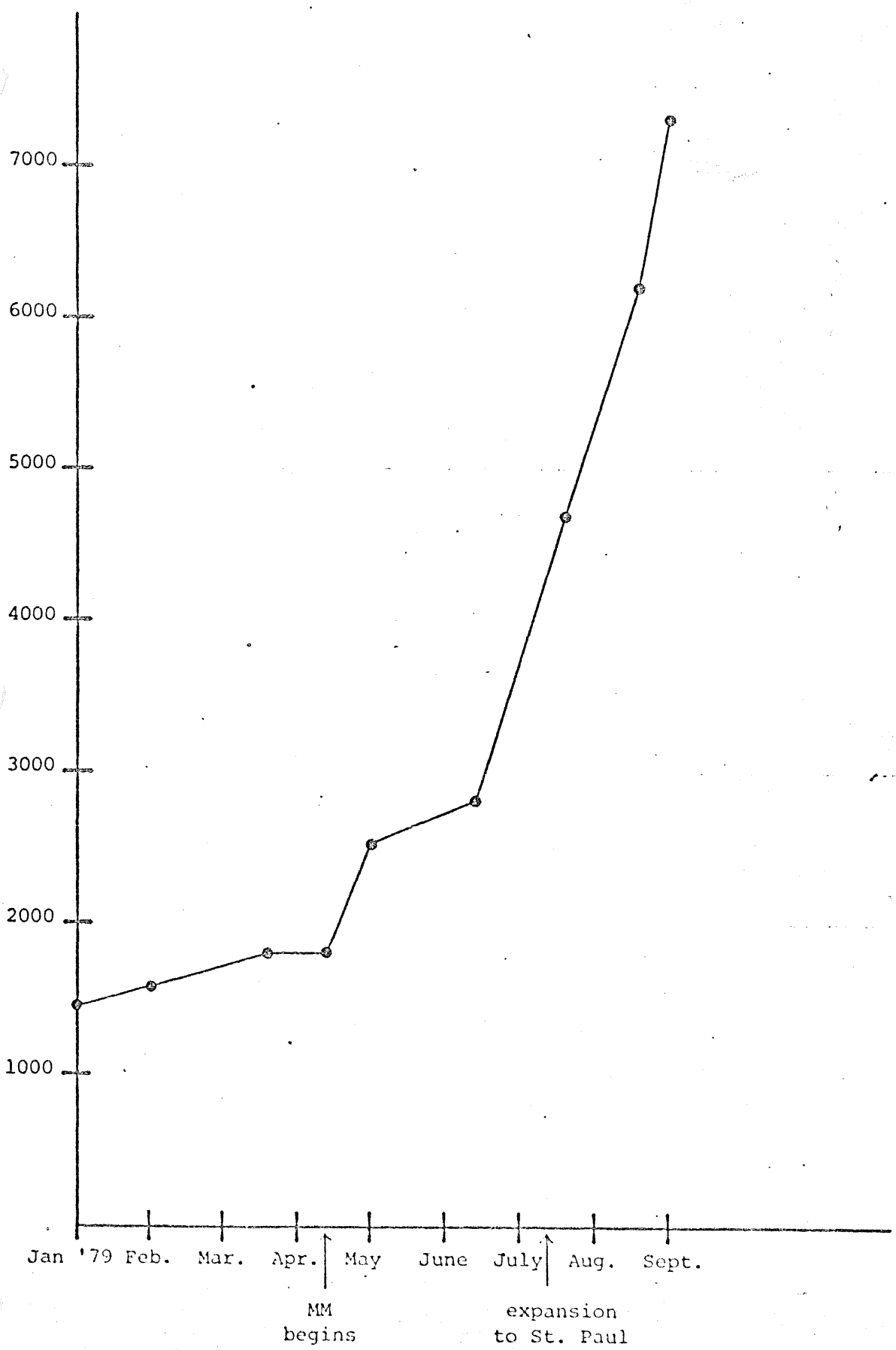


Figure 2.1
Cumulative Number of Persons Certified

Table 2.1
Certification by Handicap Type

Handicap Classification	Number	Percent of Total
21 wheelchair + accessible vehicle	513	7.1%
22 wheelchair + accessible vehicle + escort	700	9.6%
23 orthopedic device + accessible vehicle	102	1.4%
24 orthopedic device + accessible vehicle + escort	82	1.1%
31 wheelchair	227	3.1%
32 wheelchair + escort	257	3.5%
33 orthopedic device	1854	25.5%
34 orthopedic device + escort	760	10.4%
35 unable to walk to bus stop	1249	17.3%
36 unable to walk to bus stop + escort	699	9.6%
38 elderly unable to walk to bus stop	369	5.2%
unclassified*	445	6.2%
total	7257	100.0%

* These apparently are persons who are classified with the original 3-tiered PM classification and have not yet been reclassified.

attempted to estimate the total eligible population, this number represents approximately a 25% market penetration.

As an aside, the first year PM evaluation report indicated that, under the original 3-tiered classification scheme, 60% of the registrants were in wheelchairs, 22% used some aids, and 18% used no aids. The market penetration for each group was inversely related to these figures. At present, excluding the unclassified, 25.8% use wheelchairs, 42.6% use aids, and 31.6% require no aids. Given the addition of taxi service which is, in general, not suited for persons using wheelchairs, this shift in registration patterns would appear to be appropriate.

2.2 Ridership

Table 2.2 lists total ridership by month by service, for all months in 1979.

As can be seen from this table, shared-ride taxi ridership was significantly below that of PM during the first month of operation. Within two months, however, shared-ride taxi ridership had actually surpassed that of PM. In September, the last month for which data were available, taxi ridership was approximately 75% of total PM ridership, but greater than the ridership on PM in Minneapolis.

During the first month of Metro Mobility, it appears that shared-ride taxi has diverted a fair number of passengers from PM. By August, however, PM (Minneapolis) reached an all time record ridership, albeit in an area significantly larger than that served before the start of the Metro Mobility demonstration.

The basic conclusion that can be reached from these figures is that Metro Mobility has been successful in significantly increasing the amount of service being offered to and used by the handicapped community. Ridership in Minneapolis alone increased 137% from the month before the initiation of Metro Mobility service until September, 1979.

Table 2.2

Ridership Figures

	January	February	March	April	May	June	July	August	September
Taxi	-	-	-	2878	5787	6699	7964	8981	8842
PM: Minn.	6503	5803	7051	5686	6067	5900	6216	7192	7846
St. Paul	-	-	-	-	-	-	1311	4162	4443
PM: Total	6505	5803	7051	5686	6067	5900	7527	11354	12289
Total	6503	5803	7051	8564	11854	12599	15491	20335	21131

The shared-ride taxi service appears to be achieving its ridership goals. Weekday ridership in September averaged 340. Initial demand estimates for the service* called for a ridership in the range of 340-680 per weekday to be achieved after six months of service. As will be discussed later the current ridership level is probably somewhat constrained by problems with the call-taking process.

Of the current totals, approximately 49% of PM trips represent standing orders, while the remainder are trips booked at least two hours before the desired trip time. For the taxi service, approximately 34% of all trips are standing orders. Standing orders for PM service are intentionally limited, so that there is room for those persons who do not ride on a regular basis. The two-hour advance notice option, a unique feature of this system, has not noticeably impacted scheduling ability. Indeed, PM's productivity, measured in passengers per vehicle hour, has averaged close to 3 in Minneapolis, not noticeably different from the figure achieved by other systems serving handicapped individuals. Taxi service productivity cannot be measured in passenger per vehicle hour, since vehicles are not assigned to the system and no vehicle hour records are maintained.** However, as will be discussed later, taxi productivity can be measured, and problems with productivity can probably be traced more to inefficient scheduling than to the 2-hour notice provision.

Ridership by Handicap Classification

Also of interest is the ridership by handicap classification. While the Transportation Center was supposed to

* These demand estimates were incorporated in a draft application for the shared-ride taxi demonstration prepared by Multisystems in July, 1979. The final version of that application did not include the demand figures.

** The lack of dedicated vehicles makes the taxi service inherently more flexible than PM.

maintain this information on a regular basis, they did not do so. For the purposes of this evaluation, we computed this distribution for three days: Tuesday, August 7; Friday, September 14; and Saturday, August 25, 1979.* The results were extremely consistent, suggesting that the figures are representative. A composite total distribution was generated by weighting the individual days' results by ridership, and then further weighting the August 7 results (which include standing orders) by 3, the September 14 results by 2, and the August 25 results by 2 to create a representative "week" (of 5 weekdays and 2 weekend days). The resulting distributions are shown in Table 2.3.

The first thing to note is that, as should be the case, the shared-ride service is serving very few persons classified 21-24, all of whom should require an accessible vehicle. All of those persons in these groups served by taxi were either misclassified or incorrectly assigned to a taxi. Similarly, very few non-handicapped elderly persons (category 38) were assigned to PM (in Minneapolis). In St. Paul, where no taxi service exists, greater use was made of PM by non-wheelchair users.

In Minneapolis, where both PM service and taxi service are available, 69% of PM users are in wheelchairs, while only 8% of taxi passengers are wheelchair users. Thus, the taxi service appears to have been successful in allowing PM to concentrate on those persons with the most severe mobility problems. In St. Paul, non-wheelchair users comprise 68% of passengers, which limits the number of wheelchair users who can be carried. The introduction of taxi service in St. Paul would, of course, change this significantly.

* Since standing order cards do not contain this information on a daily basis, we computed the distribution separately for standing Tuesday orders and added that into the August 7 figures. We ignored standing order for the other 2 days.

Table 2.3

Handicap Type Classification

Service	Classification										
	21	22	23	24	31	32	33	34	35	36	38
Taxi	1%	0%	1%	0%	6%	1%	34%	12%	33%	6%	5%
PM Minn.	46%	12%	6%	2%	10%	1%	12%	2%	8%	1%	0%
PM St. Paul	15%	9%	2%	0%	7%	1%	38%	7%	18%	2%	1%
Total	17%	5%	3%	1%	8%	1%	28%	8%	22%	4%	3%

The next interesting analysis is to compare trip making rates with classification rates; this comparison (using August and September ridership figures only) is made in Table 2.4. As can be seen, wheelchair users who require an accessible vehicle but no escort (21) and those who do not require an accessible vehicle (31) are overrepresented in the sample of riders. Classification 22 (wheelchair + accessible vehicle + escort) and 36 (non-handicapped/unable to walk to bus stop) are underrepresented, while most of the other classifications are fairly equally represented. Correspondingly, the trip generation rate (trips per person per month) of categories 21 and 31 (as well as 23) are significantly above the average figure of 3.2, while the rates for categories 22 and 26 as well as, 32 and 38 are significantly below. One might postulate that Metro Mobility service is extremely important for those with very high trip making rates, since lower rates of other groups suggest that they have alternative transportation available.

2.3 Cost

The cost of Metro Mobility operations can be broken into three components: 1) reimbursements to the taxi company for the operation of shared-ride service; 2) cost of Transportation Center operations; and, 3) marketing. For the purposes of the demonstration, the operating costs of Project Mobility (exclusive of Transportation Center costs) are not considered.*

Costs for Metro Mobility to date are broken down in Table 2.5. A number of comments on how these costs were developed is in order. First, an attempt has been made to separate out pre-

* In September, 1979, the PM dispatchers who had been operating out of the Nicollet garage were moved into the Transportation Center. There is some question as to whether these persons will now be charged to the project.

As a further point, the cost of the Mn/DOT liaison in the Transportation Center has not been considered, since this was initially established as a temporary position.

Table 2.4

Handicap Classification Trip Generation

Classification	Number Classified	Percent of Total*	Percent of Trips (Aug-Sept)	Total September Trips	Trips/ Person Classified/ Month
21	513	7.5%	17%	3592	7.0
22	700	10.2%	5%	1052	1.4
23	102	1.5%	3%	634	6.2
24	82	1.2%	1%	211	2.6
31	227	3.3%	8%	1690	7.4
32	257	3.8%	1%	211	0.9
33	1854	27.2%	28%	5917	3.2
34	760	11.1%	8%	1690	2.2
35	1249	18.3%	22%	4648	3.7
36	369	10.3%	4%	845	2.3
38	445	5.4%	3%	634	1.4
Total	6558	100 %	100%	21131	3.2

* This table differs from Table 2.1 in that the unclassified persons are excluded.

Table 2.5
Metro Mobility Costs

	Implementation	First Five Months of Operation
<u>Taxi Reimbursement</u>	-	89,845
<u>Operations</u>		
Administrative Wages & Benefits	5,364	22,711
Secretarial Wages & Benefits	-	9,962
Control Staff Wages & Benefits	-	112,373
Telephone	2,195	4,000
Rent	3,000	7,500
Materials & Supplies & Misc.	98	4,600
Misc. Services & Contracts & Lease	-	3,850
MTC Overhead*	-	12,300
Subtotal	10,657	177,296
<u>Marketing</u>	5,592	10,000
Total	16,249	277,141

* includes finance, data processing, etc.

service implementation costs (since such costs should not be allocated to 5 months of operation only). In doing so, approximately 1/3 of marketing costs were arbitrarily charged to implementation, with the remainder charged to operations. Next, an attempt has been made to allocate costs on an accrual basis, rather than the cash flow basis utilized by MTC who prepared the operating costs. As such, the totals may differ slightly from those reported by MTC. The cost categories have also been changed slightly from those used by MTC; the format presented here is somewhat more informative for the purposes of evaluation. Finally, MTC's invoiced cost figures appear to understate Transportation Center staff costs. We have used different figures developed directly from payroll sheets.*

It is difficult to draw any conclusions from the aggregate costs appearing in Table 2.5. MTC has only just prepared the cost figures, and is still in the process of trying to analyze them. The only questions that might be asked are: 1) what is included in "miscellaneous", and 2) how were MTC overhead costs determined and are they reasonable? These issues, however, are not the direct concern of the evaluation.

Costs can be placed in perspective by comparing them with ridership figures. Table 2.6 provides this analysis for the shared-ride taxi service on a month by month basis. In developing these figures: 1) again, an attempt was made to assign costs on an accrual rather than cash flow basis; and 2) control costs were allocated to the taxi service on the basis of relative ridership between taxi and PM. Note that, in Table 2.6, the full cost of taxi service, as well as the actual reimbursement cost (i.e., full cost less fares received directly from passengers) is listed.

Based on this table, the following observations can be made.

* MTC may have understated marketing costs as well.

Table 2.6

Cost of Shared-Ride Taxi Service

	April, 1979	May	June	July	August	Total
% total pass.	34%	49%	53%	51%	44%	45.1%
total passengers	2878	5787	6699	7964	8981	32,309
tour cost	8727	17120	19525	24871	30249	100,498
reimb. cost	7720	15149	17172	22753	27101	89,845
admin. cost*	9700	13850	15900	17650	15600	72,500
tour cost/pass.	3.03	2.96	2.92	3.12	3.37	3.11
reimb. cost/pass.	2.68	2.62	2.56	2.86	3.09	2.78
admin. cost/pass.	3.37	2.39	2.37	2.21	1.73	2.24
total cost/pass.	6.40	5.35	5.29	5.33	5.10	5.34
net cost/pass.	6.05	5.01	4.93	5.07	4.82	5.01

* Includes operations and marketing. All numbers rounded.

1. On an overall basis, the cost (per passenger) of the taxi service has been significantly lower (less than half) that of Project Mobility.* This was one of the initial objectives in setting up the project.
2. Administrative cost per passenger, while declining as a result of increased ridership, represents an unusually high percentage of total costs. In total, administrative costs comprised 42.2% of total costs (34.9% in the last reported month).

Let us consider these tasks together. On the one hand, the shared-ride taxi service has been much less expensive than PM. On the other hand, the administrative cost associated with operating such a service has been fairly high. A key question to ask is whether the shared-ride taxi service is a more cost-effective alternative than simply subsidizing passengers to utilize exclusive-ride taxi service.

To help determine the answer to this question, we estimated the costs that would have accrued if all passengers on Friday, September 14, 1979, had taken exclusive-ride taxi service. The result, which should be fairly representative, indicated that the cost of exclusive-ride service would be \$4.44 per trip. Thus, the shared-ride taxi service is more expensive on a per passenger basis. Even excluding certification and marketing, both of which would have been needed even if exclusive-ride service were used, the cost of shared-ride service would currently be \$4.86 per trip, or almost 10% greater.

The next question to ask is whether there are any opportunities to reduce the cost of the shared-ride taxi service (aside from the obvious one of increasing patronage levels). The answer to this question would appear to be yes. Let us consider the tour reimbursement cost first.

* Unfortunately, up-to-date cost figures on PM are not presently available. For this reason, it is not possible to determine whether PM has benefited from any economies of scale.

The key to the efficiency of any shared-ride taxi service is to maximize the amount of shared-riding. Metro Mobility personnel, however, have not been creating the most efficient tours. Although, as a result of special training, there have been significant improvements.

During the first week of service, Multisystems analyzed the tours generated on April 2, 1979. The results indicated that the reimbursement cost could have been decreased by 6.5%, or \$21.00. As ridership increases, the potential for sharing rides increases. However, the Transportation Center staff did not appear able to respond. An analysis of some of the tours on May 14 indicated that costs could have been decreased by at least 10%, or \$33. As a result of these analyses, it was decided to hold a special scheduling training session in mid-June, conducted by Multisystems. While the Transportation Center staff reported that the reason they could not produce more efficient tours was that they did not have sufficient time, the results suggest that the training (together with greater attention of the problem on the part of management) was effective. The ratio of passengers to tours, a good indicator of scheduling inefficiencies, increased from 1.17 in April and May to 1.37 in June, 1.37 in July, 1.41 in August and 1.38 in September. In addition, the percentage of total tours which were shared-rides increased from 13.4% in June (the statistic was not collected earlier) to 17.6% in July and 22.1% in August.

These results are still below what is achievable. An analysis of tours for September 14, 1979, revealed that costs could have been reduced by 4%, or \$40. This impact is not significant. On an annual basis, the potential savings are \$160 per passenger. Thus, taxi tour costs could be reduced somewhat. The problem of tour formation will be discussed in Chapter 3.

The cost per passenger should be reducible and, as discussed in Chapter 3, the staffing

The key to the cost-effectiveness of any shared-ride taxi service is to maximize the amount of shared-riding. Metro Mobility personnel, however, have not been creating the most efficient tours, although, as a result of special training, there have been significant improvements.

During the first week of service, Multisystems analyzed the tours generated on April 2, 1979. The results indicated that the reimbursement cost could have been decreased by 6.5%, or \$23.00. As ridership increases, the potential for sharing rides increases. However, the Transportation Center staff did not appear able to respond. An analysis of some of the tours on May 18th indicated that costs could have been decreased by at least 12%, or \$50. As a result of these analyses, it was decided to hold a special scheduling training session in mid-June, conducted by Multisystems. While the Transportation Center staff reported that the reason they could not produce more efficient tours was that they did not have sufficient time, the results suggest that the training (together with greater awareness of the problem on the part of management) was effective. The ratio of passengers to tours, a good indicator of scheduling efficiencies, increased from 1.17 in April and May to 1.30 in June, 1.37 in July, 1.41 in August and 1.38 in September. As important, the percentage of total tours which were shared-ride increased from 13.4% in June (the statistic was not maintained earlier) to 17.6% in July and 22.1% in August.

However, these results are still below what is achievable. An analysis of tours for September 14, 1979, revealed that costs could have been reduced by 4%, or \$40. This impact is not insignificant. On an annual basis, the potential savings are over \$12,000, or 16¢ per passenger. Thus, taxi tour costs could be reduced somewhat. The problem of tour formation will be addressed again in Chapter 3.

The administrative cost per passenger should be reducible as well. As will be discussed in Chapter 3, the staffing

levels in the Transportation Center appear to have been on the high side for the ridership levels. As ridership increases, the control staff cost per passenger should decrease, if the operations of the Transportation Center can be made more efficient. This issue will be discussed further in the next chapter. It is also worth noting that there appears to have been an inordinate amount of overtime during the first few months of service. Overtime hours as a percent of regular hours increased from a reasonable 3% in April to a level of over 9% in August. While some of the overtime was caused by absenteeism, it is our contention that increased efficiency, improved staff scheduling, and better supervisory control would serve to reduce the amount of overtime needed.

Given the above discussion, and given the fact that shared-ride taxi costs are currently only 10% higher than exclusive-ride taxi costs, it would appear that a shared-ride taxi cost lower than the comparable exclusive-ride cost is a reasonable goal.

2.4 Comparison with Other Systems

To place the results to date of Metro Mobility in further perspective, we have developed some comparisons with two similar systems: Community Responsive Transit (CRT) and Extra Lift in Cleveland, Ohio; and the Lift in Portland, Oregon. These two services are directly comparable to Metro Mobility in that they are systems controlled by the transit authorities, with services provided by both the authority and taxi companies under contract. These systems are also located in metropolitan areas with similar populations to that of the Twin Cities. The comparison appears in Table 2.7.

Taxi service under Metro Mobility is more expensive than CRT taxi service, but less expensive than the LIFT. The Cleveland system exhibits relatively high productivity for a service of its kind. One reason for this is that service is provided within a set of pre-specified zones. However, Metro

Table 2.7

Comparison of Handicapped Transportation Services

	Metro Mobility	CRT	LIFT
Monthly Ridership			
Public	8,960 ¹	17,232 ²	6,259 ³
Taxi	8,472	9,975	888
Total	17,431	27,202	7,147
Cost			
Public: Operations	N/A	65,858	37,964
Taxi: Operations	27,560	27,814	5,053
Man. & Control ⁴	33,031	36,152	17,866
Total	N/A	129,824	60,883
Cost/Passenger			
Public: Operations	N/A	3.82	6.07
Control	N/A	1.32	2.49
Total	N/A	5.14	8.56
Taxi: Operations	3.25	2.78	5.69
Control	1.89	1.32	2.49
Total	5.14	4.11	8.18
Overall: Operations	N/A	3.44	6.02
Control	N/A	1.32	2.49
Total	N/A	4.76	8.51

¹ Based on July - August, 1979

² Based on 1977 data

³ Based on October, 1977

⁴ Excludes non Metro Mobility PM control costs and marketing

Mobility trips are limited to six miles, so this factor should not be significant. Cleveland is simply able to achieve more shared-riding. The reverse is true in Portland, where ridership levels were too low to achieve any major ride sharing. Low ridership in Portland also implies relatively high unit control costs. Note that, in both Cleveland and Portland, taxi operators are paid on a per hour, rather than per tour basis. That payment basis magnifies the importance of ride sharing.

In Portland, the relatively high costs led to a decision to include private non-profits in the delivery network. Currently, these services account for over 20% of total ridership. The cost per passenger in Portland over the past two years has increased 15% on the public service and 8% on the taxi service. Total ridership has remained constant. (Cleveland reports no increase in unit cost over that time. However, ridership has increased approximately 10%.)

While current cost data on PM are not available, it is clear from older PM cost data that PM is significantly more expensive than the comparable Cleveland service; slightly more expensive than the LIFT as well. Factors in the Cleveland case are the aforementioned zonal system and, more importantly, the fact that most CRT users are elderly and not handicapped. A more detailed comparison with the LIFT cannot be made without up-to-date data.

On the other hand, Metro Mobility's management and control costs do not appear to be significantly out of line with other systems. Management and Control comprise 37% of Metro Mobility taxi cost, as compared to 32% in Cleveland and 30.4% in Portland. Apparently, the nature of this type of service is such that management and control is relatively expensive on a per passenger basis. Nevertheless, we believe that cost reduction is still possible.

CHAPTER 3

TRANSPORTATION CENTER OPERATIONS

3.1 Vehicle Control

When Metro Mobility began operations on April 2, 1979, it employed a staff of ten persons in the Transportation Center. Eight of these were given the title "transit information representatives". Some of these persons were transfers from MTC's Information Center, but the majority were new hires. The remaining two persons were PM dispatchers shifted over to Metro Mobility.

Under PM, a distinction was made between call-takers/telephone operators, who received requests for service, and dispatchers, who developed tours and actually dispatched vehicles. Under the new set-up, information representatives were intended to do both call-taking and scheduling. The PM dispatchers located in the Transportation Center were involved primarily in tour formation. A separate group of PM dispatchers was retained at the PM garage for the actual dispatching of PM vehicles, as well as scheduling and dispatching the White Bear Lake service. The Metro Mobility staff was responsible for providing the PM dispatchers with the tour information. The reason for this separation of functions was twofold. First, it was intended to maintain the concept of the Transportation Center as independent from any provider; just as taxi tours were telephoned to a taxi dispatcher separate from the Transportation Center and employed by the providers, so too with PM. Secondly, the separation made it somewhat easier to create a new job classification for persons who would both answer phones and create tours. However, this concept proved to be relatively inefficient and, coinciding with a major restructuring of the Transportation Center, all PM dispatchers moved into the Transportation Center on September 4, 1979. This will be described further below.

Vehicle control is composed of three separable functions: call taking, tour formation or scheduling, and dispatching. An activity related to all three functions is responding to special problems. These functions are described below.

Call-takers are responsible for recording service request information (on special forms). The way the system initially functioned, forms for persons who would definitely be assigned to PM (as determined by classification number) would be filled out while the person was on the phone and, with the person on hold, the call-taker would check with the PM dispatcher as to the time of pick-up (for both the first and return trip). This process tended to both result in very long hold times for callers, and to disrupt the operations in general. The procedure was subsequently changed, as will be discussed later.

For persons who were not definitely assigned to PM, the call-takers would merely fill out the form (including a separate form for the return trip filled out after the phone call was completed) and place it on the dispatch table where it would subsequently be picked up by the person performing the scheduling. The forms were to be time stamped by the scheduler at approximately the time of call-in.

The call-takers were also responsible for handling complaints and problem calls (e.g., calls about late vehicles). In a manner similar to that of handling PM calls, the callers would be left on hold while the call-takers checked with the schedulers, who might, in turn, check with the taxi dispatcher. Again, this process appeared to tie up the phone and disrupt the activities of the Transportation Center, and was subsequently changed.

The scheduling function operated and basically continues to operate in the following manner. Periodically, a PM dispatcher would pick-up the service request forms left by the call-takers, and take the forms associated with passengers who would be assigned to PM. Subsequently, the taxi scheduler

would take the remaining forms and determine the zones of the origin and destination, based on the 1/2 mile zone system created for the fare structure. The scheduler then calculated the number of zones which would be travelled through in a direct trip. This was apparently found to be helpful in calculating tour cost (particularly since most tours were single passenger tours whose costs could be directly determined from the number of zones). The cards were then placed in a series of wall hung racks, where each rack contained cards of passengers desiring to travel during the same hour.

Approximately two hours before the desired times, the scheduler would begin to assemble taxi tours; i.e., at approximately 11:00 AM, the scheduler would begin to work with cards of passengers travelling between 1 and 2 PM.* After assembling tours and calculating the tour cost and reimbursement cost, the scheduler would contact the taxi companies (initially by telephone) and provide the necessary tour information. Tours are assigned to the three taxi companies on a 4:2:1 rotating basis.**

PM scheduling was handled the same way it had been in the past. Vehicle tours were displayed (by vehicle and time) on a wall hung rack. Under the initial Metro Mobility set-up, vehicle tours would be called into the PM dispatchers one hour before the tours were scheduled to begin.

* If a PM vehicle were underutilized, the PM dispatcher would check the taxi forms to see if a taxi passenger could be shifted to PM (since that passenger would effectively be carried free).

** Initially, there were some problems with taxi companies (particularly the smallest ones) refusing trips during peak hours. Taxi companies lose their turn in the rotation if they refuse a trip. However, this problem appears to have been corrected.

The control functions were initially carried out in a single, large room. Call-takers were located at a large table, with partitions separating call-taking stations. Racks containing PM passenger/tour information were mounted on the walls in one corner of the room, and PM tour formation was essentially done at that corner. Taxi passenger information was mounted in a separate corner. Persons creating taxi tours moved between this area, the middle of the long table where they collected request forms from the call-takers, and the end of the table where they formed tours and contacted the providers. This initial set-up proved to be inefficient for overall control purposes, particularly since the same persons performed different functions and were constantly moving around (and getting in each others' way). The problem was exacerbated when PM expanded to St. Paul. When the remaining PM dispatchers were moved over to Metro Mobility, the entire tour making/scheduling function was moved out of the existing room into a room directly below. This served to eliminate a lot of the confusion that had existed before. The two rooms were connected by chutes so that service request and other forms could be moved from the call-takers to the schedulers. The change was intended to allow both groups of persons to more easily concentrate on their own functions. The new set-up was designed to allow the call-taking function to be moved downstairs during evening (non-peak) hours.

The procedural major changes that accompanied the physical changes were the following:

1. Call-takers no longer keep callers on hold while checking on anything. PM passengers are called back by the "downstairs" staff after an assignment has been made.
2. Similarly, all problems are recorded on a special color form which is dropped downstairs for the schedulers to deal with. Where necessary, the caller is kept on hold, but the scheduler picks the phone back up.
3. Tour information is transmitted to the taxi companies via teletype terminal rather than telephone.

4. PM tour information is transmitted directly to the drivers via radio.

While these changes should have solved many of the problems (and, in fact, did solve some of them) extensive observation of the Transportation Center during the month of September suggests that there are still a considerable number of problems which must be dealt with.

First of all, the call-taking operation has totally deteriorated. Based on a two hour observation, callers are left on hold during the peak morning period for an average of just under 8 minutes, with some callers on hold for as long as 19 minutes!* The average length of conversation was 1.87 minutes; thus a typical caller is on the phone for almost 10 minutes total. As a result of this, all eight phone lines are almost constantly lit. Our analysis indicated that a line coming free remained so for less than 1/2 minute on average.

Clearly, this represents extremely poor service for persons trying to request service. While complaint logs are no longer being maintained, our discussion with staff including the Mn/DOT liaison suggests that many passengers are extremely upset, and some may no longer use the service. The poor phone service certainly constrains the number of trips which can be taken. Many callers must receive busy signals; some call back a few times, others may give up entirely. (The telephone company attempted to analyze this back in June when the problem was not as severe. While their results are somewhat questionable, they reported that, for the 10 AM - 12 noon time period, there were more than twice as many attempted calls as serviced calls.) The call-takers perceive, with apparent justification, that they are significantly understaffed and overworked.

* We suspect, but have no supporting data, that the Transportation Center staff worked faster than usual because they knew they were being observed.

While some of the problems can be traced to an increased volume of calls for service, there are a number of other factors at play. Average ridership for a September weekday was approximately 825. Subtracting standing orders and considering that most callers request two trips at a time, the average weekday telephone volume was approximately 250. While it is no longer possible to determine the hourly distribution of calls (since cards are no longer time stamped at or near the time the call is received), by utilizing a time of day analysis conducted in May it is possible to estimate the hourly distribution of calls. This estimate is presented (as a range of values $\pm 10\%$ around the estimated values) in Table 3.1.*

This table suggests that the maximum current call rate is just under 40. There is no reason why a properly operated Transportation Center with two call-takers cannot handle 40 requests per hour with virtually no holding.** The problems, as we see it, are the following:

1. The call-takers fill out a return trip form while callers are being kept on hold. While it has been recommended in previous assessments that this practice be stopped (and that the return trip forms be filled out when the phones are not busy), the argument currently is that the phones are constantly lit up, so that it does not matter when the forms are filled out. This practice currently takes almost 1 minute (this is much longer than it should take, and is a reflection of the fact that a number of the call-takers are somewhat handicapped) and significantly reduces the capacity of the call-taking process. We strongly recommend that a

* There are calls other than service request calls. Our analysis suggested that they represent less than 10% of the total; the figures in the table include that adjustment.

** As a point of comparison, we obtained data from CRT (Cleveland). In October, 1978, CRT found itself with insufficient phone capacity. They had 8 lines, the same as Metro Mobility and five call-taker/schedulers, all of whom were equipped with computer terminals. CRT reported an average daily call volume of 372, and a two hour peak of 139 (almost double that of Metro Mobility). They further report an average daily hold time of 1.5 minutes, with an 11 minute maximum.

Table 3.1
Time of Day of Calls

Time	Number of Calls
6 - 7 AM	15 - 18
7 - 8	20 - 23
8 - 9	24 - 29
9 - 10	33 - 39
10 - 11	21 - 26
11 - 12	22 - 27
12 - 1	16 - 20
1 - 2	7 - 8
2 - 3	11 - 13
3 - 4	2 - 2
4 - 5	5 - 6
5 - 6	5 - 6
6 - 7	19 - 23
7 - 8	18 - 22
8 - 9	11 - 12
9 - 10	2 - 2
10 - 11	17 - 20
11 - 12	2 - 2
12 - 1	0 - 0
Total	250 - 300

Table 3.1

Time of Day of Calls

Time	Number of Calls
6 - 7 AM	15 - 18
7 - 8	20 - 23
8 - 9	24 - 29
9 - 10	33 - 39
10 - 11	21 - 26
11 - 12	22 - 27
12 - 1	16 - 20
1 - 2	7 - 8
2 - 3	11 - 13
3 - 4	2 - 2
4 - 5	5 - 6
5 - 6	5 - 6
6 - 7	19 - 23
7 - 8	18 - 22
8 - 9	11 - 12
9 - 10	2 - 2
10 - 11	17 - 20
11 - 12	2 - 2
12 - 1	0 - 0
Total	250 - 300

new carbon copy service request form be used, with one copy serving for the initial trip, and the second copy used for the return trip.

2. The average of 1.9 minutes per call is fairly long, reflecting the fact that call-takers are not keeping the calls as short as possible and, in fact, even engage in general conversations with some callers. There appears to be little attempt by supervisors to change this practice.
3. Call-takers appear to be able to take breaks at will, without reporting to the supervisor or seeking relief. At one point during an observation period, the only call-taker left his post, leaving it entirely uncovered.
4. No attempt seems to be made to schedule staff so that two handicapped persons, who tend to be somewhat slower than the non-handicapped, are not scheduled as call-takers at the same time.
5. The staff seems to consider the current situation as fairly normal. Since the phone lines are constantly busy, they seem to make no attempt to work any faster. Again, poor supervision may be part of the problem.

The use of the two-ply service request forms should, by itself, increase the capacity of the call-takers by 30-40%. The other key element is to improve overall supervision, and get the call-takers to understand that their job does require that they work as quickly as possible.

The (shared-ride taxi) scheduling process does appear to have improved significantly since the early months. However, there are still a number of problems.

Paramount is the issue of scheduling shared-rides. While this should be the focus of the schedulers' job, it appears to have been underemphasized in the initial training. This has been corrected somewhat during subsequent training sessions, but the evidence suggests that there is still insufficient attention being played to this aspect of scheduling. The schedulers have claimed throughout that there was insufficient time for effective scheduling. (The schedulers frequently run somewhat in dispatching tours, which they blame on the work load.) While there is clearly some truth to their assertion,

the fact remains that the time constraints are in part the result of the inefficient Transportation Center procedures.

First of all, the switch from telephone to teletype for communications to the taxi companies has decreased the speed of the schedulers. (On the other hand, it has been a significant boon to the taxi companies, who no longer have to manually transcribe the information and who now have a printed record with which to generate invoices.) The largest taxi company reports that it has saved one full time clerical person. The smaller companies also report significant staff savings. This is the result of poor typing abilities of the schedulers. However, the situation need not be as bad as it currently is. We observed two schedulers who typed at speeds of 6 and 10 words per minute respectively. (The former would require approximately 42 minutes to transmit information on 25 tours/33 passengers; the latter would take some 26 minutes.) A scheduler who could type at a nominal speed of 20 words per minute could save a significant amount of time; effectively one-half of a person. While the initial job specification did not call for typing ability, any future hires should have that capability. Furthermore, only those current staff members who can type reasonably well should be allowed to handle the teletype.

A second problem is that the schedulers (and PM dispatchers) are required to call back every PM passenger to confirm their pick-up time. This requires over 100 calls per day, which can be fairly time consuming. Most other systems of this type utilize callbacks only for those passengers who cannot be picked up within a reasonable time (e.g., 20-30 minutes) of the desired pick-up time.*

A third problem has stemmed from an inefficient set-up of the room, which required considerable movement on the part of

* Callbacks are also needed in those cases where passengers cannot be served at all. Our analysis of callbacks for 1 day revealed only two such turndowns.

the call-takers. While this problem has been largely eliminated, there may still be room for further improvements.

A related issue is that cards being sent down from the call-takers arrive at two different points. While the call-takers have been asked to change positions so that they can use the same chutes, they have apparently refused to move, and no attempt has been made to force the issue.

Another issue is that the PM dispatchers* apparently provide little assistance to the taxi schedulers when such help may be possible. While a separation of taxi and PM functions is desirable in general, one of the original concepts of Metro Mobility was to achieve economies through centralized control. A particular problem is that, while the PM dispatchers are supposed to sort incoming request forms, pulling out those which can be assigned to PM, this function is generally performed by the taxi schedulers.

An issue worth noting is the general attitude of the staff. From the start, the staff has had the impression that the Transportation Center was understaffed. In fact, if anything, the Transportation Center was significantly overstaffed at first. Because of this, staff members got into a habit of working fairly slowly. As a result, as the system has increased to the point where current staffing is probably appropriate if the operation functioned smoothly (see the discussion below), the staff is unable to handle the demands placed upon them in a truly efficient manner.

As in any organization, some of the staff have shown themselves to be extremely competent while others have been marginal at best. While some of the less able staff members are no longer employed, some of the others still are. This contributes to the perception of being understaffed.

* PM dispatching itself is not a focus of this report, since that activity was carried out prior to the inception of Metro Mobility.

Again, part of the problem may stem from poor supervision. The Metro Mobility managers are not providing sufficient guidance, supervision, or encouragement. This issue is addressed further in the next section.

Two remaining issues worth discussing are staff size and the physical characteristics of the Transportation Center. First of all, the present staff size is probably reasonable. However, there appears to be some overstaffing during certain hours, particularly evenings and weekends. Table 3.2 indicates current and suggested staffing requirements (in a situation where the Transportation Center is operating smoothly). This is based on estimated hourly telephone load, computed earlier, and the scheduling/dispatching load, as computed for Friday, September 14, a fairly busy day. As can be seen, the current staffing schedule is fairly consistent with the estimated required staffing, except during evening hours. Part of the difference reflects the need to schedule breaks. In addition, there has been a considerable amount of absenteeism; some amount of overstaffing helps minimize the impact of missing staff members. However, as noted in Chapter 2, there has also been a considerable amount of scheduled overtime,* in part to make up for absenteeism. If the schedules could be adjusted so that there were fewer persons scheduled for evening hours (and more during peak periods), there might be less of a need for overtime. In addition, we would recommend assigning at least one staff member to an "extra board" to be called in to cover in the case of absence and vacation. Currently, when someone is missing, either no one covers for that person, or overtime is required.

* Currently, there appears to be an additional PM dispatcher programmed for overtime every day. We have consistently observed three PM dispatchers on duty, while the schedule calls for only two. Current ridership levels, plus our observations, suggest that there is no need for more than two PM dispatchers at any time.

Table 3.2

Current and Suggested Staffing Requirements

Time	Calls	Taxi Trips	PM Trips	Current Scheduled Staff (Wednesday)	Estimated Required Staff
6 - 7 AM	15 - 18	16	2	4	3
7 - 8	20 - 23	25	42	6	5
8 - 9	24 - 29	28	45	6	6
9 - 10	33 - 39	29	30	6	6
10 - 11	21 - 26	25	22	6	6
11 - 12	22 - 27	25	20	7	6
12 - 1	16 - 20	30	23	7	6
1 - 2	7 - 8	39	25	8	6
2 - 3	11 - 13	30	39	5-8	6
3 - 4	2 - 2	39	51	5	6
4 - 5	5 - 6	43	57	5-7	5
5 - 6	5 - 6	16	21	7	4
6 - 7	19 - 23	13	17	7	4
7 - 8	18 - 22	11	11	7	4
8 - 9	11 - 12	12	3	5-6	4
9 - 10	2 - 2	10	8	4	3
10 - 11	17 - 20	6	17	4	2
11 - 12	2 - 2	3	4	3	1
12 - 1	0 - 0	3	1	3	1

The final issue, the physical characteristics of the Transportation Center itself, is less important, but nonetheless worth discussion. Despite the adequate size of the facility, the overall impression one gets is one of amateurism, particularly in the downstairs dispatch room. The map is handmade and not formally mounted. Cards are placed in various types of hooks and racks. The room has a cluttered appearance. While we do not feel the need to stress this - it is not a major issue - a better designed control room might contribute to improved performance of the staff.

3.2 Administration

In any business, there is a temptation to blame poor performance on poor management. In the case of Metro Mobility, this assertion may be justified. Consider the following:

1. The Manager is often not at the Transportation Center.
2. The Assistant Manager has indicated that he believes that his job relates to Project Mobility only, and has nothing to do with the overall Metro Mobility demonstration.
3. The Manager and Assistant Manager work the same hours, leaving no supervision whatsoever during early mornings, evenings, and weekends.
4. The Mn/DOT liaison in the Transportation Center reports that he is constantly being asked for advice from the staff and fielding complaints from the public because the managers are not present.
5. The managers have been unable to design a system to adequately cover for absences, and have had difficulty recognizing when overtime is really needed. The managers also appear to have little feel for when to transfer staff between the upstairs and downstairs control rooms.
6. Despite an apparent policy against the practice, drivers are allowed into the control room on a daily basis. The presence of drivers (one of whom brings doughnuts every morning) does little to help the efficiency of the operations.

7. Observations of the Transportation Center over the course of the project strongly suggest that the managers provide little in the way of supervision or guidance to the staff.
8. The Transportation Center has run out of important supplies on a number of occasions.
9. On at least two occasions, staff members have quit but the managers did not realize it for a period of a few days.

The results of this problem are clearly manifested in the performance of the Transportation Center staff. The recent resignation of the Project Manager offers an opportunity to improve the situation. Obviously, an attempt should be made to find a Project Manager who understands the importance of the project and is willing to make a concerted effort to control the operation. In addition, we would offer the following suggestions:

1. Schedule the Manager and Assistant Manager on different (but perhaps overlapping) shifts, so that there is someone in charge during most operating hours.
2. During any period in which a manager cannot be scheduled to be present, one of the Transportation Center staff should be officially designated "acting supervisor" (even if it means a slightly higher pay during those hours). It is important that it be recognized that "someone is in charge" at all times.
3. It should be made clear that the Assistant Manager's position relates to Metro Mobility as a whole, and not just Project Mobility. Part of the problem stems from the fact that the current Assistant Manager was formerly a PM dispatcher; hence, there is a natural tendency to associate with PM. If the Metro Mobility concept of a truly coordinated service is to be achieved, it is important to downplay the distinction between MM and PM.

These suggestions can only help if the Manager and Assistant Manager are committed to make the system operate properly.

A related administrative issue is record keeping. Thus far, the terms of the contract with Mn/DOT regarding record

keeping have not been kept. Periodic reports of ridership by handicap classification and time of day are not being prepared. Summary reports indicating ridership by provider are also not being prepared.* These reports were to have been the responsibility of Transportation Center management. Furthermore, MTC has been extremely late in providing cost information, and there is some question about the accuracy of the data. Staff have not been encouraged to fill out fully all cards and save all forms, making it somewhat difficult to monitor the service. The first data on costs were provided in September, six months after the start of the project. No data on the costs of PM (important for measuring the impacts of Metro Mobility) have been provided. While this problem is not as critical to the day to day operation of the Transportation Center as is poor supervision, the lack of timely data makes it difficult to monitor the service effectively and allow for system changes in response to operating problems.

* The contract with Mn/DOT calls for other data as well.

CHAPTER 4

CONCLUSIONS AND RECOMMENDATIONS

Basically, the Metro Area Transportation Handicapped Demonstration is succeeding in: expanding the services available to the handicapped community; demonstrating the potential economies of private sector operation; and demonstrating the feasibility of coordinating public and private sector services. However, current problems with the operation of the Transportation Center threaten to undermine many of the gains made. The problems may lead to increasing public mistrust of the service and service reliability, as well as unnecessarily high costs. The focus of the next few months should be on improving the performance of the Transportation Center. To this end, we offer the following recommendations, many of which appeared in the previous chapters.

1. First and foremost, replace the current management with personnel who are willing to actively direct the project, monitor operations, and supervise the staff.
2. Revise the call-taking process so that service request forms need only be filled out once.
3. Revise the scheduling process so that PM call-backs are needed for exceptions only.
4. Assign only qualified typists to work with teletype.
5. Rearrange the staff schedule to more adequately reflect the work load, and improve procedures for covering for absences and breaks (possibly through an extra board). The rescheduling should include the managers. A staff member should be placed in charge during all times a manager is not (scheduled to be) present.
6. Review current staff carefully and replace persons who do not appear to be performing adequately.
7. Institute a formal training program for new staff. Training for schedulers should emphasize tour formation and shared-riding (which should also be reemphasized with existing staff).

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8. Improve the quantity, quality, and timeliness of data collection and reporting.
9. Continue to explore the feasibility of providing computer assistance for some Transportation Center functions. The taxi company staff savings resulting from the installation of the teletypes is indicative of the kind of impact automation can have.

We also recommend that a more complete evaluation of Metro Mobility be undertaken after a full year of operation. In addition to providing an opportunity to determine whether the problems cited here have been alleviated, that evaluation can focus on some additional issues, such as:

1. The performance of the private providers who will operate in the suburban areas.
2. The costs and performance of PM.
3. Passenger reactions, as determined by survey.
4. Detailed operating results, such as origin-destination, distribution, and passenger service levels.

Some additional detailed information on the operation to-date is included in Appendix A.

APPENDIX A

DETAILED OPERATING RESULTS

In this Appendix, some additional detailed operating results are presented and briefly discussed.

A.1 Day of Week (Shared-Ride Taxi)

Table A.1 presents an analysis of ridership by day of week for the first 5 months of taxi service.

Table A.1

Daily Taxi Ridership (through August)

	Sun.	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.
Average	145	274	270	272	292	283	135
Maximum	212	368	349	385	364	383	204

This table suggests that ridership does not vary significantly from weekday to weekday, although the latter part of the week is slightly heavier. As expected, weekend ridership is approximately 1/2 of weekday ridership. Sunday ridership is slightly higher than Saturday ridership, probably reflecting trips to church.

A.2 No Shows

Table A.2 indicates the no show rate for both PM and taxi for the first 6 months of Metro Mobility operation.

Table A.2

No Show Rate

	April	May	June	July	August	September
Taxi Pass.	2878	5787	6699	7964	8981	8842
Taxi No Shows	190	381	360	380	464	
% No Shows	6.6%	6.6%	5.4%	6.7%	7.3%	
PM Pass.	5686	6067	5900	7527	11354	12289
PM No Shows	169	223	250	271	485	535
% No Shows	3.0%	3.7%	4.2%	3.6%	4.3%	4.3%

As can be seen, the taxi service has experienced a no show rate approximately twice that of PM's. The likely reasons for this are: 1) the inexperience of the control staff (who often forgot to pull the return trip card for no show taxi passengers during the early weeks, thus generating a second no show); 2) the inexperience of the taxi drivers, some of whom would arrive early; and 3) the fact that many of the passengers were first time passengers. The taxi no show rate is not significantly higher than that experienced by other, similar services. However, the fact that it has not decreased is disturbing. It is time to review no show records and decide whether it is necessary to contact chronic no shows. Furthermore, it would probably be reasonable to review no shows in depth for a couple of days to pinpoint whether the fault lies with the passenger or the Transportation Center.

A.3 Trip Purpose Distribution

Call-takers are supposed to ask passengers requesting service for the purpose of their trip. We attempted to sample

the information for the purposes of the report. The result of this analysis for a single weekday is presented in Table A-3.

Table A.3
From Home Trip Purpose Distribution

	Work	School	Medical	Recreation	Other	Not Avail.
Taxi No.	26	11	39	2	113	91
Pct.	9.2%	3.9%	13.8%	0.7%	40.1%	32.3%
PM No.	72	7	18	8	82	12
Pct.	36.2%	3.5%	9.0%	4.0%	41.2%	6.0%

Looking at the results in Table A.3, it would appear that the call-takers have not been reliable about recording the information. Given the preponderance of "other" responses, we suspect that the call-takers often did not ask the question, and simply filled in a response. Thus, the results are somewhat suspect. About the only element of the results that appears reasonable is that PM carries many more work trips than does the taxi service. The reason for this is that the taxi service is serving many elderly persons who are less likely to be employed.

A.4 Rate Structure

A zone based rate structure was established for the shared-ride taxi service. The intention was for the rates to approximate meter rates. The contracts with the taxi companies called for a comparison of zone rates with meter rates, leaving the option of a change to the rate structure if the rates did not match. To effect a comparison, some of the taxi companies ran their meters during the first month of service, and then

again for 3 days after that the (exclusive-ride) taxi meter rates were increased. The results for one of the companies are shown in Table A.4. From this table, it would appear that the zone fare structure was a little on the high side at first (the taxi companies stopped testing the rate structure after the initial results), but is currently extremely close to the meter rates.

Table A.4
Test of Rate Structure

	April	August
Meter	1374	446
Zone	1567	430
% deff.	+14%	-3.5%

A.5 Taxi Ridership and Cost by Company

Table A.5 provides a breakdown of tours allocated by taxi company along with total tour cost. As can be seen, the taxi companies are providing service at fairly close to the target levels. Red & White was below target at first, largely because of a problem with service refusals. That problem appears to have been eliminated at this point.

Table A.5

Taxi Service by Company

	April	May	June	July	August	Sept.	Target
Yellow							
Tours	1417	2778	2846	3334	3564	3613	-
% of Total	57.6%	56.2%	55.1%	55.7%	55.8%	55.3%	57.1%
Cost	5084	9681	10674	12940	15814	16876	-
% of Total	58.2%	56.5%	54.7%	52.0%	52.2%	51.5%	57.1%
Blue & White							
Tours	799	1676	1682	1867	1998	2053	-
% of Total	32.5%	33.9%	32.5%	31.2%	31.2%	31.4%	26.8%
Cost	2764	5695	6394	8773	10241	9349	-
% of Total	31.6%	33.2%	32.7%	35.3%	33.8%	28.5%	28.6%
Red & White							
Tours	241	488	638	783	820	863	-
% of Total	9.8%	9.8%	12.3%	13.1%	12.8%	13.2%	14.3%
Cost	879	1744	2457	3158	4193	4222	-
% of Total	10.0%	10.2%	12.6%	12.7%	13.8%	12.9%	14.3%
Total							
Total Tours	2457	4942	5166	5984	6382	6529	-
Total Costs	8727	17120	19525	24871	30248	32754	-